

CCTV Camera  
**WV-BP102**

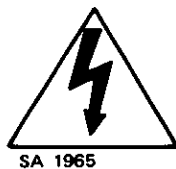
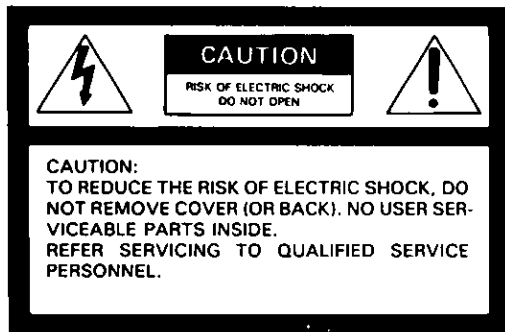
# Operating Instructions



(Lens : option)

## **Panasonic®**

Before attempting to connect or operate this product,  
please read these instructions completely.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For U.S.A.

**Warning:**

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instruction manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

For CANADA

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

The serial number of this product may be found on the bottom of the unit. You should note the serial number of this unit in the space provided and retain this book as a permanent record of your purchase to aid identification in the event of theft.

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

**WARNING:**

**TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.**

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## PREFACE

Panasonic's CCTV Camera WV-BP102 introduce a new level of high picture quality through the use of a 1/3 inch interline transfer CCD having 512 horizontal pixels (picture elements). High performance-to-cost ratio is achieved through the use of newly developed Sync IC's and ability to shoot indoor scenes with a fixed iris lens by use of Electronic Light Control (ELC) function.

## FEATURES

- Minimum illumination of 0.03 footcandle (0.3 lux) at F1.4 and Signal-to-noise ratio of 46 dB by employing a 1/3 inch interline transfer CCD image sensor with 512 (H) × 492 (V) pixels.
- 380 lines of horizontal resolution.
- Either optional standard C-mount or Special C-mount (CS-mount) auto iris control lens can be used with.
- Selectable auto iris control signal for the lens either a video signal or DC control signal.
- Switchable Multiplexed Vertical Drive (VD2) automatically for Gen-lock system.
- Ability to shoot indoor scenes with fixed iris lens by use of Electronic Light Control (ELC) function.
- Two power source are available. (12V DC, DC power supplied from the specified monitor or camera drive unit.)

## PRECAUTIONS

- **Do not attempt to disassemble the camera.**

To prevent electric shock, do not remove screws or cover. There are no user-serviceable parts inside. Refer servicing to qualified service personnel.

- **Handle the camera with care.**

Do not abuse the camera. Avoid striking or shaking it. The camera could be damaged by improper handling or storage.

- **Do not expose the camera to rain or moisture, or try to operate it in wet areas.**

Do take immediate action if ever the camera do becomes wet. Turn power off and refer servicing to qualified service personnel. Moisture can damage the camera and also create the danger of electric shock.

- **Never face the camera toward the sun.**

Whether the camera is in use or not, never face it toward the sun. Do use caution when operating the camera in the vicinity of spot lights or other bright lights and light reflecting objects.

- **Do not operate the camera beyond its temperature, humidity or power source ratings.**

Do not use the camera in an extreme environment where high temperature or high humidity exist. Use the camera under conditions where temperatures are within  $-22^{\circ}\text{F}$  -  $122^{\circ}\text{F}$  ( $-30^{\circ}\text{C}$  -  $+50^{\circ}\text{C}$ ), and humidity is below 90%.

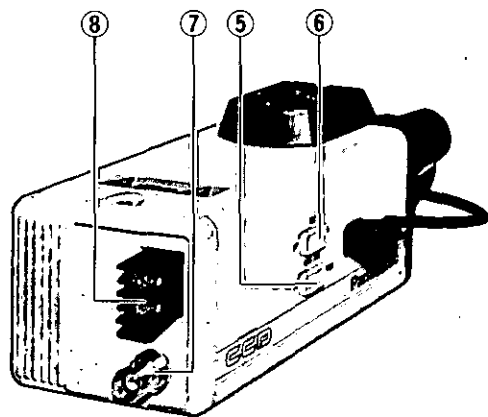
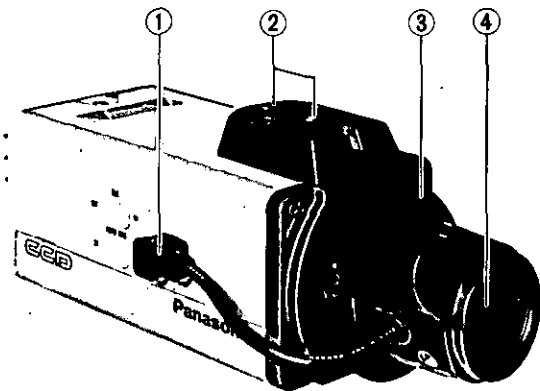
### Caution :

To prevent fire or shock hazard, the UL listed wire VW-1, style 1007 should be used for the cable for DC 12V Input Terminal.

### CAUTION :

CONNECT THIS TO A DC 12V CLASS 2 POWER SUPPLY ONLY.

## MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS



**(1) Auto Iris Lens Connector**

This 4-pin female connector supplies the power and either video signal or DC control signal to the auto iris lens.

A 4-pin male connector, which can be mated with the camera's female connector, is supplied as a standard accessory (Part No. YFE4191J100).

This male connector can be installed on lenses which have incompatible type connector.

See page 14 for installation details.

**(2) Camera Mounting Screw Hole**

These threaded holes (1/4" - 20) are used to mount the camera onto a mounting bracket or tripod.

**(3) Flange-back Adjusting Ring**

This ring is used to adjust the back focal length or picture focus by rotating this ring to clockwise for C-mount lens or counterclockwise for special C-mount (CS-mount) lens.

**Cautions :**

1. Always set this ring to fully clockwise before mounting the lens.
2. Do not turn this ring too much to counterclockwise when the C-mount lens is mounted as this could damage the inner glass and CCD image sensor.

**(4) Lens (Option)**

See pages 10, 11, 12 and 13 for details on lens selection.

**(5) Lens Selection Switch (AUTO IRIS, DC/VIDEO)**

This switch is used to select the supplied auto iris control signal to the lens from the Auto iris lens Connector (1).

**DC :**

Choose this position when the auto iris control lens requiring DC control signal such as WV-LA2.8, WV-LA4R5C3, WV-LA6B2, WV-LA9C3, WV-LA12B2, WV-LA18, WV-LA36, WV-LA4510, WV-LA608, WV-LA1208, WV-LZ81/6A, WV-LZ81/10, WV-LZ83/6, is mounted on the camera.

**VIDEO :**

Choose this position when the auto iris control lens requiring video signal such as WV-LA8B, WV-LA16B, WV-LA25B, WV-LA50B, is mounted on the camera.

**(6) Electronic Light Control ON/OFF Switch  
(ELC ON/OFF)**

**OFF :**

Choose this position used with an auto iris lens.

**ON :**

Choose this position used with a fixed or manual iris lens.

See page 6 for more details.

**(7) Video Output Connector (VIDEO)**

- A 1.0 Vp-p/75 ohms composite video signal is provided at this connector.
- This connector also receives DC power and vertical drive pulses for the camera from the video monitor and sends video information to the video monitor.

**(8) 12V DC In Terminal (DC 12V IN)**

This terminal accepts 12V DC power source (10.5V - 16V).

**ELC (Electronic Light Control)**

In this mode a continuously variable electronic shutter is employed to automatically control exposure times in the CCD Image Sensor, according to the incoming light level. With this mode selected, fixed or manual iris lens can be used instead of an ALC type lens.

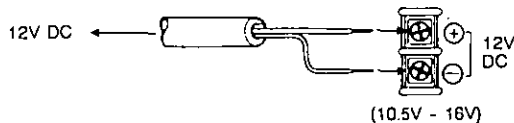
**Cautions :**

1. Under bright conditions such as outdoors, use an ALC type lens as the ELC control range is not wide enough under these conditions.
2. Under certain unique lighting conditions, the following may appear :
  - Strong smear and/or blooming on high light objects such as spot lights or windows.
  - Noticeable flicker on the picture.  
Should these phenomena occur, use an ALC lens.
3. When using in the ELC mode with a fixed iris lens, the depth of field of the image may be less than that obtained by using an ALC lens. Depth of field varies inversely with the iris opening. Thus, using this camera in the ELC mode with the fixed iris lens fully opened will result in less depth of field than if an ALC lens was used. (And distant objects in the picture might not be in focus).



## CONNECTION

1. A power supply of 12V DC is required.
2. Connect the power cable to the 12V DC In Terminal (8) on the rear panel of the camera.



Resistance of copper wire (20°C)

Copper wire size (AWG)	#24 (0.22mm <sup>2</sup> )	#22 (0.33mm <sup>2</sup> )	#20 (0.52mm <sup>2</sup> )	#18 (0.83mm <sup>2</sup> )
Resistance ohms/ft	0.257	0.165	0.099	0.059
Resistance ohms/m	0.078	0.050	0.030	0.018

### Caution :

To prevent fire or shock hazard, the UL listed wire VW-1, style 1007 should be used for the cable for DC 12V Input Terminal.

### CAUTION :

CONNECT THIS TO A DC 12V CLASS 2 POWER SUPPLY ONLY.

- Calculation method of maximum cable length between camera and power supply.

$$10.5V DC \leq V_A - (R \times 0.42 \times L) \leq 16V DC$$

L: Cable length (meter)

R: Resistance of copper wire (ohm/m)

V<sub>A</sub>: DC voltage of power supply

$$L_{\text{standard}} = \frac{V_A - 12}{0.42 \times R} \text{ (Meter)}$$

$$L_{\text{minimum}} = \frac{V_A - 16}{0.42 \times R} \text{ (Meter)}$$

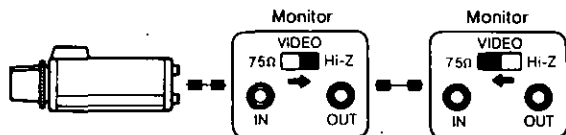
$$L_{\text{maximum}} = \frac{V_A - 10.5}{0.42 \times R} \text{ (Meter)}$$

### Note:

When the power is supplied via from the 12V DC In Terminal (8) and Video Output Connector (7), this camera is driven by the power supplied from Video Output Connector (7).

## Video Cable

1. It is recommended to use a video monitor whose resolution is at least equal to the camera's.
  2. Terminate the camera output with 75-ohm resistor at the furthest end of its cable run.
- It is recommended to use 75-ohm coaxial cable.
  - Always set the last monitor's termination switch to 75 ohms, and set the termination switches of intermediate monitors to high impedance (Hi-Z) position.



- The maximum extensible coaxial cable length between the camera and the monitor is shown in the table 1. Since cable quality varies among manufactures, verify video quality before final installation if maximum lengths are to be used.

Table 1

Type of coaxial cable		RG-59/U (3C-2V)	RG-6U (5C-2V)	RG-11/U (7C-2V)	RG-15/U (10C-2V)
Recommended maximum cable length	(ft)	825	1,650	1,980	2,640
	(m)	250	500	600	800

### Note:

Recommended maximum cable length between this camera and WV-PS11A/ WV-PS104B is also same as the Table 1.

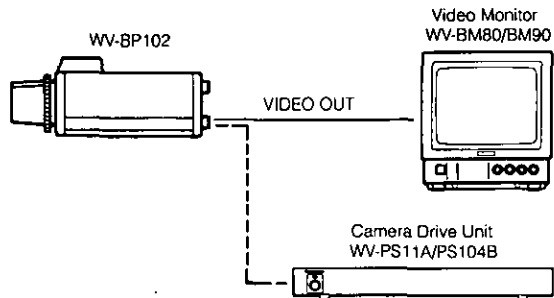
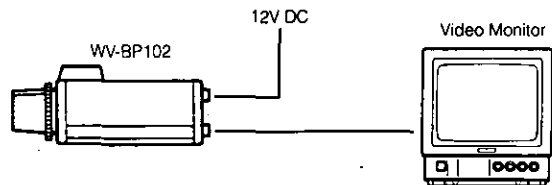
### 3. Wiring precautions :

- Do not bend coaxial cable into a curve whose radius is smaller than 10 times the cables diameter.
  - Never staple the cable-not even with circular staples. Mismatching will occur.
  - Never crush or pinch the cable.
- All of these will change the impedance of the cable and cause poor picture quality.

## SYSTEM CONNECTION

### Caution:

Keep the Power On/Off switch turned off while making the connections.



# LENSES

## 1. Selection of Lens

<Auto Iris Lenses>

Models Specifications	WV-LA2.8 (Wide Angle)	WV-LA6B2 (Wide Angle)	WV-LA12B2 (Standard)	WV-LA18 (Telephoto)	WV-LA36 (Telephoto)	
Image Size	1/2" (6.4 (H) X 4.8 (V) mm)					
Focal Length	2.8 mm	6 mm	12 mm	18 mm	36 mm	
Maximum Aperture Ratio	1 : 1.4	1 : 1.4	1 : 1.4	1 : 1.4	1 : 1.8	
Angular Field of View 1/3"	H	67.5°	43.5°	22.8°	15.5°	7.7°
	V	69.2°	33.0°	17.1°	11.5°	5.7°
Focusing Range	Adjusted by Camera			0.89 (ft) - ∞ 0.27 (m) - ∞	3.3 (ft) - ∞ 1 (m) - ∞	
Mount	Special C-mount (CS-mount, 1"-32UN)					
Filter Size	None			φ37.5 mm, P = 0.5	φ37.5 mm, P = 0.5	
Dimensions	φ1-11/16" X 1-5/16" (φ43 X 34 mm)	φ1-11/16" X 1-7/16" (φ43 X 36 mm)	φ1-11/16" X 1-7/16" (φ43 X 36 mm)	φ1-11/16" X 1-5/8" (φ43 X 41 mm)	φ1-11/16" X 1-5/8" (φ43 X 41 mm)	
Weights	0.14 lbs. (65g)	0.11 lbs. (50g)	0.09 lbs. (40g)	0.15 lbs. (70g)	0.18 lbs. (80g)	

- Dimensions and weights indicated are approximate.
- Specifications are subject to change without notice.

<Auto Iris Lenses>

Models Specifications		WV-LZ81/6A (Motorized Zoom)	WV-LZ81/10 (Motorized Zoom)	WV-LA4R5C3 (Wide Angle)	WV-LA9C3 (Standard)
Image Size		1/2" (6.4 (H) × 4.8 (V) mm)		1/3" (4.8 (H) × 3.6 (V) mm)	
Focal Length		8.5 - 51 mm (6X)	8 - 80 mm (10X)	4.5 mm	9 mm
Maximum Aperture		1 : 1.2 (Wide) 1 : 1.3 (Tele)	1 : 1.4 (Wide) 1 : 1.7 (Tele)	1 : 1.2	1 : 1.2
Angular Field of View 1/3"	H	Wide : 31.4° Tele : 5.5°	Wide : 33.5° Tele : 3.5°	56.4°	29.6°
	V	Wide : 23.5° Tele : 4.1°	Wide : 25.2° Tele : 2.6°	43.3°	22.2°
Focusing Range		3.3 (ft) - ∞ 1 (m) - ∞	3.6 (ft) - ∞ 1.1 (m) - ∞	Adjusted by Camera	
Mount		Special C-mount (CS-mount, 1"-32UN)			
Filter Size		φ49 mm, P = 0.75	φ55 mm, P = 0.75	None	
Dimensions		3-3/8"(W) × 2-7/16"(H) × 3-7/8"(D) 86(W) × 62(H) × 99(D) mm	3-3/16"(W) × 2-5/8"(H) × 4-1/2"(D) 81(W) × 66(H) × 114(D) mm	φ1-11/16" × 1-1/2" (φ43 × 38.5 mm)	φ1-11/16" × 1-1/2" (φ43 × 38.5 mm)
Weights		0.93 lbs. (420g)	0.99 lbs. (450g)	0.09 lbs. (42g)	0.09 lbs. (40g)

- Dimensions and weights indicated are approximate.
- Specifications are subject to change without notice.

<Auto Iris Lenses>

Models Specifications		WV-LA4510 (Wide Angle)	WV-LA608 (Wide Angle)	WV-LA1208 (Standard)	WV-LZ83/6 (Motorized Zoom)
Image Size		1/2" (6.4 (H) × 4.8 (V) mm)			
Focal Length		4.5 mm	6 mm	12 mm	8.5 - 51 mm (6X)
Maximum Aperture		1 : 1.0	1 : 0.75	1 : 0.8	1 : 0.8 (Wide) 1 : 1.0 (Tele)
Angular Field of View 1/3"	H	56.9°	43.8°	23.8°	Wide : 31.3° Tele : 5.5°
	V	43.6°	33.1°	17.6°	Wide : 23.4° Tele : 4.1°
Focusing Range		Adjusted by Camera			4.0 (ft) - ∞ 1.2 (m) - ∞
Mount		Special C-mount (CS-mount, 1"-32UN)			
Filter Size		None	φ46 mm, P = 0.75	φ46 mm, P = 0.75	φ67 mm, P = 0.75
Dimensions		1-11/16" × 1-11/16" (φ43 × 43 mm)	2-1/16" × 2-3/16" (φ52 × 55 mm)	2-5/8" × 2-7/8" (φ66 × 72.5 mm)	3-1/2"(W) × 3"(H) × 4-5/8"(D) 90(W) × 77(H) × 119(D) mm
Weights		0.19 lbs. (85g)	0.34 lbs. (155g)	0.56 lbs. (255g)	1.63 lbs. (740g)

- When using the above lenses with the camera, be sure to read instruction manual of lenses.
- Dimensions and weights indicated are approximate.
- Specifications are subject to change without notice.

<Manual and Fixed Iris Lenses>

Models Specifications		WV-LM4R5A (Wide Angle)	WV-LM6B2 (Wide Angle)	WV-LM12B2 (Standard)	WV-LF4R5C3 (Wide Angle)	WV-LF9C3 (Standard)
Image Size		1/2" (6.4 (H) × 4.8 (V) mm)			1/3" (4.8 (H) × 3.6 (V) mm)	
Focal Length		4.5 mm	6 mm	12 mm	4.5 mm	9 mm
Maximum Aperture Ratio		1 : 1.4	1 : 1.4	1 : 1.4	1 : 1.2	1 : 1.2
Angular Field of View 1/3"	H	56.9°	43.5°	22.8°	56.4°	29.6°
	V	43.6°	33.0°	17.1°	43.3°	22.2°
Iris		Manual	Manual	Manual	Fixed	Fixed
Focusing Range		Adjusted by Camera				
Mount		Special C-mount (CS-mount, 1"-32UN)				
Filter Size		φ37.5 mm, P = 0.5	None	None	φ30.5 mm, P = 0.5	φ30.5 mm, P = 0.5
Dimensions		φ1-3/4" × 1-5/8" (φ44 × 41 mm)	φ1-11/16" × 1-9/16" (φ43 × 39 mm)	φ1-11/16" × 1-9/16" (φ43 × 39 mm)	φ1-3/8" × 1-7/16" (φ34.4 × 36 mm)	φ1-3/8" × 1-7/16" (φ34.4 × 36 mm)
Weights		0.20 lbs. (93g)	0.10 lbs. (45g)	0.08 lbs. (35g)	0.06 lbs. (29g)	0.05 lbs. (23g)

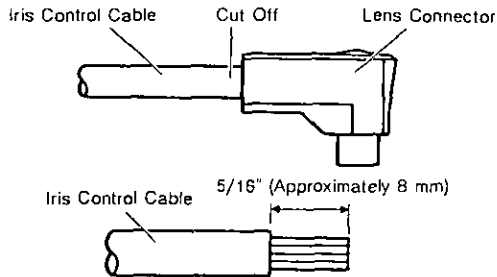
- Dimensions and weights indicated are approximate.
- Specifications are subject to change without notice.

## 2. Installation of Auto Iris Lens Connector

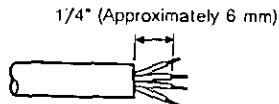
When you use an auto iris lens other than listed on pages 10, 11 and 12, for example a video servo ALC lens, install the lens connector (YFE4191J100) coming with the camera as follows.

The following installation should be made by qualified service personnel or system installers.

- (1) Cut off the iris control cable at the edge of lens connector and then cut off the outer cable cover as shown in the diagram.



- (2) Cut off the inner cable covers of the iris control cable as shown in the diagram.



- (3) Put the heat shrinkable tubes or equivalent tubes on the inner cables of the iris control cable.
- (4) Solder the inner cable of the iris control cable at the pin-plug block according to the following pin assignment and cover the heat shrinkable tubes or equivalent tubes over the soldered area and heat on the tubes to shrink them.

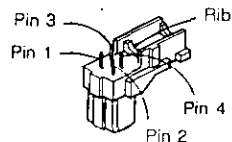
Pin 1 : Power source : +9V DC, 50 mA Max.

Pin 2 : Not used

Pin 3 : Video signal : 0.7Vp-p/40 kohms

Pin 4 : Shield, ground

(Set the Lens Selection Switch (5) to the VIDEO Position)

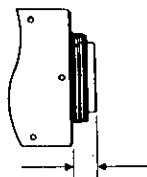
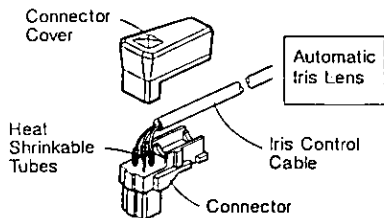




- (5) Both the connector cover and connector should be positioned to interlock.

**Note :**

Cut off the rib on the connector, when the iris control cable is too thick and the connector cover and connector can not be interlocked.



C-mount : Less than  $7/16"$  (11.5 mm)  
CS-mount : Less than  $1/4"$  (7.2 mm)

### 3. Mounting the Lens

When you use the lens other than listed on pages 10, 11, 12 and 13, lens mount should be C-mount or special C-mount (CS-mount 1"-32UN) and lens weight should be less than 0.99 lbs. (450g). If not, both the lens and camera should be secured. The protrusion of the rear of the lens should be as shown below.

**Caution :**

Always set the Flange-back adjusting ring to fully clockwise (C-mount side) by loosening screws on the ring before mounting the lens, otherwise the inner glass and CCD image sensor could be damaged by the lens.

- (1) Mount the lens by turning it clockwise onto the lens mount of the camera.
- (2) Connect the lens cable to the Auto Iris Lens Connector on the camera when an auto iris lens is used.
- (3) Set the Lens Selection Switch (5) to the proper position as follows.

## DC :

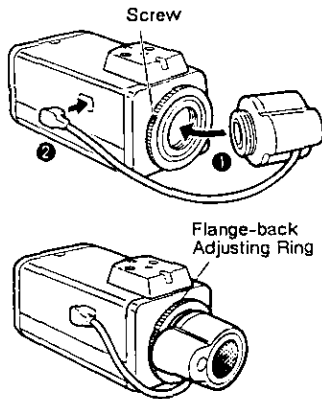
The mounted lens is one of the lenses listed on pages 10, 11 and 12 or one that requires the DC control signal for auto iris control.

## VIDEO :

The mounted lens requires video signal for auto iris control.

## Note :

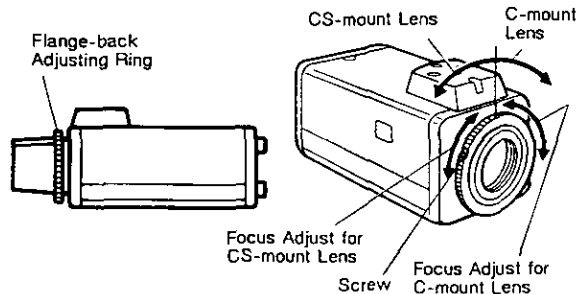
Refer to item (5) on page 5 for the lens selection switch.



## FOCUS OR FLANGE-BACK ADJUSTMENT

The following adjustment should be made by qualified service personnel or system installers.

1. Loosen screws on the flange-back adjusting ring.



2. Turn the flange-back adjusting ring to the desired position.

### Caution :

Do not turn this ring too much to counterclockwise as this could damage the inner glass and CCD image sensor.

3. Tighten the screws on the flange-back adjusting ring.

## INSTALLATION OF CAMERA

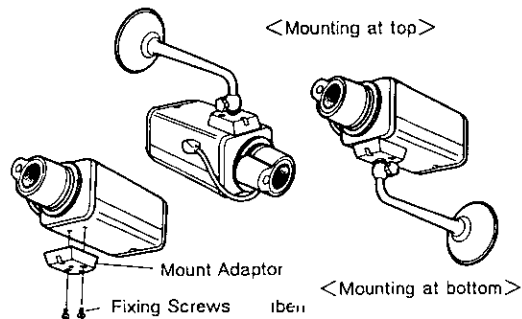
- **Mounting from the top**

This camera is originally designed to be mounted from the top, as shown. The hole is the standard photographic pan-head screw size (1/4" - 20).

- **Mounting from the bottom**

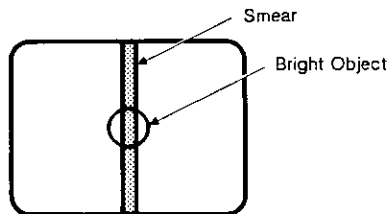
Remove the mount adaptor from the top of the camera by removing two fixing screws. Attach the mount adaptor to the bottom as shown in the diagram, then mount the camera on the mounting bracket.

**Make sure that two original screws are used when mounting the mount adaptor ; longer type screws may damage inner components.**



## PREVENTION OF BLOOMING AND SMEAR

When the camera is faced toward spot light or other bright lights and light reflecting objects, smear or blooming may appear. Therefore, the camera should be operated carefully in the vicinity of extremely bright objects to avoid smear or blooming.



## LENS MAINTENANCE AND CLEANING

1. Remove the lens connector.
2. Remove the lens, and inspect the camera CCD faceplate through the lens mount opening to assure that the faceplate is free of smudges or particles of dirt.
3. Clean the CCD faceplate, if necessary, using lens tissue or a cotton tipped applicator and ethanol.
4. Install the new lens.

## SPECIFICATIONS

Pick-up Device :	512 (H) × 492 (V) pixels. Interline Transfer CCD		
Scanning Area :	4.8 (H) × 3.6 (V) mm (Equivalent to scanning area of 1/3" pick-up tube)		
Synchronization :	Internal (at 12V DC) or Multiplexed Vertical Drive (VD2)		
Scanning System :	2 : 1 interlace		
Scanning :	525 lines/60 fields/30 frames		
Horizontal :	15.734 kHz		
Vertical :	59.94 Hz		
<b>Maximum Operable Distance to WV-BM90</b>	Coaxial Cable Type	Maximum Cable Length	DC R/1000 ft. of Inner Conductor
	RG-59/U	890 ft. (270m)	Less than 30 ohms
	RG-6/U	2210 ft. (670m)	Less than 12 ohms
Horizontal Resolution :	380 lines		
Video Output :	1.0 Vp-p composite, 75 ohms/BNC connector		
Signal-to-Noise Ratio :	46 dB		
Automatic Light Compensation :	ALC : 1 : 10,000 with F1.4 ALC lens		
Electronic Light Control :	Equivalent to continuous variable shutter speed between 1/60 sec. and 1/10,000 sec.		
Minimum Illumination :	0.03 footcandle (0.3 lux) at F1.4, AGC ON		
Lens Mount :	C-mount or special C-mount (CS-mount)		
Ambient Operating Temperature :	-22°F - 122°F (-30°C - +50°C)		
Ambient Operating Humidity :	Less than 90%		
Power Source :	12V DC at 200 mA or supplied from specified camera drive unit/monitor		
Dimensions (without lens) :	2-3/4" (W) × 2-3/4" (H) × 5-9/16" (D) 70 (W) × 70.5 (H) × 141 (D) mm		
Weights (without lens) :	1.2 lbs. (0.53 kg)		

Weights and dimensions indicated are approximate.  
Specifications are subject to change without notice.

## STANDARD ACCESSORIES

ALC Lens Connector (YFE4191J100) ..... 1 pc.  
Body Cap ..... 1 pc.

## OPTIONAL ACCESSORIES

Lenses : WV-LA2.8, WV-LA6B2, WV-LA12B2  
WV-LA18, WV-LA36, WV-LA4510  
WV-LA608, WV-LA1208, WV-LA4R5C3  
WV-LA9C3  
WV-LZ81/6A, WV-LZ81/10, WV-LZ83/6  
WV-LM4R5A, WV-LM6B2, WV-LM12B2  
WV-LF4R5C3, WV-LF9C3  
Camera Drive Unit WV-PS11A, WV-PS104B

# Panasonic

Broadcast & Television Systems Company

Division of Matsushita Electric Corporation of America

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