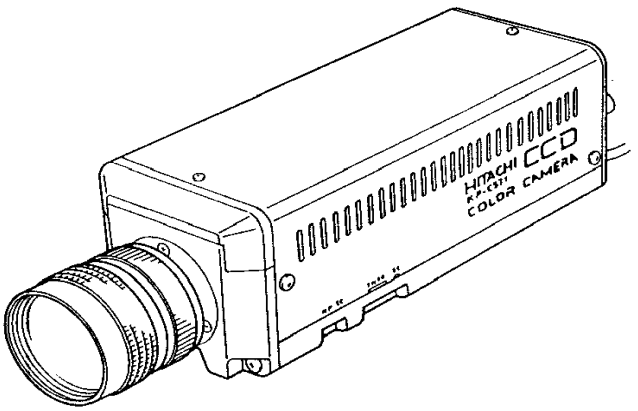
Operation Manual

CCD Color Camera

KP-C571



IMPORTANT:
READ "CAUTION FOR SAFE OPERATION" CAREFULLY AND UNDERSTAND THEM BEFORE USING YOUR COLOR CAMERA. RETAIN THIS OPERATION MANUAL FOR FUTURE REFERENCE.

Hitachi Denshi, Ltd.

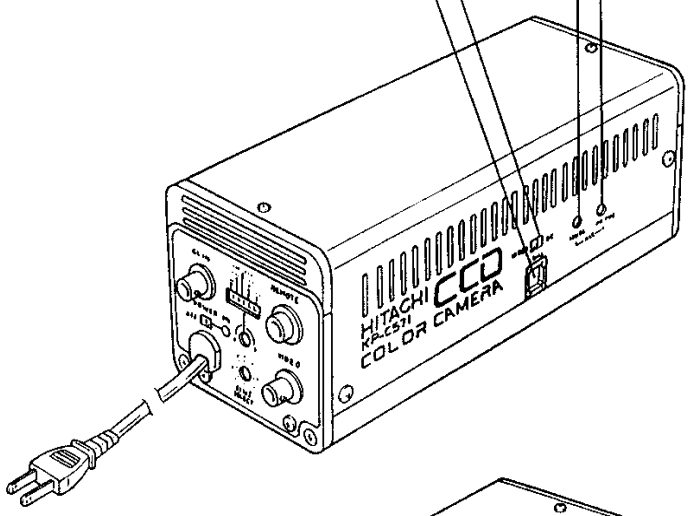
General

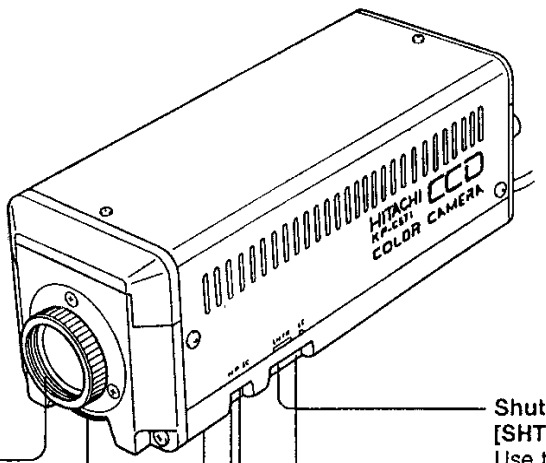
Name and function of each section

Lens selector switch [VIDEO/DC]
Select VIDEO or DC according to the auto iris system of a used lens.

Lens connector [LENS]

ALC lens control [ALC]
Adjust the photometric characteristic and the video level when an auto-iris lens having no iris amplifier is used.





C-mount adaptor
Use only when a C-mount lens is installed.

Flange focal distance adjustment ring

Camera mounting tapped holes

Shutter speed setting switch [SHTR]
Use to set a shutter speed.

Color phase control [SC]
Adjust the color phases of an external sync signal and a video output signal.

Horizontal phase control [HP]
Adjust the horizontal phases of an external sync signal and a video output signal.

White balance selector switch [AWC AUTO]
Use to select the white balance adjustment mode.

Automatic sensitivity selector switch [SENS]
Set to OFF for manual switching and to ON for automatic switching.

External sync termination switch [75Ω ON]
Set the 75Ω termination switch of the external sync signal to ON or OFF.
Set to ON unless an external sync signal is looped through.

External sync input connector [GL IN]
Connect a black burst signal (B.B.) or a composite video signal (VBS).

Pilot lamp

Power switch[POWER]

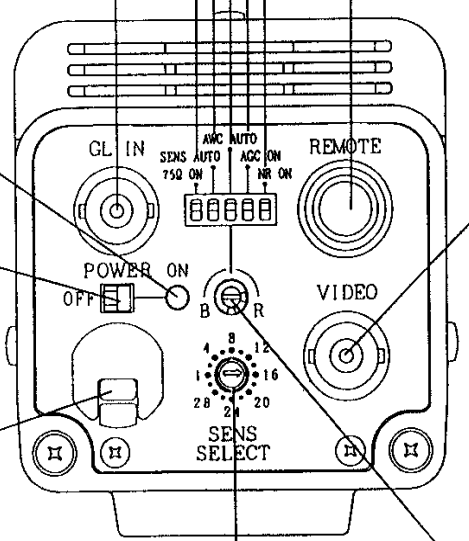
Power cable

Sensitivity setting switch[SENS]
Set sensitivity.

Gain switch [AGC ON]
Select the AGC mode or the standard gain mode. When this switch is set to ON, the AGC mode is established, and sensitivity increases automatically when illumination becomes dark.

Noise reduction switch [NR]
Set to ON to activate the noise reduction function. Set to OFF not to activate the noise reduction function.

Remote control terminal [REMOTE]
Use this terminal to control the sensitivity setting and the automatic sensitivity setting remotely.
Also use this terminal for external sync connection.



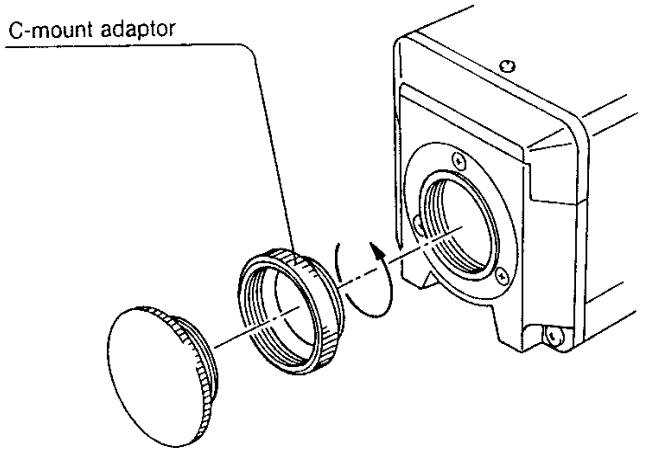
Video output terminal [VIDEO]
Connect to a video monitor, etc.

White balance control
Use to adjust white balance manually.

Lens

1. Installation of CS-mount lens

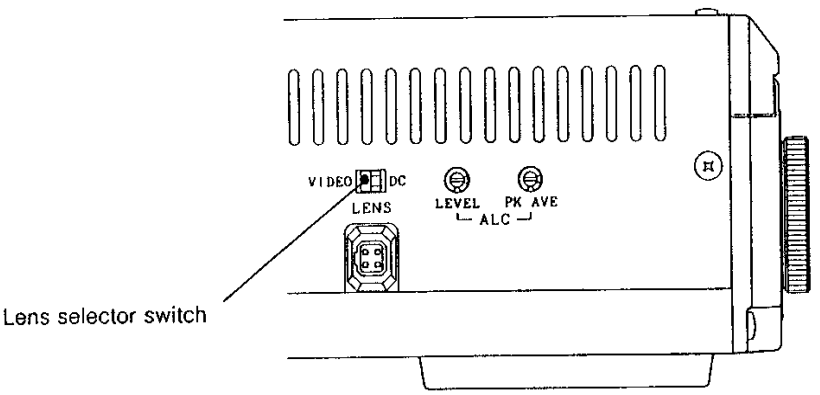
Before shipment, the C-mount adaptor for a C-mount lens is provided for the camera. When using a CS-mount lens, remove the C-mount adaptor by turning it counterclockwise.



Store the removed C-mount adaptor for future use.

2. When an auto-iris lens having no iris amplifier is used

When an auto-iris lens having no iris amplifier is used, set the lens selector switch to DC.
(When an auto-iris lens having an iris amplifier is used, set the switch to VIDEO.)



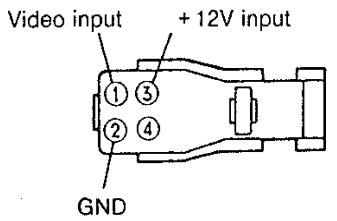
DC : . . . . . Lens not incorporating iris amp

VIDEO : . . . . . Lens incorporating iris amp

Use of lens connector

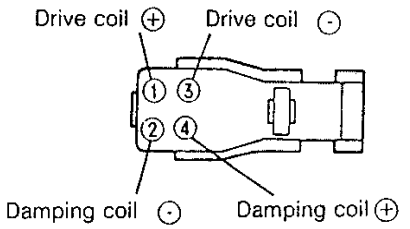
When an auto-iris lens is used, connect the lens cable to the supplied lens plug as illustrated below.
For the combination of the signals in the lens cable and wire colors, see the operation manual of the used lens.

• Lens having an iris amplifier



(Set the lens selector switch to VIDEO)

• Lens having no iris amplifier



(Set the lens selector switch to DC)

After connecting the lens plug to the tip of the lens cable, insert the plug into the lens connector [LENS] on the rear of the camera or on the side of the camera.

Recommended lenses

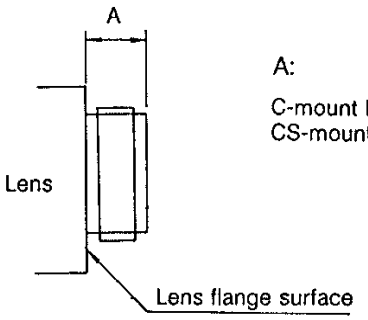
o demonstrate the full performance of the camera, select a lens from the following recommended lenses.

Type	Type name	Specification	Lens mount
Fixed iris	HS316	3.7 mm, f1.6	CS-mount
	H416	4.2 mm, f1.6	C-mount
	H612A	6 mm, f1.2	C-mount
	HS614A	6 mm, f1.4	CS-mount
	H1212A	12 mm, f1.2	C-mount
	HS1214C	12 mm, f1.4	CS-mount
Auto-iris	H416EX-2	4.2 mm, f1.6	C-mount
	H316HX	3.7 mm, f1.6	CS-mount
	HS316GX	3.7 mm, f1.6	CS-mount
	* HS316GX(HJ)	3.7 mm, f1.6	CS-mount
	H612AEX-2	6 mm, f1.2	C-mount
	H614HX	6 mm, f1.4	CS-mount
	HS614GX	6 mm, f1.4	CS-mount
	* HS614GX(HJ)	6 mm, f1.4	CS-mount
	H1212AEX-2	12 mm, f1.2	C-mount
	H1214CHX	12 mm, f1.4	CS-mount
	HS1214GX	12 mm, f1.4	CS-mount
	* HS1214GX(HJ)	12 mm, f1.4	CS-mount

Note: The auto-iris lenses marked with * do not incorporate an iris amplifier.

5. Note of lens selection

1) Observe the following condition for the dimension of the lens mounting section.



A:

C-mount lens: 8.0mm or less
CS-mount lens: 4.5mm or less

Caution

In case the above condition is not observed, the inside of the camera may be damaged.

2) Do not use a lens heavier than the camera body itself.

If a lens is heavier than the camera, the camera is not balanced, resulting in possible damage.

If it is needed to use a lens heavier than the camera body, be sure to fix the lens itself on a support.

Adjustment and operation

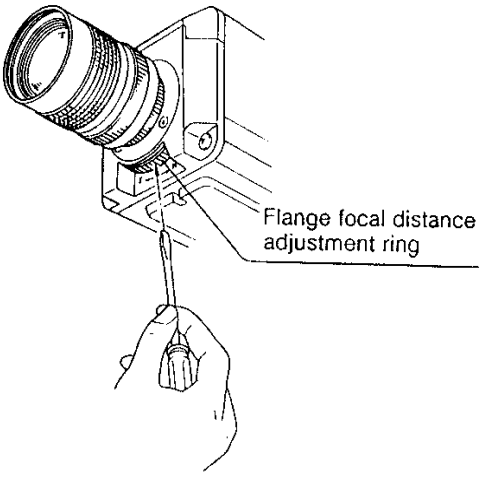
1. Flange focal distance adjustment

When the picture is out of focus after a lens is replaced, or when the picture is out of focus at the telephoto and wide positions, adjust the flange focal distance.

To adjust the flange focal distance, take the following procedure.

In case of fixed-focus lens

Set the focus ring of the lens to the infinite position and shoot an object more than 20 meters away, then rotate the flange focal distance adjustment ring in the direction of N or F to obtain optimum focus.



In case of zoom lens

1) Set the zoom lens to the telephoto position and shoot an object more than 3 meters away. Then, adjust the lens focus appropriately.
2) Set the zoom lens to the wide position and rotate the flange focal distance adjustment ring, taking care that the focus ring does not move.
   Repeat steps 1) and 2) above appropriately until the focus tracks throughout the zoom range.

2. Adjustment of ALC lens control

When an auto-iris lens having no iris amplifier is used, adjust the photometric characteristics and the video level by this control. (In this case, set the lens selector switch to DC.)

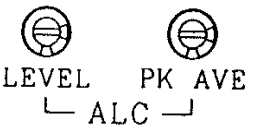
Photometric characteristics control (PK AVE)

Clockwise rotation establishes the average photometric mode, while counterclockwise rotation establishes the peak photometric mode.

ALC level control (LEVEL)

Adjust the lens iris appropriately.

(Set the SHTR switch to the normal condition(OFF) and the AGC ON switch to the lower side.)



Note: For the SHTR switch setting, see page 12.

White balance adjustment

- Full-time auto white balance

When the white balance selector switch [AWC AUTO] is set to the upper position, white balance is automatically controlled against the change in the color temperature of illumination, and the optimum color tone is ensured.

Caution

The automatic white balance adjustment function may not function appropriately in the following cases.

In such cases, adjust white balance manually.

- When the most part of the screen is the same color or when white portion is excessively little
- When illumination is made by more than one light source with different color temperatures
- When a special lamp like a natrium lamp is used
- When background color is red or blue

- **Manual adjustment**

Turn the white balance selector switch downward.

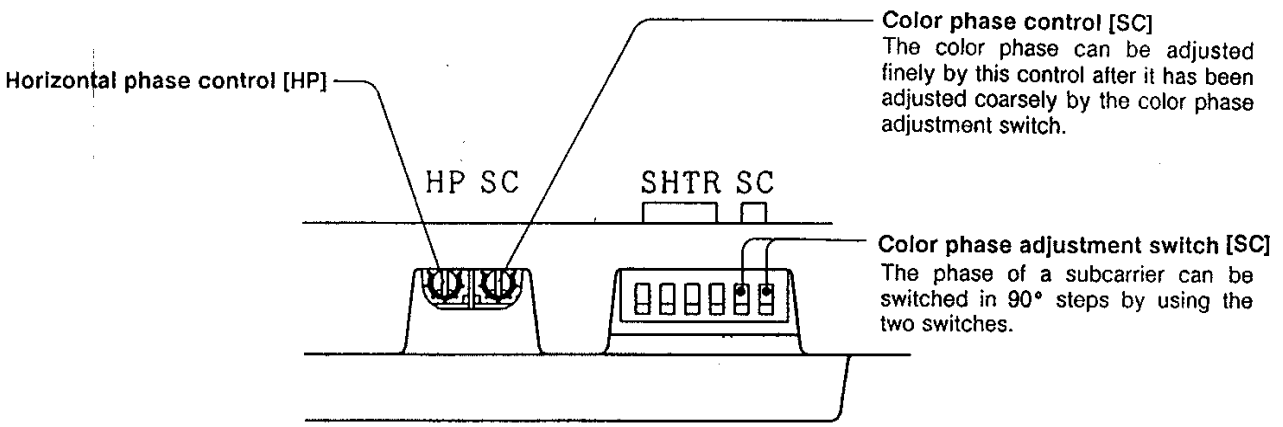
Shoot a white object, and display the object on the color monitor which is adjusted optimally.

Adjust the white balance control so that the color of the displayed object becomes maximum white.

4. Phase adjustment in genlock mode

In the genlock mode, it is possible to adjust the horizontal and color phases of the video output signal with respect to the external sync signal.

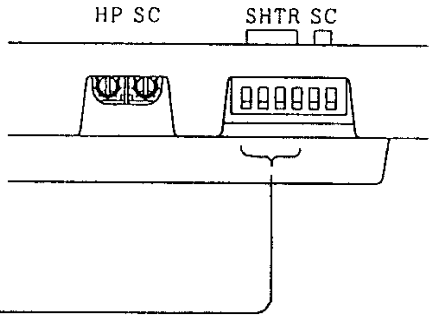
It is needed to adjust these phases for each camera when more than one camera is used in a camera system incorporating a video switcher, image processing equipment, etc.



. Shutter speed setting

Set an appropriate shutter speed by the combination of four switches.

Shutter speed (s)	Switch setting
OFF(1/60) [1/50]	
(1/100) [1/120]	*
1/125	
1/500	
1/2000	
1/10000	

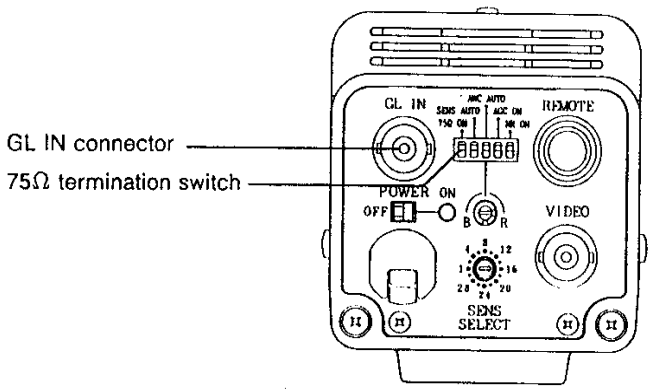


( ): NTSC , [ ]:PAL

* This shutter speed is set by setting the fourth switch from left to the upper side regardless of other three switches.

Genlock operation

To operate the camera in the genlock mode, connect a composite video signal (VBS) to the GL IN connector (BNC) on the rear of the camera. When an external sync signal is supplied, the camera is automatically placed in the genlock mode.



- External sync input — VBS: Sync : 0.3 ± 0.1Vp-p
  Burst : 0.3 ± 0.1Vp-p
  75Ω, unbalanced
- Lock-in range — Within ±50ppM for standard frequency
  Hor. frequency
  NTSC : 15733.5 to 15735.0Hz approx.
  PAL : 15624.2 to 15625.7Hz approx.

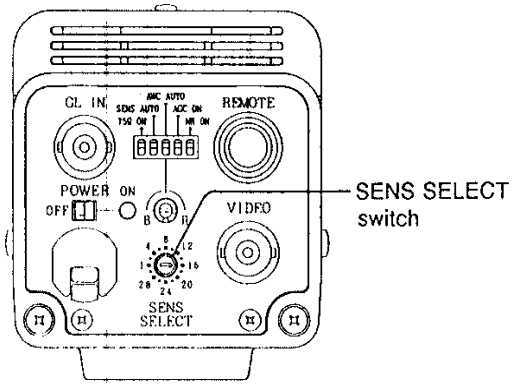
Caution

- Be sure to connect a composite color video signal.
- For genlock operation, horizontal phase and subcarrier phase may need to be adjusted. (For details, see page 11.)

Sensitivity setting

The camera incorporates a field memory. Therefore, pictures read intermittently from the field memory are available. Sensitivity is selectable from 16 steps : normal (×1), ×2, ×4, ×6, ×8, ×10, ×12, ×14, ×16, ×18, ×20, ×22, ×24, ×26, ×28 and ×30. (Sensitivity is set to ×16 at factory.) These settings can be done by the SENS SELECT switch or remotely. For remote operation, see REMOTE connector (page 16).

SENS SELECT switch



Set to the desired position.

Caution:

- When remote operation is performed via the REMOTE connector, the remote controlled item has priority.
- In a high sensitivity mode, noise as well as video information are incleased. When an ambient temperature is high, noise is further increased. Set the NR switch to ON appropriately.
- In a high sensitivity mode, white blemishes may be remarkable. This is not due to failure.

Guide to each sensitivity

Sensitivity setting	No. of frames per second	Standard Illumination(lux)f6	Min. illumination (lux)f1.2
Normal mode	60	2000	2
×2 mode	30	1000	1
×4 mode	15	500	0.5
×6 mode	10	333	0.33
×8 mode	8	250	0.25
×10 mode	6	200	0.2
×12 mode	5	167	0.17
×14 mode	4.3	143	0.14
×16 mode	3.8	125	0.13
×18 mode	3.3	111	0.11
×20 mode	3	100	0.1
×22 mode	2.7	91	0.09
×24 mode	2.5	83	0.08
×26 mode	2.3	77	0.07
×28 mode	2.1	71	0.06
×30 mode	2	67	0.05

Caution :

- In a high sensitivity mode, a moving object is displayed as if it is flowing, because the integration time of a CCD sensor is made long. Further, movement is unnatural due to intermittent read-out.
- In PAL version, flickers may be remarkable for some objects in high sensitivity mode, because the electronic sensitivity amplification system is employed.

Automatic sensitivity setting

The automatic sensitivity setting mode can be established by setting the SENS switch to AUTO or selecting the AUTO mode by remote operation. (This setting is set to AUTO at factory.)
In the automatic sensitivity setting mode, sensitivity is automatically switched from the normal mode to the preset high gain mode (SENS SELECT switch or remote operation).

Example When sensitivity is set to ×8 in the automatic sensitivity setting mode, sensitivity is automatically switched in the normal, ×2, ×4, ×6 and ×8 modes.

Note:

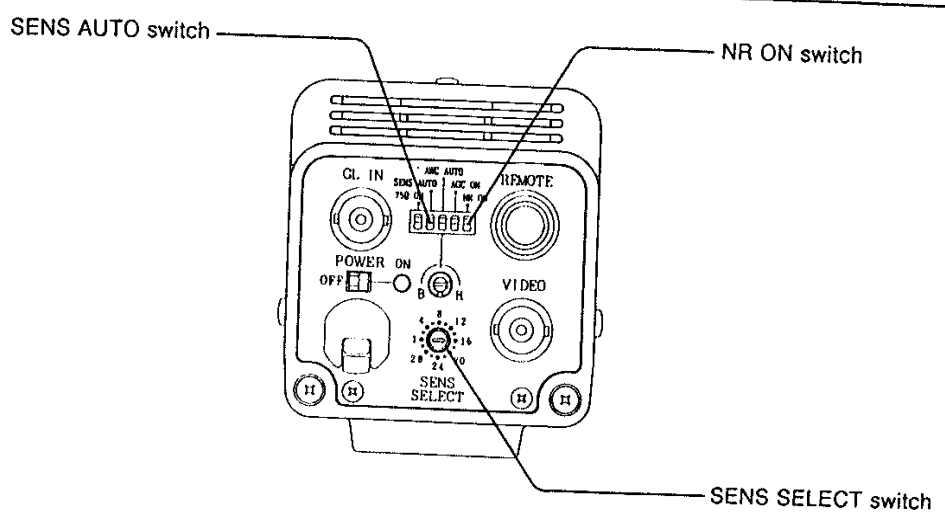
- For remote setting, see REMOTE terminal (page 16).
- In remote setting, remote controlled item has priority.

Noise reduction

The noise reduction function is available only in the high sensitivity mode. When the NR switch is set to ON, the noise reduction function is activated to improve a signal-to-noise ratio. Set the NR switch to ON or OFF according shooting conditions.

Caution :

- When shooting an object moving fast, sticking may be remarkable. In this case, set the NR switch to OFF.

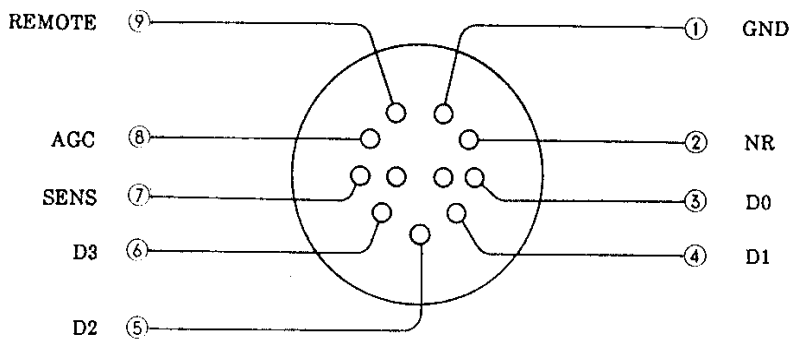


REMOTE connector

When the remote controller is connected to the REMOTE connector, the following items can be remotely controlled.

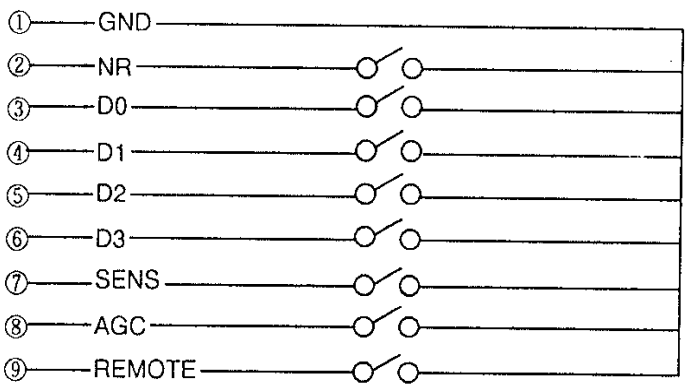
Remote-controlled items : Sensitivity setting, sensitivity selection (automatic/manual), AGC, and noise reduction

Note: Use an optional remote control connector.



(Viewed form mating side)

• **Example of schematic diagram of remote controller**



- Sensitivity setting

D3	D2	D1	D0	Mag.
0	0	0	1	2
0	0	1	0	4
0	0	1	1	6
0	1	0	0	8
0	1	0	1	10
0	1	1	0	12
0	1	1	1	14
1	0	0	0	16
1	0	0	1	18
1	0	1	0	20
1	0	1	1	22
1	1	0	0	24
1	1	0	1	26
1	1	1	0	28
1	1	1	1	30

1→SW ON
0→SW OFF

Major specifications

(1) Color system
U: Conforming to NTSC system
E/K: Conforming to PAL system

(2) Imaging device
CCD

Number of pixels
NTSC: 811(H)×508(V)
PAL: 795(H)×596(V)

Number of effective pixels
NTSC: 768(H)×494(V)
PAL: 752(H)×582(V)

(3) Scanning area
6.4(H)×4.8(V)mm
(equivalent to 1/2-inch tube)

(4) Scanning system
2:1 interlaced

(5) Scanning frequency

NTSC:	Horizontal:	15.734kHz
	Vertical:	59.94Hz
	Clock:	14.3MHz
PAL:	Horizontal:	15.625kHz
	Vertical:	50Hz
	Clock:	14.2MHz

(6) Sync system
Internal or external (automatic switching)

(7) Color subcarrier
NTSC: 3.579545MHz
PAL: 4.433618MHz

(8) Video signal output

VBS:	1.0Vp-p
Video:	0.7Vp-p, positive
Sync:	0.3Vp-p, negative
Burst:	0.3Vp-p, 8 cycles or more
Impedance:	75Ω, unbalanced
Connector:	BNC

(9) External sync input
Black burst or VBS

Sync:	0.3Vp-p/75Ω
Burst:	0.3Vp-p/75Ω,
Video:	0.7p-p or less / 75Ω

fsc = 3.579545MHz ± 100H (NTSC)
fsc = 4.433618MHz ± 100Hz (PAL)
BNC connector
75Ω ON-OFF switch provided

(10) Signal-to-noise ratio
(Y channel)
48dB (AGC:OFF, no contour correction and no gamma correction)
40dB (AGC:OFF, contour correction and gamma correction)

(11) Resolution

	Normal gain	High gain
Hor.	470 TVL	440 TVL
Vert.	350 TVL min.	260 TVL

(12) Illumination range

Normal: 2 to 100,000 lux
High: 0.05 to 100,000 lux

(13) Minimum illumination

Normal: 2 lux (f/1.2 2800K, 1/60s)
Max. gain:0.05 lux (f/1.2, 2800 lux)

(14) White balance adjustment

Automatic or manual adjustment (switch selectable)
From tungsten light to cloudy weather (approx. 2800 to 8000K)

(15) Electronic shutter

9 steps: 1/60(OFF) [1/50 (OFF) PAL], 1/100, 1/125, [1/250], 1/500, [1/1000], 1/2000, [1/4000], 1/10000
[ ] : Jumper wiring

(16) Iris control output

With lens switch set to VIDEO
Luminance video signal : 0.7Vp-p/high impedance
Power supply : +12V (60mA max.)
Connector: 4-pin square type
(When lens switch is set to DC, an automatic iris lens not incorporating an iris amp can be used)

(17) Sensitivity setting

- Normal gain : AGC ON or OFF (switch selectable)
  Set to AGC ON and AUTO (×16, shutter off) at factory.
- High gain : AGC or fixed gain selectable
  Max. sensitivity is selectable at AGC ON.
  Settable sensitivity : Normal (1/60), ×2, ×4, ×6, ×8, ×10, ×12, ×14, ×16, ×18, ×20, ×22, ×24, ×26, ×28 or ×30
- Capacity of memory : One field each for luminance signal and each color signal (8 bits)

(18) Noise reduction

ON/OFF selectable (Set to OFF at factory)
Effective only for ×2 sensitivity or more

(19) Remote control

Sensitivity setting : Normal/High
AGC : ON/OFF (in normal sensitivity mode)
Automatic sensitivity setting : 16-step fixed sensitivity (in normal or high sensitivity mode)
Noise reduction : ON/OFF (only in high sensitivity mode)

(20) Lens mount

C-/CS-mount

(21) Camera mount

1/4 inch-20UNC (bottom)

(22) Ambient temperature and humidity

Operating: −10 to 50°C, 95%RH or less
Storage: −20 to 60°C, 95%RH or less
Non-condensation

Caution

When the camera is to be used for an extended period of time in an ambient temperature in excess of 40°C, contact your local Hitachi Denshi sales representative, because such an environment will affect the service life of the camera.

(23) Anti-vibration	3G max. , 10-55Hz, 30 min to each direction (Do not apply strong vibration continuously.)
(24) Power requirement	U type: 120VAC ± 10%,60Hz, 6.5W E/K type:230V ~ ± 10%, 50Hz, 6.5W
(25) Dimensions	64(W)×68(H)×178(D)mm
(26) Mass	700g approx.

Accessories

Optional accessories

Lenses

Remote control plug, HR10A-10P-12P(01)