

SONY®

HD MULTI PURPOSE CAMERA

HDC-X300/X300K

HDC-X310/X310K

Power HAD HD

OPERATION MANUAL
1st Edition (Revised 6)

English

WARNING

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:

1. Use the approved Power Cord (2-core mains lead)/Appliance Connector/Plug that conforms to the safety regulations of each country if applicable.
2. Use the Power Cord (2-core mains lead)/Appliance Connector/Plug conforming to the proper ratings (Voltage, Ampere).

If you have questions on the use of the above Power Cord/ Appliance Connector/Plug, please consult a qualified service personnel.

For the customers in the U.S.A.

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.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

All interface cables used to connect peripherals must be shielded in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

The 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.

For customers in Canada

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

For the customers in Europe

This product with the CE marking complies with both the EMC Directive and the Low Voltage Directive issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European standards:

- EN60950-1: Product Safety
- EN55103-1: Electromagnetic Interference (Emission)
- EN55103-2: Electromagnetic Susceptibility (Immunity)

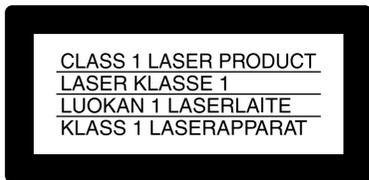
This product is intended for use in the following Electromagnetic Environments:

E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors), E4 (controlled EMC environment, ex. TV studio).

The manufacturer of this product is Sony Corporation, 1-7-1 Konan, Minato-ku, Tokyo, Japan.

The Authorized Representative for EMC and product safety is Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Germany. For any service or guarantee matters please refer to the addresses given in separate service or guarantee documents.

For HDC-X310/X310K only



This HD Multi Purpose Camera is classified as a CLASS 1 LASER PRODUCT.

Laser diode properties

Wave length: 1310 nm

Emission duration: Continuous

Laser output power: 0.51 mW (max.)

Laserdiode data

Bølgelængde: 1310 nm

Strålingsvarighed: Kontinuerlig

Lasereffekt: 0,51 mW (max.)

Laserdiodens egenskaper

Våglängd: 1310 nm

Strålningstid: utan avbrott

Laserut effekt: 0,51 mW (max.)

Laserdiodens egenskaper

Bølgelengde: 1310 nm

Emisjonslengde: Kontinuerlig

Laser utgangseffekt: 0,51 mW (max.)

CAUTION

The use of optical instruments with this product will increase eye hazard.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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Important Notes on Operation

Do not subject the unit to excessive shock

Bumping or dropping the unit will damage it.

Operation and storage

Avoid storing or operating the unit in the following conditions.

- In excessive heat or cold (operating temperature range: -10°C to +45°C (14°F to 113°F), storage temperature range: -20°C to +60°C (-4°F to +140°F)
- In damp or dusty locations
- Locations where the unit may be exposed to rain
- Locations subject to severe vibration
- Locations near strong electromagnetic fields

Connection with peripheral equipment

Before attaching/detaching peripheral equipment to/from the camera, be sure to turn off the camera.

Otherwise, the camera may not function properly.

Care of the unit

- Remove dust and dirt from the surfaces of the lenses or optical filters, using a blower.
- If the body of the camera is dirty, clean it with a soft, dry cloth.
- In extreme cases, use a cloth slightly dampened with diluted natural detergent, then wipe dry.
- Do not use organic solvents such as alcohol or thinner, as these may cause discoloration or other damage to the finish of the unit.

In the event of operating problems

If you should experience problems with the unit, contact your supplier or Sony service representative.

Notes on the lens (supplied with the HDC-X300K/X310K)

- This lens is not water-tight. Apply sufficient measures to shield the lens from water droplets, snowflakes, etc.
- If you attach or remove the lens in a damp or dusty location, take sufficient care e.g. by shielding the lens mount opening so that dust will not enter the inside of the product.
- If there is a rapid change in ambient temperature, the inside of the lens may become fogged, making shooting impossible for a certain period of time. To avoid such trouble, take sufficient fogproofing measures.
- Fingerprints or stains on the surface must be removed using a soft, clean cotton cloth lightly moistened with commercially available lens cleaner or lens paper (such

as a Silbon sheet). Wipe in a spiral pattern from the center outward.

- While the period may depend on the conditions, frequency, and circumstances of usage, periodic inspection at least once a year is recommended. When necessary, ask service personnel for overhaul of the unit.
- If the unit becomes moistened with mist or droplets, immediately wipe with a dry cloth. Then seal up the unit in a plastic bag with a desiccating agent (one fresh as possible) to completely remove the moisture inside the unit.

Phenomena specific to CCD image sensors

The following phenomena that may appear in images are specific to CCD (Charge Coupled Device) image sensors. They do not indicate malfunctions.

White flecks

Although the CCD image sensors are produced with high-precision technologies, fine white flecks may be generated on the screen in rare cases, caused by cosmic rays, etc. This is related to the principle of CCD image sensors and is not a malfunction.

The white flecks especially tend to be seen in the following cases:

- when operating at a high environmental temperature
- when you have raised the master gain (sensitivity)
- when operating in Slow-Shutter mode

This product has a compensation function and the phenomenon may be improved by performing automatic adjustment of the black balance (*see page 15*).

Vertical smear

When an extremely bright object, such as a strong spotlight or flashlight, is being shot, vertical tails may be produced on the screen.

Aliasing

When fine patterns, stripes, or lines are shot, they may appear jagged or flicker.

Using the CD-ROM Manual

When ordering, be sure to specify the part number of the manual you want.

| Part No. | Models covered |
|--------------|---------------------------|
| 3-854-613-0x | HDC-X300/X300K/X310/X310K |

The supplied CD-ROM includes versions of the Operation Manual for the HDC-X300-series cameras in Japanese, English, French, German, Italian, and Spanish in PDF format.

Preparations

The following program must be installed on your computer in order to read the operation manuals contained on the CD-ROM.

- Adobe Reader Version 6.0 or higher

Memo

If Adobe Reader is not installed, you can download it from the following URL:
<http://www.adobe.com/>

Adobe and Adobe Reader are trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Reading the CD-ROM Manual

To read the operation manual contained on the CD-ROM, do the following.

- 1** Insert the CD-ROM in your CD-ROM drive.
A cover page appears automatically in your browser. If it does not appear automatically in the browser, double-click on the index.htm file on the CD-ROM.
- 2** Select and click on the operation manual that you want to read.

This opens the PDF file of the operation manual.

Memo

The files may not be displayed properly, depending on the version of Adobe Reader. In such a case, install the latest version you can download from the URL mentioned in “Preparations” above.

Notes

- If you have lost or damaged the CD-ROM, you can purchase a new one to replace it. Contact your Sony service representative.
- You can purchase a printed version of the operation manual (Japanese/English version). Contact your Sony service representative.

Overview

The HDC-X300 series is a multipurpose HD video camera that incorporates special three units of $\frac{1}{2}$ -inch type 1.5-megapixel HD CCD in its compact body.

With its high performance and compactness, the HDC-X300 series is the ideal choice for an extensive range of HD image-acquisition applications such as large-screen displays, production, PoV (Point of View), studios, surveillance, image processing, photo booths, microscopy, and much more.

The HDC-X300-series cameras

| Model | Standard output | Product configuration |
|-----------|-------------------------------------|-------------------------|
| HDC-X300 | HD SDI (BNC type) | Camera head only |
| HDC-X300K | HD SDI (BNC type) | Auto-focus lens mounted |
| HDC-X310 | Optical transmission (LC connector) | Camera head only |
| HDC-X310K | Optical transmission (LC connector) | Auto-focus lens mounted |

Features

Superb picture quality

Incorporating three units of $\frac{1}{2}$ -inch type 1.5-megapixel HD CCD, the HDC-X300 series offers outstanding-quality images with a horizontal resolution of 800 TV lines, a low smear level of -120 dB, and a high signal-to-noise ratio of 52 dB.

Various scanning modes, including Progressive mode

Incorporating Sony's innovative Advanced Frame Accumulation (AFA) technology, the HDC-X300 series can output progressive HD signals in 24P (2-3 pulldown), 25PsF, and 30PsF modes as well as interlaced HD signals in 50i and 60i modes. Mode selection can be easily achieved through menu operations.

Compact and lightweight design

While the HDC-X300 series is equipped with sufficient functions as a studio-use camera, its compact and lightweight design (only 1.2 kg or 2 lb 10 oz), detachable tally unit, and remote control capability make it ideal for use in cramped quarters and awkward places such as on a crane head.

Low-light shooting

The camera enables shooting under minimum illumination of 0.003 lux by using two of its special functions in combination; Slow-Shutter mode, which allows the charge accumulation period of the CCD (typically 1/60 or 1/50 second) to be extended to approximately two seconds (64 frames), and the Turbo Gain function, which allows the camera gain to be boosted to +48 dB.

Auto-focus function (HDC-X300K/X310K)

The HDC-X300K/X310K comes packaged with a convenient auto-focus lens.

You can select between two auto-focus modes: One-push auto-focus to readjust the focus each time the button is pressed, and auto-tracing focus to automatically track the focus dynamically.

Versatile interfaces

In addition to HD SDI output (BNC type) (HDC-X300/X300K) or optical transmission (Single-mode LC connectors) (HDC-X310/X310K), the camera also has a D-sub 15-pin interface that allows direct connection to an LCD monitor, a video projector, or other equipment. The D-sub 15-pin output signal can be selected between analog R/G/B and analog component Y/Pr/Pb.

Flexible image controls

The camera provides highly advanced image-control functions equal to those of high-end studio cameras, such as the TruEye™ feature, skin-tone detail, and color-temperature controls. These functions allow creative images to be produced with the high clarity of high-definition imaging.

Total Level Control System (TLCS)

When a change in light volume exceeds the adjustment range of the Auto Iris function, Auto Gain Control (AGC) or Electronic Shutter (AE) is automatically activated. When using the optional HKC-SV1 Filter Servo Unit, automatic switching of the ND filters is also enabled.

Remote control capability

The camera is compatible with the RM-B750/B150 Remote Control Units, RCP-700/750-series Remote Control Panels, and MSU-700-series Master Setup Unit. These remote controls cover the complete range of control parameters that the HDC-X300 series provides, from basic camera control to sophisticated operations.

With the HDC-X310/X310K you can control the camera from a distance up to 1 km by optical transmission (Single-mode LC connectors), using an optional HFU-X310 HD Camera Interface Unit.

(The maximum transmission distance varies depending on the number of optical relay connectors used, etc.)

Two types of trigger mode

In Still mode, the camera can capture a high-quality still image synchronized with an external trigger, a function suited for photo-booth or document-stand applications.

In 24P Frame Lock mode, pull-down sequence synchronization among multiple HDC-X300-series cameras can be achieved by inputting/outputting a 2-3 pull-down trigger signal.

Optical ND filters and electronic CC function

Optimum light and color control are easily achieved by flexibly controlling the depth of field and exposure using the optical Neutral Density filter select knob and the built-in electronic Color-temperature Correction function.

The optional HKC-SV1 Filter Servo Unit permits you to switch the filters from a distance.

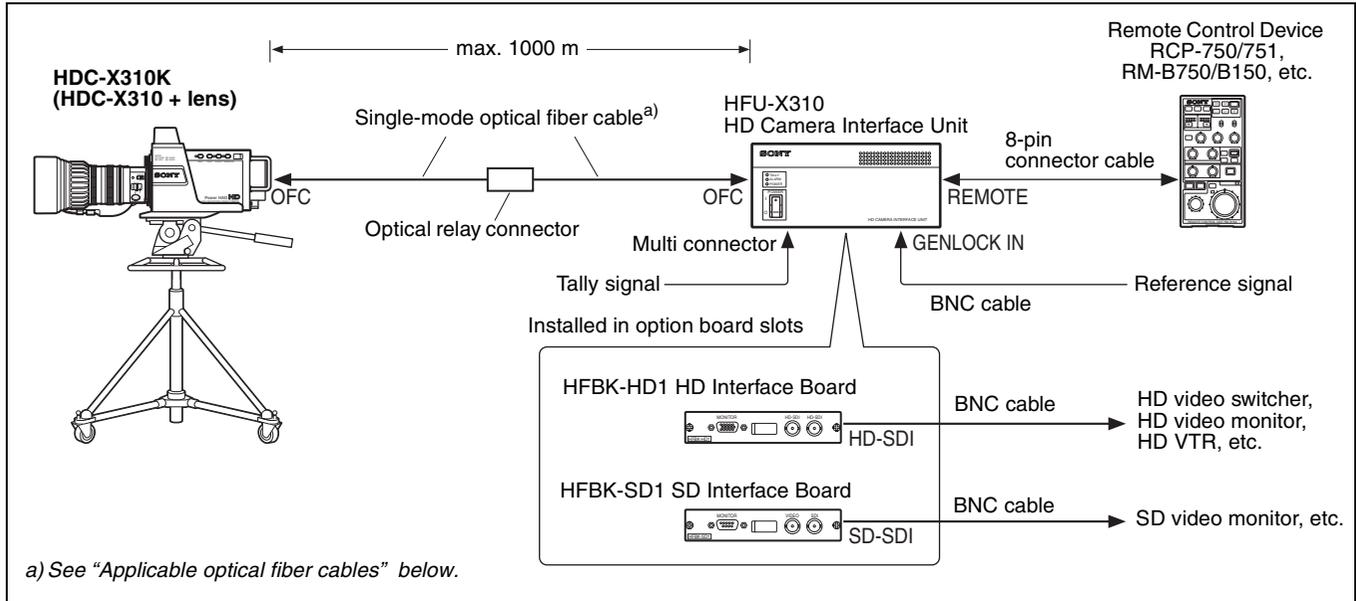
Menu operations

Menu displays on the video output enable you to perform various adjustments and maintenance of the camera.

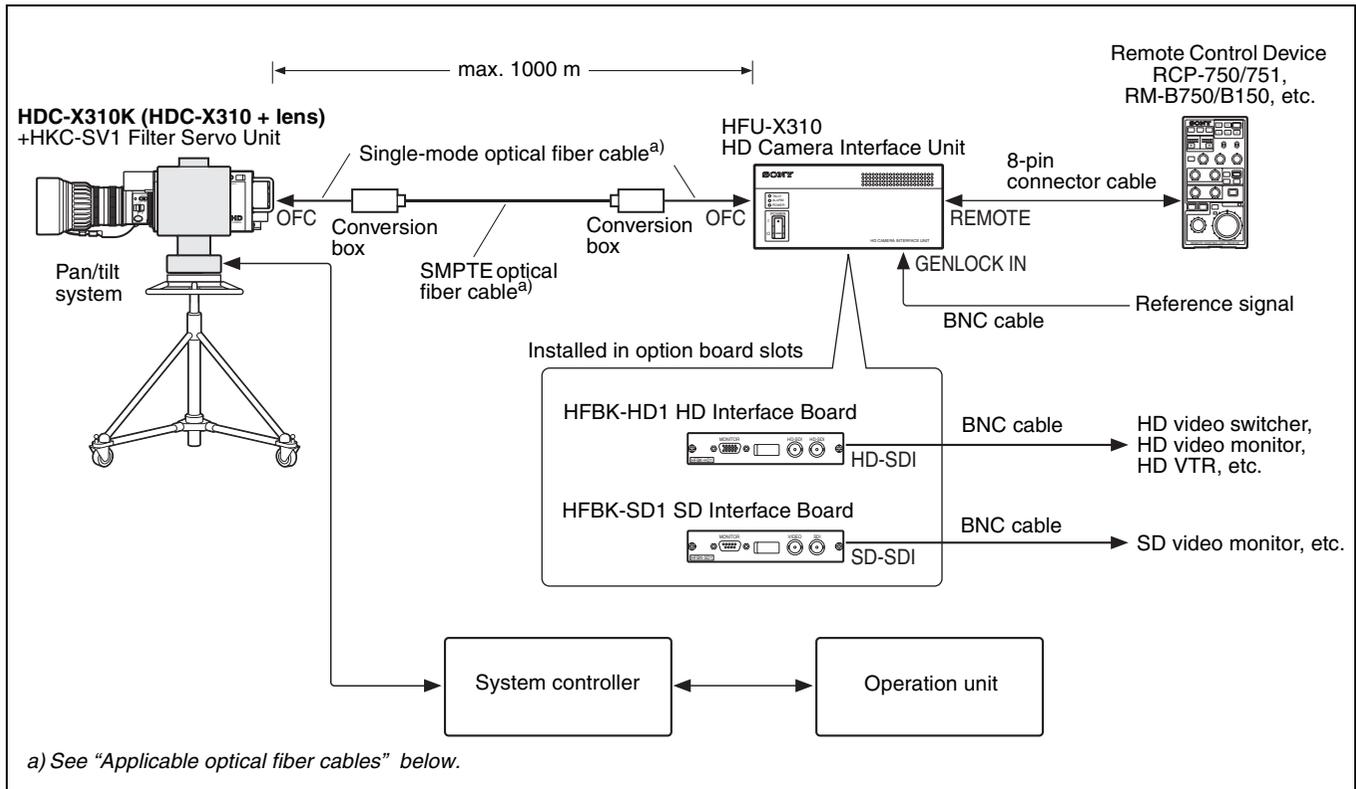
System Examples

HD studio operation

Example 1: Operation using a tripod



Example 2: Operation using a tripod and pan/tilt system



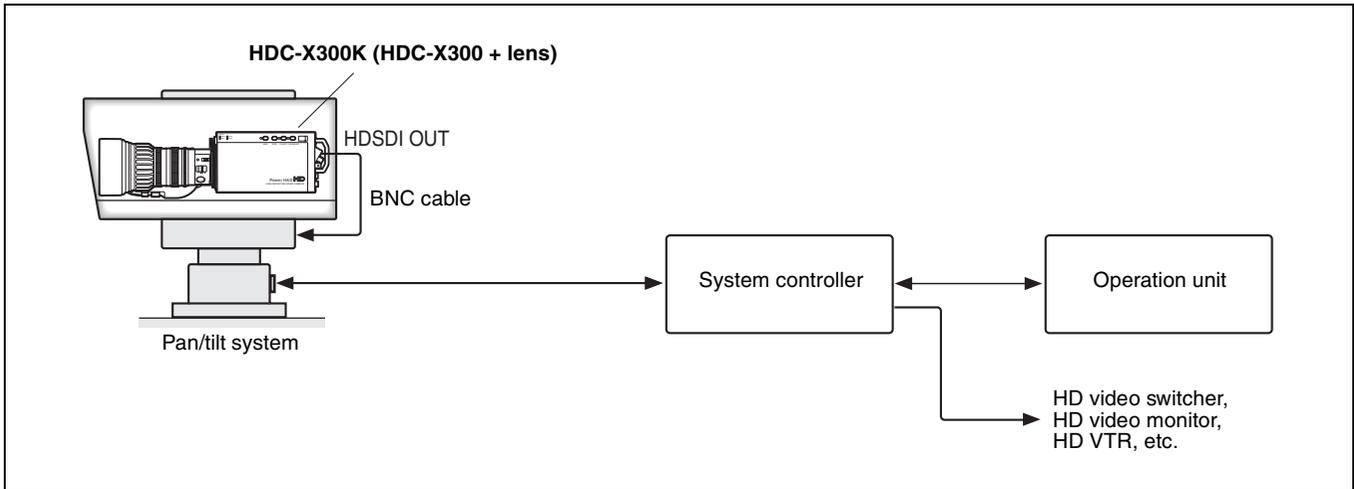
Applicable optical fiber cables

Use cables with an LC connector at each end. (The maximum distance for optical transmission varies depending on conditions, including the number of optical relay connectors or conversion boxes used.)
When optical relay connectors or conversion boxes are used, optical

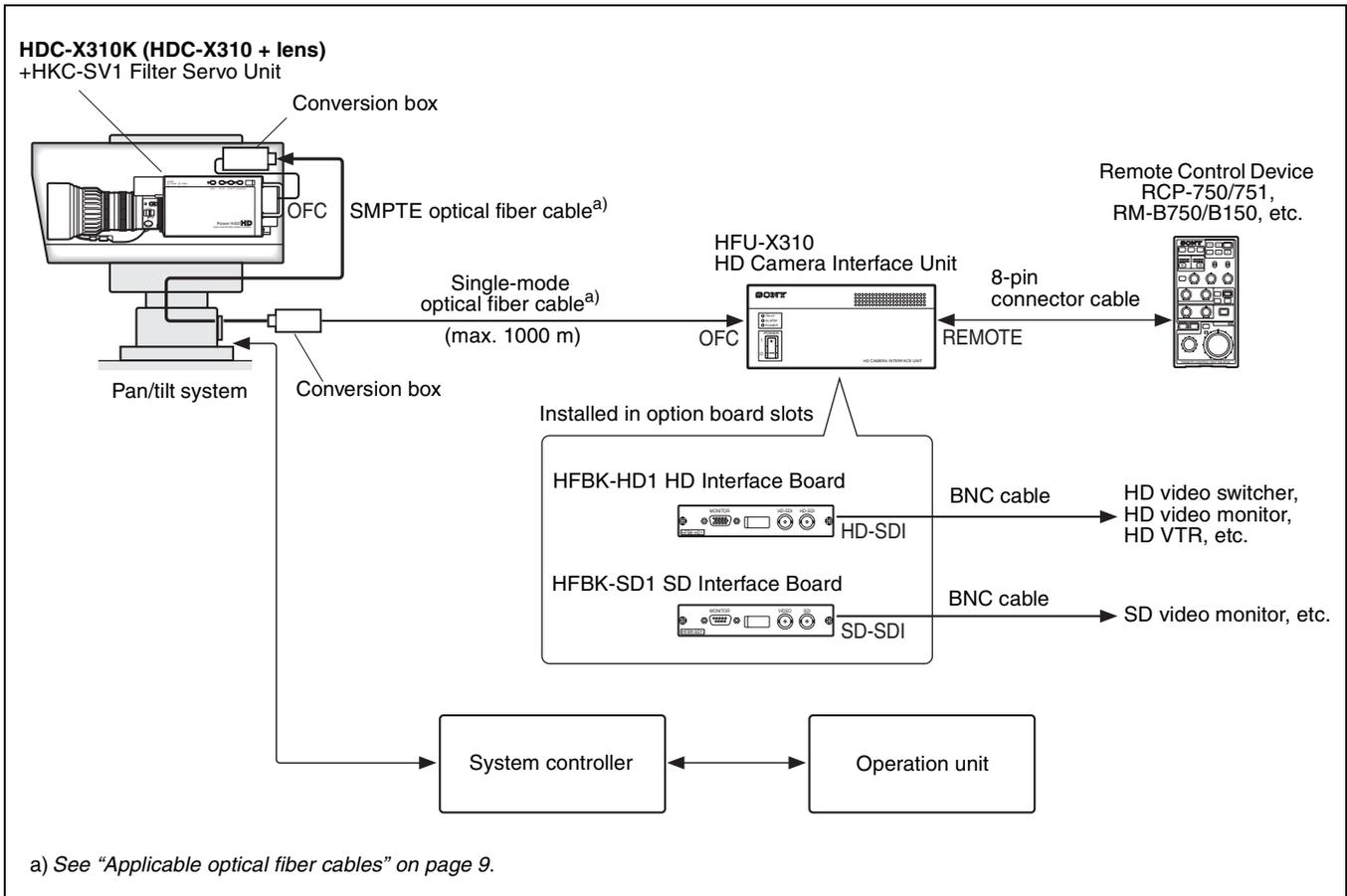
transmission may be disabled by connection loss. Use the camera system with as few optical relay connectors or conversion boxes as possible.

Camera system for long-distance transmission (e.g., fixed-point observation, weather surveillance)

Example 1

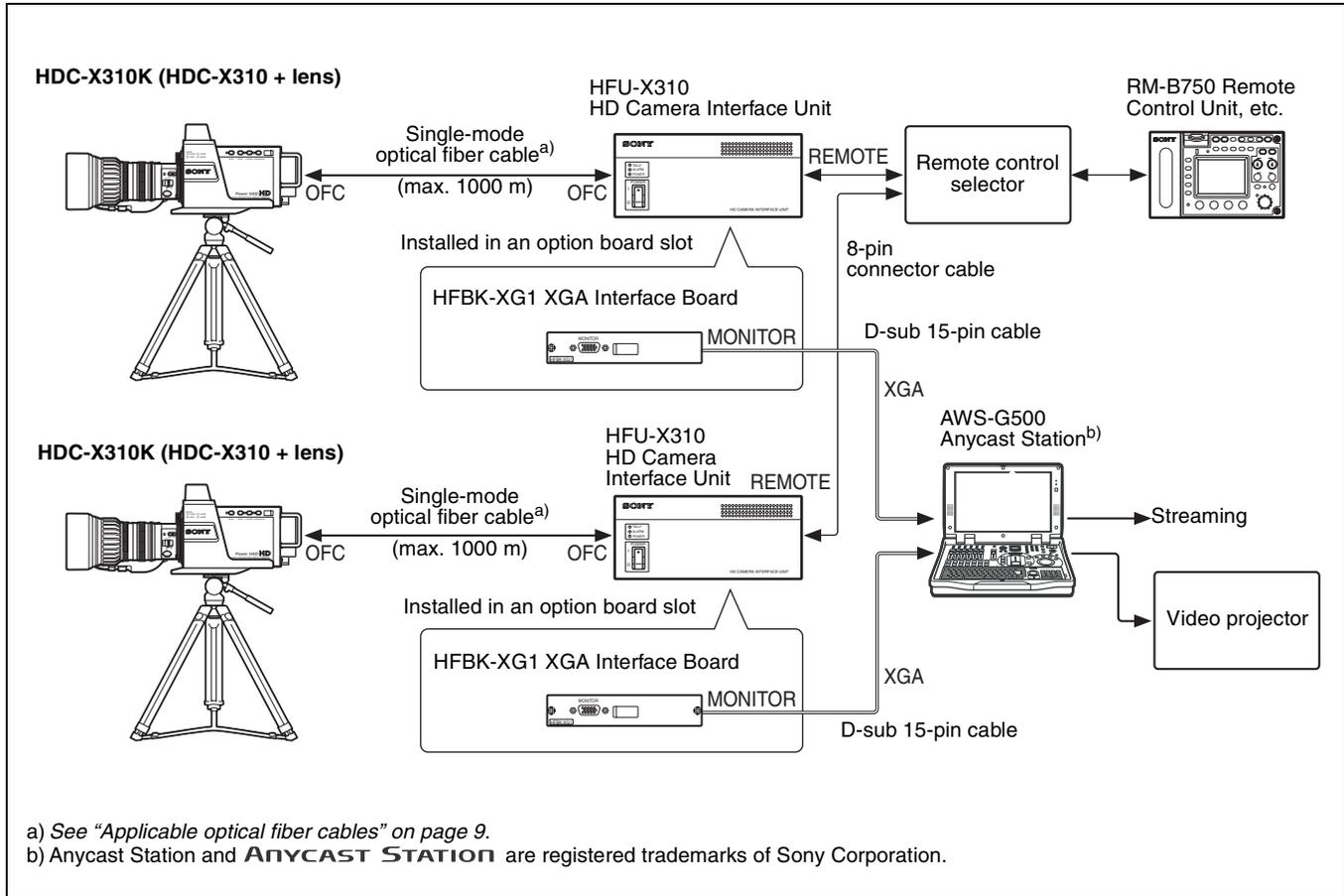


Example 2

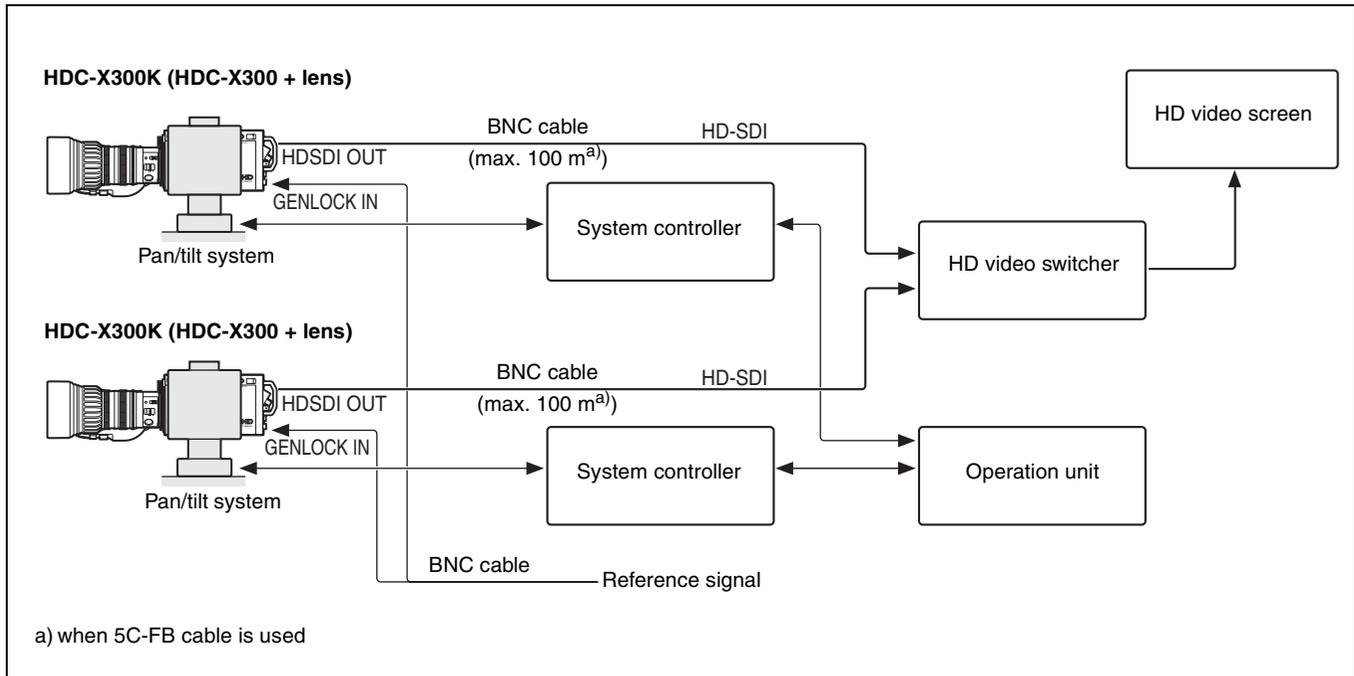


Live event operation

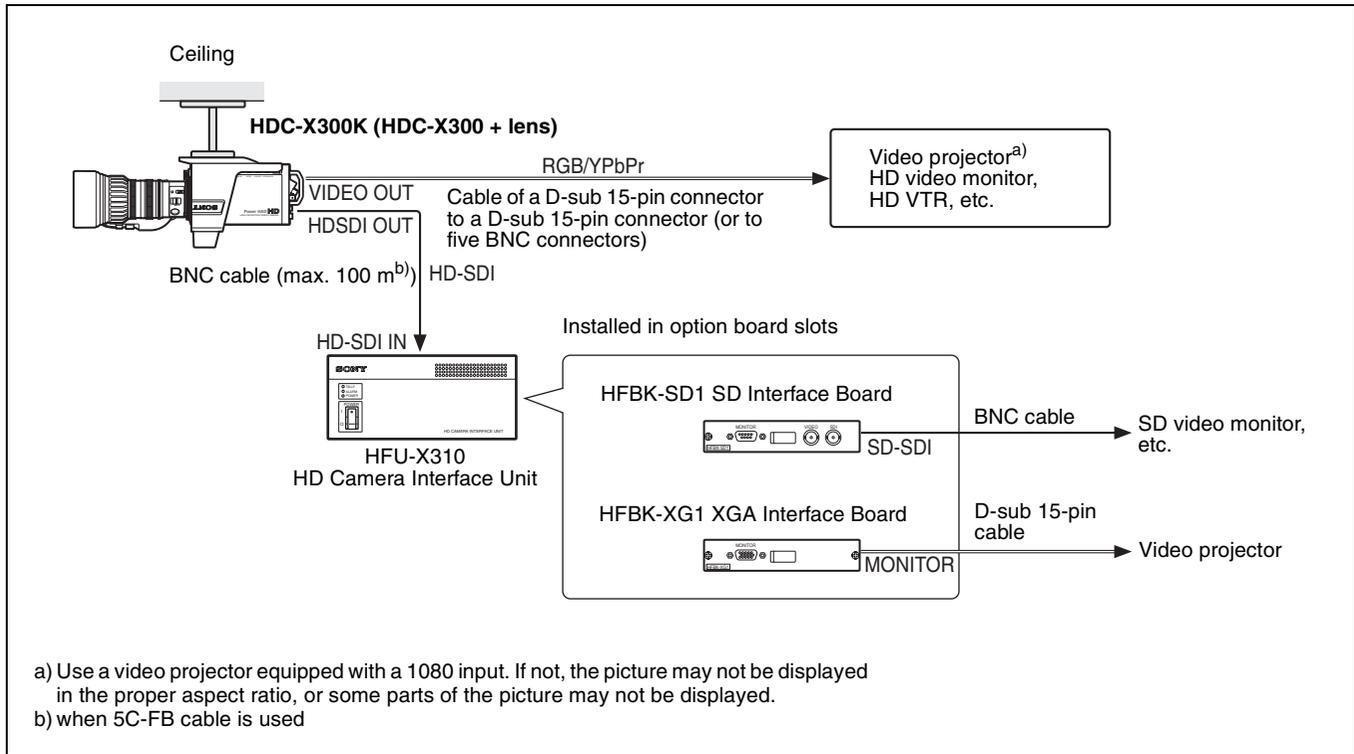
Example 1: Used with Anycast Station



Example 2: Used with an HD switcher

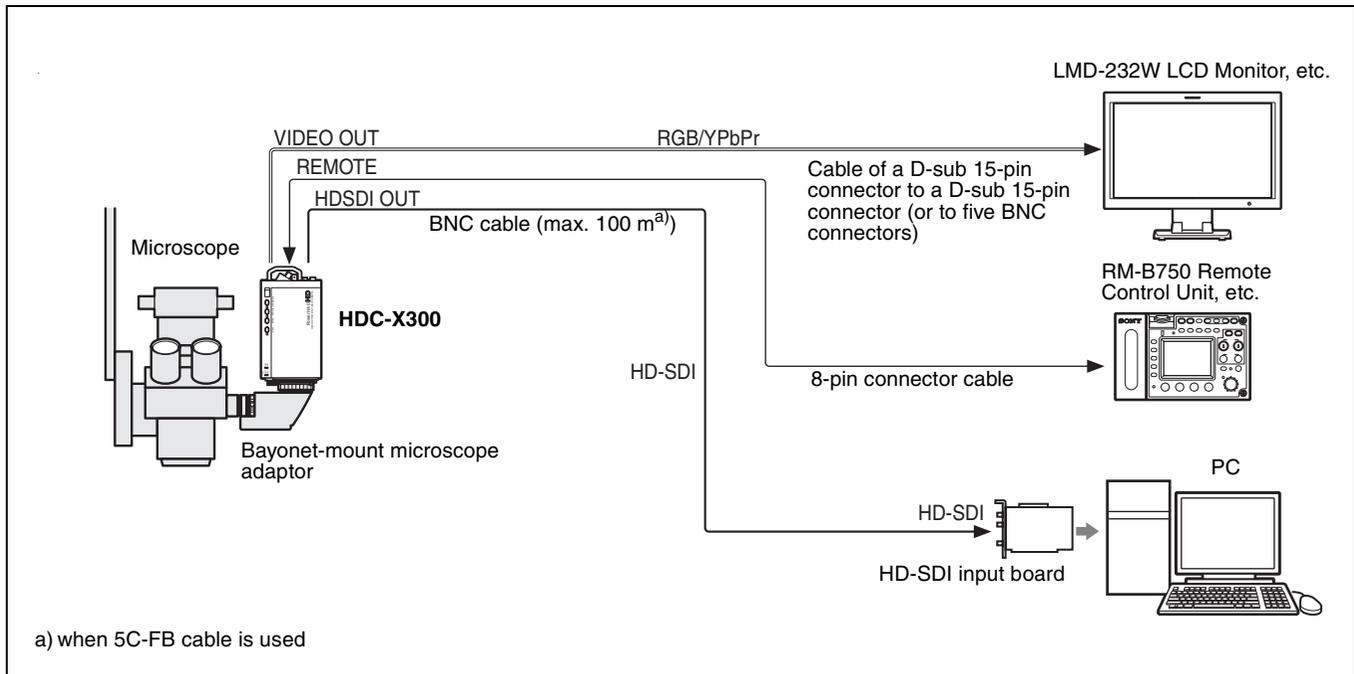


HD camera system for large venues (e.g., classroom, wedding parlors)

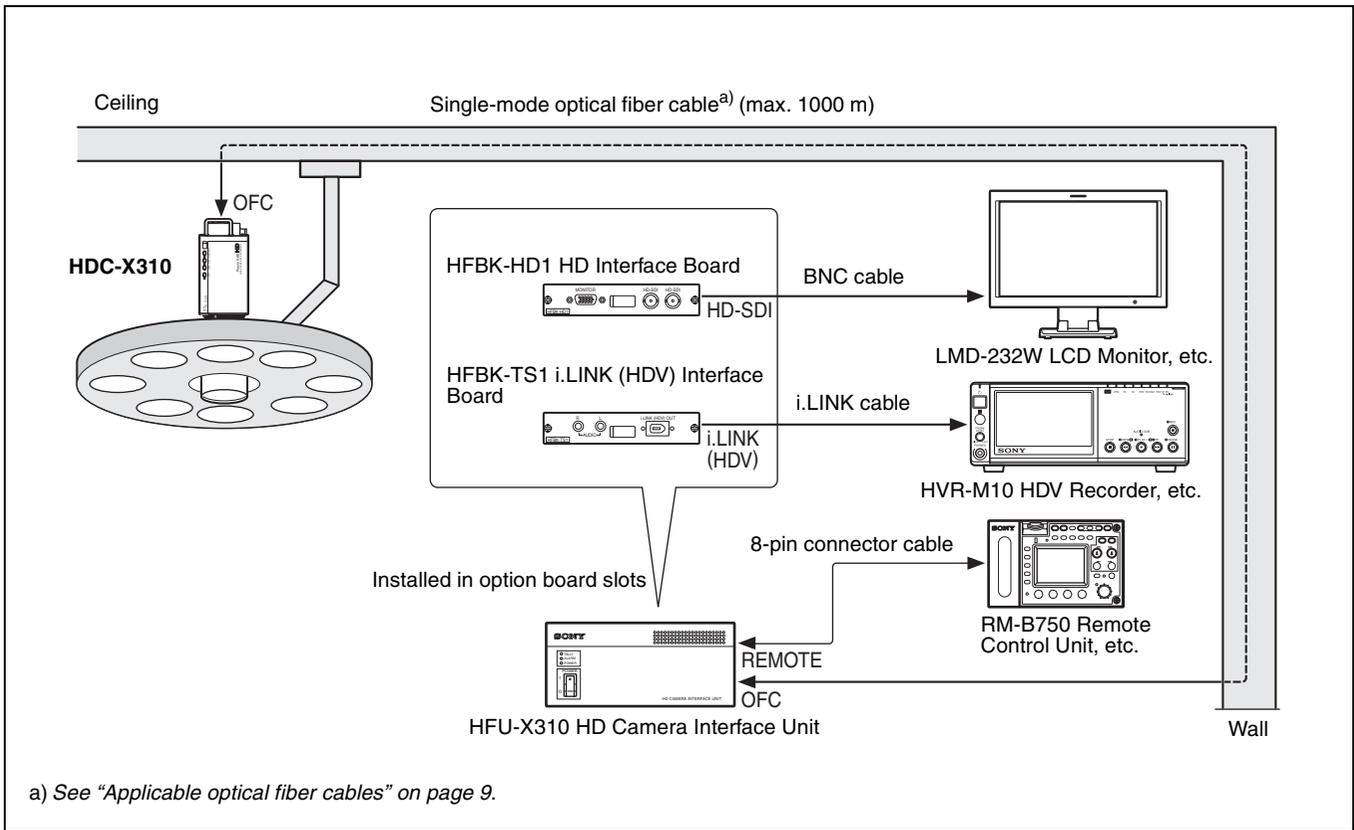


HD Medical Recording

Example 1: Microscope system

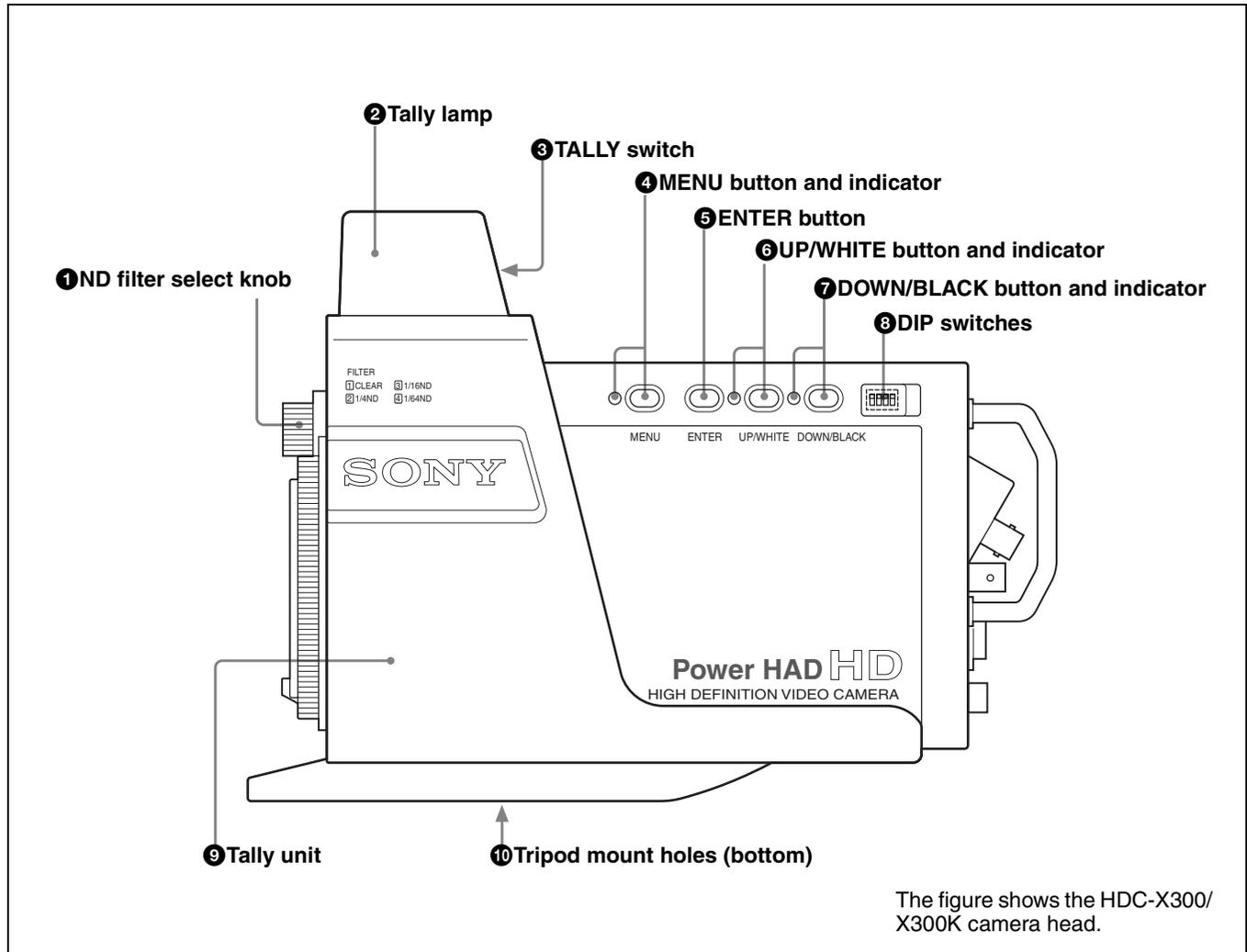


Example 2: Operating light system



Locations and Functions of Parts

Side Panel



1 ND filter select knob

Select the desired ND filter.

- 1: Clear
- 2: 1/4 ND
- 3: 1/16 ND
- 4: 1/64 ND

2 Tally lamp

It is located on the top of the tally unit. When the CALL button on the remote control connected to the REMOTE connector is pressed, it lights with the TALLY switch set to ON. Attach the supplied number plate to the front.

3 TALLY switch

This switch is located on the back of the top of the tally unit. Set the switch to the right (ON) to make the lamp light when tally signal input is supplied.

4 MENU button and indicator

Pressing the button sets the camera to Menu mode and lights the indicator.

When you press the button again, Menu mode is released and the camera returns to its normal Shooting mode. In Menu mode, the menu display is sent to all video outputs from the camera.

For details on menu operations, see "Menu Operations" on page 26.

5 ENTER button

Used to register menu settings in Menu mode.

For details on menu operations, see “Menu Operations” on page 26.

6 UP/WHITE button and indicator

In Menu mode, use this button to move the cursor and change settings.

When Menu mode is off, the button functions as the auto white-balance button.

Press the button to start auto white-balance adjustment. The indicator is lit during the adjustment and goes dark when the adjustment is completed.

If the adjustment fails, the indicator flashes. To stop its flashing, press the button again. If failed, try the adjustment again.

For details on menu operations, see “Menu Operations” on page 26.

7 DOWN/BLACK button and indicator

In Menu mode, use this button to move the cursor and change settings.

When Menu mode is off, the button functions as the auto black-balance button.

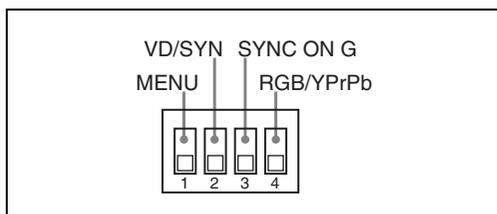
Press the button to start auto black-balance adjustment. The indicator is lit during the adjustment and goes dark when the adjustment is completed.

If the adjustment fails, the indicator flashes. To stop its flashing, press the button again. If failed, try the adjustment again.

For details on menu operations, see “Menu Operations” on page 26.

8 DIP switches

Four switches are located behind the rubber cap.



All the switches are set to their lower positions at the factory.

Switch 1 (MENU)

Enable or disable the MENU, ENTER, UP/WHITE, and DOWN/BLACK buttons on the side.

Upper (disabled): The four buttons are disabled, preventing Menu mode, auto white balance, and auto black balance from being inadvertently activated during shooting.

If you press the disabled MENU button, the indicator flashes then goes dark, and the camera does not enter Menu mode.

Lower (enabled): The four buttons are active.

Switch 2 (VD/SYNC)

Select the signal to be supplied from pin 14 of the VIDEO OUT connector.

Upper (SYNC): To output composite sync

Lower (VD): To output vertical sync

Switch 3 (SYNC ON G)

Specify whether to add a sync signal to the G signal when the VIDEO OUT connector output is RGB.

Upper (SYNC ON G): To output the G signal with a sync signal

Lower (NO SYNC): Not to add any sync signal

Switch 4 (RGB/YPrPb)

Select the video signal to be output from the VIDEO OUT connector.

Upper (YPrPb): To output component signals

Lower (RGB): To output RGB signals

9 Tally unit

This unit is equipped with a tally lamp, TALLY switch, and tripod mount holes. Depending on the purpose of use, it can be detached from the camera.

When the unit is detached, you can use the fixing screw holes on the top or bottom of the camera to secure the camera to a ceiling or a tripod.

10 Tripod mount holes

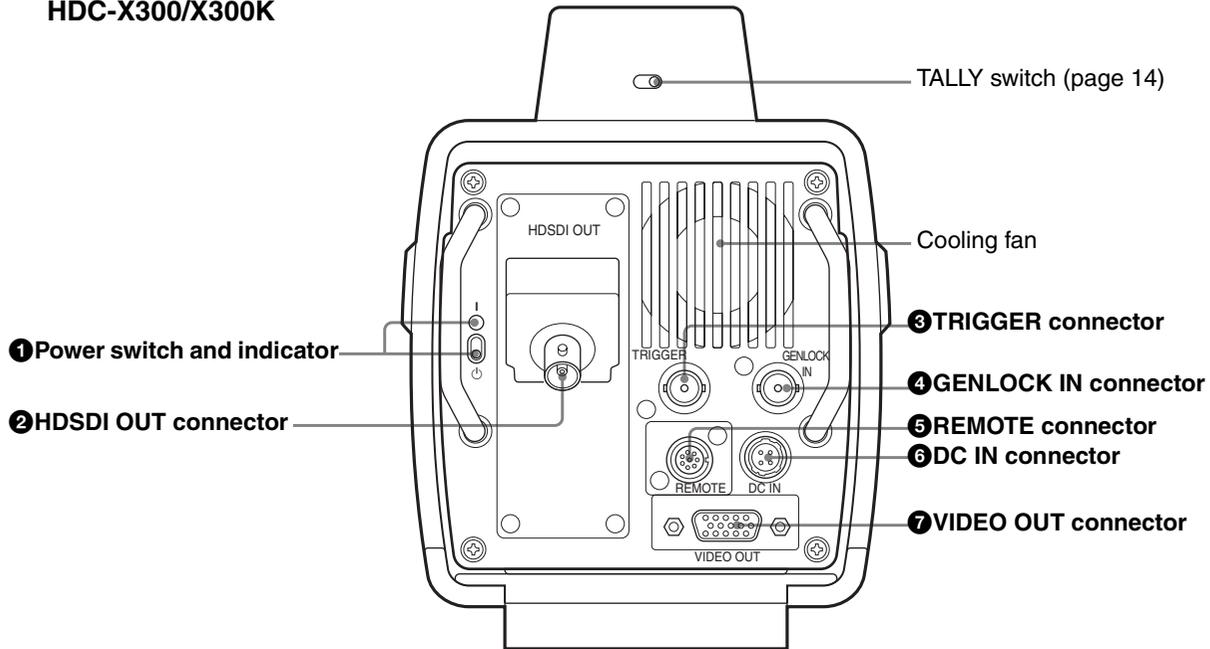
Two $\frac{1}{4}$ -inch and two $\frac{3}{8}$ -inch threaded mount holes are provided on the bottom of the tally unit.

Use the one of an appropriate size that gives the best balance to mount the camera on your tripod.

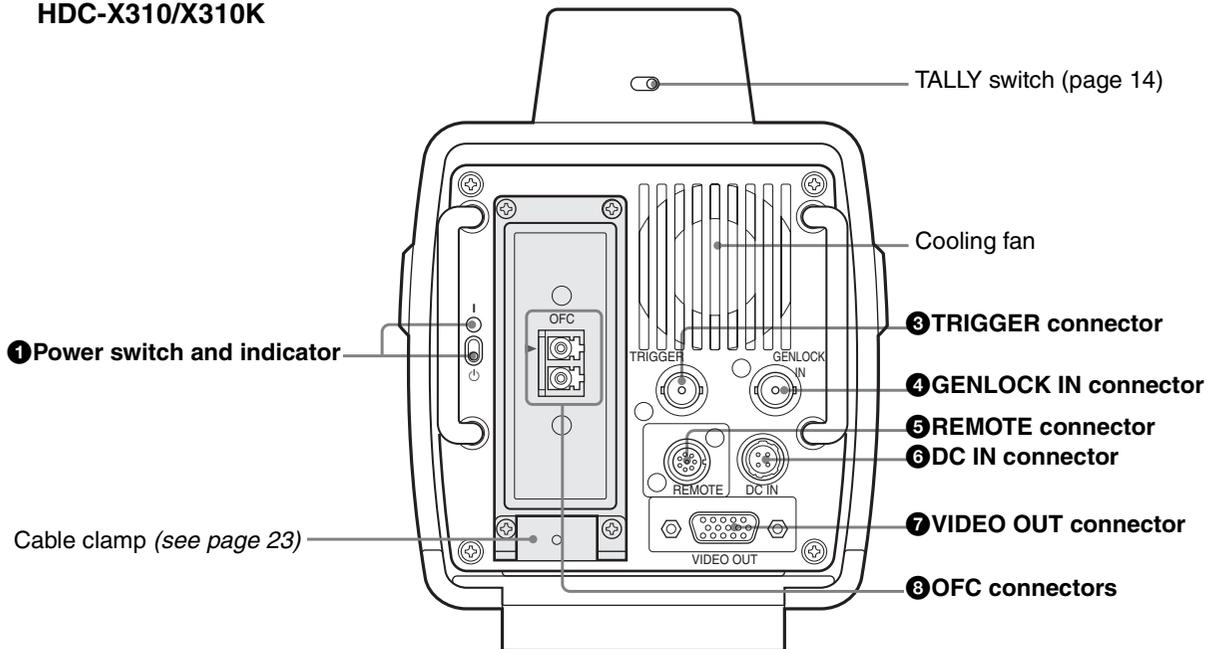
For details, see “Mounting the Camera to a Tripod” on page 23.

Rear Panel (Connector Panel)

HDC-X300/X300K



HDC-X310/X310K



① Power switch and indicator

Set the switch to the upper position (I) to turn on the camera. The indicator is lit when the power is on.

② HDSDI OUT connector (BNC type) (HDC-X300/ X300K)

To supply video signals of the camera in HD SDI format.

③ TRIGGER connector (BNC type)

When the camera is in Still mode, this connector functions as the still-picture trigger input. While this connector is on the ground level, the camera output still pictures.

When the camera is in 24P (2-3 pulldown) mode, the connector functions as the 2-3 pull-down sequence signal connector.

The input and output is TTL level.

Switching between Still mode and 24P mode and input/output setting of 2-3 pulldown sequence signals are achieved using the MAINTENANCE menu.

④ GENLOCK IN connector (BNC type)

This accepts analog HD (3-level sync) or SD (2-level sync) signal.

Note

Any signal that does not match the vertical sync of the output signal of the camera is not accepted. When the HFU-X310 is connected to the HDC-X310/X310K via an optical fiber cable, input to the GENLOCK IN connector is not accepted.

⑤ REMOTE connector (8-pin)

Connect a camera control device, such as the RCP-700/750-series, RM-B750/B150, or MSU-700-series unit.

Notes

- The camera control devices are not exclusive to this camera. Some of the switches and menu items may not be operative with this camera.
- If a camera control device is connected to the REMOTE connector of the HFU-X310 and another camera control device is connected to that of the HDC-X310/X310K when the HFU-X310 and HDC-X310/X310K are connected via optical fiber cables, operations of the camera control devices are not guaranteed.

⑥ DC IN connector

Connect to a power source via the supplied AC adaptor.

⑦ VIDEO OUT connector (HD D-sub 15-pin)

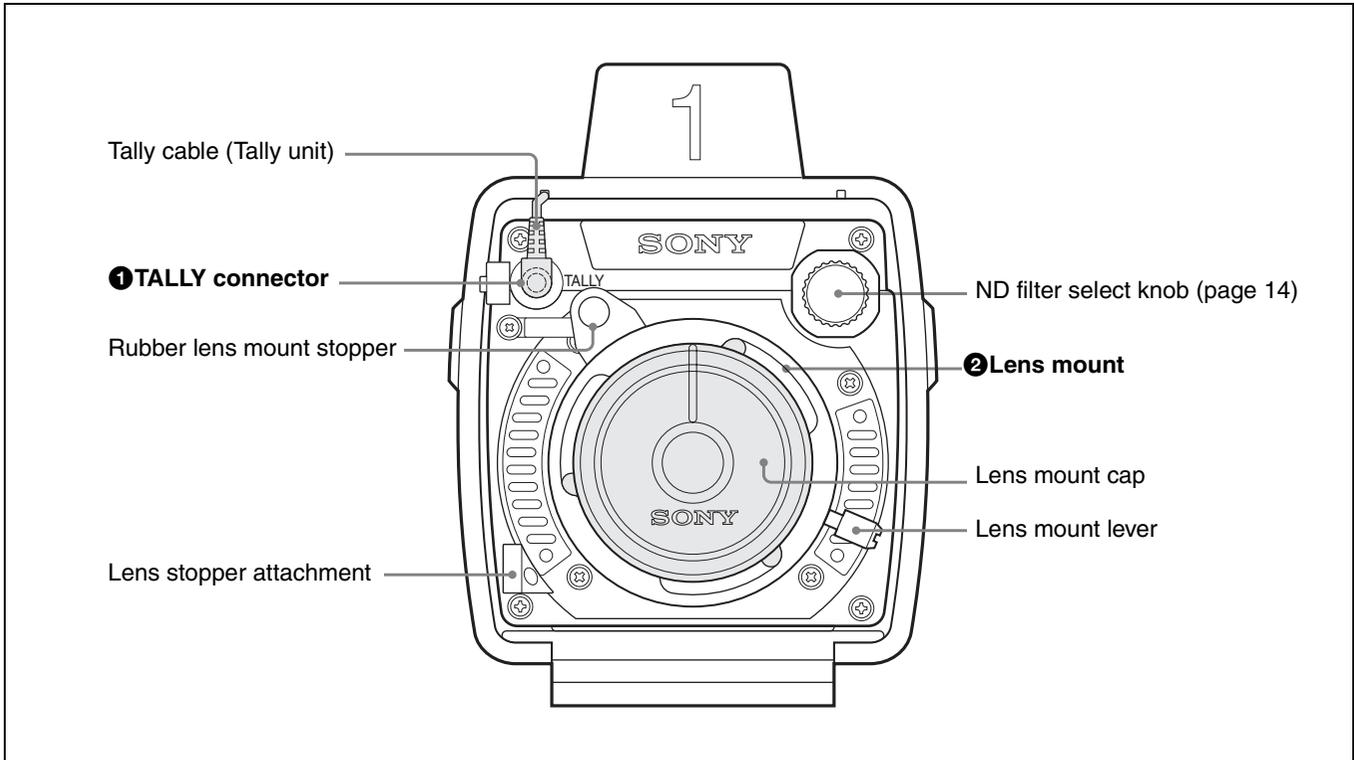
This outputs video signals. The output format can be selected using the DIP switch on the side panel.

⑧ OFC (optical fiber cable) connectors (HDC-X310/X310K)

For video and control signal connection via a single mode optical fiber cable.

For details on connection with the HFU-X310, see “Connecting Optical Fiber Cables (HDC-X310/X310K)” on page 23.

Front Panel



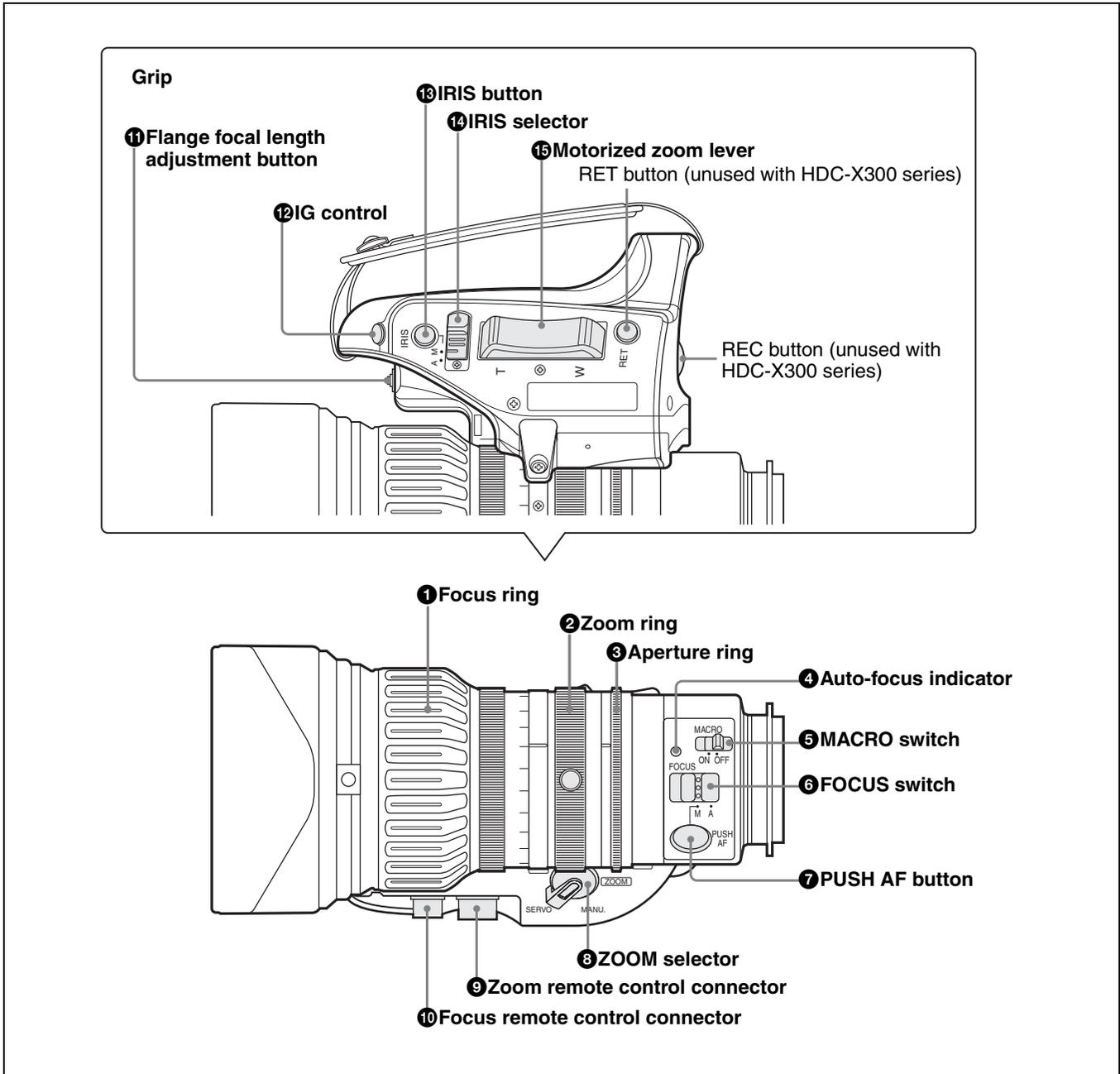
① TALLY connector (minijack)

The tally signal is supplied from this connector. Tally can be controlled via the cable from the tally unit connected here.

② Lens mount (1/2-type Bayonet)

A lens mount cap is attached here at the factory as shown in the above figure. Remove the cap and attach an appropriate lens.

Lens (HDC-X300K/X310K only)



1 Focus ring

Turn this ring to bring the subject in focus. The faster you turn the ring, the less the rotation angle you need to turn until the subject is in focus.

2 Zoom ring

For direct manual zoom control, set the ZOOM selector to the “MANU.” position and turn this ring.

3 Aperture ring

For manual aperture control, set the IRIS switch to the “M” position and turn this ring.

4 Auto-focus indicator

Lit in green while the auto focus function is operating. It flashes in amber or green while the flange focal length adjustment is in progress. If an error is generated, it lights in red.

For details on operation during the flange focal length adjustment, see “Adjusting the Flange Focal Length” on page 24.

5 MACRO switch

Set to ON for close-up work in Macro mode. In this mode, you can focus subjects in the range of 5 cm* to infinity, including the macro area (5 cm* to 90 cm from the lens top).

This operation is possible regardless whether the focus adjustment mode is Auto or Manual.

Note that the operation speed of auto focus is decreased in the macro area.

*At the W (wide) end

6 FOCUS switch

Select the focus adjustment mode:

A (Auto): The auto-focus function always activates. The auto-focus indicator is lit in green while the auto focus function is active. You can manually control the focus by turning the focus ring even in Auto mode.

M (Manual): To manually adjust the focus using the focus ring. In Manual mode, you can activate the auto focus function by pressing the PUSH AF button.

7 PUSH AF button

In Manual focus mode, you can activate the auto-focus function by pressing this button. Auto focus for the current subject starts when you press the button, and it stops once the subject is in focus.

8 ZOOM selector

Select the mode for zoom operation.

SERVO: Power zoom for operation with the Zoom lever

MANU. (manual): Manual zoom for operation with the Zoom ring

9 Zoom remote control connector (8-pin)

Connect an optional zoom servo control for remote control of zooming.

10 Focus remote control connector (6-pin)

Connect an optional focus servo control for remote control of focusing.

11 Flange focal length adjustment button

Press the button to adjust the flange focal length (the distance from the lens flange to the plane of the image along the optical axis).

For details on the adjustment, see “Adjusting the Flange Focal Length” on page 24.

12 IG (iris gain) control

To adjust the gain for automatic aperture adjustment, remove the rubber cap and turn the inside control.

Note

The control has been properly adjusted at the factory. Normally use with the factory setting.

13 IRIS (instant automatic aperture adjustment) button

While using manual aperture control (IRIS selector set to M), press this button to switch temporarily for automatic aperture control setting. Automatic setting is maintained as long as you hold the button down.

14 IRIS selector

This selects the mode of aperture operation.

A (automatic): Automatic aperture

M (manual): Manual aperture for aperture adjustment with the Aperture ring

15 Motorized zoom lever

Use this to perform a power zoom. This lever is active when the ZOOM selector is set to SERVO.

Press the W end to zoom toward wide angle and the T end to zoom toward telephoto.

Pressing the lever farther increases the zoom speed.

Notes on auto focus

- The focus may not be easily fixed on the following subjects. In such a case, manually adjust the focus:
 - Subjects having very little contrast
 - Subjects moving quickly
 - Light sources, such as street lights or night scenes
 - Subjects near an extremely bright thing
 - Subjects through a glass window
- If there are multiple subjects both near and far from the camera in the same picture frame, the focus may be fixed on an unintended subject.
- If you zoom to a telephoto angle after adjusting the focus while in a wide angle, the subject may become out of focus.
- If you perform the zoom or iris adjustment after adjusting the focus using the PUSH AF button, the depth of field may become shallow, making the focus insufficient. In such a case, press the PUSH AF button again to bring the subject into focus.
- The auto focus function does not operate during zoom operation.
- The auto focus function does not operate in SLS (Slow Shutter) mode (selected on the FUNCTION 1 page of the OPERATION menu).

Note on zoom speed

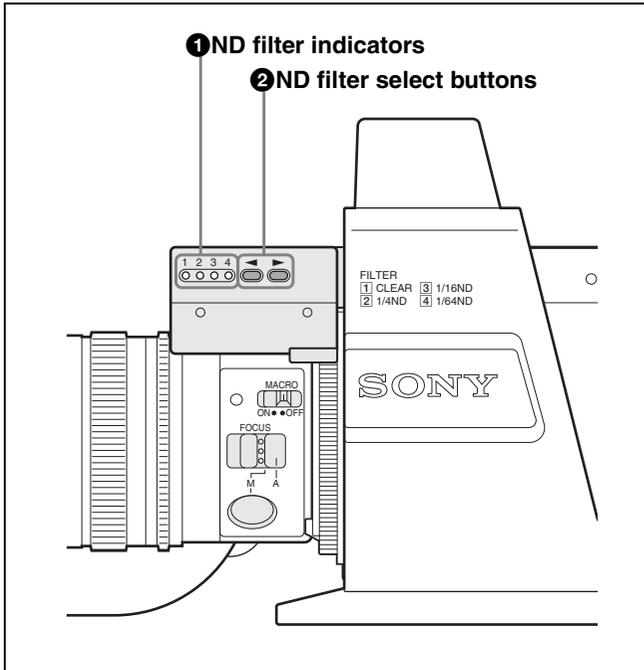
Depending on the shooting distance, zoom speed may decrease when approaching the maximum telephoto position.

HKC-SV1 Filter Servo Unit (Optional)

The optional HKC-SV1 Filter Servo Unit permits you to remotely control ND filter switching from a remote control unit connected via the REMOTE connector.

The buttons for direct switching are also available on the HKC-SV1.

Attaching the HKC-SV1 should be made by a qualified Sony service personnel.



1 ND filter indicators

The indicator corresponding to the ND filter being selected lights.

- 1: Clear
- 2: 1/4 ND
- 3: 1/16 ND
- 4: 1/64 ND

2 ND filter select buttons

Press to select the desired ND filter.

Pressing ► changes the filter in the sequence of 1, 2, 3, 4, 1,

Pressing ◀ changes the filter in the sequence of 1, 4, 3, 2, 1,

Note

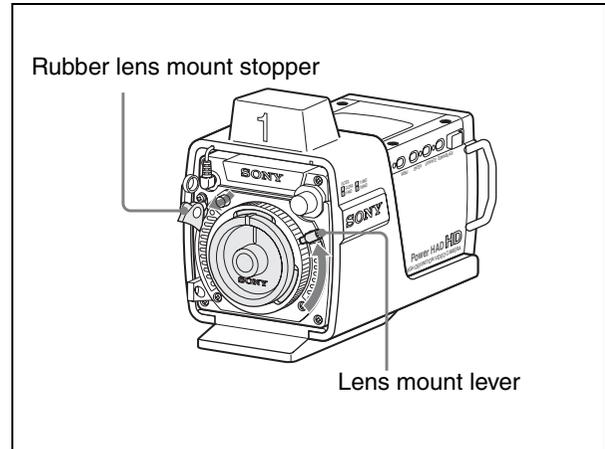
To attach the HKC-SV1 to the HDC-X300/X300K, modification of the camera may be required. Consult your Sony representative.

Installation

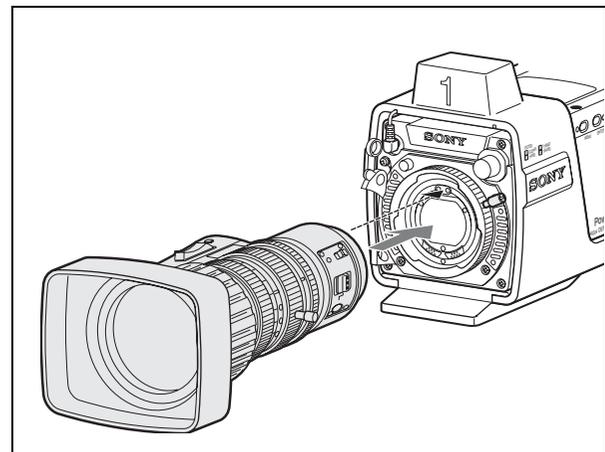
Attaching the Lens

Attaching procedure

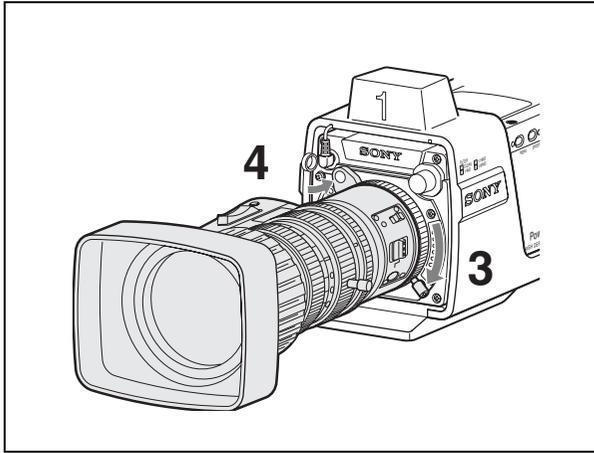
- 1 Detach the rubber lens mount stopper and turn the lens mount lever counterclockwise to remove the lens mount cap.



- 2 Align the center pin of the lens with the recess at the top of the mount section and set the lens in place.



- 3 Turn the lens mount lever fully clockwise while holding the lens to secure it.
- 4 Return the rubber lens mount stopper to its original position.

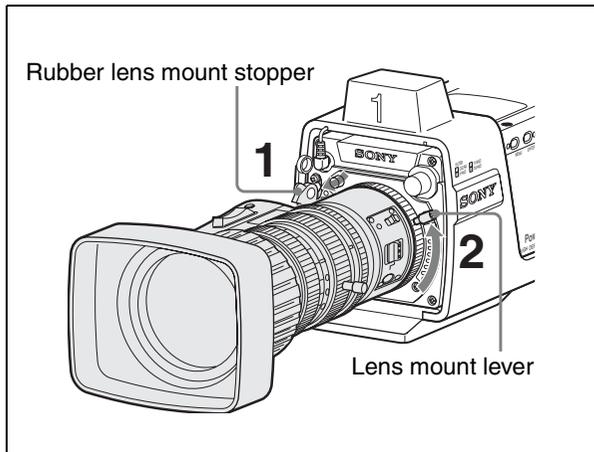


To remove the lens

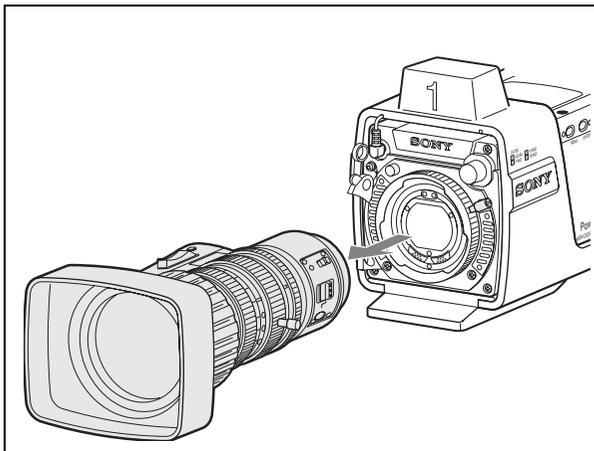
Note

To remove the lens, first place the camera on a stable surface to prevent the lens from dropping.

- 1 Detach the rubber lens mount stopper.
- 2 While holding the lens, turn the lens mount lever counterclockwise until it stops.



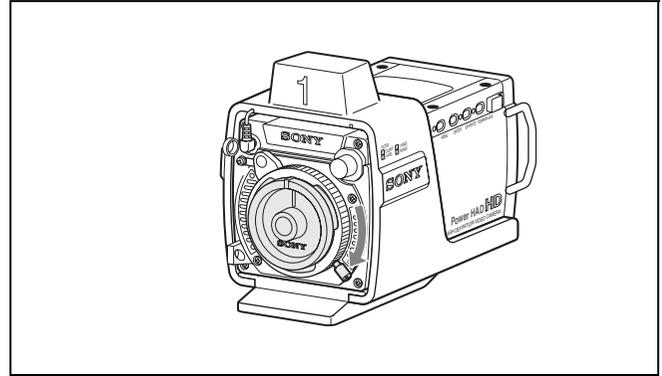
- 3 Remove the lens.



When transporting or storing the camera without attaching the lens

Attach the mount cap and secure it by turning the lens mount lever clockwise.

Then return the rubber lens mount stopper to its original position.

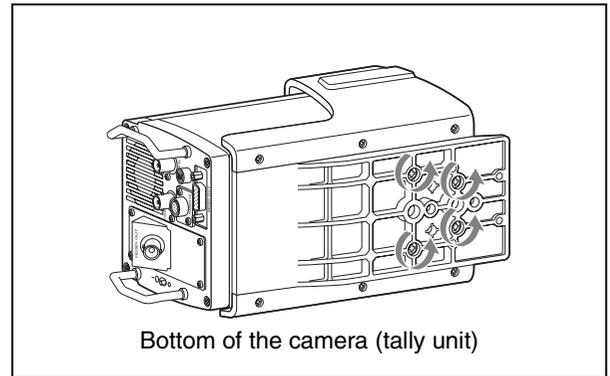


Removing the Tally Unit

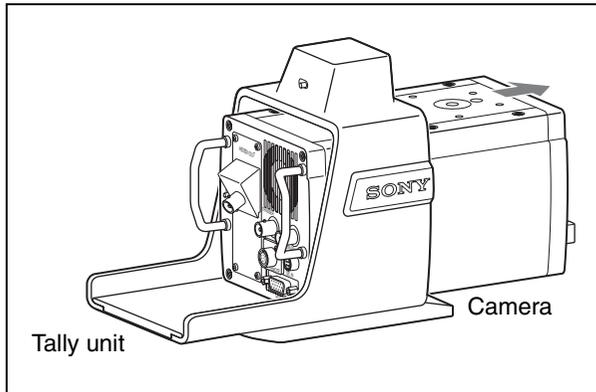
The tally unit can be removed, depending on purposes of use.

To remove

- 1 Disconnect the tally cable from the TALLY connector on the front panel.
- 2 Loosen the four screws on the bottom.

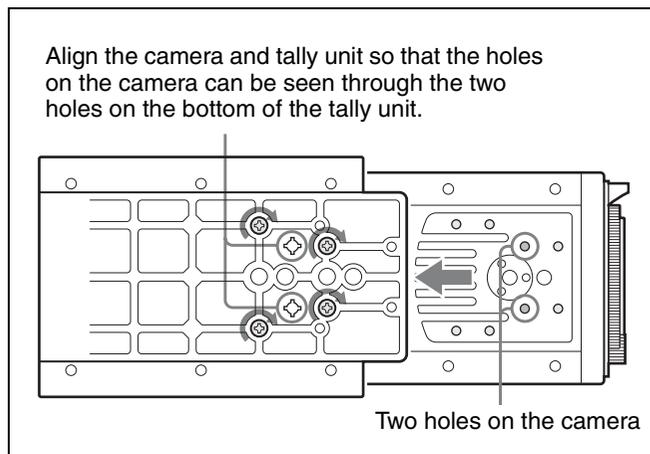


- 3 Pull out the camera body by sliding it.



To attach

Proceed in the reverse order of removing.



When you wish to suspend the camera from a ceiling, you can attach the tally unit upside down. (Note, however, that this usage is not allowed when you use the optional Filter Servo Unit.)

Mounting the Camera to a Tripod

Four mount holes are provided on the bottom of the tally unit.

Select an appropriate hole of the right size from among those at the bottom of the tally unit, considering the balance of the weight of the camera.

Notes

- If an inappropriate hole is selected, the camera may fall over.
- Check that the size of the selected hole matches that of the screw threads of the tripod. If they do not match, the camera cannot be attached to the tripod securely.

Connecting Optical Fiber Cables (HDC-X310/X310K)

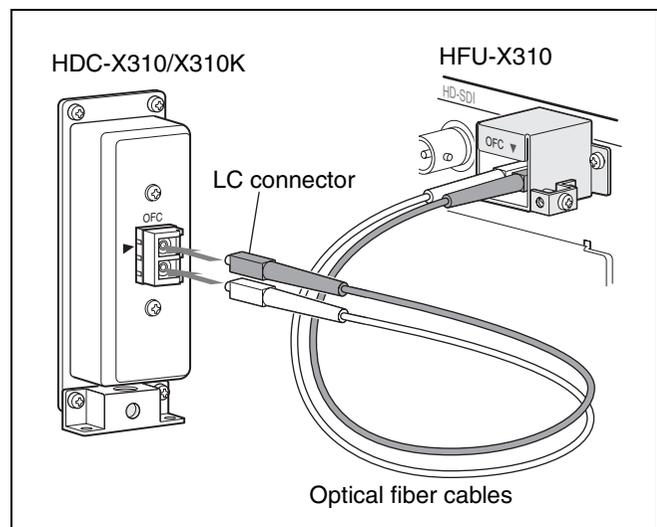
To connect the optional HFU-X310 HD Camera Interface Unit to the HDC-X310/X310K, use commercially available optical fiber cables (Single mode, LC connectors at both ends).

Connect the cables to the OFC connectors of the HFU-X310 and HDC-X310/X310K.

The cable connected to the OFC connector of the HDC-X310/X310K marked with ► should be connected to that of the HFU-X310 marked with ▼.

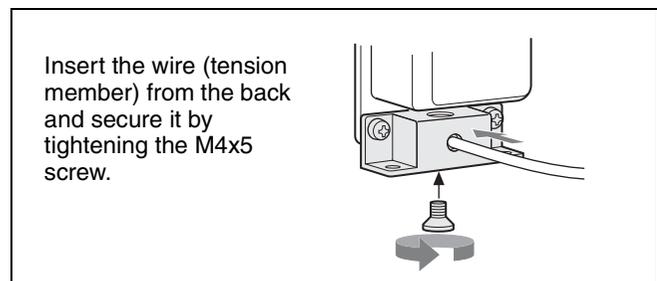
For details on connection to the HFU-X310, refer to the *Operation Manual of the HFU-X310*.

For details on optical fiber cables, see “Optical Fiber Cable (on the market) (for the HDC-X310/X310K)” on page 42.

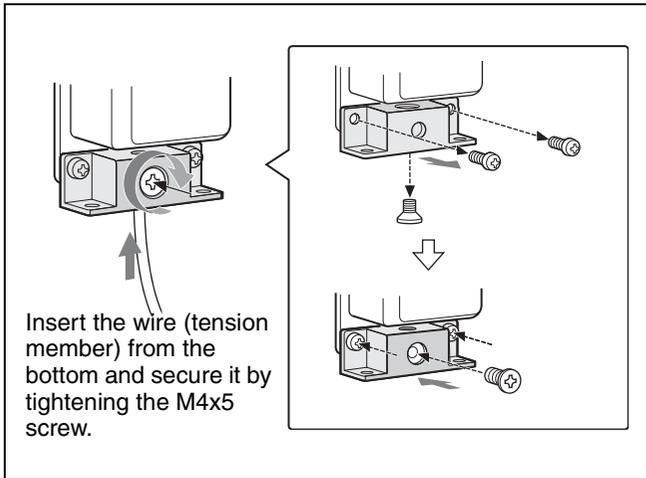


To use the cable clamp

Secure the wire (tension member) of the optical fiber cable using the cable clamp as required.



Change the direction of the cable clamp, as shown below, when you want to insert the tension member from the bottom.



Adjusting the Flange Focal Length

It is necessary to adjust the flange focal length (the distance from the lens flange to the plane of the image along the optical axis) if the focus does not match properly from telephoto to wide angle during zoom operations.

With the lens supplied with the HDC-X300K/X310K, you can select “automatic adjustment” to adjust the flange focal length while operating the zoom and focus automatically or “manual adjustment” to adjust it by operating the zoom and focus manually.

In either case, use the supplied flange focal length adjustment chart as the subject.

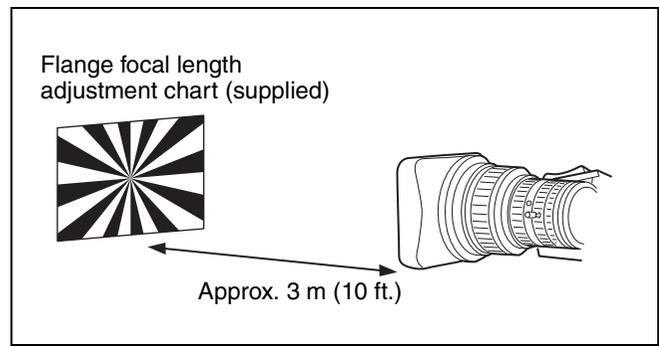
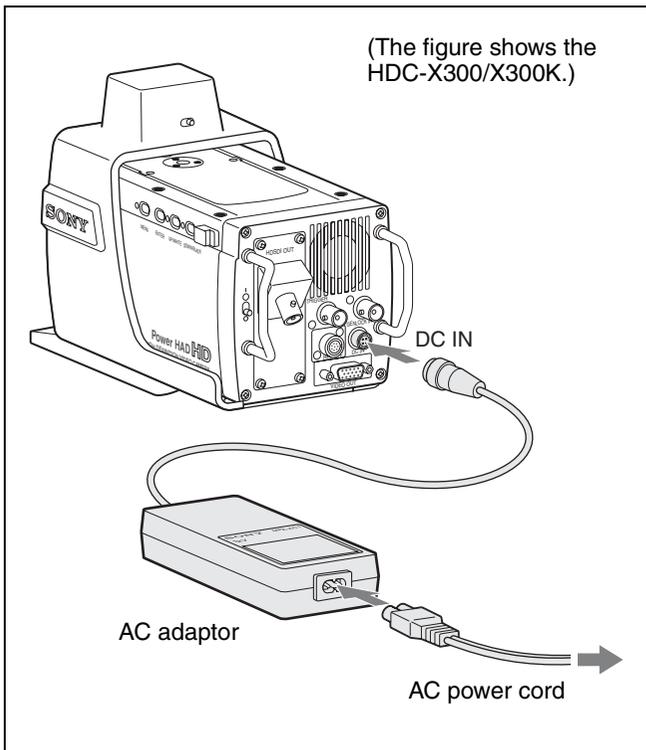
Connecting a Power Source

Connect a power source via the AC adaptor (supplied) and the AC power cord (supplied for USA only).

Optional AC power cord:

1-757-562-61 (for Canada)

1-575-131-91 (for European countries)



Note

If a subject of insufficient contrast is used, or if the camera or subject moves during the adjustment, adjustment may fail.

Selecting the adjustment mode

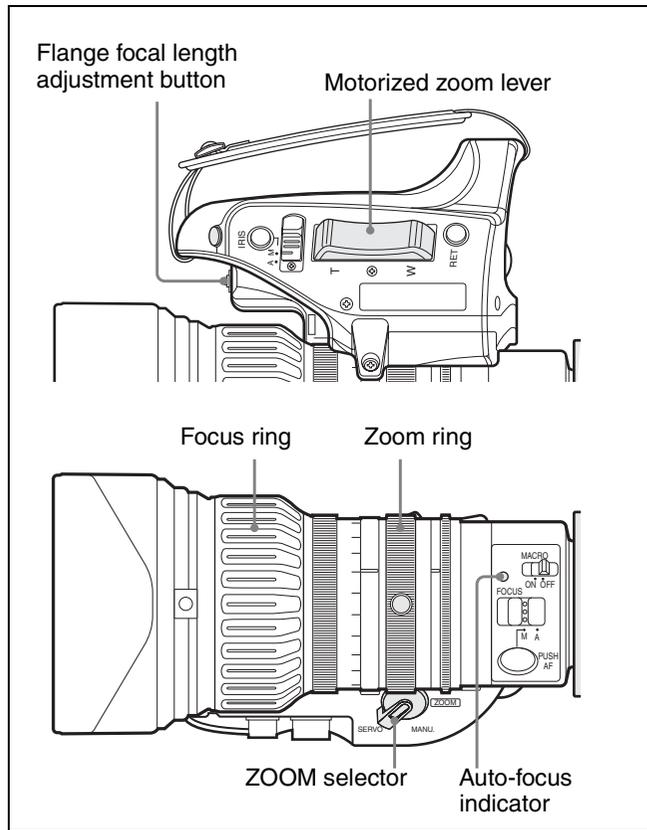
Select the adjustment mode Auto or Manual on the FB ADJUST page of the MAINTENANCE menu.

| | |
|----------------|--------|
| M09 FB ADJUST | TOP |
| →AUTO/MANUAL | : AUTO |
| AUTO FB ADJUST | : EXEC |

Set the AUTO/MANUAL line to AUTO for Auto adjustment or to MANUAL for Manual adjustment.

For details on menu operations, see “Menu Operations” on page 26.

Adjusting



To adjust in Auto mode

Set the AUTO/MANUAL line on the FB ADJUST page of the MAINTENANCE menu to AUTO and proceed as follows:

- 1 Open the iris, place the supplied flange focal length adjustment chart about 3 m (10 ft.) away from the camera, and light it well enough to provide a sufficient video output level.
- 2 Set the ZOOM selector to SERVO.
- 3 Hold the flange focal length adjustment button pressed for more than 3 seconds. Or move the cursor to AUTO FB ADJUST: EXEC on the FB ADJUST page of the MAINTENANCE menu and press the ENTER button.

The auto-focus indicator flashes in amber, and the flange focal length adjustment begins.

During the adjustment

The auto-focus indicator flashes in amber and green alternately. The message "AUTO FB EXECUTING" is displayed on the FB ADJUST page.

When the adjustment is completed successfully

The auto-focus indicator goes dark, and the message on the FB ADJUST page changes to "FB: OK."

To adjust in Manual mode

Set the AUTO/MANUAL line on the FB ADJUST page to MANUAL and proceed as follows:

- 1 Open the iris, place the supplied flange focal length adjustment chart about 3 m (10 ft.) away from the camera, and light it well enough to provide a sufficient video output level.
- 2 Hold the flange focal length adjustment button pressed for 3 seconds until the auto-focus indicator starts flashing in amber.
- 3 Press the T side of the motorized zoom lever (ZOOM selector at SERVO) or turn the zoom ring counterclockwise (when viewed from the camera side) (ZOOM selector at MANU.) fully to the maximum telephoto position, and turn the focus ring to bring the subject in focus.

Note

If the zoom setting is not in the maximum telephoto position, the flange focal length adjustment cannot be performed properly.

- 4 Press the flange focal length adjustment button.

The auto-focus indicator flashes in amber and green alternately.

- 5 Press the W side of the motorized zoom lever (ZOOM selector at SERVO) or turn the zoom ring clockwise (when viewed from the camera side) (ZOOM selector at MANU.) fully to the maximum wide-angle position and turn the focus ring to bring the subject into focus.

Note

If the zoom setting is not in the maximum wide-angle position, the flange focal length adjustment cannot be performed properly.

- 6 Press the flange focal length adjustment button.

When the adjustment is completed successfully, the auto-focus indicator flashes in orange for one second, then goes dark.

If the adjustment fails

The auto-focus indicator flashes in red. Check the conditions of the subject and lighting then perform the adjustment again.

Selecting the Scan Mode

Scan modes 60I/30PsF/24P and 50I/25PsF can be selected for this camera.

To select the scan mode when turning on the power

By performing either of the following when you turn on the power, you can change the scan mode to 60I or 50I.

- To select 60I, turn on the power while holding both the MENU and UP/WHITE buttons down.
- To select 50I, turn on the power while holding both the MENU and DOWN/BLACK buttons down.

When you turn on the power without the above actions, the scan mode previously used is selected.

To select the scan mode by menu operation

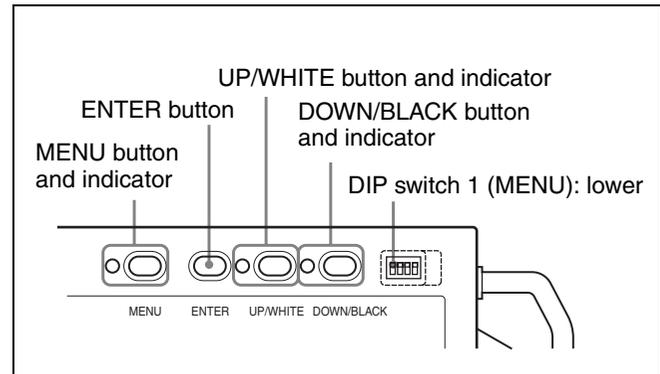
- When the scan mode has been set to 60I, 30PsF, or 24P, you can change it to 60I, 30PsF, or 24P on the FUNCTION 2 page of the OPERATION menu. You cannot change it to 50I/25PsF by menu operation.
- When the scan mode has been set to 50I or 25PsF, you can change it to 50I or 25PsF on the FUNCTION 2 page of the OPERATION menu. You cannot change it to 60I/30PsF/24P by menu operation.

Menu Operations

You can perform various settings using menus displayed on the video output.

The menu display is sent to all video output lines.

For the menu operations, use the four buttons on the side panel.



Enabling/disabling menu operation

Menu operations are permitted only when DIP switch 1 (MENU) is set to its lower position.

By opening the rubber cap and setting the switch to the upper position, you can inhibit menu operations so that the menu display will not be inadvertently activated during normal shooting.

Menu Configuration

The menus of this camera are composed of the following items:

OPERATION menu

This menu contains items for changing settings according to conditions related to the subject when the camera is being operated. The reference value for white balance adjustment, the shutter mode, etc. are included.

PAINT menu

This menu contains items for making detailed image adjustments while using a waveform monitor to monitor the waveforms output from the camera. Support of a video engineer is usually required to use this menu. Although you can also use an external remote control panel or master setup unit to set the items on this menu, use of this menu is most effective when using the camera by itself outdoors.

MAINTENANCE menu

This menu contains basic items usually not changed after being set once.

FILE menu

This menu permits you to access several types of files for storing/retrieving the various setting data of the camera.

DIAGNOSIS menu

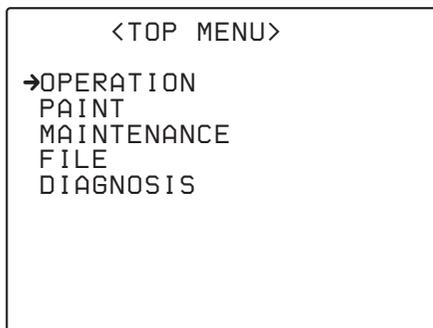
This menu enables you to confirm the camera's status or identify a failed circuit board.

Setting the Camera to Menu Mode

Press the MENU button.

The camera enters Menu mode, and the indicator to the left of the button lights.

When you do this for the first time after the power is turned on, the TOP menu is displayed.



The second or any subsequent time, the menu page that was selected when you last quit Menu mode is displayed.

To quit Menu mode

Press the MENU button again.

Menu mode is released, and the camera returns to the normal shooting mode.

Selecting Menus

When selecting a menu from the TOP menu

Press the UP/WHITE or DOWN/BLACK button to move the arrow to the desired menu, then press the ENTER button.

The page previously selected with that menu is displayed, and a question mark flashes at the left of the page number. While the question mark is flashing, pressing the UP/WHITE or DOWN/BLACK button changes the page. If you press the ENTER button, the question mark disappears, and the displayed page enters Setting mode.

To move to another menu page

1 Press the UP/WHITE button to move the arrow to the page number at the upper left corner of the screen then press the ENTER button.

The arrow changes to a flashing question mark.

2 Press the UP/WHITE or DOWN/BLACK button until the desired page is displayed.

3 Press the ENTER button

The question mark disappears, and the displayed page enters Setting mode.

To return to the TOP menu

Move the arrow to the page number at the top of the screen, press the UP/WHITE button again to move the arrow to "TOP," and press the ENTER button.

Making a Setting on the Menu

Display the menu page on which you wish to make settings, then follow the procedure below:

1 Press the UP/WHITE or DOWN/BLACK button to move the arrow to the item to be set.

2 Press the ENTER button.

A question mark flashes at the selected item.

3 Press the UP/WHITE or DOWN/BLACK button to change the setting.

4 Press the ENTER button.

The question mark disappears, and your selection is registered.

Repeat steps **1** through **4** as required.

To specify a character string

When you press the ENTER button with the arrow pointing to an item for which a character string, such as the camera ID or a file ID, is to be specified, a cursor and the list of selectable characters are displayed.

The displayed cursor can be moved using the UP/WHITE or DOWN/BLACK button.

1 Set the cursor to the position where you wish enter a character, then press the ENTER button.

Another cursor appears on the character list.

2 Set the cursor to the character to be entered and press the ENTER button.

Repeat steps **1** and **2**.

By selecting **INS** on the line below the character, list, you can enter a space at the cursor position. Selecting **DEL** deletes the character at the cursor position.

You can return to step **1** without changing the character by selecting **RET**.

If you enter the permitted maximum number of characters (up to the stop mark at the right end of the line), the cursor moves to **ESC** on the line below the character list.

To register the new string you have set, select **END** and press the **ENTER** button.

To restore the previous string, select **ESC** and press the **ENTER** button.

Caution

If any of the following messages is displayed when you enter Menu mode, immediately stop using the camera and contact Sony service personnel:

HIGH TEMPERATURE!: The temperature inside the unit is extremely high.

FAN DOES NOT WORK!: The fan is not operating even when needed.

HIGH TEMP! CAM SHUTDOWN!: The temperature inside the unit exceeds the limit, and some circuit blocks stop operating (no camera picture is obtained).

Menu Items

When the setting range in the Settings column is enclosed by parentheses (), the setup value is a relative value. The indication 0 means that the item is set at the preset value stored in the ALL file (see page 38).

The setting range shown on the menu screen may differ depending on the preset status.

For the indications in the File column, see “FILE Menu” on page 38.

OPERATION Menu

| Pages | Items | Settings (default in <input type="checkbox"/>) | Function | File |
|--|--------------|--|---|------|
| 01: FUNCTION 1 | OUTPUT | BARS/ <input type="checkbox"/> CAM | To select the output signal: BARS: Color bar signal for adjustment CAM: Video signal being shot | |
| | MASTER GAIN | -3/ <input type="checkbox"/> 0/3/6/9/12/18/24/30/ 36/42/48 | To select the master gain value (dB) | S R |
| | WHITE BAL | PRE/ <input type="checkbox"/> A/B(ATW) | To select the reference value for automatic white balance adjustment: PRE: To use the preset value set with the MAINTENANCE menu A: To use the value stored in memory cell A with the PAINT menu B (ATW): To use the value stored in memory cell B with the PAINT menu or Auto Tracing White function (switching between B and ATW is achieved with the FUNCTION 3 page of the MAINTENANCE menu.) | |
| | SHUTTER MODE | <input type="checkbox"/> OFF/SHUTTER/ECS/SLS | To select the shutter mode: OFF: Normal Shooting mode SHUTTER: Shutter mode (to obtain clear images of quickly moving subjects) ECS: Extended Clear Scan mode (to obtain images of computer monitors without horizontal striping) SLS: Slow Shutter mode (for shooting under insufficient illumination) Note If a lens that does not return the iris value signal is used, the iris is fixed to the open end when the IRIS switch of the lens is set to A (Auto) in SLS (Slow Shutter) mode. | S R |
| | SHUTTER [s] | 60I: <input type="checkbox"/> 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 | To select the shutter speed (sec.) when you set SHUTTER MODE to SHUTTER (The selectable speeds differ among the scan modes.) | S |
| | | 30PsF: <input type="checkbox"/> 1/40, 1/60, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000 | | |
| | | 24P: <input type="checkbox"/> 1/32, 1/48, 1/96, 1/125, 1/250, 1/500, 1/1000, 1/2000 | | |
| | | 50I: <input type="checkbox"/> 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 | | |
| | | 25PsF: <input type="checkbox"/> 1/33, 1/50, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 | | |
| | ECS [Hz] | 60I: <input type="checkbox"/> 60.01 to 19000 | To select the ECS frequency (Hz) when you set SHUTTER MODE to ECS (The selectable speeds differ among the scan modes.) | S |
| 30PsF: <input type="checkbox"/> 29.99 to 26000 | | | | |
| 24P: <input type="checkbox"/> 23.99 to 21000 | | | | |
| 50I: <input type="checkbox"/> 50.14 to 29000 | | | | |
| 25PsF: <input type="checkbox"/> 25.02 to 25000 | | | | |

| | | | | |
|---------------------------|----------------------------------|--|--|-------|
| 01: FUNCTION 1 (cont.) | SLS [F] | <input type="checkbox"/> 2/3/4/5/6/7/8/16/32/64 | To select the number of accumulating frames of the slow shutter when you set SHUTTER MODE to SLS | S |
| 02: FUNCTION 2 | IRIS OVERRIDE | -1/ -0.5/ <input type="checkbox"/> 0/0.5/1 | To select the reference value for the iris | A |
| | D5600 | ON/ <input type="checkbox"/> OFF | To turn the function that electrically applies a 5600K color temperature filter on/off | S R A |
| | EVS | ON/ <input type="checkbox"/> OFF | To turn the EVS function that increases the vertical resolution on/off | S R A |
| | SCAN MODE | <input type="checkbox"/> 60I/30PsF/24P | To set the scan mode to 60I, 30PsF or 24P | S |
| | | <input type="checkbox"/> 50I/25PsF | To set the scan mode to 50I or 25PsF | S |
| STILL MODE | ON/ <input type="checkbox"/> OFF | To turn Still mode on/off Note If a lens that does not return the iris value signal is used, the iris is fixed to the open end when the IRIS switch of the lens is set to A (Auto) in Still mode. | | |
| 03: TLCS | AGC | ON/ <input type="checkbox"/> OFF | To turn the automatic gain adjustment on/off (With AGC ON, the unit maintains the luminance at a certain level by automatically adjusting the gain in the range up to the AGC LIMIT value when the iris setting becomes wider (toward OPEN) than the AGC CHANGE POINT setting.) | A |
| | AGC LIMIT | 3/6/9/ <input type="checkbox"/> 12/15/18/ dB | To select the maximum gain value of the automatic gain adjustment | A |
| | AGC CHANGE POINT | OPEN/F2/ <input type="checkbox"/> F2.8/F4/F5.6 | To select the iris value at which the unit is switched from Auto iris mode to Automatic Gain Adjustment mode | A |
| | AE | ON/ <input type="checkbox"/> OFF | To turn the automatic shutter adjustment on/off (With AE ON, the unit maintains the luminance at a certain level by automatically adjusting the shutter speed in the range up to the AE LIMIT value when the iris setting becomes narrower than the AE CHANGE POINT setting.) | A |
| | AE LIMIT | 1/100, 1/150, 1/200, <input type="checkbox"/> 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 | To select the minimum shutter speed of the automatic shutter adjustment | A |
| | AE CHANGE POINT | F5.6/F8/F11/ <input type="checkbox"/> F16 | To select the iris value at which the unit is switched from Auto iris mode to Automatic Shutter Adjustment mode | A |
| | AUTO ND ¹⁾ | ON/ <input type="checkbox"/> OFF | To turn the auto ND filter function on/off (With AUTO ND ON, the unit maintains the luminance at a certain level by automatically switching the ND filters so that the iris is set in the range of ±2 steps from the ND CENTER POINT setting. Note that this ND filter switching will not occur when the tally lamp is lit.) | A |
| | ND CENTER POINT ¹⁾ | F4/ <input type="checkbox"/> F5.6/F8 | To select the center iris value to be the target of the auto ND filter function | A |

| | | | | |
|----------------|------------------|---|---|---|
| 04: OFFSET WHT | OFFSET WHITE <A> | ON/ <input type="checkbox"/> OFF | To determine whether to add the offset adjusted on this page to the white balance setting in memory cell A | A |
| | WARM-COOL <A> | Color temperature values (<input type="text" value="3200"/>) | To set the offset (as a color temperature value) for the white balance to add to the white balance setting in memory cell A when OFFSET WHITE <A> is ON Note Adjust the value while viewing the actual image, because error tends to be bigger for adjustment at high color temperature. | A |
| | COLOR FINE <A> | (-99 to <input type="text" value="0"/> to +99) | To fine-adjust the WARM-COOL <A> setting | A |
| | OFFSET WHITE | ON/ <input type="checkbox"/> OFF | To determine whether to add the offset adjusted on this page to the white balance setting in memory cell B | A |
| | WARM-COOL | Color temperature values (<input type="text" value="3200"/>) | To set the offset (as a color temperature value) for the white balance to add to the white balance setting in memory cell B when OFFSET WHITE is ON Note Adjust the value while viewing the actual image, because error tends to be bigger for adjustment at high color temperature. | A |
| | COLOR FINE | (-99 to <input type="text" value="0"/> to +99) | To fine-adjust the WARM-COOL setting | A |
| 05: CAMERA ID | CAMERA ID DISP | CAM/BARS/ <input type="checkbox"/> OFF | To determine whether to superimpose the camera ID CAM: to the camera image BARS: onto the color bars OFF: not to superimpose | |
| | ID | character string | To specify the camera ID (12 characters) to be superimposed | |

1) The items AUTO ND and ND CENTER POINT are displayed only when the optional HKC-SV1 Filter Servo Unit is attached.

PAINT Menu

| Pages | Items | Settings (default in <input type="text"/>) | Functions | File |
|----------------------|--------------------------|---|--|-------|
| P01: SW STATUS | GAMMA ¹⁾ | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the gamma correction on/off | S R A |
| | MATRIX | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the linear matrix correction on/off | S R A |
| | KNEE ¹⁾ | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the knee correction on/off | S R A |
| | WHITE CLIP ¹⁾ | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the white clipping correction on/off | S R A |
| | DETAIL ¹⁾ | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the detail signal on/off | S R A |
| | APERTURE ¹⁾ | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the aperture function on/off | S R A |
| | FLARE ¹⁾ | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the flare function on/off | S R A |
| | TEST SAW | ON/ <input type="checkbox"/> OFF | To turn the test signal on/off | A |
| P02: WHITE | COLOR TEMP <A> | Color temperature values (<input type="text"/> 3200) | To set the color temperature for the white balance setting in memory cell A | A |
| | COLOR FINE <A> | (-99 to <input type="text"/> 0 to +99) | To fine-adjust the COLOR TEMP <A> setting | A |
| | R GAIN <A> | (-99 to <input type="text"/> 0 to +99) | To fine-adjust the COLOR TEMP <A> setting only toward R (red) | A |
| | B GAIN <A> | (-99 to <input type="text"/> 0 to +99) | To fine-adjust the COLOR TEMP <A> setting only toward B (blue) | A |
| | COLOR TEMP | Color temperature values (<input type="text"/> 3200) | To set the color temperature for the white balance setting in memory cell B | A |
| | COLOR FINE | (-99 to <input type="text"/> 0 to +99) | To fine-adjust the COLOR TEMP setting | A |
| | R GAIN | (-99 to <input type="text"/> 0 to +99) | To fine-adjust the COLOR TEMP setting only toward R (red) | A |
| | B GAIN | (-99 to <input type="text"/> 0 to +99) | To fine-adjust the COLOR TEMP setting only toward B (blue) | A |
| P03: BLACK/ FLARE | MASTER BLACK | (-99 to <input type="text"/> 0 to +99) | To adjust the master black level | S R A |
| | R BLACK | (-99 to <input type="text"/> 0 to +99) | To adjust the R black level | S R A |
| | B BLACK | (-99 to <input type="text"/> 0 to +99) | To adjust the B black level | S R A |
| | MASTER FLARE | (-99 to <input type="text"/> 0 to +99) | To adjust the flare level of the master | S A |
| | R FLARE | (-99 to <input type="text"/> 0 to +99) | To adjust the R flare level | S R A |
| | G FLARE | (-99 to <input type="text"/> 0 to +99) | To adjust the G flare level | S R A |
| | B FLARE | (-99 to <input type="text"/> 0 to +99) | To adjust the B flare level | S R A |
| | FLARE | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn flare correction on/off. | S R A |
| P04: GAMMA | GAMMA | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn gamma correction on/off | S R A |
| | STEP GAMMA | 0.35 to <input type="text"/> 0.45 to 0.90 (0.05 steps) | To set the master gamma correction curve in steps | S R A |
| | MASTER GAMMA | (-99 to <input type="text"/> 0 to +99) | To set the master gamma correction curve | S A |
| | R GAMMA | (-99 to <input type="text"/> 0 to +99) | To set the R gamma correction curve | S R A |
| | G GAMMA | (-99 to <input type="text"/> 0 to +99) | To set the G gamma correction curve | S R A |
| | B GAMMA | (-99 to <input type="text"/> 0 to +99) | To set the B gamma correction curve | S R A |
| | GAMMA SELECT | <input type="checkbox"/> STD/ <input type="checkbox"/> FILM | To select the gamma table: STD: To use the standard gamma table FILM: To use the gamma table similar to the film characteristics | S R A |
| | GMA SEL (STD) | <input type="text"/> 1/2/3/4 | To select one of the four gamma curves from the STD gamma table | S R A |
| | GMA SEL (FILM) | <input type="text"/> 1/2/3/4 | To select one of the four gamma curves from the FILM gamma table | S R A |

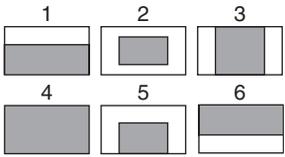
| | | | | |
|------------------|------------------|--|--|---|
| P05: KNEE | KNEE | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn knee correction on/off | S R A |
| | DCC | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the DCC function for high-luminance subjects on an off | S R |
| | KNEE POINT | 50.0 to <input type="text" value="85.0"/> to 109.0 (0.1 steps) | To set the knee point level (in %) | S R A |
| | KNEE SLOPE | (-99 to <input type="text" value="0"/> to +99) | To set the knee slope level | S A |
| | KNEE MAX | ON/ <input type="checkbox"/> OFF | To turn the knee max function on/off | R |
| | KNEE SAT LEVEL | (-99 to <input type="text" value="0"/> to +99) | To set the knee saturation level | S R A |
| | WHITE CLIP | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the white clipping function on/off | S R A |
| | WHITE CLIP LEVEL | 100.0 to <input type="text" value="109.0"/> to 109.5 (0.1 steps) | To adjust the white clipping level (in %) | S R A |
| P06: DETAIL 1 | DETAIL | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the detail correction (contour correction) function on/off | S R A |
| | DETAIL LEVEL | (-99 to <input type="text" value="0"/> to +99) | To adjust the general detail correction level | S R A |
| | DETAIL FREQ. | (-99 to <input type="text" value="0"/> to +99) | To adjust the H detail frequency (thickness of contour lines) | S R A |
| | CRISPENING | (-99 to <input type="text" value="0"/> to +99) | To adjust the crispening level at which noise signals are to be removed in detail correction | S R A |
| | DTL H/V RATIO | (-99 to <input type="text" value="0"/> to +99) | To adjust the ratio of vertical detail to horizontal detail in detail correction | S R A |
| | LEVEL DEPEND | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the "level depend" function to decrease the black level in detail correction on/off | S R A |
| | LVL DEPEND LVL | (-99 to <input type="text" value="0"/> to +99) | To adjust the level of the "level depend" function | S R A |
| | APERTURE | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the aperture correction on/off | S R A |
| | APERTURE LEVEL | (-99 to <input type="text" value="0"/> to +99) | To adjust the aperture level | S R A |
| | P07: DETAIL 2 | KNEE APERTURE | ON/ <input type="checkbox"/> OFF | To turn the knee aperture function on/off |
| KNEE APT LEVEL | | (-99 to <input type="text" value="0"/> to +99) | To adjust the knee aperture level | S R A |
| DETAIL LIMIT | | (-99 to <input type="text" value="0"/> to +99) | To adjust the both detail black and white limiters | S R A |
| DTL WHT LIMIT | | (-99 to <input type="text" value="0"/> to +99) | To adjust the detail white limiter | S R A |
| DTL BLK LIMIT | | (-99 to <input type="text" value="0"/> to +99) | To adjust the detail black limiter | S R A |
| DTL V-BLK LIMIT | | (-99 to <input type="text" value="0"/> to +99) | To adjust the V detail black limiter | S A |
| V DTL CREATION | | NAM/G/ <input type="text" value="R+G"/> /Y | To select the source signal for V detail | S R A |
| H/V CONTROL MODE | | V, <input type="text" value="H/V"/> | To select the operation mode of DTL H/V RATIO on the DETAIL 1 page V: To change only vertically H/V: To change both horizontally and vertically | S R A |
| P08: SKIN DTL | SKIN DETECT | EXEC | To call the COLOR DETECT screen to detect the color for which the color detail function is to operate: To detect the color Shoot so that the desired color enters in [] displayed at the center of the COLOR DETECT screen, then press the ENTER button. Adjust SKIN SAT and SKIN HUE as required. | |
| | SKIN SAT | (-99 to <input type="text" value="0"/> to +99) | To adjust the saturation level of the hue processed by the color detail function | S R A |
| | SKIN HUE | <input type="text" value="0"/> to 359 | To adjust the center phase of the hue processed by the color detail function | S R A |
| | SKIN WIDTH | 0 to <input type="text" value="40"/> to 90 | To adjust the width of the hue processed by the color detail function | S R A |
| | SKIN DETAIL | ON/ <input type="checkbox"/> OFF | To turn the color detail function on/off | S R A |
| | SKIN DETAIL LVL | (-99 to <input type="text" value="0"/> to +99) | To set the level of the color detail signal | S R A |

| | | | | |
|----------------------|-----------------|---|---|-------|
| P09: MATRIX 1 | MATRIX | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the linear matrix correction function on/off Note The user matrix and preset matrix settings are disabled when MATRIX is set to OFF. | S R A |
| | USER MATRIX | ON/ <input type="checkbox"/> OFF | To turn the user-set matrix correction function on/off | S R A |
| | USER MATRIX SAT | (-99 to <input type="text" value="0"/> to +99) | To adjust the color saturation (color intensity) of the whole picture when USER MATRIX is ON | S R A |
| | USER MATRIX HUE | (-99 to <input type="text" value="0"/> to +99) | To adjust the hue of the whole picture when USER MATRIX is ON | S R A |
| | PRESET MTX | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the preset matrix correction function on/off | S R A |
| | PRESET MTX SEL | <input type="text" value="STD"/> /HI SAT/FL | To select the preset matrix to be used when PRESET MATRIX is ON: STD: Standard color tones HI SAT: For more vivid picture (The color intensity slightly increases.) FL: For shooting under fluorescent light, to prevent the skin tones from becoming greenish | S R A |
| P10: MATRIX 2 | MATRIX R-G | (-99 to <input type="text" value="0"/> to +99) | To set the arbitrary R-G user-set matrix coefficients | S R A |
| | MATRIX R-B | (-99 to <input type="text" value="0"/> to +99) | To set the arbitrary R-B user-set matrix coefficients | S R A |
| | MATRIX G-R | (-99 to <input type="text" value="0"/> to +99) | To set the arbitrary G-R user-set matrix coefficients | S R A |
| | MATRIX G-B | (-99 to <input type="text" value="0"/> to +99) | To set the arbitrary G-B user-set matrix coefficients | S R A |
| | MATRIX B-R | (-99 to <input type="text" value="0"/> to +99) | To set the arbitrary B-R user-set matrix coefficients | S R A |
| | MATRIX B-G | (-99 to <input type="text" value="0"/> to +99) | To set the arbitrary B-G user-set matrix coefficients | S R A |
| P11: V MODULATION | V MOD | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn the V modulation function on/off | R A |
| | MASTER VMOD | (-99 to <input type="text" value="0"/> to +99) | To turn the master V modulation function on/off | S A |
| | R VMOD | (-99 to <input type="text" value="0"/> to +99) | To turn the R V modulation function on/off | S A |
| | G VMOD | (-99 to <input type="text" value="0"/> to +99) | To turn the G V modulation function on/off | S A |
| | B VMOD | (-99 to <input type="text" value="0"/> to +99) | To turn the B V modulation function on/off | S A |
| P12: LOW KEY SAT | LOW KEY SAT | ON/ <input type="checkbox"/> OFF | To turn the low key saturation function on/off. | S R A |
| | L.KEY SAT LEVEL | (-99 to <input type="text" value="0"/> to +99) | To set the saturation level of the low luminance part | S R A |
| | L.KEY SAT RANGE | LOW/L.MID/H.MID/ <input type="text" value="HIGH"/> | To set the luminance level at which the low key saturation function is to be in effect | S R A |
| | Y BLACK GAMMA | ON/ <input type="checkbox"/> OFF | To turn the Y black gamma function on/off | S R A |
| | Y BLK GAM LEVEL | (-99 to <input type="text" value="0"/> to +99) | To set the gamma curve in the low luminance part | S R A |
| | Y BLK GAM RANGE | LOW/L.MID/H.MID/ <input type="text" value="HIGH"/> | To set the luminance level at which the Y black gamma is to be in effect | S R A |

1) The settings of the items GAMMA, KNEE, WHITE CLIP, DETAIL, APERTURE, and FLARE are stored in the Reference file as ON.

MAINTENANCE Menu

| Pages | Items | Settings (default in <input type="text"/>) | Functions | File |
|-----------------------|-----------------|---|---|-------|
| M01: WHITE SHADING | WHT SHAD CH SEL | <input type="text"/> R/G/B | To select the channel to be adjusted on this page (The four items below can be set independently.) | |
| | WHT H SAW | (-99 to <input type="text"/> 0 to +99) | To adjust H Saw white shading compensation | |
| | WHT H PARA | (-99 to <input type="text"/> 0 to +99) | To adjust H Parabola white shading compensation | |
| | WHT V SAW | (-99 to <input type="text"/> 0 to +99) | To adjust V Saw white shading compensation | |
| | WHT V PARA | (-99 to <input type="text"/> 0 to +99) | To adjust V Parabola white shading compensation | |
| | WHT SAW/PARA | <input type="text"/> ON/OFF | To turn white shading Saw and Parabola compensation on/off | |
| M02: BLACK SHADING | BLK SHAD CH SEL | <input type="text"/> R/G/B | To select the channel to be adjusted on this page | |
| | BLACK H SAW | (-99 to <input type="text"/> 0 to +99) | To adjust H Saw black shading compensation | |
| | BLACK H PARA | (-99 to <input type="text"/> 0 to +99) | To adjust H Parabola black shading compensation | |
| | BLACK V SAW | (-99 to <input type="text"/> 0 to +99) | To adjust V Saw black shading compensation | |
| | BLACK V PARA | (-99 to <input type="text"/> 0 to +99) | To adjust V Parabola black shading compensation | |
| | BLACK SAW/PARA | <input type="text"/> ON/OFF | To turn black shading Saw and Parabola compensation on/off | |
| | MASTER BLACK | (-99 to <input type="text"/> 0 to +99) | To adjust the master black level | S R A |
| | MASTER GAIN | -3/ <input type="text"/> 0/3/6/9/12/18/24/30/ 36/42/48 | To adjust the master gain value (dB) | S R |
| M03: PRESET WHT | COLOR TEMP <P> | Color temperature values (<input type="text"/> 3200) | To adjust the preset color temperature for white balance adjustment | A |
| | COLOR FINE <P> | (-99 to <input type="text"/> 0 to +99) | To adjust the value more precisely when the color temperature adjustment through COLOR TEMP <P> is not satisfactory | A |
| | R GAIN <P> | (-99 to <input type="text"/> 0 to +99) | To change the COLOR TEMP <P> value only toward R (red) | A |
| | B GAIN <P> | (-99 to <input type="text"/> 0 to +99) | To change the COLOR TEMP <P> value only toward B (blue) | A |
| | AWB ENABLE <P> | ON/ <input type="text"/> OFF | To turn on/off the function that automatically acquires your preset value for automatic white balance adjustment | |
| M04: DCC ADJUST | DCC POINT | (-99 to <input type="text"/> 0 to +99) | To adjust DCC minimum knee point | R A |
| | DCC GAIN | (-99 to <input type="text"/> 0 to +99) | To adjust the gain for the DCC detected value | R A |
| | DCC DELAY TIME | (-99 to <input type="text"/> 0 to +99) | To adjust the DCC reaction speed | R A |

| | | | | |
|--------------------|------------------|--|---|-------|
| M05: AUTO IRIS | IRIS WINDOW | <input type="checkbox"/> 1/ <input type="checkbox"/> 2/ <input type="checkbox"/> 3/ <input type="checkbox"/> 4/ <input type="checkbox"/> 5/ <input type="checkbox"/> 6 | To select the auto iris detection windows:  The shaded portion indicates the area where light detection is to occur. | S R A |
| | IRIS LEVEL | (-99 to <input type="checkbox"/> 0 to +99) | To adjust the auto iris target value | S R A |
| | IRIS APL RATIO | (-99 to <input type="checkbox"/> 0 to +99) | To adjust the Mix ratio of auto iris detection peak value and average value | S R A |
| | IRIS SPEED | (-99 to <input type="checkbox"/> 0 to +99) | To adjust the auto iris speed | S R A |
| | CLIP HIGH LIGHT | ON/ <input type="checkbox"/> OFF | To turn on/off the function that, during auto iris adjustment, ignores very bright areas by dulling the reaction to high luminescence | |
| M06: FUNCTION 3 | WHT FILTER INH | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | To turn on/off the function that inhibits independent white memory for each filter position | A |
| | COLOR BAR SEL | <input type="checkbox"/> MULTI/ <input type="checkbox"/> 100%/75% | To select the color bar type | A |
| | GAIN LOW | -3/ <input type="checkbox"/> 0/3/6/9/12/18/24/30/36/42/48 | To select the value (dB) when the gain setting at the connected camera control is set to LOW | A |
| | GAIN MID | -3/0/3/6/ <input type="checkbox"/> 9/12/18/24/30/36/42/48 | To select the value (dB) when the gain setting at the connected camera control is set to MID | A |
| | GAIN HIGH | -3/0/3/6/9/12/ <input type="checkbox"/> 18/24/30/36/42/48 | To select the value (dB) when the gain setting at the connected camera control is set to HIGH | A |
| | WHITE SWITCH | MEM/ <input type="checkbox"/> ATW | To select the adjustment method for white balance when WHITE BAL is set to B on FUNCTION 1 page of OPERATION menu: MEM: To use the value stored in memory cell B using the PAINT menu as the reference ATW: To use Auto Tracing White balance (function that automatically traces the white balance or changes in lighting condition) | A |
| | SHOCKLESS WHITE | OFF/ <input type="checkbox"/> 1/2/3 | To select the speed for switching the white balance | A |
| | ATW SPEED | 1/2/3/ <input type="checkbox"/> 4/5 | To set the convergence speed for Auto Tracing White balance | A |
| | 232C CamCnt RATE | 4800/9600/ <input type="checkbox"/> 19200/38400 | To select the transmission rate (bps) when the unit is to be controlled with "RS-232C camera control protocol." <i>For details on "RS-232C camera control protocol," ask your Sony representative.</i> | |
| | ZOOM SELECT | <input type="checkbox"/> 1/2 | To set the zooming direction of the lens when operating it from the connected camera controller (With a certain lens, the zooming direction may be reversed when operated from a camera controller. In such a case, change the setting of this item.) | |

| | | | | |
|---|---|-----------------------------------|---|-----|
| M07:GENLOCK (when the HFU-X310 is not connected) | SOURCE | [HD]/SD | To select the type of genlock signal HD: analog HD (3-level sync) SD: SD (2-level sync) | A |
| | H PHASE FINE | 0 to 99 | To fine-adjust the H phase for genlock (The value changes in steps of 1, updating the first and second digits of the setting.) | A |
| | H PHASE COARSE | -1800 to +1800 | To roughly adjust the H phase for genlock (The value changes in steps of 100, updating the third and fourth digits of the setting. For the first and second digits, the value set at H PHASE FINE is displayed.) | A |
| | H ADVANCE 0/90H (displayed only when SD is selected for SOURCE) | [0]/90 | To determine whether to advance the H phase for SD genlock by 90 lines | A |
| | FRM SEQ TRIGGER (displayed in 24P mode only) | [IN]/OUT | To select the mode for frame trigger IN: input OUT: output | |
| M07:GENLOCK (when the HFU-X310 is connected) | SOURCE | FIBER | "FIBER" is displayed when the HFU-X310 is connected. | |
| | H PHASE ¹⁾ (displayed only when the connected HFU-X310 has the H PHASE adjustment capability) | (-99 to [0] to +99) | To adjust the output H phase of the HFBK-HD1 and HFBK-SD1 mounted in the HFU-X310 for genlock ^{2) 3)} (The output phase of VIDEO OUT on this camera cannot be adjusted.) | A |
| | SD OFFSET (displayed only when the connected HFU-X310 has the H PHASE adjustment capability) | (-99 to [0] to +99) | To adjust the output H phase of the HFBK-SD1 mounted in the HFU-X310 for genlock ³⁾ (The output phase of VIDEO OUT on this camera cannot be adjusted.) | A |
| | FRM SEQ TRIGGER (displayed in 24P mode only) | [IN]/OUT | To select the mode for frame trigger IN: input OUT: output | |
| M08:AUTO SHADING | AUTO BLK SHADING | EXEC | To execute the auto black shooting function | |
| | RESET BLK SHD | EXEC | To clear black shooting compensation values | |
| | MASTER GAIN | -3/[0]/3/6/9/12/18/24/30/36/42/48 | To set the master gain value (dB) | S R |
| M09: FB ADJUST | AUTO/MANUAL | [AUTO]/MANUAL | To select the adjustment mode for the flange focal length | |
| | AUTO FB ADJUST | EXEC | To execute flange focal length adjustment | |
| M10: PROCESS SETTING | MODE CONFIG | [MODE1]/MODE2 | MODE1: This mode sets the camera parameters for a normal environment. MODE2: This mode sets the camera parameters for environments at standard lighting and requiring higher SN ratio. | |

- 1) The value of this item varies when you change H PHASE using a remote control device.
- 2) As the frequency of the internal operating clock is different between the HFBK-HD1 and the HFBK-SD1, the amount of change in the phase in H PHASE adjustment may not be the same.
- 3) The output phase of the HFBK-SD1 is adjusted using the combination value of H PHASE and SD OFFSET.

FILE Menu

The adjustment data can be stored as files in memory on this camera.

There are following types of file, which are accessed using the FILE menu:

ALL file

The preset values of the menu items can be stored.

The items included in this file are indicated with “A” in the File column of the menu table.

Scene files

Up to five sets of paint data adjusted for specific scenes can be stored and retrieved when required.

The items included in this file are indicated with “S” in the File column of the menu table.

Reference file

This file stores the reference values used for auto-setup adjustments and the standard settings of control functions. When you execute an auto setup operation from the connected camera control, the corresponding items are adjusted in reference to the settings stored in this file. If there is no reference file stored in the camera, the factory-set standard values are used as the reference data.

The items included in this file are indicated with “R” in the File column of the menu table.

Lens files

By your storing the data (such as compensation data) specific to the lenses to be used as files, required adjustments and compensation can be performed merely by retrieving the appropriate file when changing lenses.

| Pages | Items | Settings (default in <input type="checkbox"/>) | Functions | File |
|--|------------------|---|---|------|
| F01: ALL FILE | ALL PRESET | EXEC | To return the items included in the ALL file to your preset values | |
| | STORE ALL PRESET | EXEC | To store the current settings for the items included in the ALL file as your preset value | |
| | CLEAR ALL PRESET | EXEC | To return the preset values for the items in the ALL file to the default values | |
| | 3SEC CLR PRESET | ON/ <input type="checkbox"/> OFF | To turn on/off the function to return the setting of each menu item and the preset values to the factory settings by holding the ENTER button pressed for 3 seconds | |
| F02: SCENE FILE | 1/2/3/4/5 | | To select the number of the scene file to be retrieved | |
| | STANDARD | | To reset the paint data to the standard values stored in the reference file | |
| | SCENE WHITE DATA | ON/ <input type="checkbox"/> OFF | To determine whether white balance data are to be retrieved from the scene files: ON: To retrieve OFF: Not to retrieve | A |
| | SCENE STORE | EXEC | To move to the SCENE FILE STORE page | |
| | F. ID | character string | To specify the ID (max.16 characters) of the scene file | |
| SCENE FILE STORE (sub page of F02: SCENE FILE) | 1/2/3/4/5 | | To select the number of the scene file in which the current paint settings are to be stored | |
| F03: REFERENCE | REFERENCE STORE | EXEC | To update the reference file using the current settings | |
| | REFERENCE CLEAR | EXEC | To return the contents of the reference file to the standard values | |

| | | | | |
|---|------------------|--|--|-------|
| F04: LENS FILE 1 | LENS FILE RECALL | EXEC | To move to the LENS RECALL page for calling a stored lens file | |
| | LENS FILE STORE | EXEC | To move to the LENS STORE page for storing the current setting in a lens file | |
| | F. ID | character string | Displays the ID (max.16 characters) of the lens file being selected (can be changed). | |
| | LENS NO OFFSET | EXEC | To clear the contents of the lens file | |
| | IRIS GAIN | (-99 to <input type="text" value="0"/> to +99) | Displays the iris gain value of the selected lens file. | S R A |
| LENS RECALL/ LENS STORE (sub pages of F04: LENS FILE 1) | 1/2/3/4/5 | | To select a lens file of the corresponding number | |
| | F. ID | character string | To specify the ID (max.16 characters) of the lens file | |
| F05: LENS FILE 2 | LENS M VMOD | (-99 to <input type="text" value="0"/> to +99) | To adjust the master V modulation shading of the lens file | |
| | LENS R FLARE | (-99 to <input type="text" value="0"/> to +99) | To adjust the R flare level of the lens file | |
| | LENS G FLARE | (-99 to <input type="text" value="0"/> to +99) | To adjust the G flare level of the lens file | |
| | LENS B FLARE | (-99 to <input type="text" value="0"/> to +99) | To adjust the B flare level of the lens file | |
| F06: LENS FILE 3 | SHADING CH SEL | <input type="text" value="R"/> /G/B | To select the channel to be adjusted on this page (The four items below can be set independently.) | |
| | LENS H SAW | (-99 to <input type="text" value="0"/> to +99) | To adjust H Saw white shading compensation of the lens file | |
| | LENS H PARA | (-99 to <input type="text" value="0"/> to +99) | To adjust H Parabola white shading compensation of the lens file | |
| | LENS V SAW | (-99 to <input type="text" value="0"/> to +99) | To adjust V Saw white shading compensation of the lens file | |
| | LENS V PARA | (-99 to <input type="text" value="0"/> to +99) | To adjust V Parabola white shading compensation of the lens file | |

DIAGNOSIS Menu

| Pages | Items | Functions |
|------------------|---|---|
| D01: HOURS METER | OPERATION (H) | Displays the accumulated value of powered time of the camera. |
| | FAN (H) | Displays the accumulated operation time of the fan. |
| D02: DEV STATUS | FRAM AT | Display the conditions inside the camera. |
| | EEPROM VA DPR PA | |
| | LSI HT BCS | |
| | FILTER SERVO (displayed only with HKC-SV1 attached) | Displays the status of the Filter Servo Unit. ¹⁾ |
| | OPTICAL MODULE (displayed for HDC- X310/X310K only) | Displays the conditions of the optical transmission module. TxLD: Condition of the laser diode for transmission from the camera Rx LEVEL: Level status of the optical reception of the camera side Rx ERROR: Error status of optical reception data error of the camera side |

1) If the filter is kept rotated continuously, it may be regarded as an abnormal operation and "ERROR" may be displayed. The "ERROR" indication is maintained until the camera is turned off.

Note

If NG appears, consult your Sony service personnel.

Specifications

Note

Always verify that the unit is operating properly before use. SONY WILL NOT BE LIABLE FOR DAMAGES OF ANY KIND INCLUDING, BUT NOT LIMITED TO, COMPENSATION OR REIMBURSEMENT ON ACCOUNT OF THE LOSS OF PRESENT OR PROSPECTIVE PROFITS DUE TO FAILURE OF THIS UNIT, EITHER DURING THE WARRANTY PERIOD OR AFTER EXPIRATION OF THE WARRANTY, OR FOR ANY OTHER REASON WHATSOEVER.

Camera

Pick-up device

Pick-up device 1/2-type, interline transfer CCD

Device configuration

RGB 3-CCD system

Picture elements 1440 (h) × 1080 (v)

Optical specifications

Spectral system F1.4 prism system

Built-in ND filters

1: Clear

2: 1/4 ND

3: 1/16 ND

4: 1/64 ND

General

Power requirements

12 V DC

Power consumption

HDC-X300/X300K:

23.5 W (with the VCL-719BXS Zoom Lens, HKC-SV1 Filter Servo Unit, and the RM-B750 Remote Control Unit connected)

18 W (camera head only)

HDC-X310/X310K:

24.5 W (with the VCL-719BXS Zoom Lens, HKC-SV1 Filter Servo Unit, and the RM-B750 Remote Control Unit connected)

19 W (camera head only)

Operating temperature

-10°C to +45°C (+14°F to +113°F)

Storage temperature

-20°C to +60°C (-4°F to +140°F)

Mass

HDC-X300/X300K:

Camera head: Approx. 1.2 kg
(2 lb 10 oz) (not including lens)

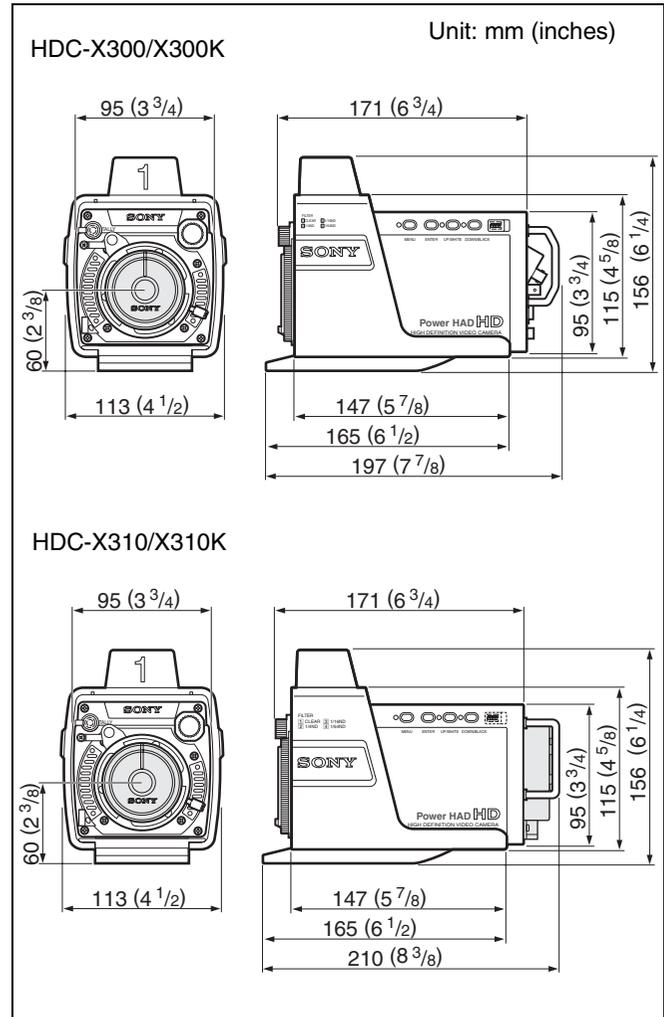
Camera head+Tally unit: Approx. 1.7 kg
(3 lb 12 oz) (not including lens)

HDC-X310/X310K:

Camera head: Approx. 1.3 kg
(2 lb 13 oz) (not including lens)

Camera head+Tally unit: Approx. 1.8 kg
(3 lb 15 oz) (not including lens)

Dimension



Electrical characteristics

Sensitivity 2,000 lux (F10, typical)
Reflection ratio of 89.9%

Minimum subject illumination About 0.003 lux (F1.4, +48 dB gain,
Slow Shutter of 64 frames)

Video signal-to-noise ratio 52 dB (typical)

Modulation 40% (typical) at 21 MHz (with HDSDI
output)

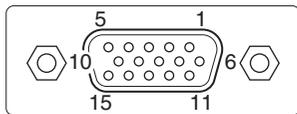
Smear -120 dB (typical)

Input connectors

GENLOCK IN BNC-type (1)
TRIGGER BNC-type (1), TTL level

Output connectors

TALLY OUT mini jack (1)
HDSDI OUT BNC-type (1) (HDC-X300/X300K only)
VIDEO OUT HD D-sub 15-pin (1)
Output level
Y: 1.0 V_{p-p}, 75 ohms
Pr, Pb: 1.0 V_{p-p}, 75 ohms
R, G, B: 1.0 V_{p-p}, 75 ohms
HD, VD: TTL level (3 V_{p-p})
SYNC: 0.6 V_{p-p}, 75 ohms
Pin assignment



| Pin | Signal | Pin | Signal | Pin | Signal |
|-----|----------|-----|----------|-----|---------|
| 1 | R/Pr (X) | 6 | R/Pr (G) | 11 | NC |
| 2 | G/Y (X) | 7 | G/Y (G) | 12 | NC |
| 3 | B/Pb (X) | 8 | B/Pb (G) | 13 | HD |
| 4 | NC | 9 | NC | 14 | VD/SYNC |
| 5 | GND | 10 | GND | 15 | NC |

Input/output connectors

OFC Single mode, LC optical connector (2)
(HDC-X310/X310K only)
REMOTE 8-pin (1)

Supplied accessories

Lens (1) (HDC-X300K/X310K only)
Lens mount cap (1)
AC adaptor (1)
AC power cord (2 m) (1) (for USA only)
Flange focal length adjustment chart (1)
Number plate (1 set)
Operation Manual (1)
CD-ROM Operation Manual (1)

Recommended AC power cord

1-757-562-61 (2 m) (for Canada)
1-575-131-91 (for European countries)

Related equipment

MSU-700A/750 Master Setup Unit
RCP-700-series Remote Control Panel
RM-B150/B750 Remote Control Unit
HKC-SV1 Filter Servo Unit
HFU-X310 HD Camera Interface Unit

Design and specifications are subject to change without notice.

AC Adaptor (Supplied)

Power requirements

100–240 V AC, 50/60 Hz

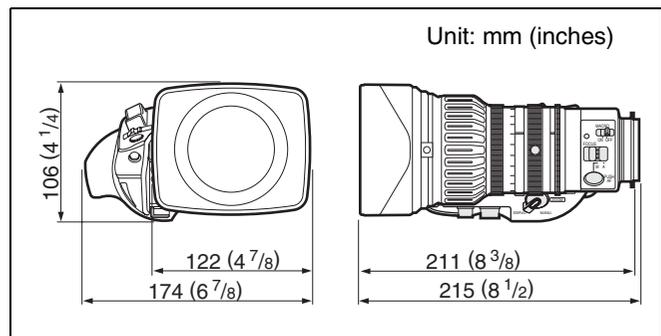
Peak inrush current

- (1) Power ON, current probe method:
70 A (240 V), 30 A (100 V)
- (2) Hot switching inrush current, measured in accordance with European standard EN55103-1: 10 A (230 V)

Design and specifications are subject to change without notice.

VCL-719BXS Zoom Lens (supplied with the HDC-X300K/X310K)

Focal length 6.7 to 127 mm
Zoom Manual or power, selectable
Zoom ratio ×19
Maximum aperture 1: 1.6, 1:2.1 (at Telephoto end)
Aperture Manual or automatic, selectable
f/1.6 to f/16 and C (closed)
Focusing range Infinity to 5 cm
Filter attachment threads 82 mm dia. 0.75 mm pitch
Mounting 1/2-type bayonet mount
Mass 1.34 kg (2 lb 15 oz) including the food
External dimensions



Design and specifications are subject to change without notice.

Optical Fiber Cable (on the market) (for the HDC-X310/X310K)

Use optical fiber cables of the following specifications:

Type of fiber: Single-mode fiber

End surface of fiber: SPC (spherical polishing)

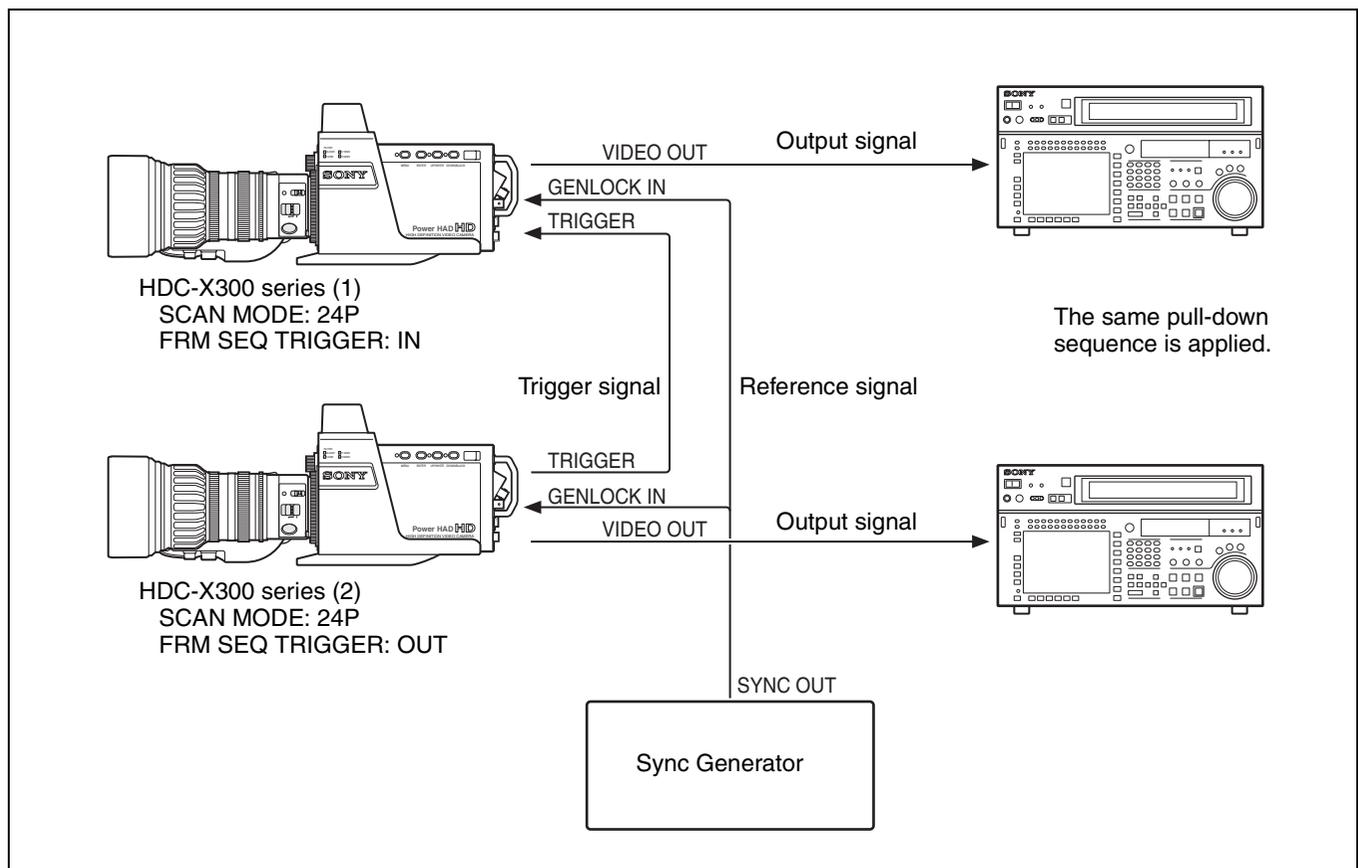
Spherical polishing with a return loss of -40 dB or more

Optical connectors: LC connectors at both ends
(conforming to MSA)^{a)}

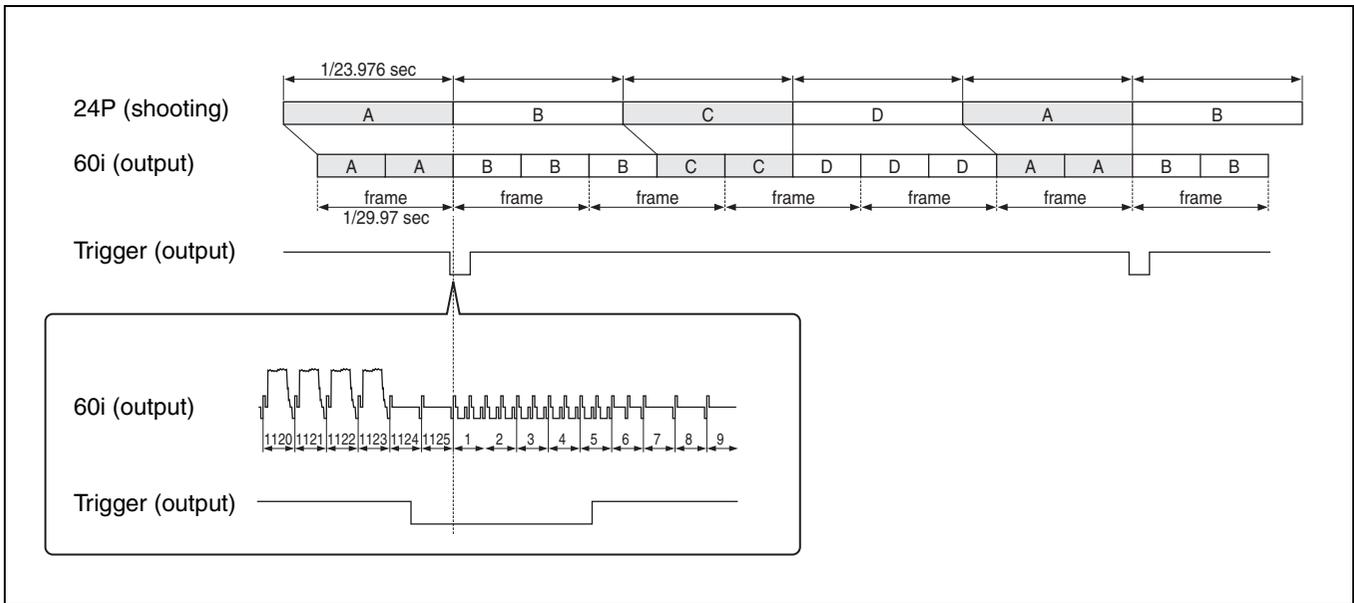
a) An LC pair connector is recommended.

Design and specifications are subject to change without notice.

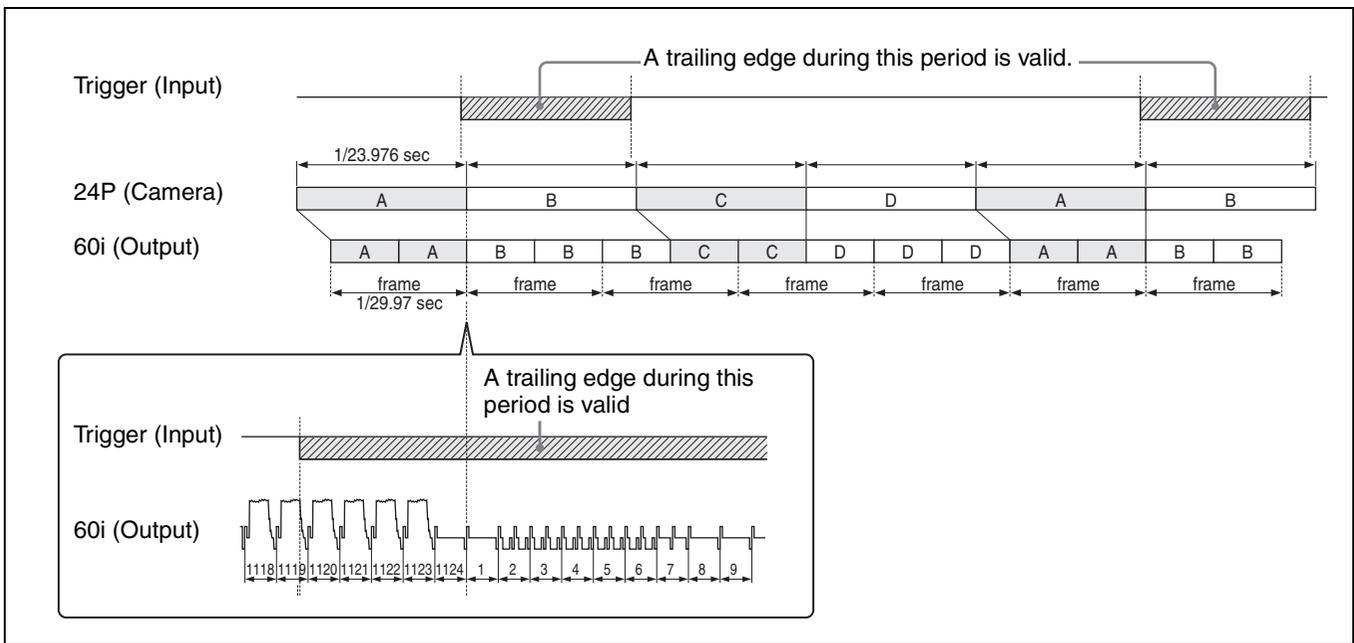
Synchronous Operations in 24P Mode



Timing chart 1: FRM SEQ TRIGGER: OUT

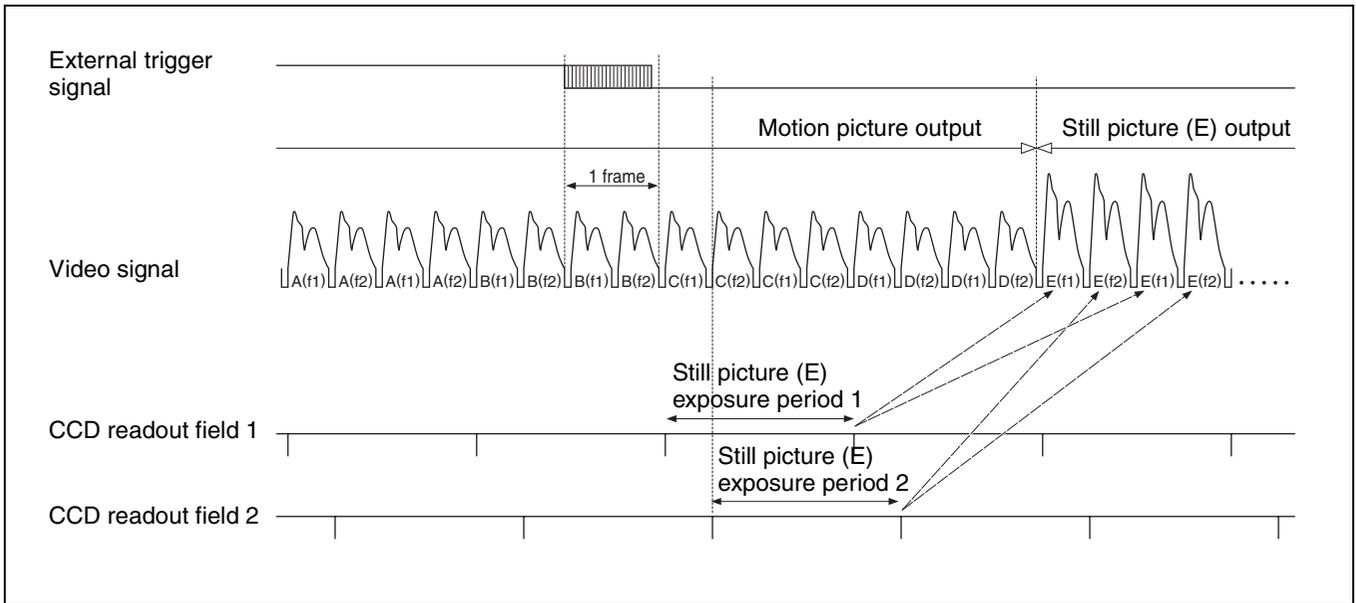


Timing chart 2: FRM SEQ TRIGGER: IN

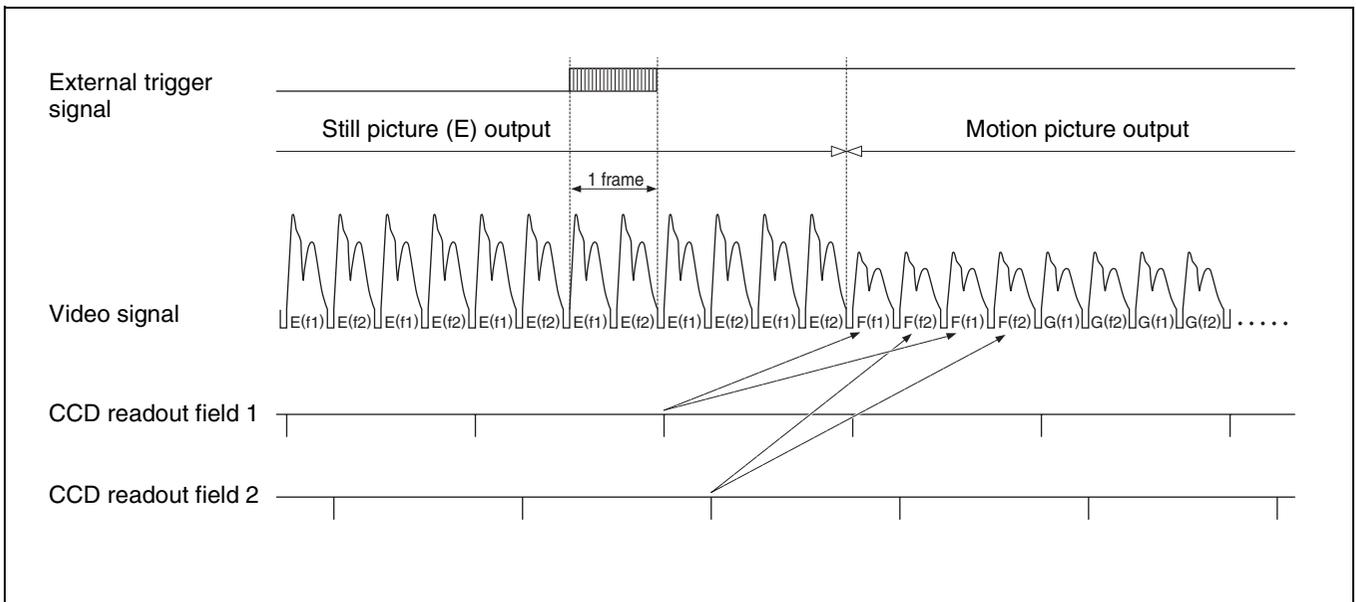


Shooting in Still Mode

Timing chart 1: From Motion to Still

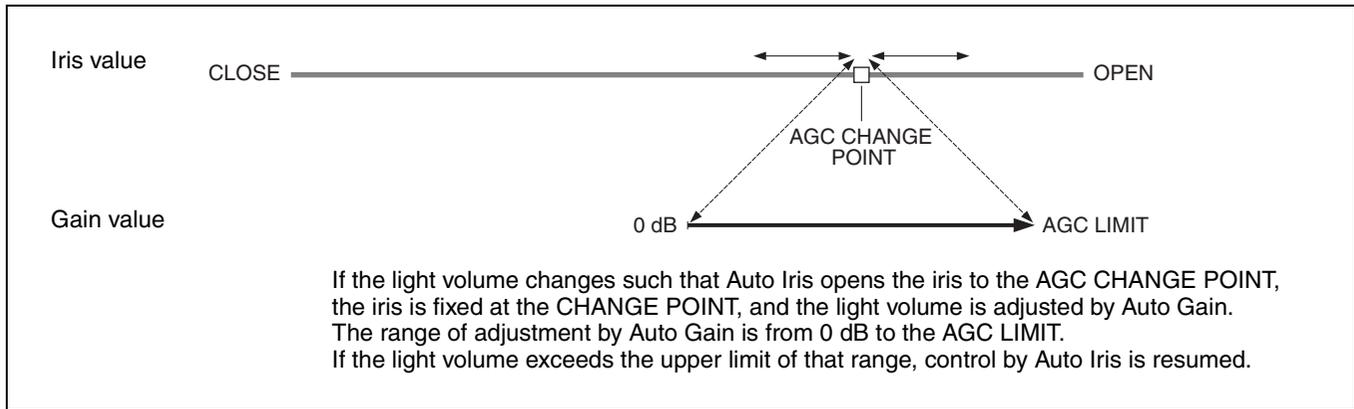


Timing chart 2: From Still to Motion

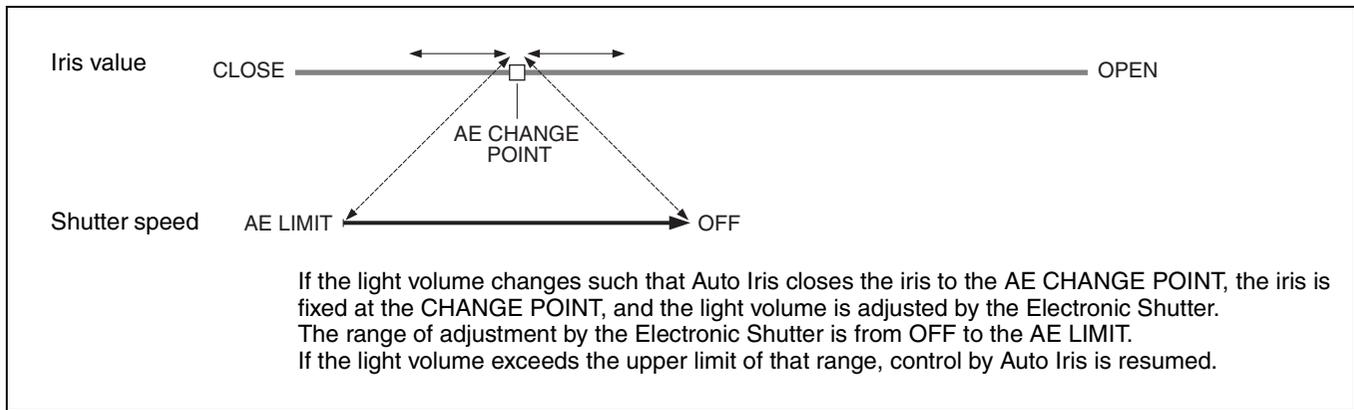


Operations of the Total Level Control System (TLCS)

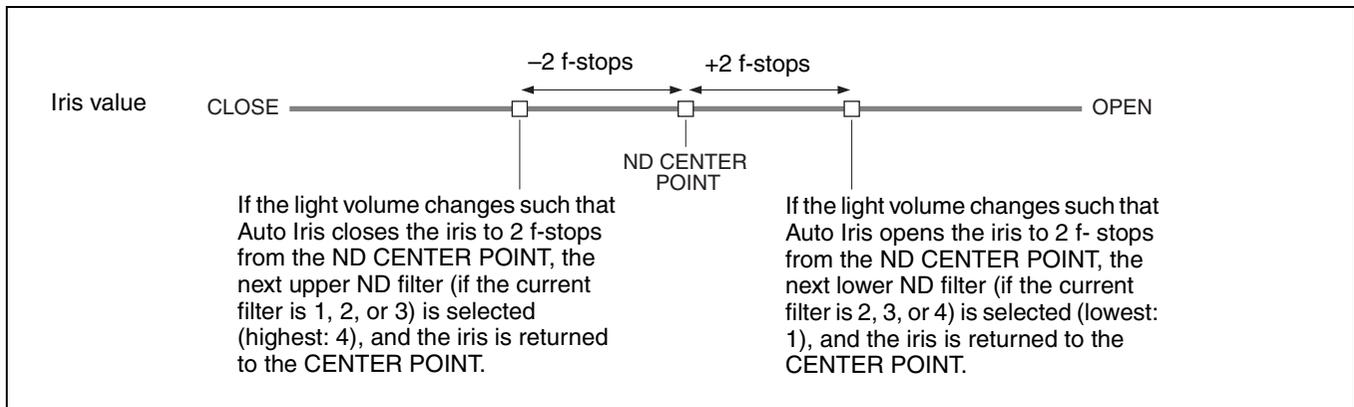
1. Auto Gain Control (AGC) operation



2. Electronic Shutter (AE) operation



3. Auto ND operation



- Auto ND has the priority over AGC and AE. (When Auto ND is ON, AGC operates only when the ND filter is 1. When Auto ND is ON, AE operates only when the ND filter is 4.)
- Auto ND does not work when the Tally lamp is on.

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