SONY

5-055-461-**11** (1)

Color Camera

Operating Instructions

Before operating the unit, please read this manual thoroughly and retain it for future reference.

HXC-FZ90

Table of Contents

Overview

The HXC-FZ90 employs a 2/3-inch type 4K CMOS image sensor that achieves a high sensitivity of F10 and high S/N ratio of 62 dB.
You can use this unit as a studio camera by connecting it to an HXCU-FZ90 4K/HD Camera Control Unit (CCU) using a fiber cable.

Supported Formats

The HXC-FZ90 supports 1920×1080/59.94P, 50P, 60P, 1920×1080/59.94i, 50i, 1920×1080/29.97PsF, 25PsF, 24PsF, 23.98PsF and 1280×720/59.94P, 50P formats as standard.

You can extend the formats that are supported by installing the following camera operating software (option).
- HZC-UHD9/HZC-UHD9W/HZC-UHD9M 4K/HDR Processor

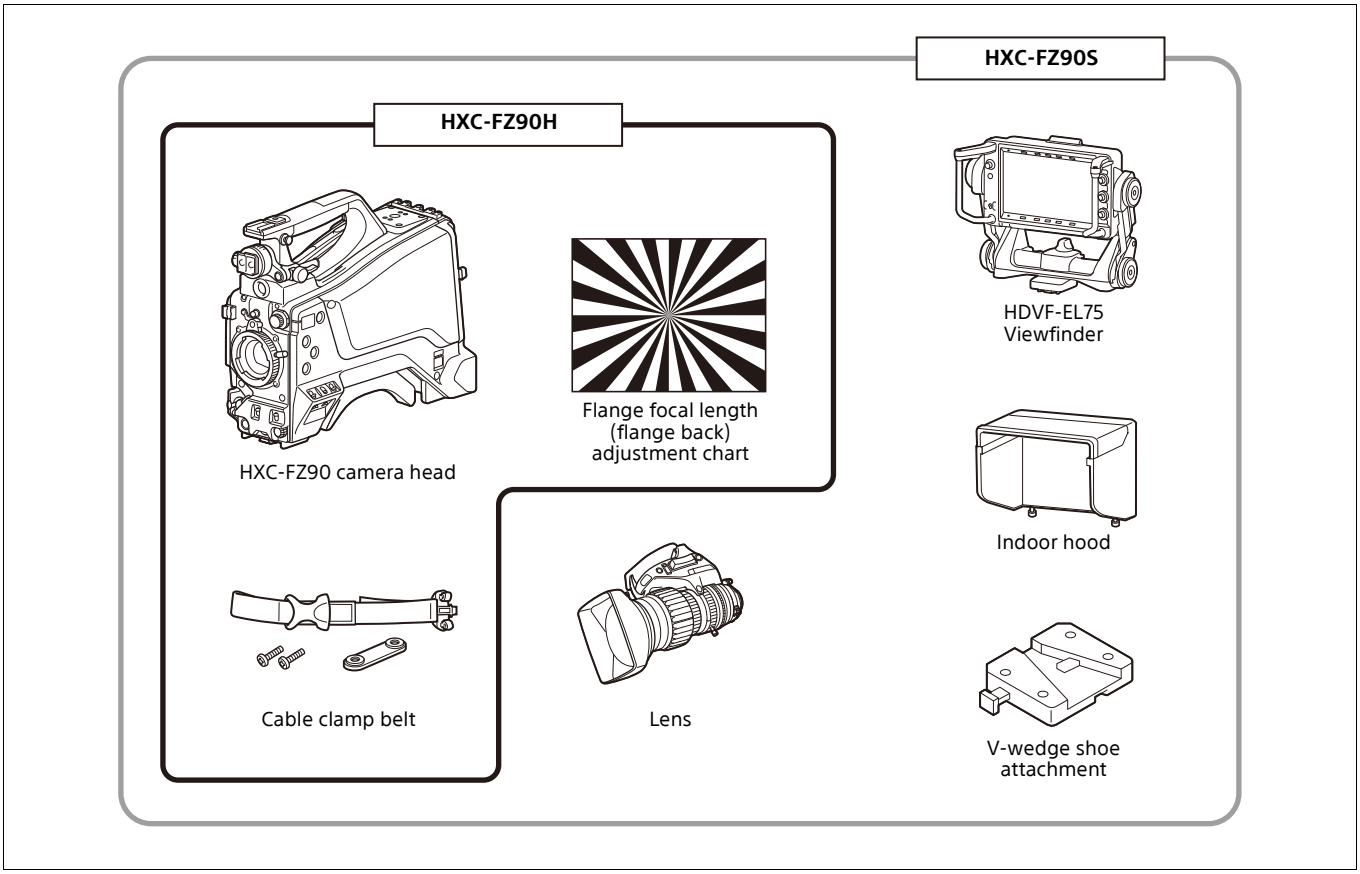
The following formats can be selected when the unit is connected to a CCU when camera operating software is installed.[a)]
CAMERA FORMAT setting of CCU: UHD/60P(4K/HDR), 59.94P(4K/HDR), 50P(4K/HDR), 30P(4K/HDR), 29.97P(4K/HDR), 25P(4K/HDR), 24P(4K/HDR), 23.98P(4K/HDR)
Output in the following format from the SDI OUT connector of the unit is supported in standalone operation mode.
3840×2160/60P, 3840×2160/59.94P, 3840×2160/50P, 3840×2160/30P, 3840×2160/29.97P, 3840×2160/25P, 3840×2160/24P, 3840×2160/23.98P

a) When connected with a CCU, 12G/6G output from the camera is not supported.

- Limited subscription licenses are available for each software, with the period of validity of the license indicated by the last character of the name. If a character that does not denote a license period of validity is the last character, the license will not expire (indefinite).
  - M: Valid for 30 days
  - W: Valid for 7 days

Camera System Components

The HXC-FZ90 camera system comprises the components shown in the figure below.
The operation of the camera head is the same for all models.



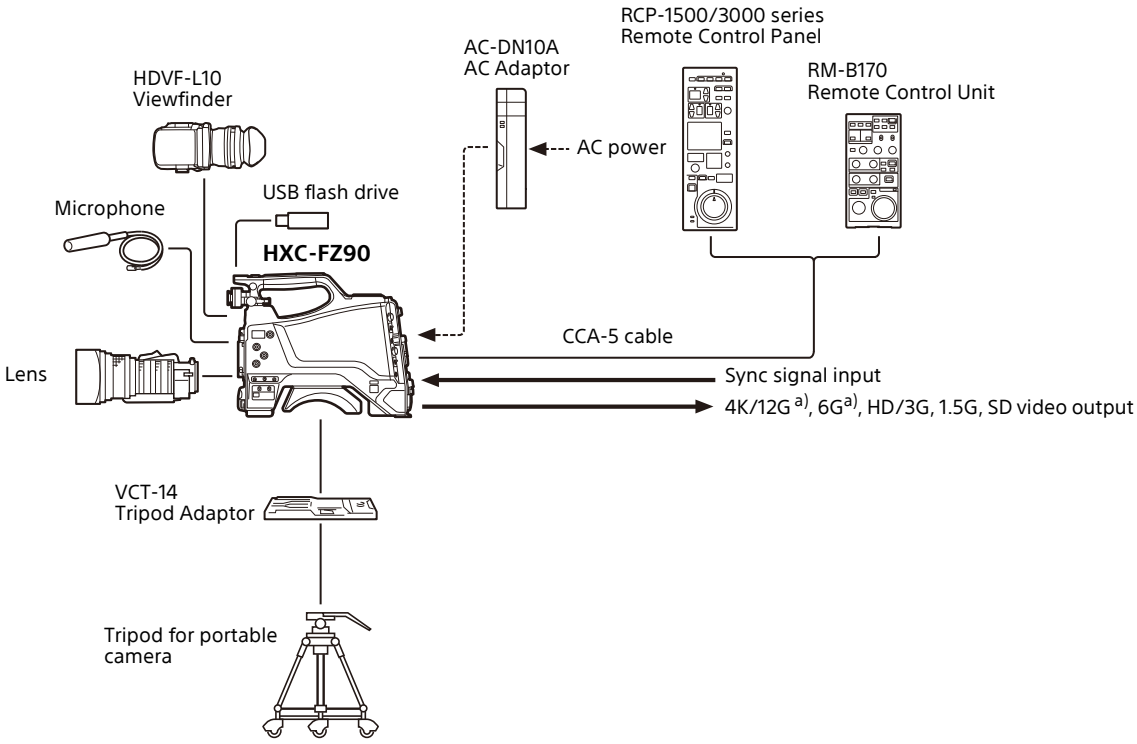
System Configuration

Peripherals and related devices for the camera are shown in the figures.

Note

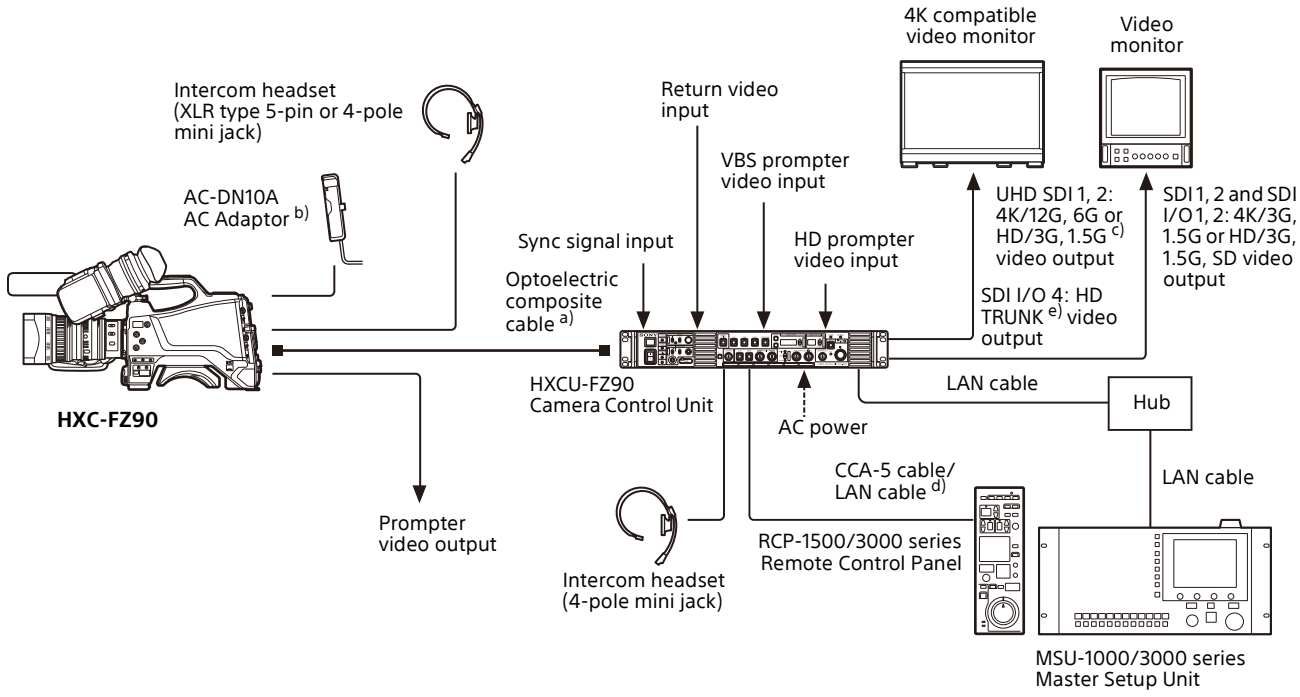
Production of some of the peripherals and related devices shown in the figures may have been discontinued. For advice on choosing devices, please contact your Sony dealer or a Sony service representative.

Standalone operation example



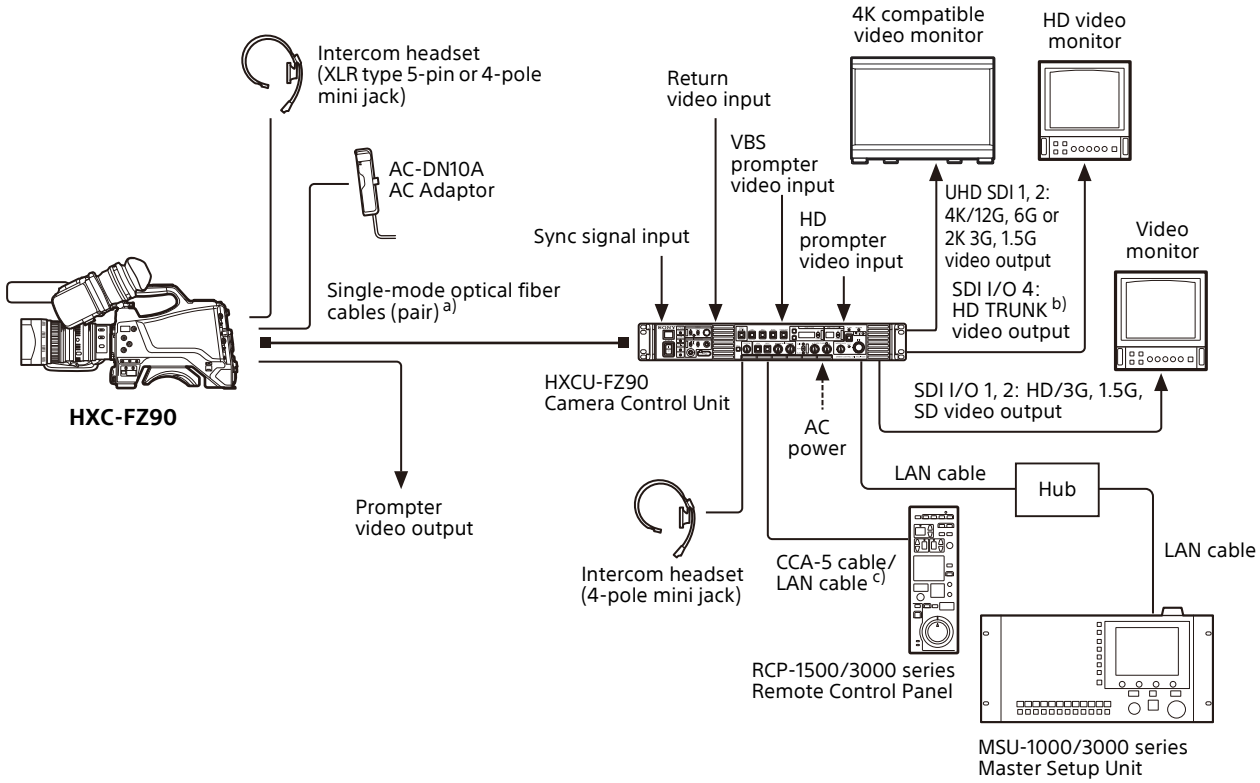
a) To support 4K video output from the unit, the software option must be installed. Also, 4K video output is supported in standalone operation mode only.

Optoelectric composite cable connection example



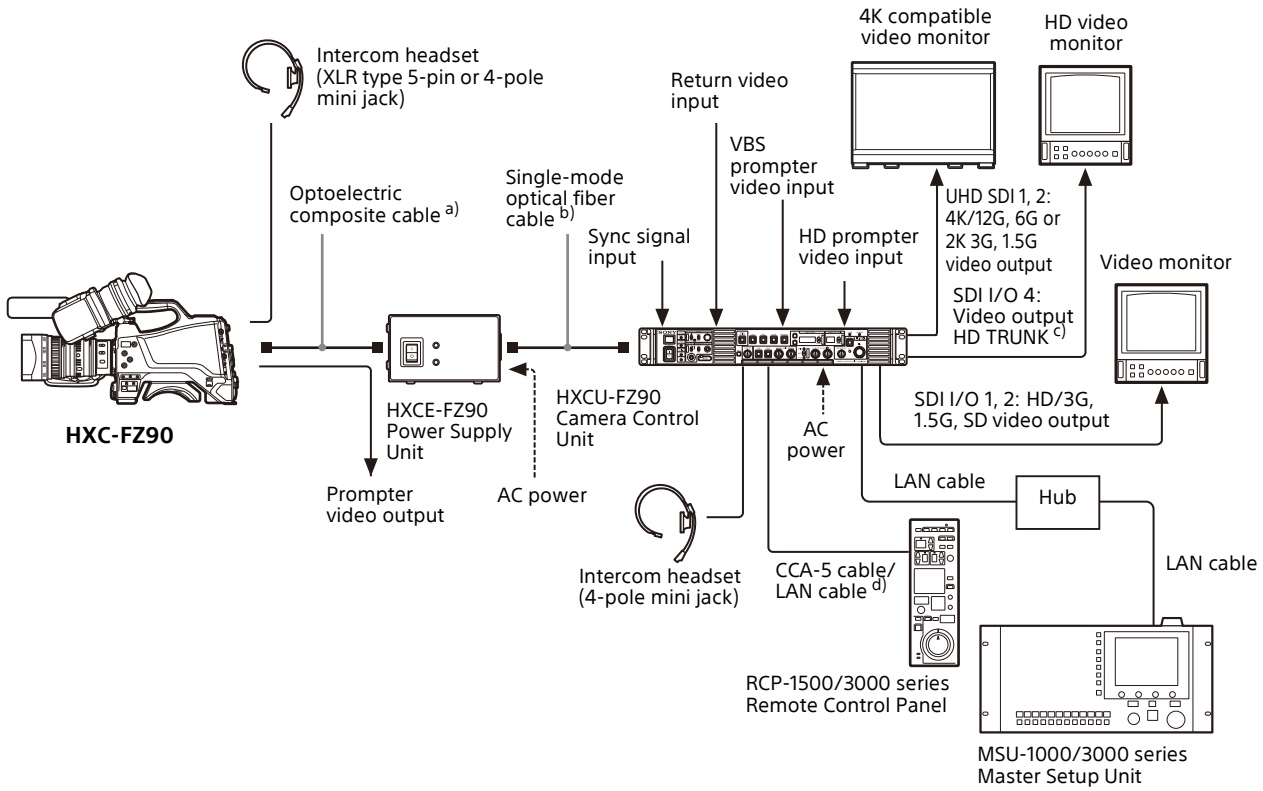
a) The maximum transmission distance is approximately 300 m (984 ft) when using CCFN-25/50/100/150/200/250 Hybrid Fiber Cable, CCFN-JC1 Cable Coupler, and LEMO optical fiber composite cable.
b) The maximum transmission distance is approximately 2 km (6560 feet) when the HXC-FZ90 is powered by an AC-DN10A (CAMERA POWER switch set to EXT) and CAM POWER SUPPLY is set to OFF on the <CAMERA I/F> page in the SYSTEM CONFIG menu of the CCU.
c) 4K/3G output and 2K output are not supported at the same time.
d) A LAN cable can be used only to connect the RCP-1500/3000 series. When connecting, power needs to be supplied via a PoE hub or supplied to the EXT DC IN connector of the RCP-1500/3000 series.
e) Operation supported when connected with HXC-FZ90 and the signal format is set to 1080/59.94i, 50i, 29.97PsF, 25PsF, 24PsF, 23.98PsF, 720/59.94P, or 50P and also NETWORK TRUNK is set to OFF or NETWORK+VIDEO on the <TRUNK/PROMPTER> page on the HXCU-FZ90.

Single-mode optical fiber cable connection example



a) The maximum transmission distance is approximately 10 km (6 miles) when using general-purpose single-mode fiber cables with LC connectors.
b) Operation supported when connected with HXC-FZ90 and the signal format is set to 1080/59.94i, 50i, 29.97PsF, 25PsF, 24PsF, 23.98PsF, 720/59.94P, or 50P and also NETWORK TRUNK is set to OFF or NETWORK+VIDEO on the <TRUNK/PROMPTER> page on the HXCU-FZ90.
c) A LAN cable can be used only to connect the RCP-1500/3000 series. To connect, power needs to be supplied via a PoE hub or supplied to the EXT DC IN connector of the RCP-1500/3000 series.

HXCE-FZ90 Power Supply Unit connection example



a) The maximum transmission distance is approximately 300 m (984 ft) when using CCFN-25/50/100/150/200/250 Hybrid Fiber Cable and LEMO optical fiber composite cable. (The maximum transmission distance will vary depending on the format setting and power supply requirements of peripheral devices.)

b) The maximum transmission distance is approximately 10 km (6 miles) when using general-purpose single-mode fiber cables with LC connectors. When using a single-mode optical fiber cable, set CABLE TYPE to SINGLE MODE FIBER in the CCU menu.

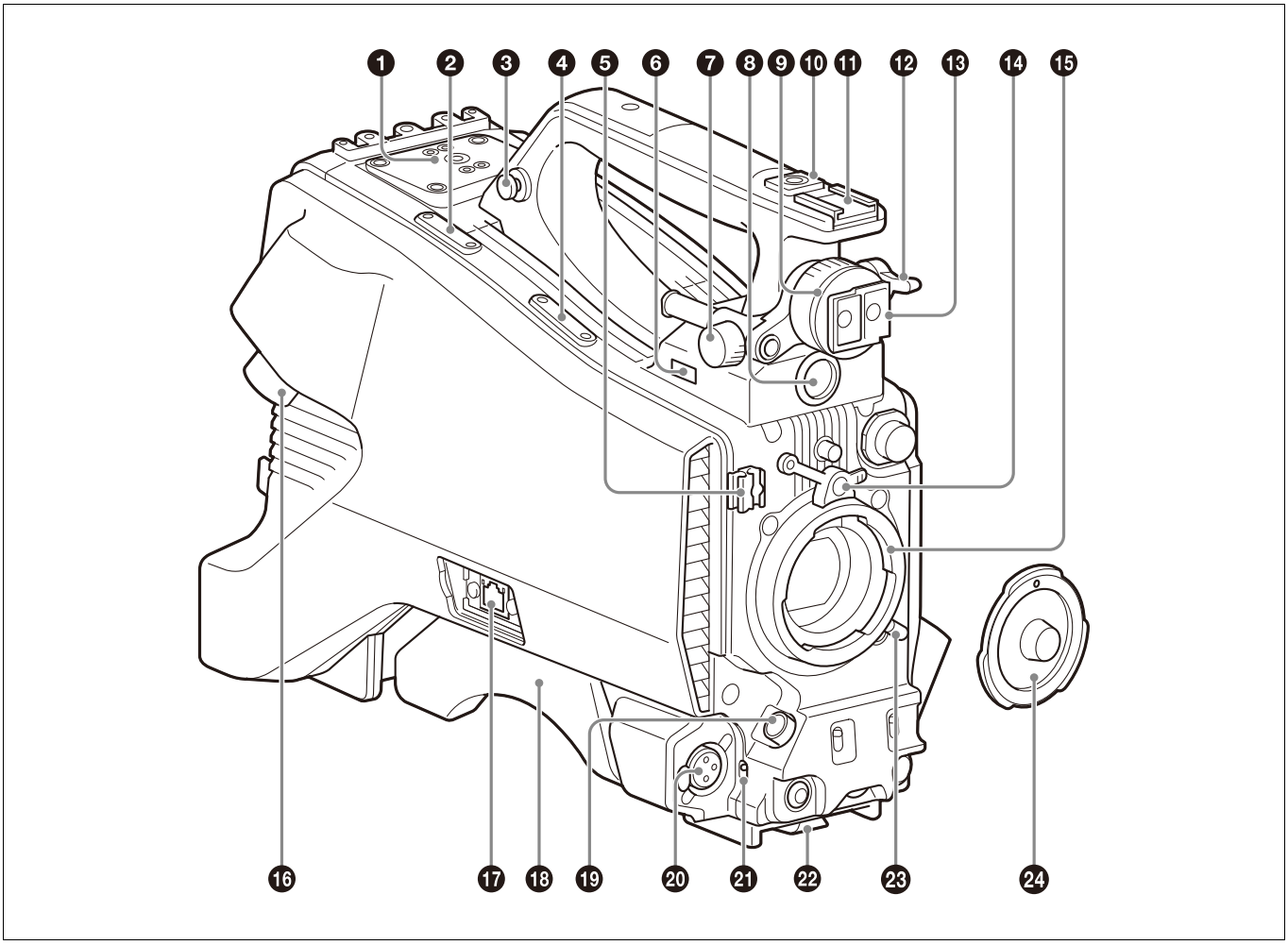
c) Operation supported when connected with HXC-FZ90 and the signal format is set to 1080/59.94i, 50i, 29.97PsF, 25PsF, 24PsF, 23.98PsF, 720/59.94P, or 50P and also NETWORK TRUNK is set to OFF or NETWORK+VIDEO on the <TRUNK/PROMPTER> page on the HXCU-FZ90.

d) A LAN cable can be used only to connect the RCP-1500/3000 series. When connecting, power needs to be supplied via a PoE hub or supplied to the EXT DC IN connector of the RCP-1500/3000 series.

Name and Function of Parts

Front and Left Side

For the pin assignment of each connector, see "Pin Assignment" (page 75).



1 V-wedge shoe attachment
Attach a viewfinder. To attach a viewfinder, attach the V-wedge shoe here.

For details about the V-wedge shoe attachment, see "Attaching the V-Wedge Shoe Attachment" (page 21).

2 Cable clamp attachment

For details about attaching, see "Attaching the cable clamp belt" (page 16).

3 Shoulder strap fitting

For details about attaching, see "Attaching the Shoulder Strap" (page 25).

4 Microphone holder attachment

For details about attaching, see "Attaching the microphone holder" (page 24).

5 Cable clamp
Clamp the lens cable and microphone cable.

6 (USB) connector

For details about how to use a USB flash drive and compatible USB flash drives, see "Supported USB Flash Drives" (page 73).

7 Viewfinder front-to-back positioning lock knob
Loosen this knob to adjust the front-to-back position of the viewfinder.

8 VF (viewfinder) connector (20-pin, round)
Connect the viewfinder cable.

For details about attaching, see "Attaching and Adjusting the Viewfinder" (page 17).

9 Viewfinder left-to-right positioning ring
Adjusts the left-to-right position of the viewfinder attached to the viewfinder shoe. Loosen the ring to adjust the viewfinder position, then return the ring to the original position to secure the viewfinder.

10 1/4-inch screw-type accessory shoe

⓫ **Slide-type accessory shoe**

⓬ **Viewfinder front-to-back positioning lever**
Adjusts the front-to-back position of the viewfinder attached to the viewfinder shoe. Loosen the lever to adjust the viewfinder position, then return the lever to the original position to secure the viewfinder.

⓭ **Viewfinder shoe**
Attach a viewfinder.

For details about attaching, see "Attaching and Adjusting the Viewfinder" (page 17).

⓮ **Lens mount securing rubber**
After locking the lens in position using the lens locking lever, fit this rubber over the lower of the two projections. This secures the lens mount, preventing it from coming loose.

⓯ **Lens mount (special bayonet mount)**
Attach a lens.
Consult your Sony dealer or a Sony service representative for information about available lenses.

For details about attaching, see "Attaching and Adjusting the Lens" (page 22).

⓰ **CCU (Camera Control Unit) connector (optoelectric composite connector)**
Connect to the HXCU-FZ90 4K/HD Camera Control Unit.
Neutrik/LEMO connector model:
When connected with an Neutrik/LEMO optoelectric composite cable, all the signals of the camera, comprising the power supply, control signals, video signals, and audio signals, can be transmitted/received with the one optoelectric composite cable.
Neutrik connector model:
When connected with a pair of single-mode fiber cables, all the signals except the power supply can be transmitted/ received with the pair of single-mode fiber cables.

⓱ **NETWORK TRUNK connector (RJ-45 8-pin)**
Ethernet communication is supported between an external device connected to the NETWORK TRUNK connector of the unit and an external device connected to the NETWORK TRUNK connector of the HXCU-FZ90 Camera Control Unit.

⓲ **Shoulder pad**
Raise the shoulder pad fixing lever to adjust the position in the front-to-rear direction. Adjust the position for maximum convenience when operating the camera on your shoulder.

For details about adjusting the position, see "Adjusting the Shoulder Pad Position" (page 25).

⓳ **LENS connector (12-pin)**
Connect the lens cable.

For details about attaching, see "Attaching and Adjusting the Lens" (page 22).

⓴ **AUDIO IN CH1 (audio input 1) connector (XLR type, 3-pin, female)**
Connect to audio equipment or a microphone.
When connected with a CCU, the audio signal input on the AUDIO IN CH1 connector will be output from the AUDIO OUT CH1 connector of the HXCU-FZ90. You can configure the camera so that the audio is embedded in the output from the SDI output (MIC1) on the <SDI OUT> page in the MAINTENANCE menu.
You can set to output the audio from the earphone jack of the unit on the <EARPHONE> page in the OPERATION menu.

㉑ **Audio input 1 selector switch**
Select the audio level input to the AUDIO IN CH1 connector.
+48V: When supplying +48 V phantom power to microphones
MIC: When a microphone-level input is connected
LINE: When a line-level (0 dBu) signal source is connected

㉒ **Tripod mount**

For details about attaching, see "Mounting on a Tripod" (page 24).

㉓ **Lens locking lever**
After inserting the lens in the lens mount, rotate the lens mount ring with this lever to lock the lens in position. After locking the lens, be sure to use the lens mount securing rubber to prevent the lens from becoming detached.

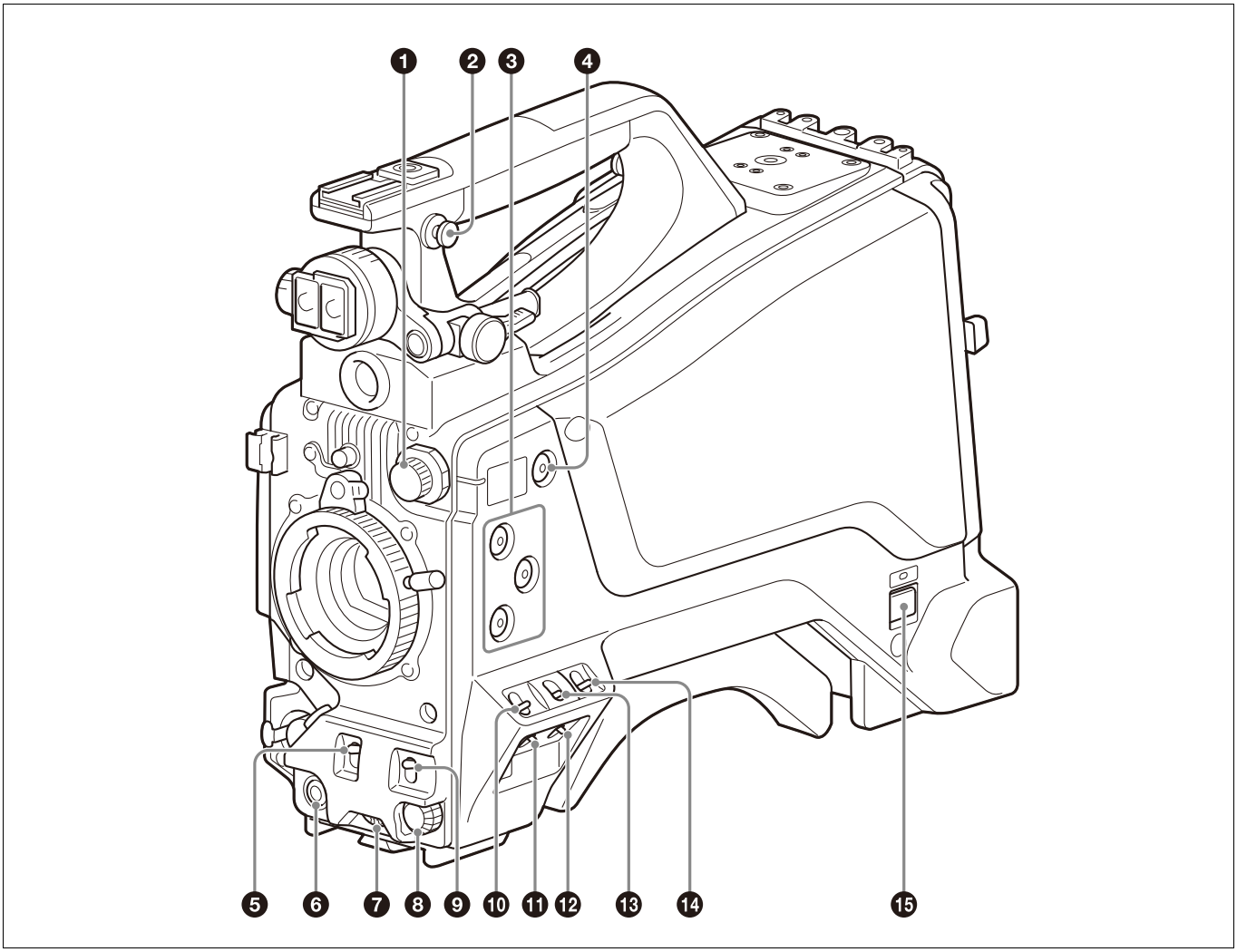
㉔ **Lens mount cap**
Remove by raising the lens locking lever. When no lens is mounted, keep this cap fitted for protection from dust.

Front and Right Side

Note

When connected to a camera control unit (CCU) or external remote control device (for example, RCP or RM), the following switch functions are controlled from the connected device. The switches on the camera do not function.

- SHUTTER switch
- WHT/BLK switch
- GAIN switch
- OUTPUT/AUTO KNEE switch
- WHITE BAL switch



1 FILTER (filter select) knob
Switch between four built-in ND filters. When this switch is adjusted, the filter setting appears in the viewfinder for about three seconds.

FILTER knob setting	ND filter type
1	Clear
2	1/4 ND (attenuates light to approximately 1/4)
3	1/16 ND (attenuates light to approximately 1/16)
4	1/64 ND (attenuates light to approximately 1/64)

2 Shoulder strap fitting

For details about attaching, see "Attaching the Shoulder Strap" (page 25).

3 ASSIGN (assignable) 1/2/3 buttons
You can assign functions to these buttons using ASSIGN1/2/3 on the <SWITCH ASSIGN1> page in the OPERATION menu.
No function is assigned by factory default.

4 COLOR TEMP. (color temperature) button
Press the button, turning it on, to change the color temperature for shooting (factory default: 5600K).
You can assign a function to this button using COLOR TEMP on the <SWITCH ASSIGN1> page in the OPERATION menu.

5 SHUTTER switch
When using the camera in standalone operation mode without connection to a CCU, set to the ON position to use the electronic shutter. Set to the SEL position to switch the shutter speed and shutter mode. When this switch is operated, the shutter settings appear in the viewfinder for about three seconds.

❻ RET (return video) button

Displays the return video signal in the viewfinder while this button is pressed.

You can assign a function to this button using FRONT RET on the <SWITCH ASSIGN2> page in the OPERATION menu.

Note

The display image may be distorted when the video signal is switched.

❼ INTERCOM LEVEL knob

When connected with a CCU, use this knob to adjust the volume level of the intercom headset connected to the INTERCOM connector. The intercom volume level can also be adjusted using the INTERCOM knob at the rear of the camera.

When the camera is used in standalone operation mode, use this knob to set the gain for microphones connected to the AUDIO IN CH1 and AUDIO IN CH2 connectors.

You can assign a function to this knob using FRONT VOLUME on the <VOLUME ASSIGN> page in the OPERATION menu.

❽ Menu control knob (rotary encoder)

Rotate to select settings from menus displayed in the viewfinder and press to confirm settings.

❾ WHT/BLK (automatic white/black balance adjustment) switch

When using the camera in standalone operation mode without connection to a CCU, this automatically adjusts the white balance and black balance.

WHT: Adjust the white balance automatically. If the WHITE BAL switch is set to A or B, the white balance setting is stored in the corresponding memory (A or B). If the WHITE BAL switch is set to PRST, the adjustment function does not operate.

BLK: Adjust the black set and black balance automatically.

You can use the switch even when the ATW (Auto Tracing White Balance) function is operating.

If you push the switch to the WHT position once more during automatic white balance adjustment, the adjustment is canceled and the white balance setting returns to the original setting.

If you push the switch to the BLK position once more during the automatic black balance adjustment, the adjustment is canceled and the black balance setting returns to the original setting.

❿ GAIN switch

When using the camera in standalone operation mode without connection to a CCU, this switches the gain of the video amplifier to match the lighting conditions. When this switch is adjusted, the new setting appears in the viewfinder for about three seconds.

The gain values corresponding to the L, M, and H settings are specified using GAIN on the <SWITCH ASSIGN1> page in the OPERATION menu (factory default: L = 0 dB, M = 6 dB, and H = 12 dB).

⓫ STATUS/CANCEL switch

STATUS: Displays camera status information when no menu is displayed and the DISPLAY/MENU switch is set to DISPLAY.

CANCEL: Cancel changed settings or return the display to the previous menu when a menu is displayed.

⓬ DISPLAY/MENU switch

Select the display in the viewfinder.

DISPLAY: Displays various textual information and markers, such as messages showing the camera settings and operating status, center marker, and safety zone marker, in addition to the camera image.

OFF: Displays the camera image only.

MENU: Displays the menu, in addition to the camera image.

⓭ OUTPUT (output signal select)/AUTO KNEE switch

When using the camera in standalone operation mode without connection to a CCU, this selects the signal to output from the camera.

BARS: Output the color bar signal.

CAM: Output the video signal being shot. When this is selected, you can switch the AUTO KNEE function [1] ON/OFF.

1) AUTO KNEE function:
Against a very bright background with the iris opening adjusted for the subject, objects in the background will be lost in the glare. The AUTO KNEE function suppresses areas of high brightness automatically to reproduce the background more clearly. This is particularly effective in the following cases.
- Shooting people in the shade on a sunny day
- Shooting a subject indoors, against a background through a window
- Any high contrast scene

⓮ WHITE BAL (white balance memory select) switch

When using the camera in standalone operation mode without connection to a CCU, this switches the white balance adjustment method. When this switch is adjusted, the new setting appears in the viewfinder for about three seconds.

PRST: Adjust the color temperature to the preset value (factory default: 3200K). Use this setting when you have no time to adjust the white balance.

A or B: Recall the white balance adjustment value already stored in memory A or B. Push the WHT/BLK switch to the WHT position to automatically adjust the white balance and save the adjustment value in memory A or memory B.

⓯ CAMERA POWER switch and indicator

Set to one of the following, according to the power supply method.

CCU: When supplying power from the camera control unit

EXT: When supplying power on the DC IN connector or camera adaptor power connector

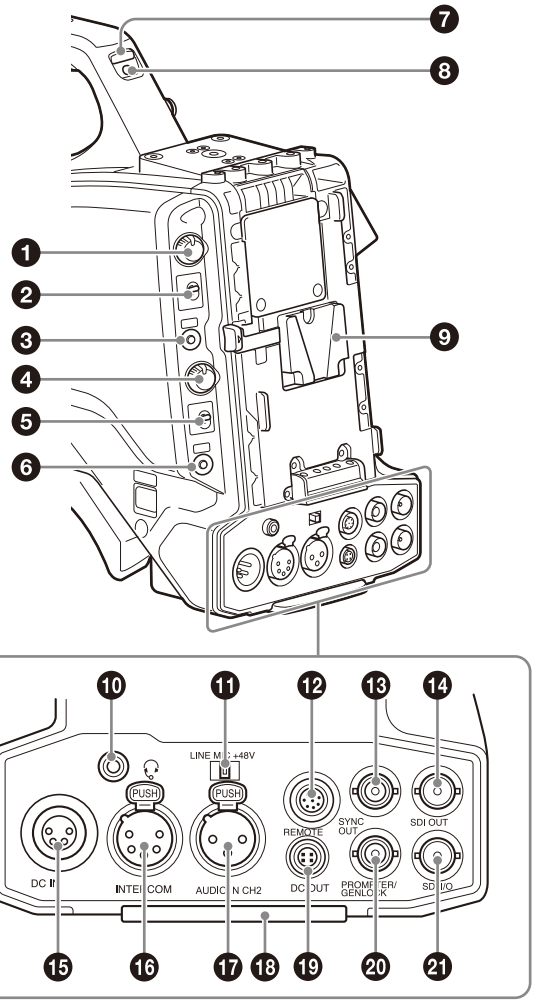
The indicator lights up in green during operation.

Rear

For the pin assignment of each connector, see "Pin Assignment" (page 75).

For details about removing the rear cover, see "Removing the rear cover" (page 17).

(With rear cover removed)



❶ PGM LEVEL (program level) knob/assignable button
Adjust the intercom PGM audio level.
When connected with a CCU, this adjusts the PGM audio level input from the CCU.
In standalone operation mode, this adjusts the audio signal level embedded in the SDI signal input on the SDI I/O connector.
No function is assigned to the assignable button by factory default. You can have a conversation using the intercom microphone while the button is pressed by assigning the INTERCOM MIC ON function using REAR ENC SW on the <SWITCH ASSIGN2> page in the OPERATION menu (enabled when INTERCOM TYPE is set to UCJ).

❷ RET2 (return video 2) selector switch
Select the return video signal (2, 3, 4) displayed when the button assigned with the return video 2 function is pressed.

❸ RET1 (return video 1) button
Displays the return video 1 signal in the viewfinder while this button is pressed.

❹ INTERCOM (intercom volume) knob
Adjusts the volume level of the intercom headset connected to the INTERCOM connector.
When connected with a CCU, the intercom volume level can also be adjusted using the INTERCOM LEVEL knob at the front of the unit.
You can assign a function to this knob using REAR VOLUME on the <VOLUME ASSIGN> page in the OPERATION menu.

❺ INTERCOM MIC (intercom microphone) switch
The switch function varies depending on the INTERCOM TYPE setting on the <INTERCOM> page in the OPERATION menu (factory default: CE).

When the INTERCOM TYPE setting is CE
Functions as the intercom microphone line selector switch.
PROD: Output the microphone on the PROD line.
OFF: Turn the microphone OFF.
ENG: Output the microphone on the ENG line.

When the INTERCOM TYPE setting is UCJ
Functions as the intercom line and microphone ON/OFF selector switch.
PROD: Select the PROD line and turn the microphone OFF.
OFF: Select the ENG line and turn the microphone OFF.
ENG: Select the ENG line and turn the microphone ON (output on ENG line).
You can have a conversation on the selected line while the assignable button at the rear is pressed by assigning the INTERCOM MIC ON function to the button.

❻ CALL button
When you press this button, the red tally indicators on the connected CCU and external control device (for example, RCP or RM) will light up.

❼ TALLY indicator (red/green)
When the TALLY switch is set to ON, the tally indicator lights up when a tally signal is input to the connected CCU or a call signal is generated by pressing the CALL button.

❽ TALLY switch
Set to ON to activate the TALLY indicator function.

❾ Camera adaptor attachment
Attach an optional AC-DN10A AC adaptor.

❿ (earphone) jack (stereo, mini jack)
Connect an earphone to listen to the intercom audio signal, AUDIO IN CH1 connector input audio signal, or AUDIO IN CH2 connector input audio signal.
You can also connect an earphone equipped with a microphone (4-pole mini plug type) for use as an intercom headset.
Set the earphone output on the <EARPHONE> page in the OPERATION menu.
You can assign the earphone audio level adjustment function to the INTERCOM LEVEL knob at the front or the INTERCOM knob at the rear on the <VOLUME ASSIGN> page in the OPERATION menu.

⓫ Audio input 2 selector switch
Select the audio level input to the AUDIO IN CH2 connector.
+48V: When supplying +48 V phantom power to microphones
MIC: When a microphone-level input is connected
LINE: When a line-level (0 dBu) signal source is connected

⓬ **REMOTE (remote control) connector (8-pin)**
Connect a remote control unit for remote control of the camera.

Note

Before connecting/disconnecting a remote control unit, power off the camera first.

⓭ **SYNC OUT connector (BNC type)**
Outputs an analog sync signal.
You can select HD-SYNC signal or SD-SYNC signal for output on the <SYNC OUT> page in the MAINTENANCE menu.

⓮ **SDI OUT connector (BNC type)**
Outputs a 12G-SDI signal, 6G-SDI signal, 3G-SDI signal, HD-SDI signal, or SD-SDI signal.
Select the output signal on the <SDI OUT> page in the MAINTENANCE menu.
A software option must be installed to support 4K video output from the unit. Also, 4K video output is supported in standalone operation mode only.

For details about the formats that can be selected, see "SDI Output Formats" (page 78).

⓯ **DC IN (DC power supply input) connector (XLR 4-pin, male)**
To operate the camera from an external DC power supply, connect an optional DC power cord to this connector and then connect the cord to an AC-DN10A AC Adaptor or other source.

⓰ **INTERCOM connector (XLR 5-pin, female)**
Connect an XLR 5-pin headset for input and output of intercom audio signals.

⓱ **AUDIO IN CH2 (audio input 2) connector (XLR type, 3-pin, female)**
Connect to audio equipment or a microphone.
When connected with a CCU, the audio signal input on the AUDIO IN CH2 connector will be output from the AUDIO OUT CH2 connector of the HXCU-FZ90. You can configure the camera so that the audio is embedded in the output from the SDI output (MIC2) on the <SDI OUT> page in the MAINTENANCE menu.
You can set to output the audio from the earphone jack of the unit on the <EARPHONE> page in the OPERATION menu.

⓲ **Tail guard**
Protects the cables connected to the connectors on the rear panel.

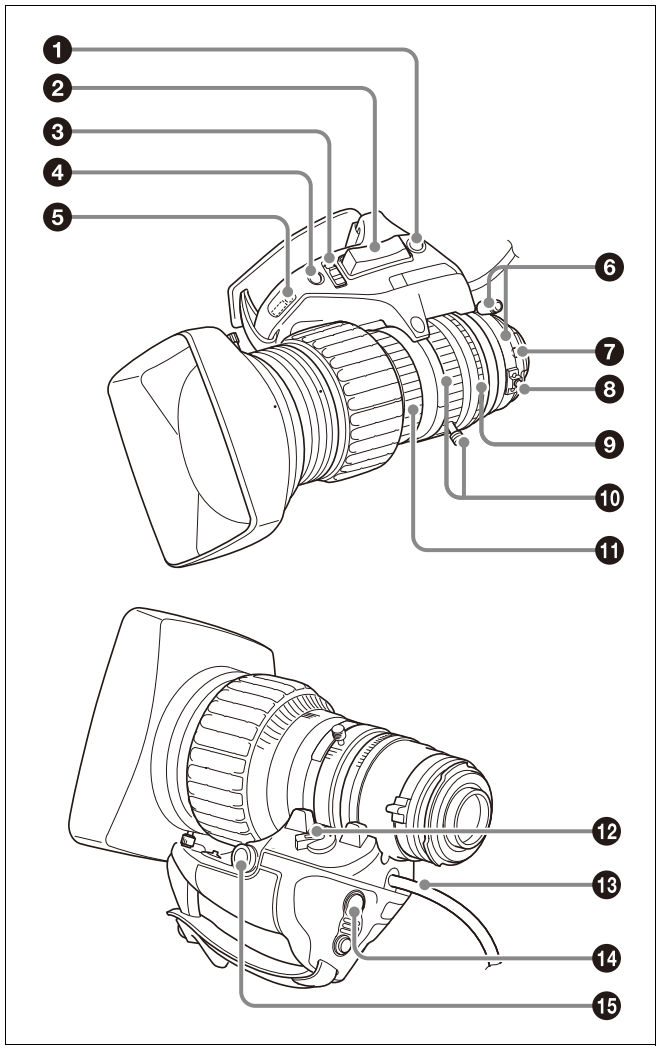
⓳ **DC OUT (DC power supply output) connector (4-pin, female)**
Supplies power to a script light or other device (maximum 1.5 A). You can also use pin 2 as an assignable input/output pin. Set the assignment on the <PIN ASSIGN> page in the OPERATION menu.

⓴ **PROMPTER/GENLOCK (prompter signal output/ external sync signal input) connector (BNC type)**
When connected with a CCU, this outputs the VBS prompter signal.
In standalone operation mode, connect an external sync signal (BB or tri-level sync) for synchronizing the camera.

㉑ **SDI I/O connector (BNC type)**
Input (IN) or output (OUT) mode can be selected on the <SDI OUT> page in the MAINTENANCE menu. In standalone operation mode or when connected with a CCU, you can output the video displayed in the viewfinder as an HD SDI signal (factory default is VF OUT).
In standalone operation mode, you can configure this as an input to display the HD-SDI or SD-SDI signal video that is input on the SDI I/O connector in the viewfinder when the RET button is pressed.
When connected to a CCU, you can configure this as an output and use the connector as an HD PROMPTER output signal connector. You can configure this as an input and use the connector as an HD TRUNK input signal connector.

Lens (supplied with HXC-FZ90S)

For details about attaching a lens, see "Attaching and Adjusting the Lens" (page 22).



❶ **RET (return video) button**
Displays the return video signal in the viewfinder while this button is pressed.

❷ **Zoom see-saw switch**
This is enabled when the zoom servo/manual selector knob is in the SERVO position. The zoom speed increases when you push the switch deeper, and decreases when you push less deeply.
W (Wide): Wide angle.
T (Telephoto): Telephoto.

❸ **Iris operation mode selector switch**
A (Auto): The iris is adjusted automatically.

M (Manual): Adjust the iris with the iris ring.

❹ Iris one-push auto switch
When the iris operation mode selector switch is in the M position for manual adjustment, press this switch for instantaneous auto iris adjustment. The iris is automatically adjusted while the switch is pressed.

❺ Iris gain adjustment trimmer
Adjust the iris gain when the iris operation mode selector switch is in the A (Auto) position.
Flip off the rubber cap, and turn the iris gain adjustment trimmer using a screwdriver or similar object. Rotate clockwise to increase the gain, and rotate counterclockwise to decrease the gain.

❻ F.B. lock screw/F.B. adjustment ring
Use to adjust the flange back (flange focal length).

❼ Positioning pin
When attaching a lens, align this pin with the slot in the top center of the lens mount on the camera.

❽ Macro button/macro ring
Press and hold the macro button and rotate the macro ring to focus (close-up: 10 mm minimum).

❾ Iris ring
For manual iris adjustment, set the iris operation mode selector switch to the M (manual) position, then rotate this ring.

Note

Always set the iris operation mode selector switch to the M (manual) position before rotating the ring.

❿ Zoom lever/zoom ring
For manual zoom adjustment, set the zoom servo/manual selector switch to the MANU (manual) position, then operate this lever/ring.

⓫ Focus ring
Rotate this ring to adjust the focus.

⓬ Zoom servo/manual selector knob
SERVO: Power (servo) zoom. Control the zoom using the zoom see-saw switch.
MANU (Manual): Manual zoom. Control the zoom using the zoom lever/zoom ring.

⓭ Lens cable
Connect to the LENS connector on the camera.

⓮ VTR button
You can assign a function to this button using VTR S/S on the <LENS SWITCH> page in the OPERATION menu.

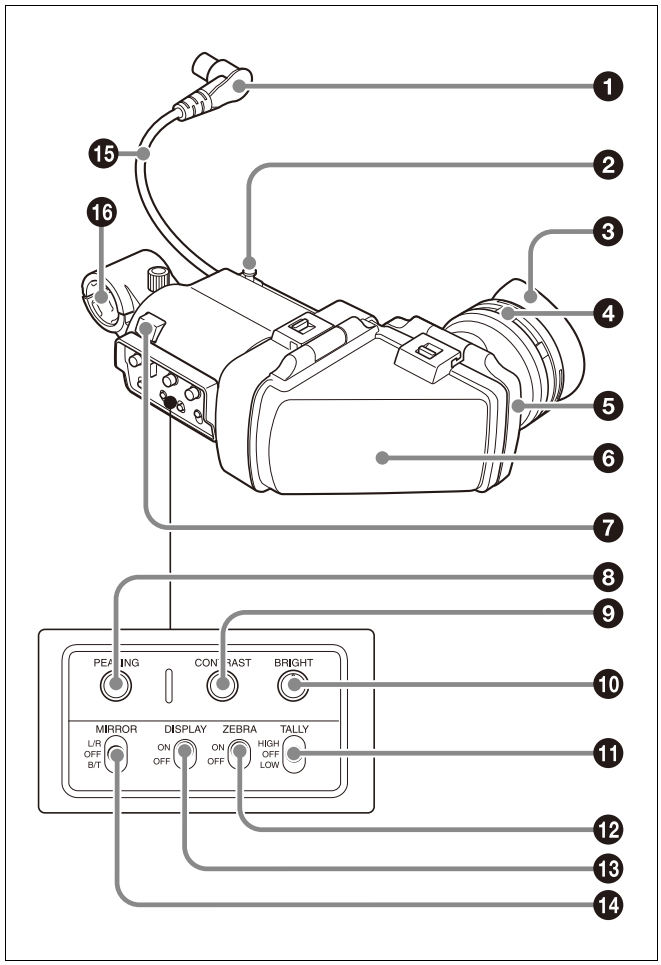
⓯ Zoom remote control connector
Connecting an optional zoom servo controller allows remote control of zooming.

Viewfinder

This section describes the optional HDVF-L10 viewfinder.

For details about attaching the HDVF-L10 viewfinder, see "Attaching and Adjusting the Viewfinder" (page 17).

For details about the viewfinder supplied with the HXC-FZ90S, refer to the operation manual for the HDVF- EL75.



❶ Connector
Connect to the VF connector on the camera.

❷ Slide stopper
Prevents the viewfinder from coming off the camera when it is slid from side to side.

❸ Eyecup

❹ Diopter adjustment ring
Rotate the ring to adjust the image for clear focus.

❺ Eyepiece
You can raise the eyepiece or remove it when required by the usage situation.

❻ Viewfinder barrel
You can raise the viewfinder barrel or remove it when required by the usage situation.

❼ Tally indicator
The indicator lights up when a red tally signal is input to the camera.
When an abnormality occurs, the tally indicator flashes to indicate a warning.

❽ PEAKING knob
Rotate clockwise to adjust the picture sharpness to make lens focusing easier. This has no effect on the output signal of the camera.

❾ CONTRAST knob
Adjust the contrast of the screen. This has no effect on the output signal of the camera.

⑩ BRIGHT knob
Adjust the brightness of the screen. This has no effect on the output signal of the camera.

⑪ TALLY switch
Used to control the tally indicator on the viewfinder.
HIGH: The tally indicator brightness is set to high.
OFF: The tally indicator is disabled.
LOW: The tally indicator brightness is set to low.

⑫ ZEBRA (zebra pattern) switch
Use to control the zebra pattern display.
ON: Display the zebra pattern.
OFF: Do not display the zebra pattern.

⑬ DISPLAY switch
Use to control the display of text information.
ON: Display text information.
OFF: Do not display text information.
Also used when switching to full-screen display mode or reduced display mode.

Note

There may be a mismatch between the DISPLAY switch ON/OFF state and the actual ON/OFF operation, depending on the camera settings.

⑭ MIRROR switch
Used to reverse the image display on the monitor screen horizontally or vertically when the viewfinder barrel is raised up or rotated.
L/R (left/right): Reverse the image horizontally.
OFF: Do not reverse the image.
B/T (bottom/top): Reverse the image vertically.

⑮ Viewfinder cable

⑯ Microphone holder

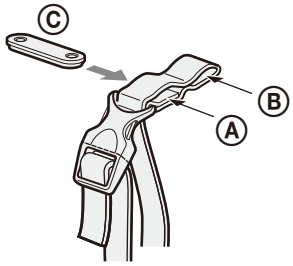
Connection and Setup

Connecting to a Camera Control Unit

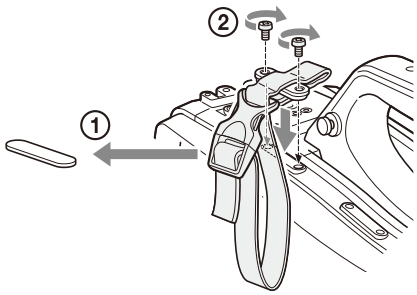
When operating the camera in a system with a camera control unit (CCU), connect the CCU connector of the camera and the CAMERA connector of the CCU using an optoelectric composite cable.
When required, secure the cable, using the supplied cable clamp belt.

Attaching the cable clamp belt

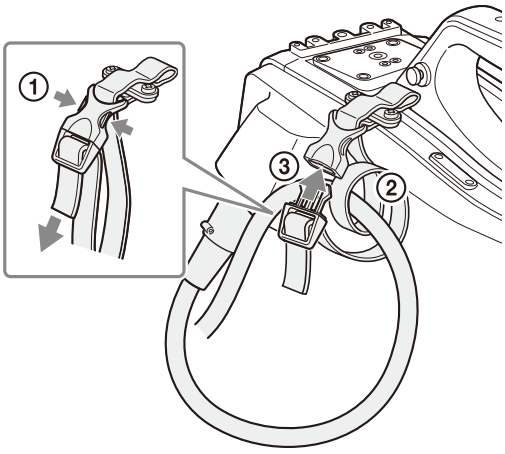
1 **Insert the belt bracket Ⓒ into hole Ⓐ or Ⓑ of the cable clamp belt.**



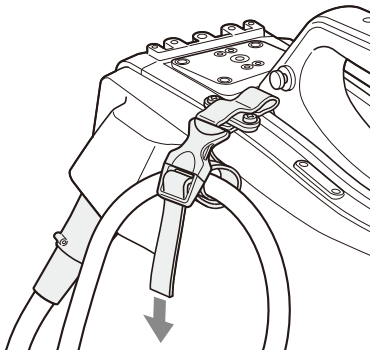
2 **① Remove the screw-hole cover on the top rear of the camera and ② secure the cable clamp belt to the camera using the two supplied screws (+B3×10).**



3 **① Release the buckle, ② bundle the cable with the belt, ③ then lock the buckle again.**



4 **Adjust the length by pulling down on the end of the belt.**



AC Power Supply (Standalone Operation)

Prepare an AC power supply when using the camera in standalone operation mode (without a CCU).
For safety, use only the Sony AC adaptor listed below.
- AC adaptor: AC-DN10A

If using the DC IN connector

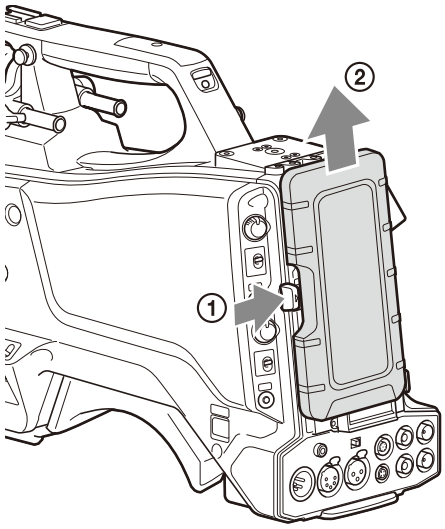
Connect the AC-DN10A AC adaptor to the DC IN output connector on the camera using an optional DC power cord.

If attaching the AC adaptor

Remove the rear cover and attach the AC adaptor to the camera.

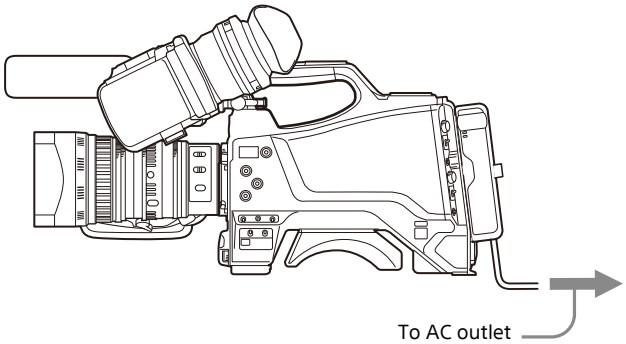
Removing the rear cover

① Hold the release button on the camera in, and ② pull the rear cover up.



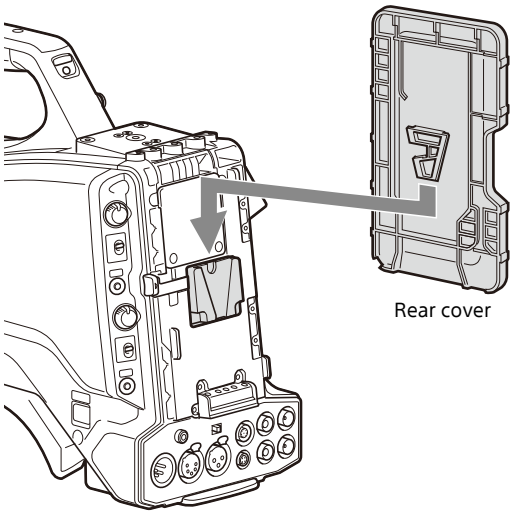
Attaching the AC adaptor

Attach an optional AC-DN10A AC adaptor to the camera, then connect to the AC power supply.
The AC-DN10A can supply up to 100 W of power.



To attach the rear cover

Align the guide on the inner side of the rear cover with the camera adaptor mount, and insert the cover.



Attaching and Adjusting the Viewfinder

Warning

When the viewfinder is attached, do not leave the camera with the eyepiece facing the sun.
Direct sunlight can enter through the eyepiece, be focused in the camera and cause a fire.

This section describes how to attach and adjust the optional HDVF-L10 viewfinder. For details about attaching and adjusting the viewfinder supplied with the HXC-FZ90S, refer to the operation manual for the HDVF- EL75.

Attaching the viewfinder

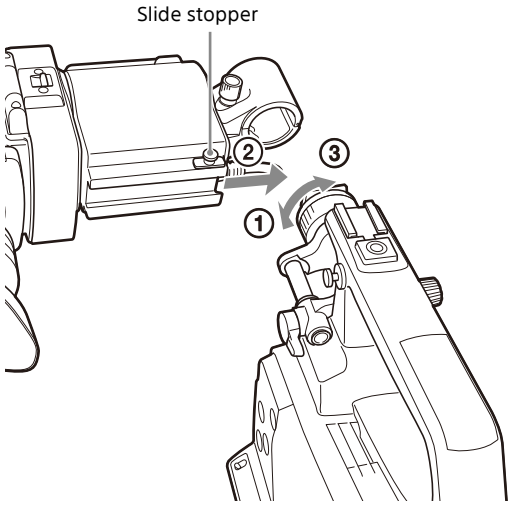
Attach the optional HDVF- L10 viewfinder.

Notes

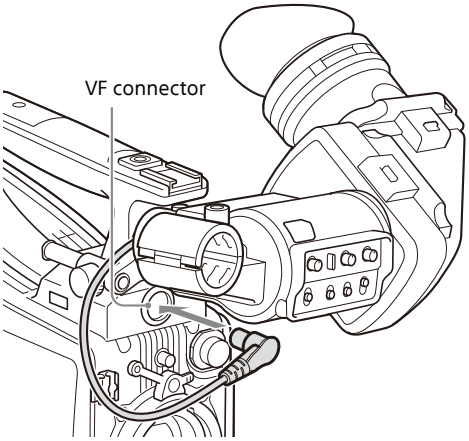
- Be sure to power off the camera before plugging the viewfinder connector into the VF connector of the camera. If the connector is plugged in while the power is on, the viewfinder may not operate correctly.
- Plug the viewfinder connector all the way into the VF connector of the camera. If the connector is not firmly connected, the

image may become distorted or the tally indicator may not operate properly.

1 ① Loosen the viewfinder left-to-right positioning ring, ② attach the viewfinder to the viewfinder shoe, and ③ tighten the viewfinder left-to-right positioning ring.



2 Connect the viewfinder connector to the VF connector.

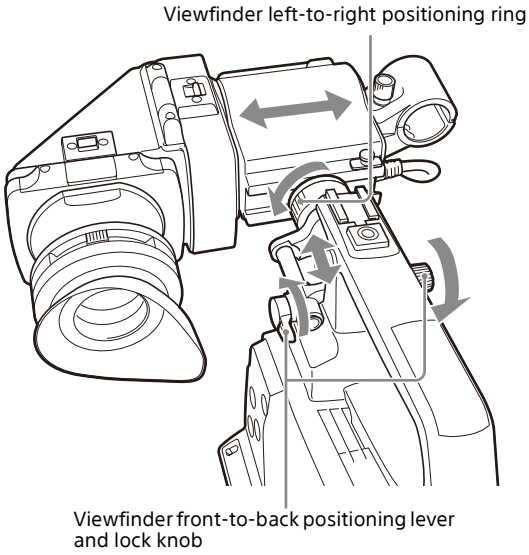


To detach the viewfinder

Detach in the reverse procedure of attaching. When detaching the viewfinder from the shoe, lift up the slide stopper on the viewfinder.

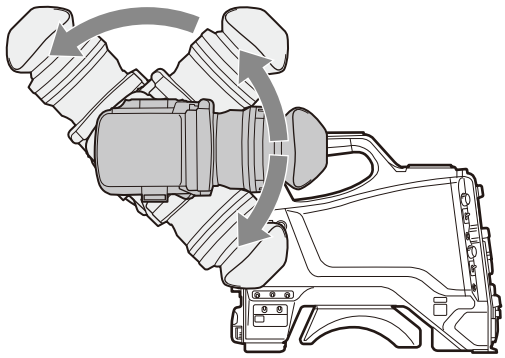
Adjusting the position

To adjust the viewfinder left-to-right position, loosen the left-to-right positioning ring. To adjust the front-to-back position, loosen the front-to-back positioning lever and lock knob.



Adjusting the angle

You can adjust the angle of the viewfinder.



To reverse the display (image/text indication) vertically

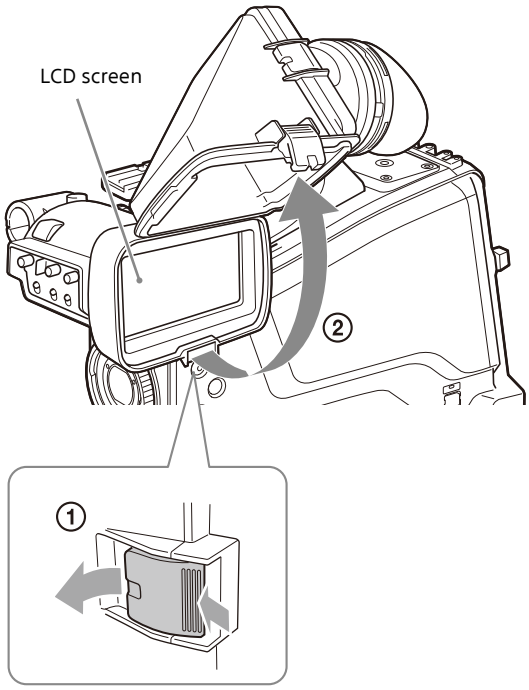
The viewfinder can be rotated as much as 180 degrees so that it is facing the subject.
In this case, the image and other information displayed appear upside down on the screen.
To restore the normal display, set the MIRROR switch on the viewfinder to the B/T position to flip the display vertically.

Raising the viewfinder barrel or eyepiece

You can view the LCD screen inside the viewfinder or its mirrored image by raising the viewfinder barrel or eyepiece. This section describes how to raise and detach the viewfinder barrel. The eyepiece can also be raised and detached in the same way.

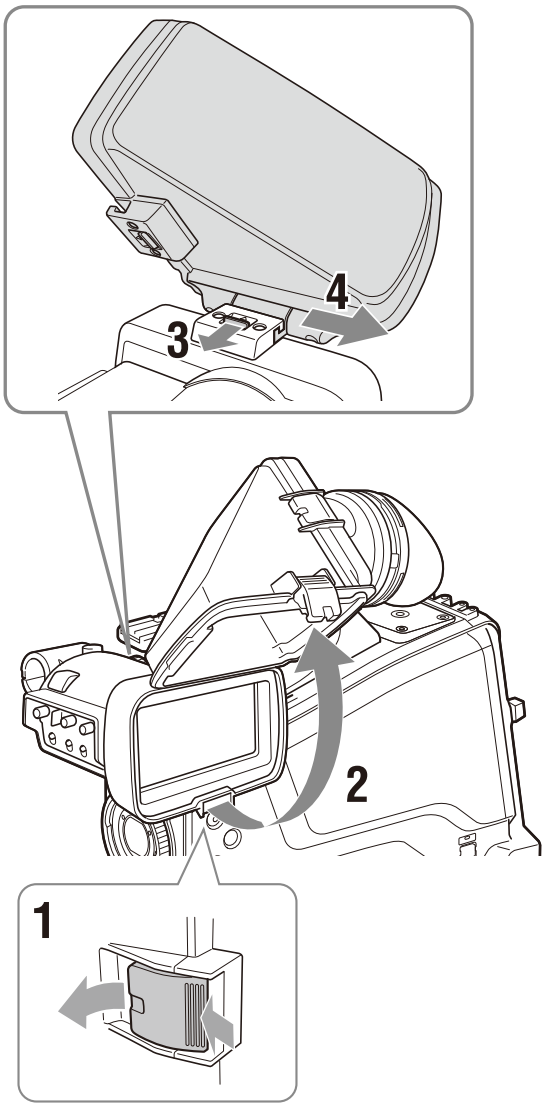
To raise the viewfinder barrel

① Push the clip on the bottom to release it, and ② flip up the viewfinder barrel.
It locks at the 120-degree position.



Keep in the lock position for normal use.
You can also open it farther from the lock position. To set to the 120-degree position again, return it to the closed position and then open it again.

To detach the viewfinder barrel



1 **Push the clip on the bottom to release it.**

2 **Flip up the viewfinder barrel.**

3 **Slide the button on the top in the direction opposite to the viewfinder barrel to unlock the barrel.**

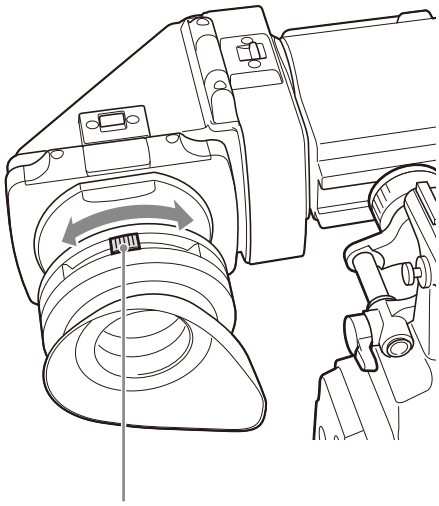
4 **Detach the viewfinder barrel by sliding it horizontally.**

To reverse the display (image/text indication) horizontally

Set the MIRROR switch on the viewfinder to the L/R position to reverse the picture and other information displayed in the viewfinder horizontally.

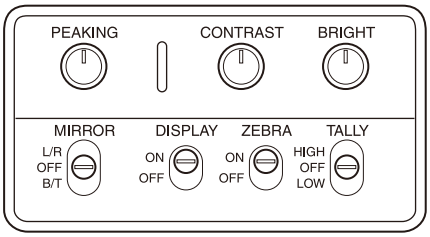
Adjusting the diopter

Rotate the diopter adjustment ring until the viewfinder image is sharpest.



Diopter adjustment ring

Adjusting the screen



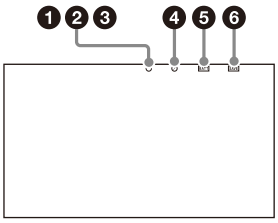
You can adjust the following items.
Peaking: Adjust using the PEAKING knob.
Contrast: Adjust using the CONTRAST knob.
Brightness: Adjust using the BRIGHT knob.

Screen display mode and indicator

The viewfinder screen can be set to full-screen display mode or reduced display mode.
To switch the display mode, switch the DISPLAY switch "ON → OFF → ON → OFF" or "OFF → ON → OFF → ON" in quick succession.

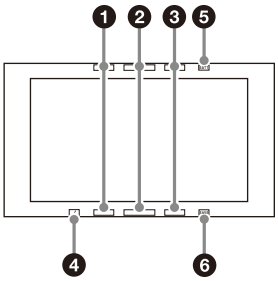
Full-screen display mode

Displays the image so that it fills the full-screen display area.
Tally and other indicators are superimposed on the camera image. Use this mode when the resolution of the displayed image is more important.



Reduced display mode

Displays the camera image at a reduced size, with the tally and other indicators displayed in the spaces above and below the camera image.
Use this mode when the clear visibility of the tally and other indicators is more important.



Indicators are located at the top and bottom of the screen to indicate the status of the camera and viewfinder.

❶ G TALLY (green tally) indicator (green)
Lights up when a green tally signal is input.

❷ R TALLY (red tally) indicator (red)
Lights up when a red tally signal is input.

❸ Y TALLY (yellow tally) indicator (yellow)
Not supported by the camera.

Note

In full-screen display mode, the display position of the tally indicators is fixed in one location. Accordingly, only one R/G/Y tally indicator can be lit at any one time, regardless of the signal that is input. The display priority of the tally indicator is red, green, and yellow, in that order.

❹ [!] indicator (amber)
Lights up when non-standard settings are configured, using the '!' IND function.

❺ BATT (battery) indicator (red)
Lights up or flashes to indicate the status of the power supply to the camera.
Lit: Significant voltage decrease
Flashing: Voltage decrease

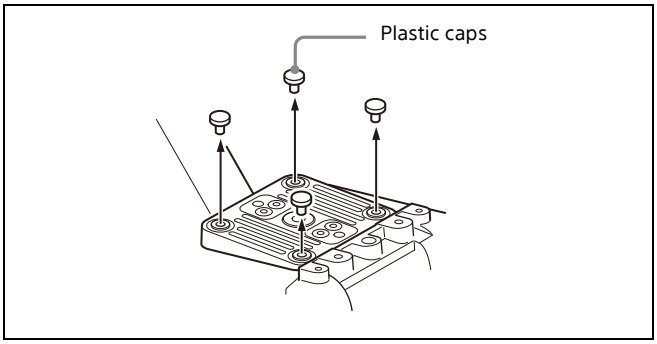
❻ SAVE indicator (amber)
Not supported by the camera.

Attaching the V-Wedge Shoe Attachment

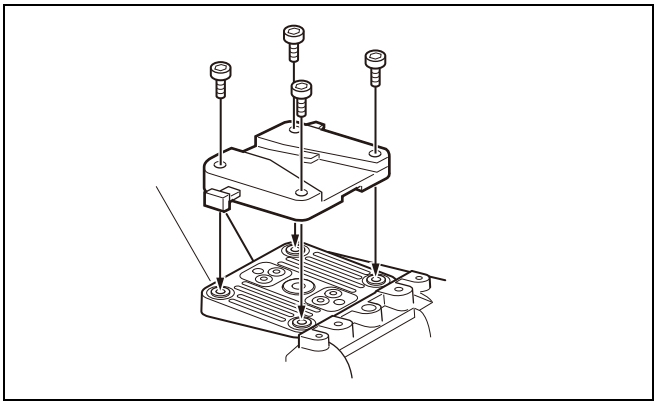
To attach the HDVF-EL75 Viewfinder supplied with the HXC-FZ90S, connect the V-wedge shoe attachment supplied with the camera or viewfinder to the camera and then attach the viewfinder to the attachment.
The procedure for attaching the attachment is given below.

For details about attaching a viewfinder, refer to the operation manual for the viewfinder.

1 Remove the four plastic caps from the camera.



2 Attach the V-wedge show attachment (supplied) to the camera using the hex wrench (supplied) and four hex socket bolts (4×12, supplied).



3 Insert the viewfinder firmly into the V-wedge shoe attachment.
A click sound occurs when properly attached.

Front-to-back position adjustment (when HDVF-EL75 is attached)

To attach an HDVF-EL75 HD Electronic Viewfinder, move the mount wedge on the bottom of the viewfinder 15 mm toward the camera operator from the default position.

For details about attaching, refer to the operation manual for the viewfinder.

Using the Camera for the First Time

When using the camera for the first time, set the current local time on the <DATE> page in the MAINTENANCE menu.

For details about menu operations, see "Menu Operation" (page 32).

1 Turn on the camera.

2 Press and hold the menu control knob and set the DISPLAY/MENU switch to MENU.
The camera enters menu mode, and "TOP" is displayed at the upper-right corner of the screen.

3 Rotate the menu control knob to align the ➡ pointer with TOP and press the menu control knob.
The TOP MENU screen is displayed.

```
<TOP MENU>

→USER
 USER MENU CUSTOMIZE
 ALL
 ·OPERATION
 ·PAINT
 ·MAINTENANCE
 ·FILE
 ·DIAGNOSIS
```

4 Rotate the menu control knob to align the ➡ pointer with MAINTENANCE and press the menu control knob.
The CONTENTS page of the MAINTENANCE menu appears.

```
     CONTENTS                    M00 TOP
↓↓
→01.<AUTO SETUP>
 02.<WHITE SHADING>
 03.<BLACK SHADING>
 04.<OHB MATRIX>
 05.<AUTO IRIS>
 06.<LENS1>
 07.<LENS2>
 08.<MIC GAIN>
 09.<CALL/TALLY>
 10.<OUTPUT FORMAT>
 11.<SYNC OUT>
 12.<SDI OUT>
 13.<METADATA>
 14.<TRUNK>
```

5 Rotate the menu control knob to scroll the page and align the ➡ pointer with <DATE> and press the menu control knob.
The <DATE> page appears.
Press the menu control knob to confirm the page selection.

```
<DATE>                              M16 TOP

 DATE/TIME
   ↓
   2023/10/31      08:32

 FILE TIMESTAMP FORMAT
    : 5 M/D/Y
```

6 **Set the date and time items.**
Rotate the menu control knob to select an item, and press the menu control knob.
Rotate the menu control knob to change the setting of the selected item, and press the menu control knob to confirm the setting.

7 **When finished, set the DISPLAY/MENU switch to OFF to exit menu mode.**

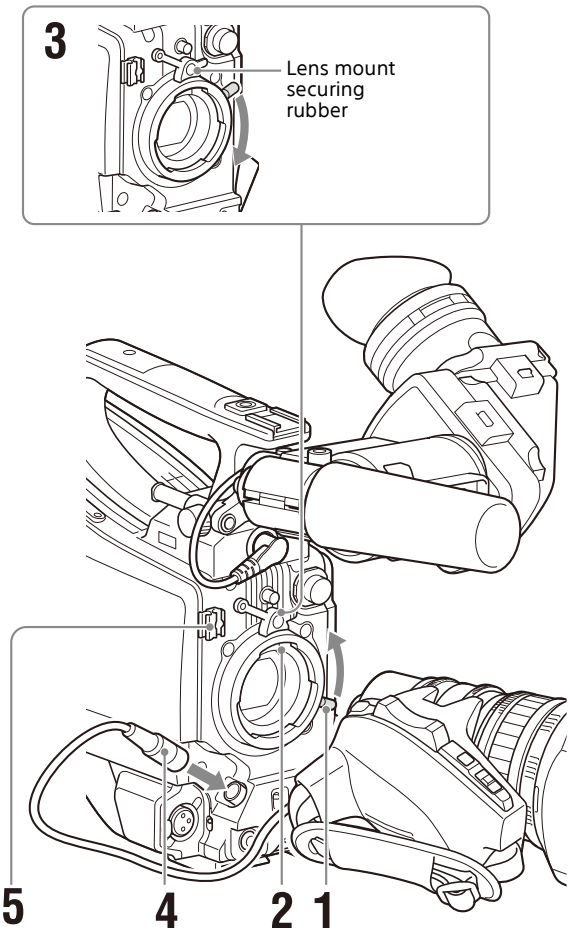
Attaching and Adjusting the Lens

For information on handling lenses, refer to the operation manual for the particular lens.

Attaching the lens

Note

Before attaching the lens, power off the camera first.



1 **Push the lens locking lever up and remove the lens mount cap from the lens mount.**

2 **Align the center pin on the lens with the center slot in the lens mount, and insert the lens into the mount.**

3 **Holding the lens in place, push the lens locking lever down to lock the lens.**

Caution

If the lens is not firmly locked, it may come off while the camera is being used. This could cause a serious accident. Make sure the lens is firmly locked. It is recommended that the lens mount securing rubber be put on the lens locking lever as illustrated above.

4 **Connect the lens cable to the LENS connector.**

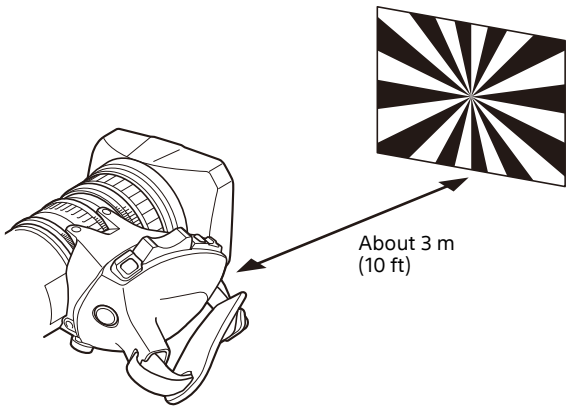
5 **Secure the lens cable with the cable clamps.**

When attaching an aberration correction lens

The aberration correction function is activated automatically. Starting the camera with an aberration correction lens may require more time than normal because of data loading at start-up.
The lens supplied with the HXC-FZ90S is an aberration correction lens. Contact your Sony dealer or a Sony service representative for information about other aberration correction lenses.

Adjusting the flange back (flange focal length)

If the lens does not stay in focus properly as you zoom from telephoto to wide angle, adjust the flange focal length (the distance from the plane of the lens mounting flange to the imaging plane).
This adjustment is required once only after attaching or changing the lens.
When carrying out the adjustment, use the supplied flange focal length adjustment chart as the subject.



Notes

- If you use a subject with insufficient contrast, or move the camera or subject during adjustment, this will cause an adjustment error.
- Place the subject (the flange focal length adjustment chart) so that it appears at the center of the screen at the telephoto end. Arrange so that no nearby object (no object closer to the camera than the chart) enters the screen at the wide-angle end.

1 **Set the iris to manual, and open the iris.**

2 **Position the supplied flange focal length adjustment chart approximately 3 m (10 ft) away from the camera, and arrange the lighting to obtain a satisfactory video output.**

3 **Loosen the F.B. (flange back) lock ring.**

4 **Use manual or servo zoom to set the lens to telephoto.**

5 **Point the camera at the flange focal length adjustment chart and rotate the focus ring to focus the image.**

6 **Set the zoom ring to wide angle.**

7 **Rotate the F.B. adjustment ring to focus on the chart.**
Take care not to move the focus ring.

8 **Repeat steps 4 to 7 until the chart stays in focus all the way from wide angle to telephoto.**

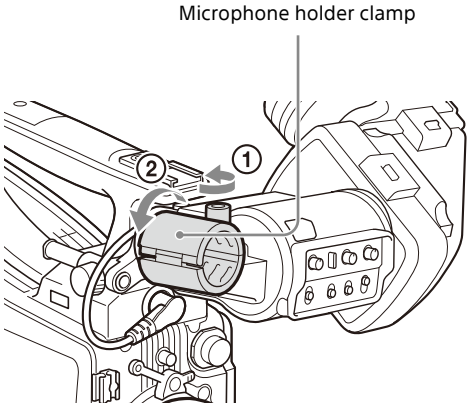
9 **Tighten the F.B. lock screw.**

Preparing the Audio Input

Connecting a microphone to the AUDIO IN CH1 connector

Attach an optional microphone to the microphone holder on the viewfinder.

1 **① Loosen the screw and ② open the microphone holder clamp.**

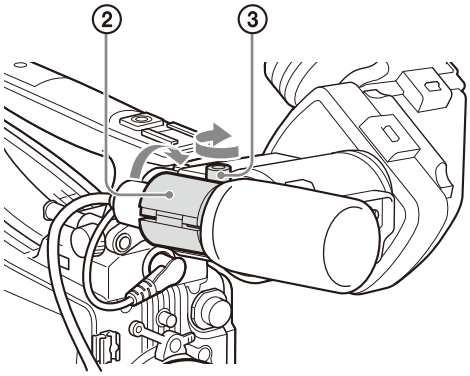


2 **Place the microphone in the microphone holder.**

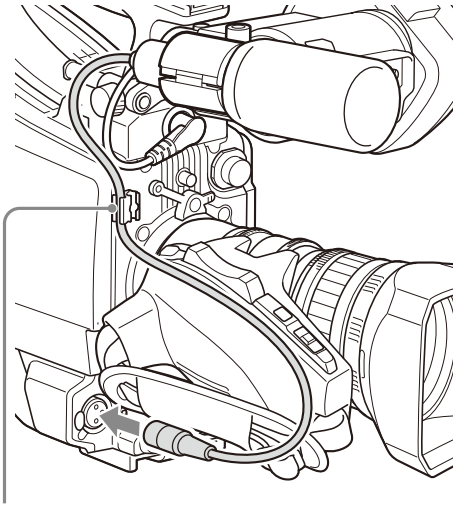
① Place the microphone in the holder so that “UP” is at the top.

② Close the microphone holder.

③ Tighten the screw.



3 **Connect the microphone cable to the AUDIO IN CH1 connector, and secure with the cable clamp.**



4 **Set the audio input 1 selector switch to match the type of microphone used.**

Microphone not requiring a phantom power supply from the camera:
Set to MIC.

Microphone requiring a phantom power supply from the camera:
Set to +48V.

Note

The AUDIO IN CH1 and AUDIO IN CH2 connectors on the camera are female XLR connectors (3-pin) used to provide a phantom 48 V power supply. If the microphone cable has a female connector, use an adaptor.

5 **Switch the input level to match the sensitivity of the microphone used.**
The input level in standalone operation mode can be adjusted using the <AUDIO> page setting (factory default: 60 dB) in the MAINTENANCE menu or by assigning the function on the <VOLUME ASSIGN> page in the OPERATION menu.

Note

If the input level on the camera is not at an appropriate setting for the microphone sensitivity, loud sounds may be distorted, and the signal-to-noise ratio may be affected.

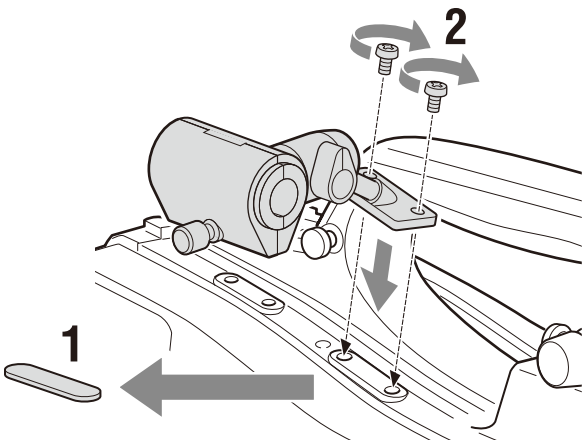
Connecting a microphone to the AUDIO IN CH2 connector

You can connect a monaural microphone to the AUDIO IN CH2 connector, using an optional CAC-12 microphone holder.

For details about attaching the microphone, refer to the operation manual for the microphone.

*For details about setting the audio input 2 selector switch and input level of the AUDIO IN CH2 connector, see steps **4** and **5** in “Connecting a microphone to the AUDIO IN CH1 connector” (page 23).*

Attaching the microphone holder



1 Remove the screw hole cover from the microphone holder attachment.

2 Attach the CAC-12 microphone holder and secure to the camera using the two supplied screws (+B4×8).

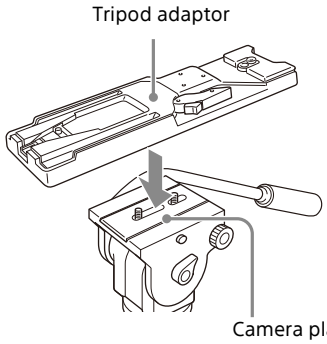
Mounting on a Tripod

Mount the camera on a tripod, using the optional VCT-14 Tripod Adaptor.

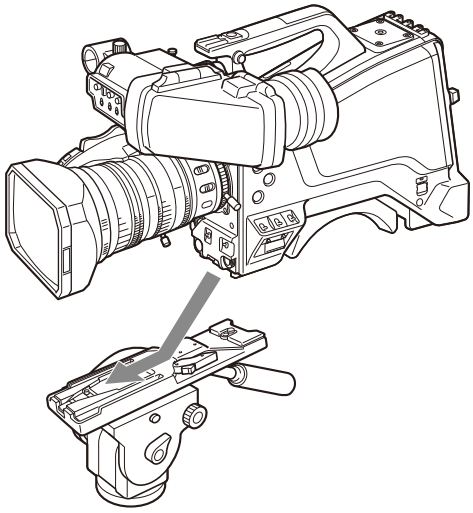
Notes

- Select an appropriate hole from among those at the bottom of the tripod adaptor, considering the balance of the weight of the camera and the tripod adaptor. If an inappropriate hole is selected, the center of gravity may cause the camera to fall over, resulting in injury.
- Check that the size of the selected hole matches that of the screw of the tripod. If they do not match, the tripod adaptor cannot be attached to the tripod securely.

1 Attach the VCT-14 Tripod Adaptor to the camera platform.



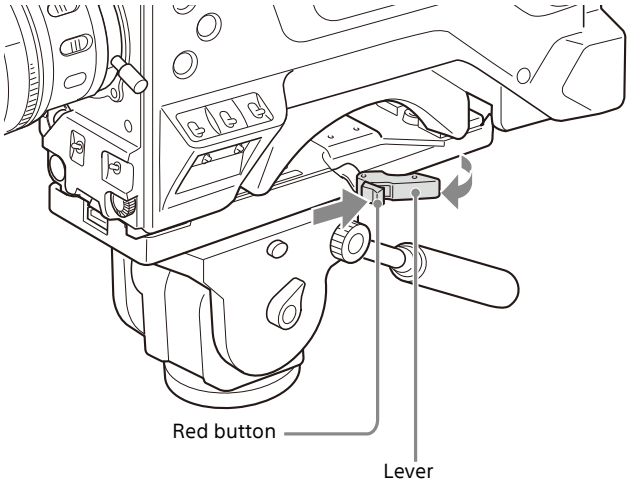
2 Place the camera on the tripod adaptor and slide it forward along the groove of the platform until it clicks into place.



3 Move the camera back and forth, and check that it is securely fixed.

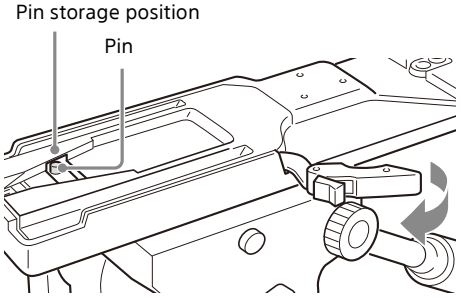
To remove the camera from the tripod adaptor

Hold down the red button and pull the lever in the direction of the arrow.



If the pin of the tripod adaptor does not return to its original position

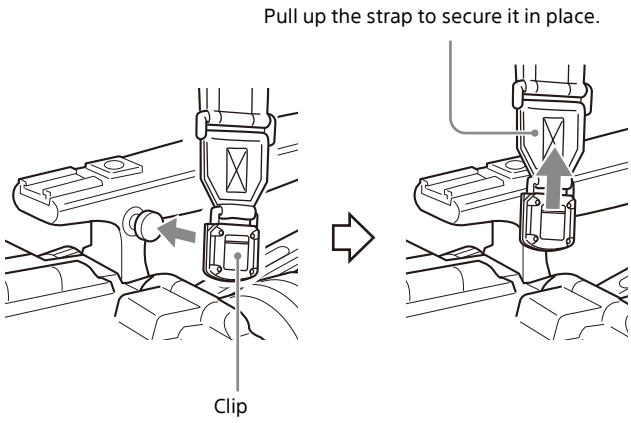
After removing the camera, if the pin of the tripod adaptor does not return to its original position (storage position), hold down the red button and move the lever in the direction of the arrow to return the pin to its original position. It is not possible to mount a camera if the pin remains in the center.



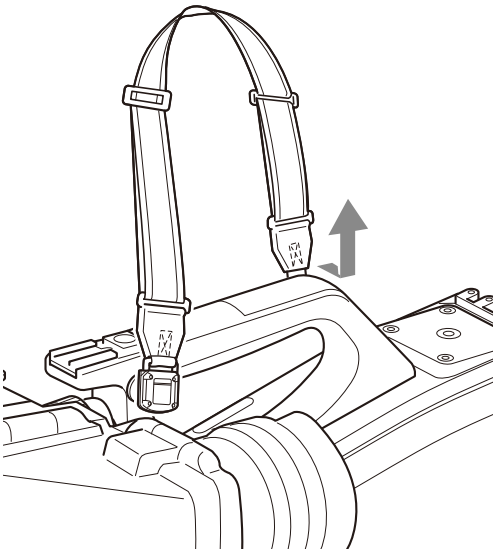
Attaching the Shoulder Strap

Attach an optional shoulder strap (part number: A-6772-374-E) to the camera.

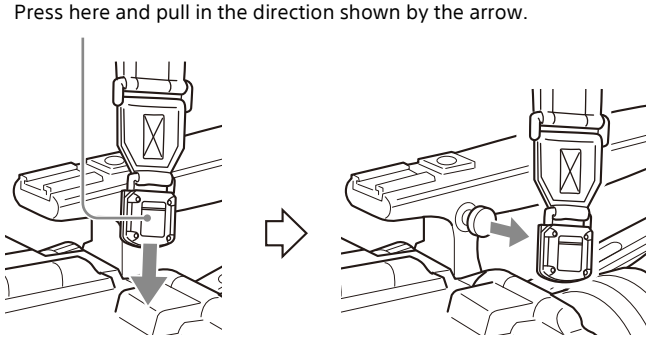
1 Fit one of the clips to the shoulder strap fitting.



2 Fit the other clip to the shoulder strap fitting on the other side of the grip.

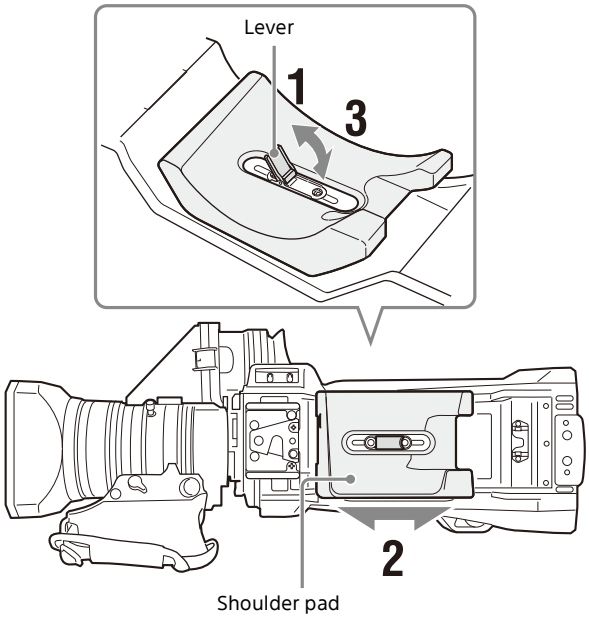


To remove the shoulder strap



Adjusting the Shoulder Pad Position

You can slide the shoulder pad back and forth within a 40 mm range. This adjustment helps you get the best balance for shooting with the camera on your shoulder.



1 Raise the lever in the center of the shoulder pad to unlock the shoulder pad.

2 Slide the shoulder pad backward or forward until it is in the most convenient position.

3 Lower the lever to lock the shoulder pad.

Shooting

Basic Procedure for Shooting

1 Turn the camera on.

2 Set the FILTER knob and COLOR TEMP. button appropriately for the lighting conditions.

Filter settings

FILTER knob	Lighting conditions
1 (Clear)	Indoor shooting
2 (1/4 ND)	Outdoor (cloudy or rainy) or indoor shooting when you wish to reduce the depth of field [a)]
3 (1/16 ND)	Outdoor shooting in daytime
4 (1/64 ND)	Outdoor shooting when you wish to reduce the depth of field, or especially under bright outdoor ambient light

a) Depth of field: This is the range over which the subject is sharply in focus. If the range is narrow, the depth of field is called "shallow focus." If the range is wide, the depth of field is called "deep focus."

From the viewpoint of the characteristics of lenses, shooting with an F-stop value in the range of F4 to F8 is generally recommended for good quality pictures. Set the FILTER knob to bring the iris setting into that range. However, this may not apply when special composition is desired.

5600K setting

The 5600K function ON/OFF switching is assigned to the COLOR TEMP. button by factory default.

5600K	Lighting conditions
OFF	Indoor shooting under lighting with lower color temperature, such as a halogen or tungsten lamp
ON	Outdoor shooting in daytime, or indoor shooting under lighting with higher color temperature

3 Check the settings of the camera.

- Settings of switches/knobs
- Settings in the OPERATION menu *(see page 44)* and the PAINT menu *(see page 57)*
- Electronic shutter setting *(see page 28)*
- Settings for the output signals from the camera *(see page 31)*
- Flange focal length adjustment *(see page 22)*

4 Adjust the viewfinder diopter, as well as the contrast and brightness of the viewfinder image *(see page 17)*.

For details about the operation of optional viewfinders, refer to the operation manual for the viewfinder.

5 If required, switch on the center marker, safety zone, and zebra pattern display in the viewfinder.

Configure in the following menu items.

- <VF MARKER> page *(see page 45)* in the OPERATION menu
- <ZEBRA> page *(see page 47)* in the OPERATION menu

6 Check the microphone connection and the audio input selector switch settings *(see page 23)*.

7 Adjust the white balance and black balance *(see page 27)*.

8 Rotate the focus ring on the lens to adjust the focus.

Adjustments and Settings

For details about menu operations, see "Menu Operation" (page 32).

Changing the Video Format

1 Select the <OUTPUT FORMAT> page in the MAINTENANCE menu.

2 Select the desired format in RESOLUTION and FREQUENCY.

Adjusting the Black Balance and White Balance

To ensure excellent image quality when using this camera, conditions may require that both the black balance and the white balance be adjusted.
Black balance and white balance adjustment values that are automatically set by the camera and other various settings are stored in the camera memory and retained when the power is turned off.

Note

When connected to a camera control unit (CCU) or external control device (for example, RCP or RM), the black balance and white balance adjustment functions are controlled from the connected device. They are not controlled using the camera.

For details about operations on the external control device, refer to the operating instructions or operation manual for the device.

Black balance adjustment

The black balance will require adjustment in the following cases.
- When using the camera for the first time
- When the camera has not been used for a long time
- When the camera is used under conditions in which the surrounding temperature has changed greatly

It is not usually necessary to adjust the black balance when using the camera after it has been turned off.

White balance adjustment

Always readjust the white balance when the lighting conditions change.

Adjusting the black balance

In automatic black balance mode, adjustments are performed in the following order: black set and black balance. Manual black balance adjustment can be selected in the menu.

For details about manual black balance adjustment, contact a Sony service representative.

1 Set the OUTPUT/AUTO KNEE switch to CAM.

2 Push the WHT/BLK switch to the BLK position and release the switch.
The message "ABB: EXECUTING" appears during execution, and changes to "ABB: OK" when the adjustment finishes.
Adjustment values are saved in memory automatically.

Notes

- During the black balance adjustment, the iris is automatically shielded.
- During the black balance adjustment, the gain selection circuit is automatically activated so you may see flicker in the viewfinder, but this is not a fault.

If automatic black balance adjustment cannot be made

If the black balance adjustment cannot be completed normally, an error message will appear for about three seconds in the viewfinder.
If an error message is displayed, retry the black balance adjustment. If the error message occurs again, consult your Sony dealer or a Sony service representative.

Note

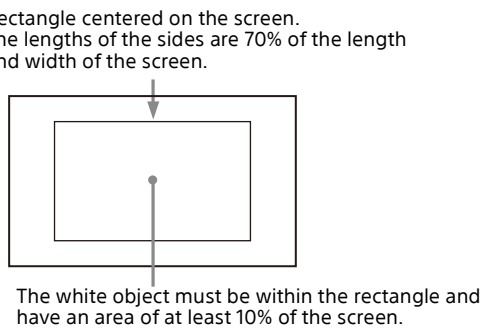
If the lens cable is not firmly connected to the LENS connector, it may not be possible to adjust the lens iris. If this happens, the black balance will be incorrect.

Adjusting the white balance

1 Set the switches as shown below.
- GAIN switch: L (set to a gain value that is as small as possible)
- OUTPUT/AUTO KNEE switch: CAM
- WHITE BAL switch: A or B

2 Set the FILTER knob to suit the lighting conditions.

3 Place a white test card under the same lighting conditions as for the subject to be shot and zoom up to it.
Alternatively, any white object such as a cloth or a wall can be used.
The minimum required white area is as follows.

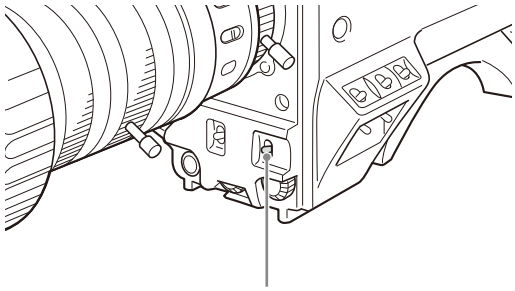


Note

Make sure there are no bright spots in the rectangle.

4 Adjust the lens iris.
Manually adjustable lens: Set the iris to an appropriate setting.
Lens with automatic iris: Set the iris automatic/manual switch on the lens to automatic.

5 Push the WHT/BLK switch to the WHT position and release the switch.



WHT/BLK switch

The message “AWB: EXECUTING” appears during execution, and changes to “AWB: OK” when the adjustment finishes.
The adjustment values are saved automatically in the memory selected in step **1** (A or B).

Note

If the camera has a zoom lens with an automatic iris, the iris may hunt [1] during the adjustment. To prevent this, adjust the iris gain knob (labeled IG, IS, or S) on the lens.
1) Hunting: Repeated brightening and darkening of the image, resulting from repeated response to automatic iris control.

For details, refer to the operation manual supplied with the lens.

If the automatic white balance adjustment cannot be made

If the white balance adjustment cannot be completed normally, an error message will appear for about three seconds in the viewfinder.
If an error message is displayed, retry the white balance adjustment. If the error message occurs again, consult your Sony dealer or a Sony service representative.

If you have no time to adjust the white balance

Set the WHITE BAL switch to PRST.
The white balance is set to 5600K by pressing the COLOR TEMP. button.
You can set the color temperature to 3200K, 4300K, or 6300K by assigning the electrical CC filter function to the COLOR TEMP. button.

To switch the electrical CC filter

You can assign the electrical CC filter switching function to the ASSIGN 1/2/3 buttons or the COLOR TEMP. button. This allows you to switch between color temperatures (3200K/4300K/6300K) configured for the three positions (B to D) selected with each press of the button.

1 Assign the CC filter switching function (ELECTRICAL CC) to a button on the <SWITCH ASSIGN1> page in the OPERATION menu.
For the ASSIGN 1/2/3 buttons, select ASSIGN1/2/3 and set to ELECTRICAL CC. For the COLOR TEMP. button, select COLOR TEMP. and set to ELECTRICAL CC.

White balance memory

There are two white balance memories: A and B. When you execute automatic white balance adjustment, the adjusted white balance value is stored in the memory (A or B) selected with the WHITE BAL switch.
The white balance values stored in memory are retained until the white balance is adjusted again, including when power is turned off.
When power is turned on again, the white balance in memory corresponding to the current WHITE BAL switch setting is loaded. When an camera control unit (CCU) or external control device (for example, RCP or RM) is connected, the WHITE BAL switch is disabled and the white balance is stored in memory different from A and B.

Setting the Electronic Shutter

Note

When connected to a camera control unit (CCU) or external control device (for example, RCP or RM), the electronic shutter settings are controlled from the connected device. They are not controlled using the camera.

For details about operations on the external control device, refer to the operating instructions or operation manual for the device.

Shutter modes

The shutter modes that can be used with the electronic shutter and the shutter speeds that can be selected are listed below.

Standard mode

Select this mode for shooting fast-moving subjects with little blurring.

System frequency	Shutter speed (sec.)
• 60P • 59.94P/i	1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000
• 50P/i	1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000
• 30P • 29.97P/PsF	1/40, 1/60, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000
• 25P/PsF	1/33, 1/50, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000
• 24P/PsF • 23.98P/PsF	1/32, 1/48, 1/96, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000

ECS (Extended Clear Scan) mode

Select this mode for obtaining images with no horizontal bands of noise when shooting subjects such as monitor screens.

System frequency	Shutter speed (Hz)
60	60.13 to 4600
59.94	60.07 to 4600
50	50.12 to 4600
30	30.02 to 2700
29.97	29.99 to 2700
25	25.02 to 2300
24	24.02 to 2200
23.98	23.99 to 2200

SLS (Slow Shutter) mode

Select this mode to shoot dimly lit subjects.
You can set the number of accumulated frames to 2, 3, 4, 5, 6, 7, or 8 frames.

Note

In SLS mode, the following limitations apply to automatic functions.

○: Supported, ×: Not supported

Function	Operation in SLS mode	
	2F	3F/4F/5F/6F/7F/8F
AUTO WHITE	○	○
AUTO BLACK	○	2F setting
AUTO LEVEL	×	×
AUTO HUE	×	×
AUTO IRIS	○	○
ATW	○	○
AUTO KNEE	○	○
FLARE	○	○
D.EXT	○	○
TLCS (AUTO SHUTTER)	×	

Setting the shutter mode and shutter speed

Notes

- When automatic iris is used, the iris opens wider as the shutter speed increases, reducing the depth of field.
- The selectable shutter speeds vary depending on the current system frequency.

Setting the shutter mode and standard mode shutter speed

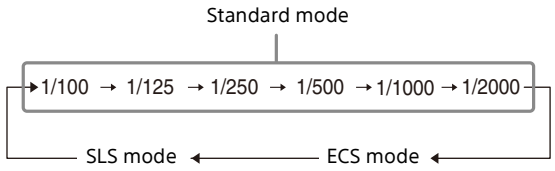
Once the shutter speed is selected, it is retained even when the camera power is turned off.

1 Push the SHUTTER switch from ON to SEL.

The current shutter setting indication appears in the viewfinder for about three seconds.
Example: SHUTTER: 1/250

2 Before the shutter setting indication disappears, push the SHUTTER switch to SEL again.

Repeat this operation until the desired speed is displayed.
To set ECS mode, select “ECS.” To set SLS mode, select “SLS.”
All modes and speeds are displayed in the following order.
Example: System frequency of 59.94i



To set the shutter speed in ECS mode

1 Set the shutter mode to ECS.

2 Select the ECS FREQ item and rotate the menu control knob to set the desired frequency.

To set the shutter speed in SLS mode

1 Set the shutter mode to SLS.

2 Select the SLS FRAME item and rotate the menu control knob to set the desired number of frames.

Setting Automatic Iris

The automatic iris setting may need to be changed, according to the subject lighting conditions, to aid the shooting of clear pictures of back-lit subjects or to prevent blown-out highlights of subjects illuminated with spotlights.
The reference value for the lens iris can be set within the range –99 (equivalent to closing the iris by 2 stops) to 99 (equivalent to opening the iris by 2 stops) with respect to the standard value.
You can monitor the current reference value using the F-stop value indicator displayed in the viewfinder.
Also, you can set the auto iris target range.

Changing the reference value

The changed reference value is retained until the power of the camera is turned off. Even if the reference value is changed, it reverts to the original value every time the power is turned on.

1 Select the <AUTO IRIS> page in the MAINTENANCE menu.

2 Select AUTO IRIS and set to ON.

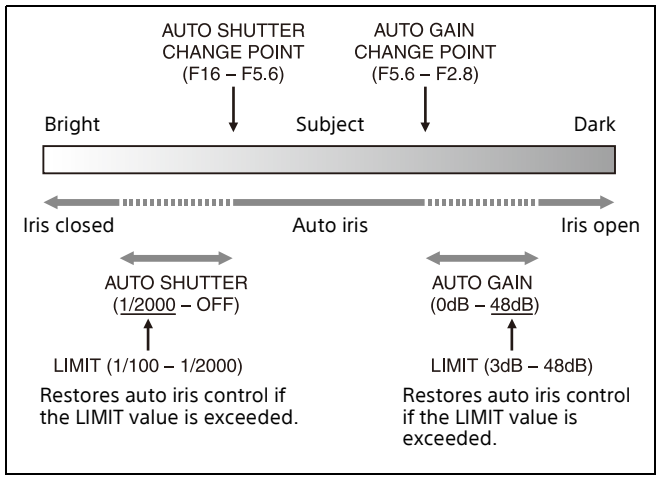
3 Select OVERRIDE and set the reference value.

Note

Check that the current shutter mode is not ECS before proceeding.

Setting the TLCS Function

You can maintain the proper exposure by using the TLCS (Total Level Control System) function. This function controls not only the iris, but also the shutter (Auto Shutter) and gain (Auto Gain) automatically.
The TLCS function can be assigned to one of the ASSIGN 1/2/3 buttons, and turned ON/OFF by pressing the button.
The target auto control range is set as shown in the following diagram on the <TLCS> page in the OPERATION menu.



Note

SLS mode and AUTO SHUTTER cannot be used at the same time. If AUTO SHUTTER is set to ON, SHUTTER is forcibly set to OFF.

Setting the Focus Assist Function

The assist functions for easier focus adjustment can be displayed in the viewfinder.

Adding the viewfinder detail signal

Adding a detail signal to sharp edges in the image in the viewfinder makes it easier to check the focus condition by observing changes in the detail signal or in the color converted from the detail signal (color detail).
The focus setting where the detail signal becomes strongest is the best focus setting.

1 Select the <VF DETAIL> page in the OPERATION menu.

```
<VF DETAIL>                    → 04 TOP

 VF DETAIL     :  ON    8%
  CRISP        :    0
  FREQUENCY    :  9M
  FLICKER      : OFF
  AREA         : 100%
  ZOOM LINK    :  ON  100%

 COLOR DETAIL  : OFF
  COLOR        : BLUE
  PEAK COLOR   : OFF
  CHROMA LEVEL:  25%

 RETURN DISABLE : OFF
 DYNAMIC FOCUS  : OFF
```

2 To use the VF detail signal, select VF DETAIL and set to ON.

Set VF DETAIL to ON to activate the viewfinder detail function to add the detail signal to sharp edges in the image. You can adjust the level in the range of 0% to 100% (factory default: 8%).

You can adjust the characteristics of the added detail signal with the menu items below.

CRISP: Eliminate fine portions of the detail signal.

FREQUENCY: Change the detection band of sharp edges.

FLICKER: Set the function for flickering the detail signal to ON/OFF. (Setting the function to ON makes it easier to check the detail signal on the viewfinder screen.)

AREA: Limit the area where to display the detail signal.

ZOOM LINK: Set the VF detail level at the full WIDE position. (The VF detail level changes according to the zoom position. The default setting is no change at the 100% WIDE position, and half at 50%.)

3 To use color detail, select COLOR DETAIL and set to ON.

Setting COLOR DETAIL to ON converts the detail signal to a color. The display color can be selected using COLOR.

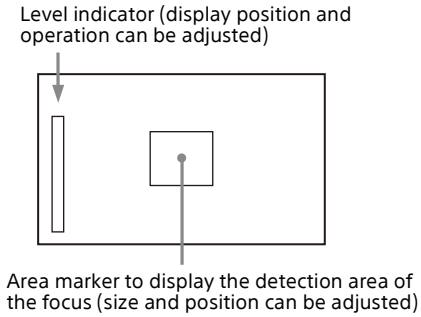
You can adjust how color is added with the menu items below.

PEAK COLOR: Turn the function ON/OFF to change the color where the detail signal is strongest.

CHROMA LEVEL: Reduce the chroma components of the video signal.

Displaying the focus assist indicators

The focus assist indicator function extracts the irregularities of a subject and converts the integrated values to a level indicator for display in the viewfinder.



The focus setting where the indicator shows the maximum level is the best focus setting. (The width of the indicator substantially changes depending on the picture content and shooting environment. Adjust using GAIN and OFFSET, as required.)

1 Select the <FOCUS ASSIST> page in the OPERATION menu.

```
<FOCUS ASSIST>                 → 08 TOP

 INDICATOR  : OFF
  MODE      :  BOX
  LEVEL     :  4    QUICK
  GAIN      :  50
  OFFSET    :  50

 AREA MARKER: OFF
  SIZE      :  MIDDLE
  POSITION  :  CENTER
  POSITION H:  50
  POSITION V:  50
```

2 To use a level indicator, select INDICATOR and set to ON.

Setting INDICATOR to ON displays the level indicator for focusing on the monitor.

You can set the display method with the menu items below.

MODE: Set the type and display position of the indicator.

LEVEL: Set the density and the response speed of the indicator.

GAIN: Set the sensitivity of the indicator.[1)]

OFFSET: Set the offset of the focus detection value.[2)]

1) Normally, the value is automatically set to the optimum value in conjunction with the AREA MARKER SIZE set value. Use this setting when an optimum sensitivity value cannot be obtained, depending on the shooting environment.
2) Normally, the optimum offset is automatically set in conjunction with the AREA MARKER SIZE and MASTER GAIN set values. Use this setting when the optimum offset cannot be obtained, depending on the shooting environment.

3 To use an area marker, select AREA MARKER and set to ON.

Setting AREA MARKER to ON displays an area marker indicating the focus detection area on the monitor.
You can set the size and position of the detection area with the menu items below.

SIZE: Change the size of the detection area. (If the detection area size is too large, both the subject and the background are included in the area,

making the indicator display deviate from the subject.)

POSITION: Roughly set the position of the detection area.

POSITION H: Finely adjust the position of the detection area in the horizontal directions.

POSITION V: Finely adjust the position of the detection area in the vertical directions.

Note

When displaying the focus assist indicators, check that the flange focal length (flange back) has been precisely adjusted *(see page 22)*.

Setting the Camera Outputs

You can specify video signals directly output from the camera using the menu.

Outputting the signal being shot (camera picture)

Menu page	Page No.	Item	Setting
<SDI OUT>	M12	SDI OUT	MAIN

You can select 12G-SDI, 6G-SDI, 3G-SDI, HD-SDI, or SD-SDI as the output by configuring the appropriate setting for MAIN.
A software option must be installed to support 4K video output from the unit. Also, 4K video output is supported in standalone operation mode only.

Constantly outputting a return video

- When a CCU is connected, one of the signals being supplied to the CCU can be output from the camera.
- The last displayed return signal is output.

To output as HD-SDI

Menu page	Page No.	Item	Setting
<SDI OUT>	M12	SDI OUT	RET

Outputting the same image as that in the viewfinder

With HD-SDI, you can obtain a signal that includes the same information as that being displayed in the viewfinder according to the settings for VF MARKER, CHARACTER, VF DETAIL, ZEBRA, etc. The individual ON/OFF and other settings for adding information are common to those for the viewfinder. The output is synchronized with the switching of Y, R, G, B, or return signal in the viewfinder.

Menu page	Page No.	Item	Setting
<SDI OUT>	M12	SDI OUT	VF
		SDI I/O	VF OUT

Outputting a prompter signal

The VBS signal supplied to the PROMPTER connector of the CCU is output from the PROMPTER/GENLOCK connector of the camera.

Adjusting the Audio Level

When the HXCU-FZ90 is connected

The input levels from audio sources connected to the AUDIO IN CH1 and AUDIO IN CH2 connectors can be adjusted using a remote control panel connected to the CCU or the CONFIGURATION menu on the CCU.
When the audio input select switch is set to MIC, the level can be adjusted between 20 dB and 60 dB in steps of 10 dB.
When the audio input selector switch is set to LINE, the level cannot be adjusted.

In standalone operation mode

The input level from audio sources connected to the AUDIO IN CH1 and AUDIO IN CH2 connectors can be adjusted using the INTERCOM LEVEL knob at the front of the camera.
When the audio input select switch is set to MIC, the level can be adjusted between 20 dB and 60 dB in steps of 10 dB.
When the audio input selector switch is set to LINE, the level cannot be adjusted.
Set the gain to avoid clipping the audio signal by monitoring the audio level meters and waveforms.
You can assign a function to the INTERCOM LEVEL knob on the <VOLUME ASSIGN> page in the OPERATION menu.

Setting the Digital Extender Function

The central area of the screen can be magnified by a factor of 2 or 4 by enabling the digital extender function. The digital extender does not operate in 4K formats.
To use the digital extender function, assign the function to one of the ASSIGN 1/2/3 buttons. Press the button to magnify the central area of the screen by a factor of 2 or 4, and press again to return to the original image.

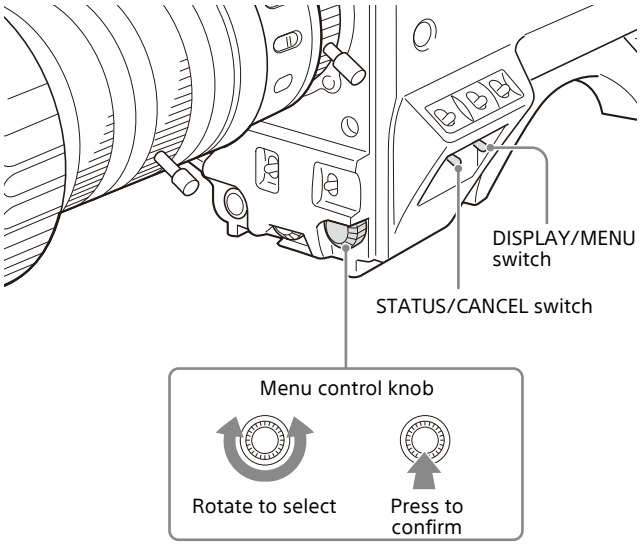
1 Assign the digital extender function (D.EXTENDER ×2 or ×4) to a button on the <SWITCH ASSIGN1> page in the OPERATION menu.
Select one of ASSIGN1/2/3, and set to D.EXTENDER ×2 (2×) or D.EXTENDER ×4 (4×).

Note

After the power is turned on, the video that is output from the unit will be delayed by 1 field if the digital extender function is enabled even once. The delay is canceled when the power is turned off.

Menu Operation

The menus displayed in the viewfinder enable various settings of the camera.
The following switches are used to operate the menus. Rotate the menu control knob to select menu items or values, and press it to apply the selection.

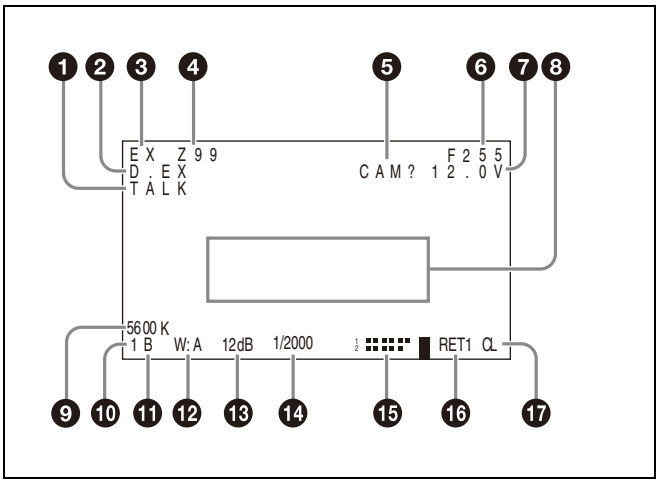


Viewfinder Display Screen

Besides the video image, the viewfinder can display text and messages showing the camera settings and operation status, as well as items such as a center marker or safety-zone marker.

When the DISPLAY/MENU switch is set to DISPLAY

Items set to ON using the menu or related switches will be displayed.



❶ TALK indicator
Displayed when the intercom microphone is ON.

❷ D.EX indicator
Displayed when the digital extender function is ON.

❸ EX (lens extender) indicator
Displayed when using a lens extender.

❹ Zoom position indicator
Indicates the approximate position of the zoom lens variator between wide angle (0) and telephoto (99).

❺ DIAG indicator
Displays self-diagnostic information.

❻ Focus position indicator
Displays the focus position of a zoom lens as a numeric value (0 to 255 (∞)).

❼ Voltage indicator
Displays the voltage supplied to the camera.

❽ Message area
Displays various types of messages.

❾ 5600K mode indicator
Displayed when the 5600K setting is ON.

❿ Filter indicator
Displays the type of ND filter (1 to 4).

⓫ ECC indicator
Displays the type of built-in electrical CC filter (A to D).

⓬ White balance memory indicator
Displays the white balance automatic adjustment memory. This is not displayed when a CCU is connected.
W:A: The WHITE BAL switch is set to A.
W:B: The WHITE BAL switch is set to B.
W:P: The WHITE BAL switch is set to PRST.

⓭ Gain value indicator
Displays the video gain value (dB) set with the GAIN switch.

⓮ Shutter/ECS indicator
Displays the shutter/ECS setting. Not displayed if the shutter is OFF.

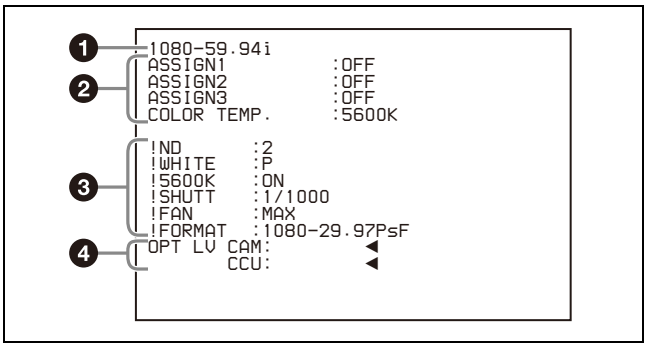
⓯ Audio level meters
Displays the audio levels input to the AUDIO IN CH1 and AUDIO IN CH2 connectors.

⓰ Return video indicator
Displayed while the RET button is pressed.

⓱ F-stop value indicator
Displays the lens F-stop (iris opening) value.

When the STATUS/CANCEL switch is set to STATUS

The status display appears when you set the STATUS/CANCEL switch to STATUS with the DISPLAY/MENU switch set to DISPLAY.
The status screen displays the video format and non-standard settings of the camera.



❶ Format indicator
Displays the current video format.

❷ Assignable button function indicators
Displays the functions assigned to the ASSIGN 1/2/3 buttons and COLOR TEMP. button.

For details, see "<SWITCH ASSIGN1>" (page 50) in the OPERATION menu.

❸ '!' indicator area
This area is used to display non-standard status, using the '!' IND function. Display options can be set using the menu.

For details, see "<'!' IND>" (page 45) in the OPERATION menu.

❹ Optical level indicators
Displays the optical levels using multi-segment indicators.
CAM: Optical level on the CCU connector of the camera
CCU: Optical level on the CAMERA connector of the CCU

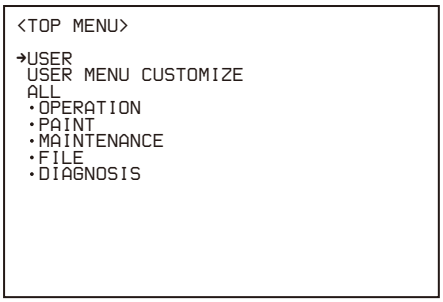
Operating the Menu

To display a menu page

Set the DISPLAY/MENU switch to MENU.
The menu page last accessed will be displayed. If it is the first time, the CONTENTS page of the USER menu will be displayed.

To display the TOP MENU screen

If you set the DISPLAY/MENU switch to MENU while holding the menu control knob pressed, "TOP" is displayed at the upper right corner of the screen.
Rotate the menu control knob to move the ➡ pointer on the display to "TOP" and press the menu control knob to display the TOP MENU screen, listing the available menus.



Menu	Function
USER	This menu is user defined and can include often-used menu pages selected from among the OPERATION, PAINT, MAINTENANCE, FILE, and DIAGNOSIS menus. The factory default configuration can be changed using the USER MENU CUSTOMIZE menu.
USER MENU CUSTOMIZE	This menu allows you to edit the USER menu. For details, see *"Editing the USER Menu" (page 34)*.
ALL	This menu permits you to control all items of the OPERATION menu, PAINT menu, MAINTENANCE menu, FILE menu, and DIAGNOSIS menu as a single menu.
OPERATION *(page 44)*	This menu contains items for camera operators to operate the camera. It mainly permits viewfinder, intercom, and switch settings.
PAINT *(page 57)*	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 control device to set the items in this menu, the menu is effective when using the camera outdoors in standalone operation mode.
MAINTENANCE *(page 64)*	This menu contains items for performing camera maintenance operations and for setting infrequently used "paint" items.
FILE *(page 68)*	This menu is for performing file operations, such as writing or clearing the reference file.
DIAGNOSIS *(page 71)*	This menu displays self-diagnostic information.

To disable the "TOP" indication

Turn the power off then on again, or set the DISPLAY switch from OFF to MENU while holding the STATUS/CANCEL switch in the CANCEL position. This disables the TOP selection.

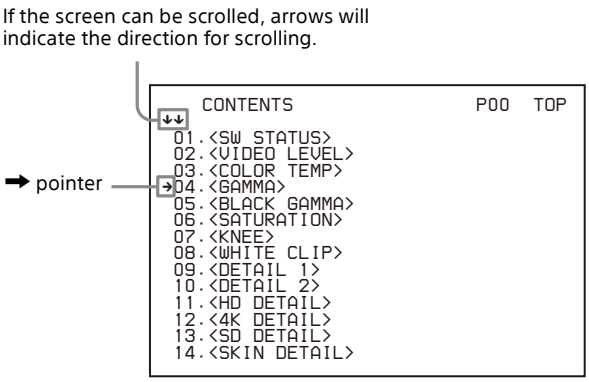
To select a menu on the TOP MENU screen

Rotate the menu control knob to align the ➡ pointer with the desired menu and press the menu control knob.
The CONTENTS page (page No. 00) or the last accessed page of the selected menu is displayed.

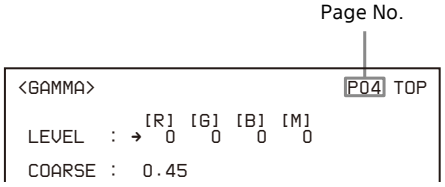
Selecting a Page

To select a page from the CONTENTS page

Rotate the menu control knob to align the ➡ pointer with the desired page and press the menu control knob.

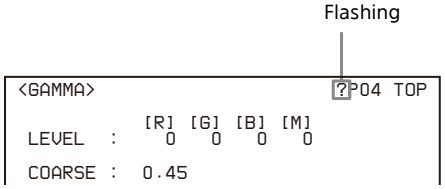


The selected page is displayed.
Press the menu control knob to confirm the page selection.



To change the displayed page

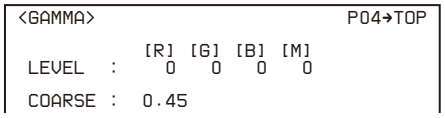
1 **Check that the ➡ pointer is located on the left of the page number and press the menu control knob.**
The ➡ pointer changes to a flashing question **?** mark.



2 **Rotate the menu control knob to flip through the pages, and press the menu control knob when the desired page is displayed.**
The **?** mark will change back to the ➡ pointer, and operations on the selected page are enabled.

To return to the TOP MENU screen

Align the ➡ pointer with "TOP" at the top right of the menu page and press the menu control knob.



Setting Menu Items

If a **?** mark is flashing on the left of the page number, press the menu control knob to change it to the ➡ pointer. Operation on the displayed page is enabled.

1 **Align the ➡ pointer with the desired item and press the menu control knob.**
The ➡ pointer changes to a flashing question **?** mark.

2 **Rotate the menu control knob to change the setting value.**
When the knob is rotated quickly, the values will change quickly; when rotated slowly, the values will change slowly.

To reset a changed value
If you set the STATUS/CANCEL switch to CANCEL before pressing the menu control knob, the setting will be returned to its previous value.

To interrupt settings
Set the DISPLAY/MENU switch to OFF to turn off the menu screen display.
The setting operation can be restarted by setting the DISPLAY/MENU switch back to MENU.

3 **Press the menu control knob.**
The **?** mark will change back to the ➡ pointer, and the setting will be registered.

4 **To change other setting items on the same menu page, repeat steps 1 to 3.**

To specify a character string

When you press the menu control knob with the ➡ pointer aligned with an item for which a character string, such as a file ID, is to be specified, a rectangular cursor and a list of selectable characters are displayed.
The cursor can be moved by rotating the menu control knob.

1 **Set the cursor to the position where you wish to enter a character, then press the menu control knob.**
A cursor appears in the character list.

2 **Set the cursor to the character to be entered and press the menu control knob.**
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 below the character list.

3 **Select END and press the menu control knob.**
The new string you have set is registered.

To restore the previous string
Select ESC and press the menu control knob.

To return a menu item to the standard value

When an item is selected and the ➡ pointer is displayed, pressing and holding the menu control knob for 3 seconds restores the setting value to the state in the reference file.

To exit menu operations

Set the DISPLAY/MENU switch to OFF.

Editing the USER Menu

You can select desired pages and items from the OPERATION, PAINT, MAINTENANCE, FILE, and DIAGNOSIS menus and register them in the USER menu.
If you specify pages or items frequently used for the USER menu, you can easily call and use them.
The following pages are included in the USER menu by factory default.

Menu page	USER menu No.	Source menu / Page No.	
<VF OUT>	U01	OPERATION	14
<VF DETAIL>	U02	OPERATION	4
<FOCUS ASSIST>	U03	OPERATION	8
<SWITCH ASSIGN1>	U04	OPERATION	15
<SWITCH ASSIGN2>	U05	OPERATION	16

Menu page	USER menu No.	Source menu / Page No.	
<VOLUME ASSIGN>	U06	OPERATION	18
<VF DYNAMIC CONTRAST>	U07	OPERATION	12
<VF DISPLAY>	U08	OPERATION	1
<'!' IND>	U09	OPERATION	2
<VF MARKER>	U10	OPERATION	3
<CURSOR>	U11	OPERATION	10
<ZEBRA>	U12	OPERATION	9
<HEADSET MIC>	U13	OPERATION	20
<INTERCOM>	U14	OPERATION	21
<EARPHONE>	U15	OPERATION	22
<OUTPUT FORMAT>	U16	MAINTENANCE	M10
<SDI OUT>	U17	MAINTENANCE	M12
<ROM VERSION>	U18	DIAGNOSIS	D03

For the items on each page, see "OPERATION Menu" (page 44), "MAINTENANCE Menu" (page 64), "FILE Menu" (page 68), or "DIAGNOSIS Menu" (page 71).

The USER MENU CUSTOMIZE menu allows you to configure the USER menu as follows.

- Creating a new menu page and selecting and adding (registering) items that you use very frequently from multiple menu pages
- Deleting (unregistering) added items
- Changing the order of added items
- Adding (registering) a menu page (new page you create or existing menu page) to the USER menu
- Deleting (unregistering) a page from the USER menu
- Changing the order of pages of the USER menu

Editing by items

The USER MENU CUSTOMIZE menu allows you to create a new page for the USER menu and add any item. Initially, the EDIT page of the USER MENU CUSTOMIZE already contains items but the USER 1 EDIT to USER 19 EDIT pages are blank. Up to 10 items can be selected and registered to these pages from different menu pages.

To add items to a page

1 **Select USER MENU CUSTOMIZE on the TOP MENU screen *(see page 33)*.**
If this is the first time the USER MENU CUSTOMIZE menu has been displayed, the CONTENTS page appears.

```
     CONTENTS                    E00 TOP
↓↓
 01.EDIT PAGE
 02.USER 1 EDIT
→03.USER 2 EDIT
 04.USER 3 EDIT
 05.USER 4 EDIT
 06.USER 5 EDIT
 07.USER 6 EDIT
 08.USER 7 EDIT
 09.USER 8 EDIT
 10.USER 9 EDIT
 11.USER 10 EDIT
 12.USER 11 EDIT
 13.USER 12 EDIT
 14.USER 13 EDIT
```

If the menu has been used before, the page last accessed appears.

2 **If the CONTENTS page is displayed, rotate the menu control knob to move the ➡ pointer to any of USER 1 EDIT to USER 19 EDIT and press the menu control knob to display the page.**
If a different page is displayed, rotate the menu control knob until the desired page appears, then press the menu control knob to select the page.
Example: If the USER 2 EDIT page is selected

```
     USER 2 EDIT                 E03 TOP
→
```

3 **Move the ➡ pointer to the item to be added (this operation is unnecessary if no item exists on the page, as shown in the figure for the previous step), then press the menu control knob.**
The EDIT FUNCTION screen appears.

```
     EDIT FUNCTION                   ESC
→INSERT
 MOVE
 DELETE
 BLANK
```

4 **Move the ➡ pointer to INSERT and press the menu control knob.**
The CONTENTS page appears.

```
     CONTENTS                  ?P00 ESC
↓↓
 01.<VF OUT>
 02.<VF DETAIL>
 03.<FOCUS ASSIST>
 04.<SWITCH ASSIGN1>
 05.<SWITCH ASSIGN2>
 06.<VOLUME ASSIGN>
 07.<VF DYNAMIC CONTRAST>
 08.<VF DISPLAY>
 09.<'!'IND>
 10.<VF MARKER>
 11.<CURSOR>
 12.<ZEBRA>
 13.<HEADSET MIC>
 14.<INTERCOM>
```

5 **Add the items.**

① Rotate the menu control knob until the page that has the desired items appears, and press the menu control knob.

② Rotate the menu control knob to move the ➡ pointer to the desired item, and press the menu control knob.

The USER 2 EDIT page appears again, displaying the newly added item.

6 **Add the remaining items by repeating steps 3 to 5.**
You can add up to 10 items on one page.

To change the order of items on a page

1 **Move the ➡ pointer to the item to be moved and press the menu control knob.**
The EDIT FUNCTION screen appears.

2 **Select MOVE and press the menu control knob.**
The previously displayed page appears again.

3 **Move the ➡ pointer to the position where you wish to move the item and press the menu control knob.**

```
      ITEM MOVE                    ESC

→VF DETAIL     :  ON

 COLOR DETAIL : OFF

 MARKER        :  ON
 CURSOR        : OFF
×ZEBRA         : OFF


 ~~~END OF PAGE~~~
```

The item selected in step **1** moves to the position selected in step **3**.
In the above example, ZEBRA is moved to the top, and the other items are moved down one line.

To delete items from a page

1 **Move the ➡ pointer to the item to be deleted and press the menu control knob.**
The EDIT FUNCTION screen appears.

2 **Select DELETE and press the menu control knob.**
The previously displayed page appears again, and the message “DELETE OK ? YES➡NO” appears.

3 **To delete, rotate the menu control knob to move the ➡ pointer to YES and press the menu control knob.**

To insert a blank line

1 **Move the ➡ pointer to the position where you wish to insert a blank line.**
The EDIT FUNCTION screen appears.

2 **Select BLANK and press the menu control knob.**
The previously displayed page appears again, and a blank line is inserted above the position selected in step **1**.

Note

You cannot insert a blank line on a page where 10 items have already been registered.

Editing by pages

Use EDIT PAGE in the USER MENU CUSTOMIZE menu to add, delete, and sort new pages and existing pages in the USER menu.

To add a page

1 **Select USER MENU CUSTOMIZE on the TOP MENU screen.**
If this is the first time the USER MENU CUSTOMIZE menu has been displayed, the CONTENTS page appears.
If the menu has been used before, the page last accessed appears.

2 **If the CONTENTS page is displayed, rotate the menu control knob to move the ➡ pointer to EDIT PAGE and press the menu control knob to display the EDIT PAGE screen.**
If a different page is displayed, rotate the menu control knob until the EDIT PAGE screen appears, then press the menu control knob to select the page.

```
      EDIT PAGE                  E00 TOP
↓↓
 01.<VF OUT>
→02.<VF DETAIL>
 03.<FOCUS ASSIST>
 04.<SWITCH ASSIGN1>
 05.<SWITCH ASSIGN2>
 06.<VOLUME ASSIGN>
 07.<VF DYNAMIC CONTRAST>
 08.<VF DISPLAY>
 09.<'!'IND>
 10.<VF MARKER>
 11.<CURSOR>
 12.<ZEBRA>
 13.<HEADSET MIC>
 14.<INTERCOM>
```

3 **Move the ➡ pointer to the position where you wish to add the page and press the menu control knob.**
The EDIT FUNCTION screen appears.

4 **Select INSERT and press the menu control knob.**
The page selection screen appears.

```
      CONTENTS                     ESC
↓↓
→01.USER 1
 02.USER 2
 03.USER 3
 04.USER 4
 05.USER 5
 06.USER 6
 07.USER 7
 08.USER 8
 09.USER 9
 10.USER 10
 11.USER 11
 12.USER 12
 13.USER 13
 14.USER 14
```

5 **Move the ➡ pointer to the desired page and press the menu control knob.**
This adds the page above the item selected in step **3**.

To cancel addition of a page
Before pressing the menu control knob in step **5**, rotate the menu control knob to move the ➡ pointer to ESC at the top right of the screen and press the menu control knob.
The EDIT PAGE screen appears again.

To delete a page

1 **On the EDIT PAGE screen of the USER MENU CUSTOMIZE menu, move the ➡ pointer to the page to be deleted and press the menu control knob.**
The EDIT FUNCTION screen appears.

2 **Select DELETE and press the menu control knob.**
The previously displayed page appears again, and the message “DELETE OK ? YES➡NO” appears.

```
     ITEM DELETE                    ESC
          DELETE OK?  YES →NO
 01.<VF OUT>
 02.<VF DETAIL>
 03.<FOCUS ASSIST>
×04.<SWITCH ASSIGN1>
 05.<SWITCH ASSIGN2>
 06.<VOLUME ASSIGN>
 07.<VF DYNAMIC CONTRAST>
 08.<VF DISPLAY>
 09.<'!'IND>
 10.<VF MARKER>
 11.<CURSOR>
 12.<ZEBRA>
 13.<HEADSET MIC>
 14.<INTERCOM>
```

3 **To delete, rotate the menu control knob to move the ➡ pointer to YES and press the menu control knob.**

To change the order of pages

1 **On the EDIT PAGE screen of the USER MENU CUSTOMIZE menu, move the ➡ pointer to the page to be moved and press the menu control knob.**
The EDIT FUNCTION screen appears.

2 **Select MOVE and press the menu control knob.**
The previously displayed page appears again.

3 **Move the ➡ pointer to the position where you wish to move the item and press the menu control knob.**

```
     ITEM MOVE                      ESC
↓↓
 01.<VF OUT>
 02.<VF DETAIL>
 03.<FOCUS ASSIST>
→04.<SWITCH ASSIGN1>
 05.<SWITCH ASSIGN2>
 06.<VOLUME ASSIGN>
×07.<VF DYNAMIC CONTRAST>
 08.<VF DISPLAY>
 09.<'!'IND>
 10.<VF MARKER>
 11.<CURSOR>
 12.<ZEBRA>
 13.<HEADSET MIC>
 14.<INTERCOM>
```

The page selected in step **1** is moved to the position above the page selected in step **3**.
In the above example, <CURSOR> moves to 04, and <VF DISPLAY> and the following pages move down one line.

Hiding the TOP MENU Screen

1 **Select MAINTENANCE on the TOP MENU screen.**

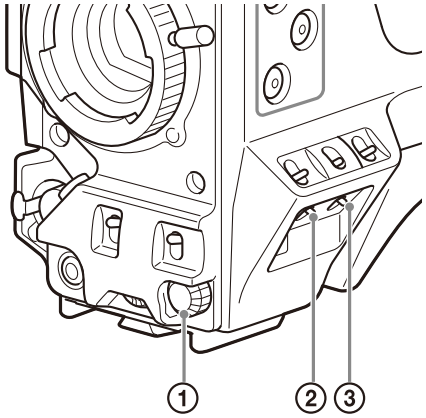
2 **Change TOP MENU LOCK on the <OTHERS> page from OFF to LOCK.**

3 **Turn the unit off and then back on.**

To show the TOP MENU screen again

1 **Set the DISPLAY/MENU switch to OFF.**

2 **Press and hold the menu control knob ① and set the STATUS CANCEL switch ② to the STATUS position (up) and the DISPLAY/MENU switch ③ to the MENU position.**



TOP appears at the top right of the USER MENU screen.

3 **Select TOP to display the <TOP MENU> page.**

4 **Select MAINTENANCE on the TOP MENU screen.**

5 **Change TOP MENU LOCK on the <OTHERS> page from LOCK to OFF.**

Menu List

This section shows the menus to be displayed on the viewfinder screen in tables.

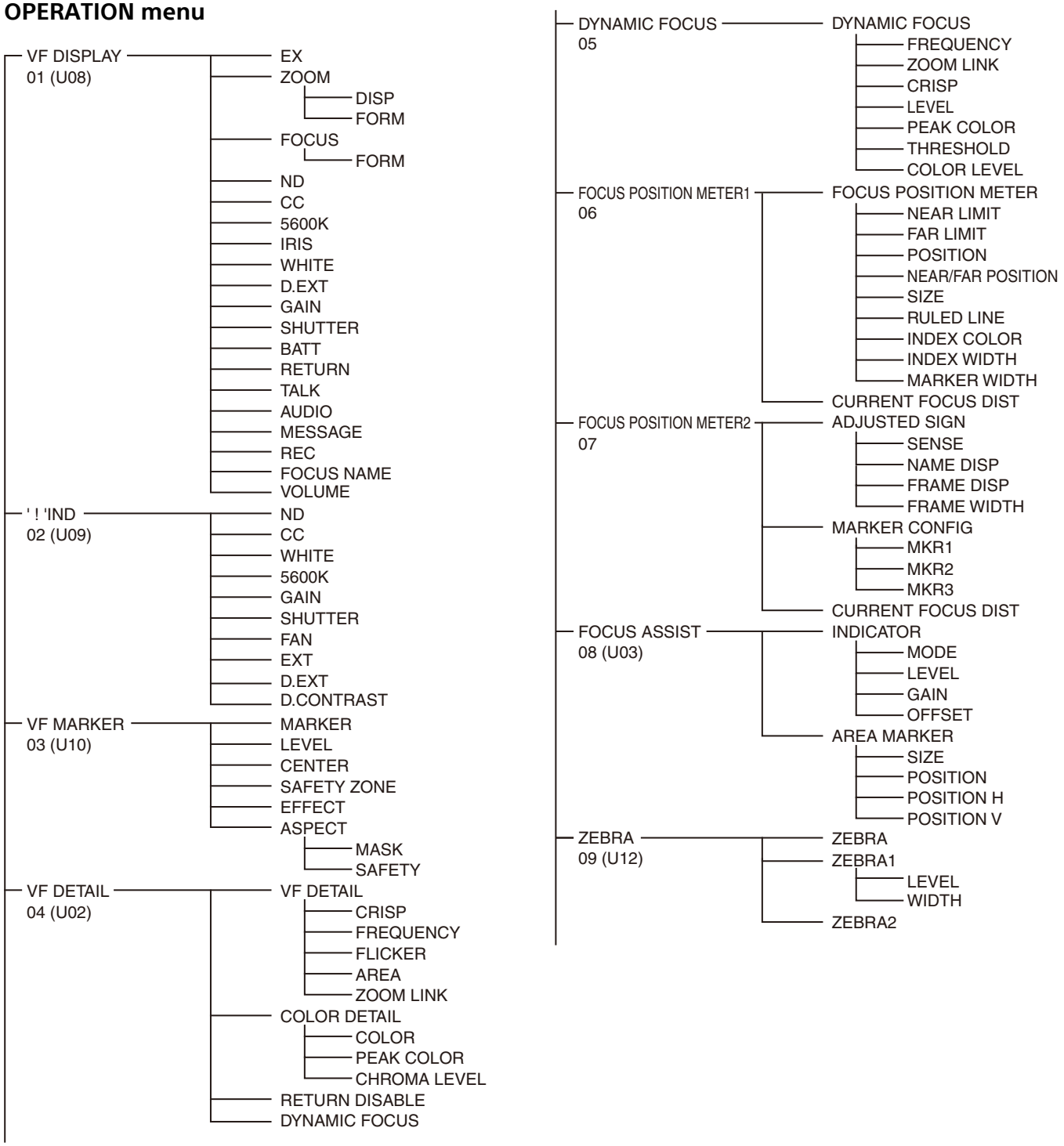
- For the pages that have been registered in the USER menu at the factory, the USER menu page numbers are indicated in parenthesis in the Page No. column of the tables.
- A CONTENTS page (numbered 00) is also provided for each menu.

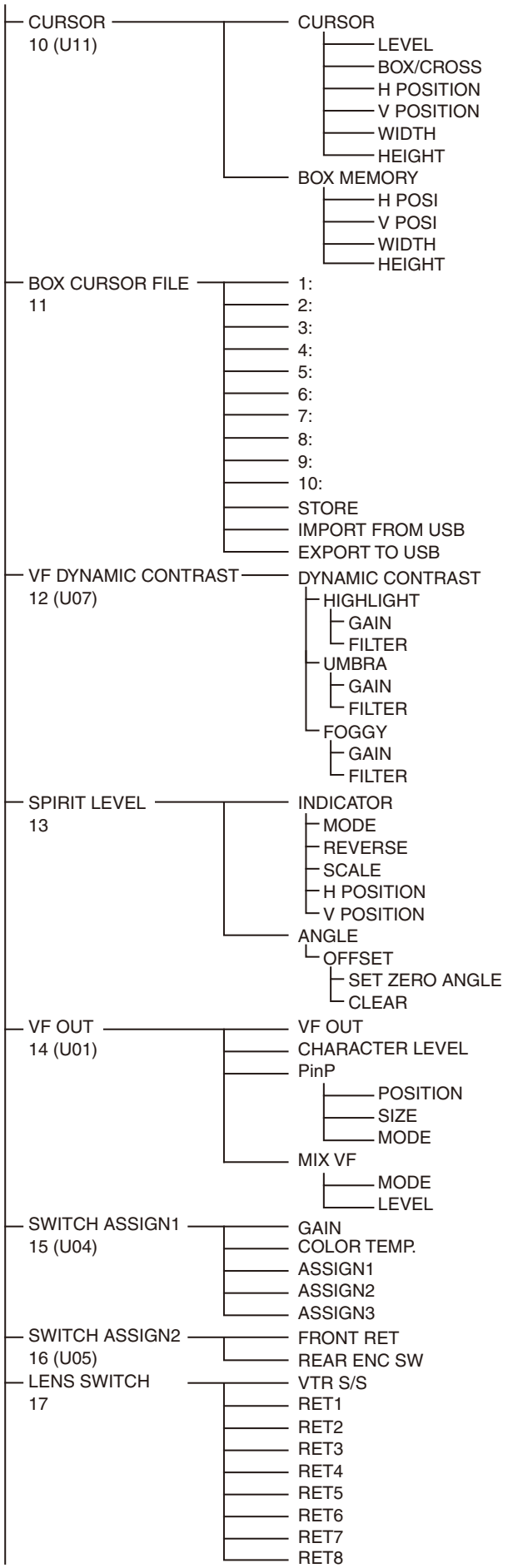
Conventions

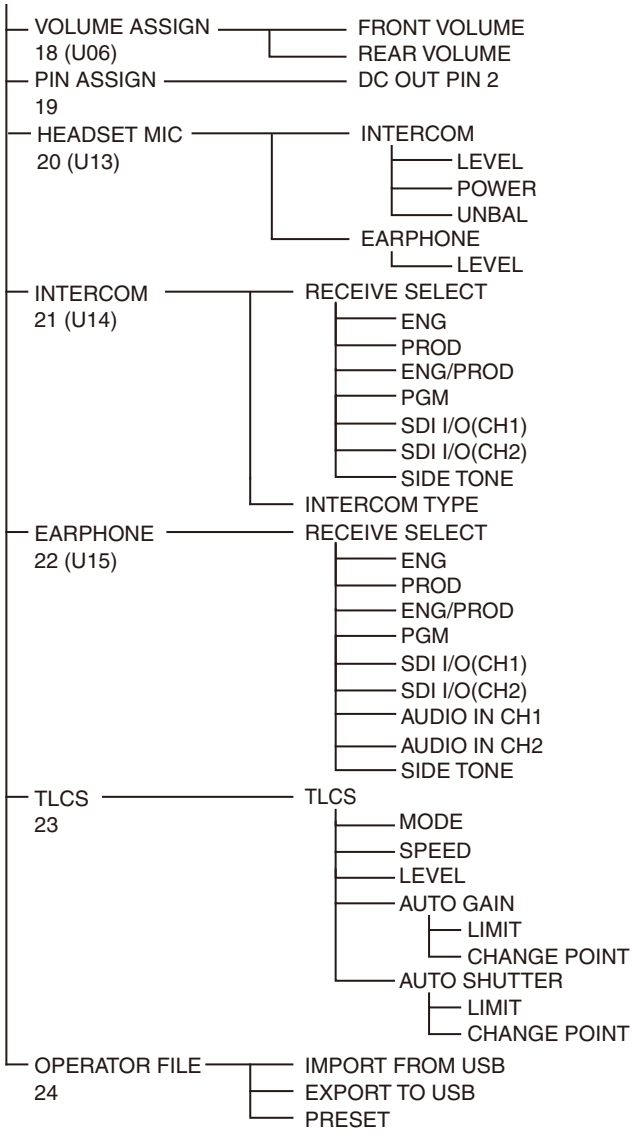
CCU: HXCU-FZ90 Camera Control Unit
Underlined values (e.g. ON, OFF, 0): Default settings
Execute using ENTER: Execute by pressing the menu control knob.

Menu Tree

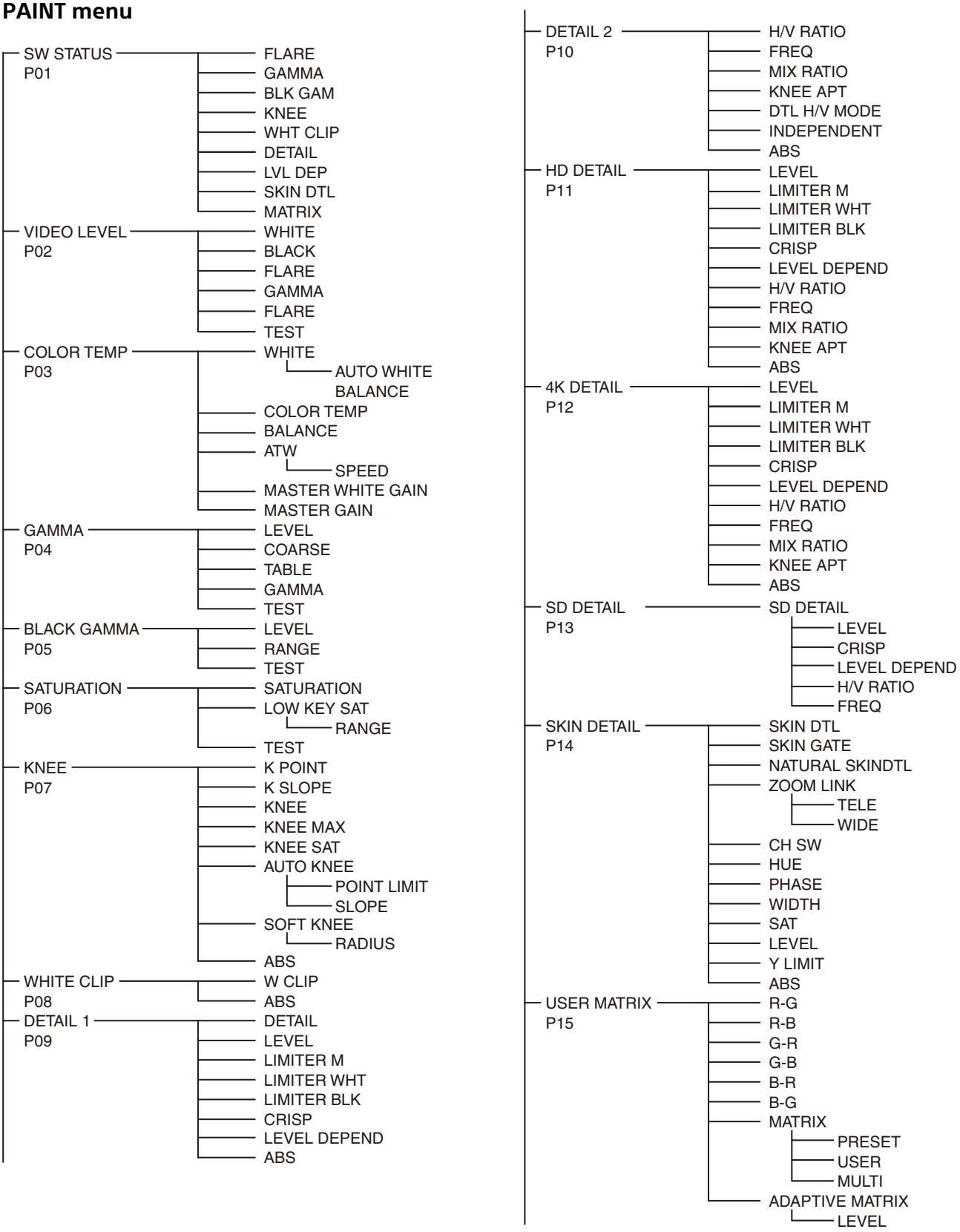
OPERATION menu

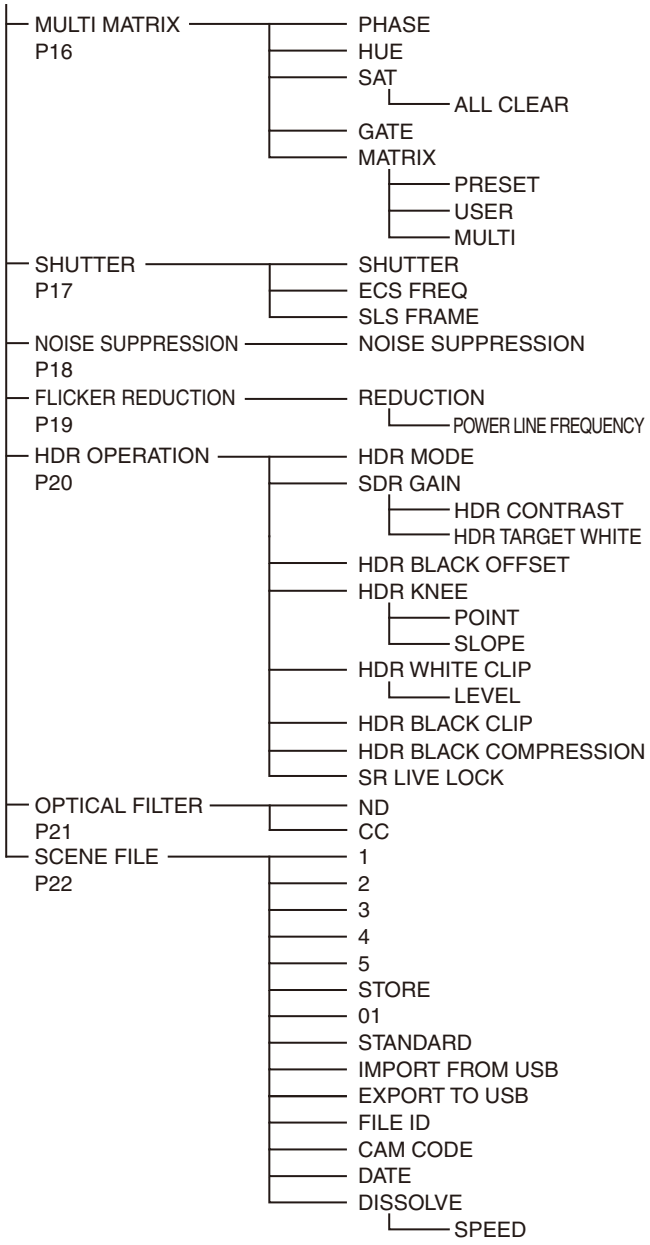



CURSOR
10 (U11)
CURSOR
LEVEL
BOX/CROSS
H POSITION
V POSITION
WIDTH
HEIGHT
BOX MEMORY
H POSI
V POSI
WIDTH
HEIGHT
BOX CURSOR FILE
11
1:
2:
3:
4:
5:
6:
7:
8:
9:
10:
STORE
IMPORT FROM USB
EXPORT TO USB
VF DYNAMIC CONTRAST
12 (U07)
DYNAMIC CONTRAST
HIGHLIGHT
GAIN
FILTER
UMBRA
GAIN
FILTER
FOGGY
GAIN
FILTER
SPIRIT LEVEL
13
INDICATOR
MODE
REVERSE
SCALE
H POSITION
V POSITION
ANGLE
OFFSET
SET ZERO ANGLE
CLEAR
VF OUT
14 (U01)
VF OUT
CHARACTER LEVEL
PinP
POSITION
SIZE
MODE
MIX VF
MODE
LEVEL
SWITCH ASSIGN1
15 (U04)
GAIN
COLOR TEMP.
ASSIGN1
ASSIGN2
ASSIGN3
SWITCH ASSIGN2
16 (U05)
FRONT RET
REAR ENC SW
LENS SWITCH
17
VTR S/S
RET1
RET2
RET3
RET4
RET5
RET6
RET7
RET8

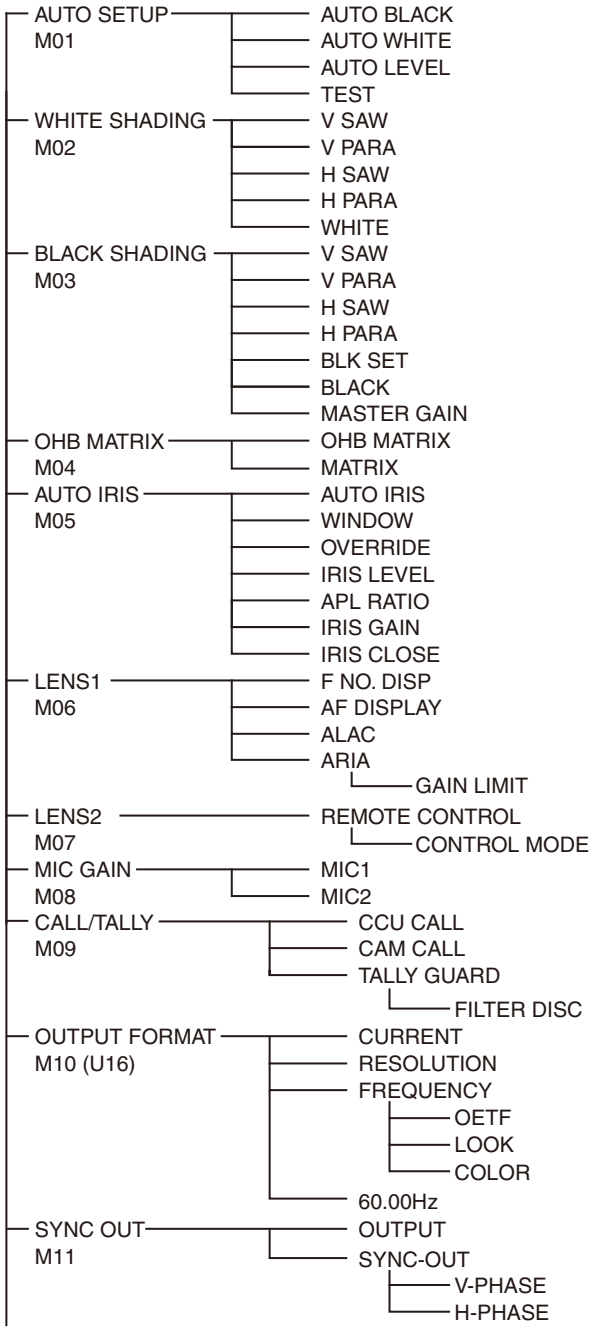

VOLUME ASSIGN
18 (U06)
FRONT VOLUME
REAR VOLUME
PIN ASSIGN
19
DC OUT PIN 2
HEADSET MIC
20 (U13)
INTERCOM
LEVEL
POWER
UNBAL
EARPHONE
LEVEL
INTERCOM
21 (U14)
RECEIVE SELECT
ENG
PROD
ENG/PROD
PGM
SDI I/O(CH1)
SDI I/O(CH2)
SIDE TONE
INTERCOM TYPE
EARPHONE
22 (U15)
RECEIVE SELECT
ENG
PROD
ENG/PROD
PGM
SDI I/O(CH1)
SDI I/O(CH2)
AUDIO IN CH1
AUDIO IN CH2
SIDE TONE
TLCS
23
TLCS
MODE
SPEED
LEVEL
AUTO GAIN
LIMIT
CHANGE POINT
AUTO SHUTTER
LIMIT
CHANGE POINT
OPERATOR FILE
24
IMPORT FROM USB
EXPORT TO USB
PRESET

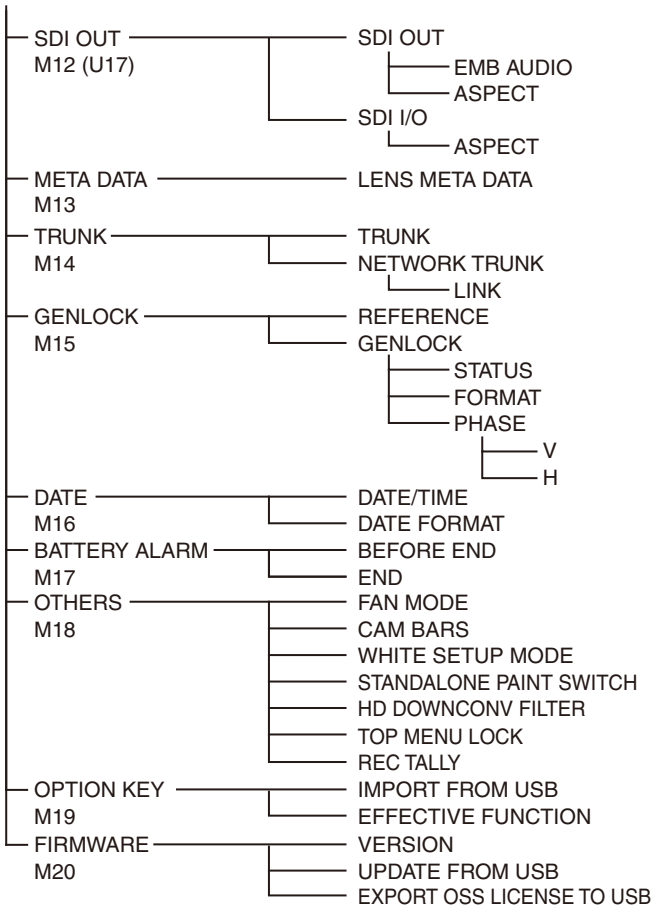
PAINT menu


SW STATUS
P01
FLARE
GAMMA
BLK GAM
KNEE
WHT CLIP
DETAIL
LVL DEP
SKIN DTL
MATRIX
VIDEO LEVEL
P02
WHITE
BLACK
FLARE
GAMMA
FLARE
TEST
COLOR TEMP
P03
WHITE
AUTO WHITE BALANCE
COLOR TEMP
BALANCE
ATW
SPEED
MASTER WHITE GAIN
MASTER GAIN
GAMMA
P04
LEVEL
COARSE
TABLE
GAMMA
TEST
BLACK GAMMA
P05
LEVEL
RANGE
TEST
SATURATION
P06
SATURATION
LOW KEY SAT
RANGE
TEST
KNEE
P07
K POINT
K SLOPE
KNEE
KNEE MAX
KNEE SAT
AUTO KNEE
POINT LIMIT
SLOPE
SOFT KNEE
RADIUS
ABS
WHITE CLIP
P08
W CLIP
ABS
DETAIL 1
P09
DETAIL
LEVEL
LIMITER M
LIMITER WHT
LIMITER BLK
CRISP
LEVEL DEPEND
ABS
DETAIL 2
P10
H/V RATIO
FREQ
MIX RATIO
KNEE APT
DTL H/V MODE
INDEPENDENT
ABS
HD DETAIL
P11
LEVEL
LIMITER M
LIMITER WHT
LIMITER BLK
CRISP
LEVEL DEPEND
H/V RATIO
FREQ
MIX RATIO
KNEE APT
ABS
4K DETAIL
P12
LEVEL
LIMITER M
LIMITER WHT
LIMITER BLK
CRISP
LEVEL DEPEND
H/V RATIO
FREQ
MIX RATIO
KNEE APT
ABS
SD DETAIL
P13
SD DETAIL
LEVEL
CRISP
LEVEL DEPEND
H/V RATIO
FREQ
SKIN DETAIL
P14
SKIN DTL
SKIN GATE
NATURAL SKINDTL
ZOOM LINK
TELE
WIDE
CH SW
HUE
PHASE
WIDTH
SAT
LEVEL
Y LIMIT
ABS
USER MATRIX
P15
R-G
R-B
G-R
G-B
B-R
B-G
MATRIX
PRESET
USER
MULTI
ADAPTIVE MATRIX
LEVEL

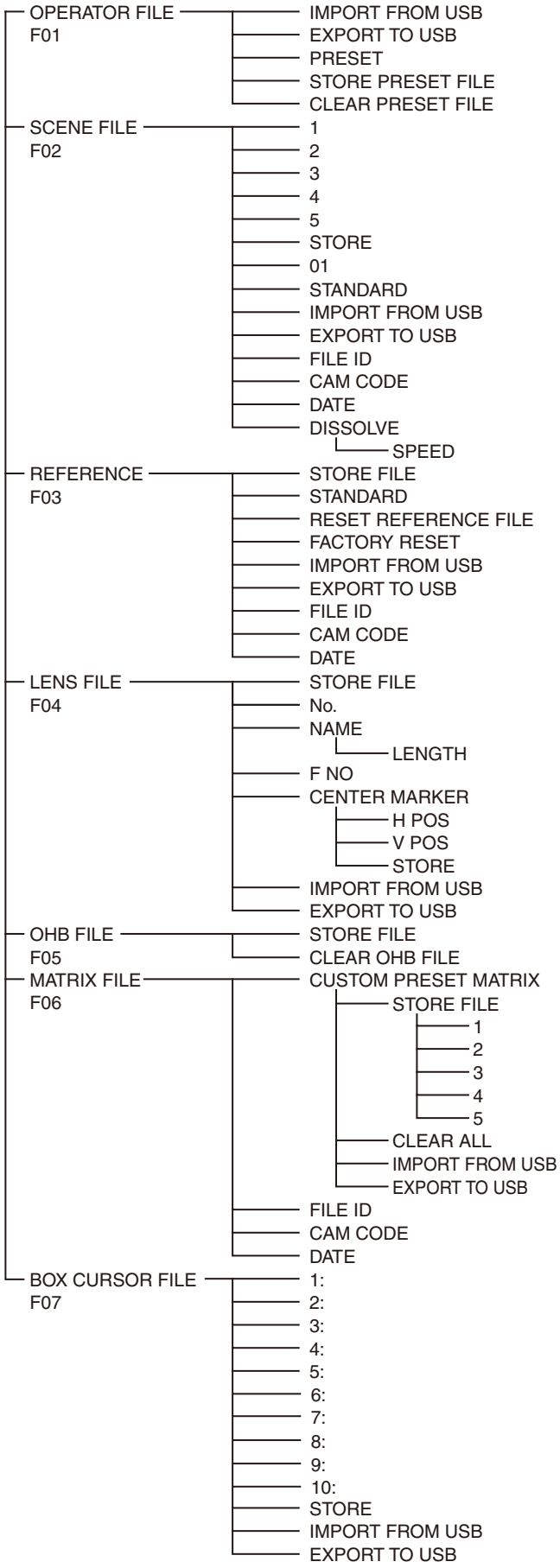


MAINTENANCE menu

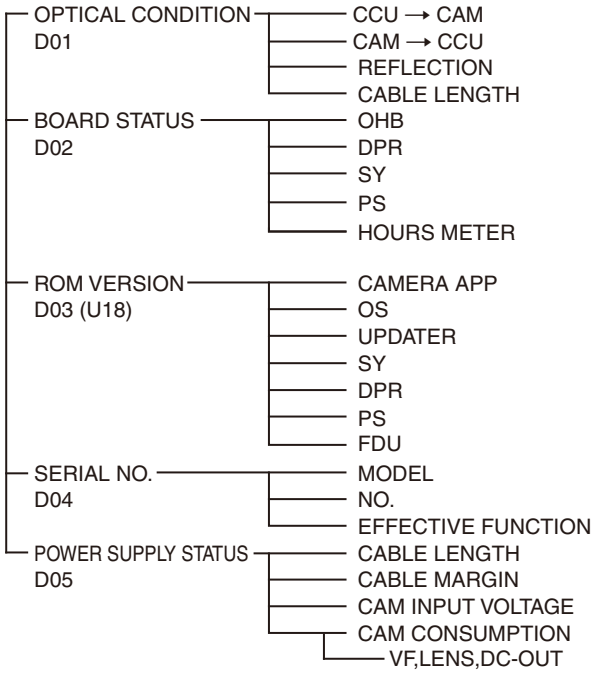



SDI OUT
M12 (U17)
SDI OUT
EMB AUDIO
ASPECT
SDI I/O
ASPECT
META DATA
M13
LENS META DATA
TRUNK
M14
TRUNK
NETWORK TRUNK
LINK
GENLOCK
M15
REFERENCE
GENLOCK
STATUS
FORMAT
PHASE
V
H
DATE
M16
DATE/TIME
DATE FORMAT
BATTERY ALARM
M17
BEFORE END
END
OTHERS
M18
FAN MODE
CAM BARS
WHITE SETUP MODE
STANDALONE PAINT SWITCH
HD DOWNCONV FILTER
TOP MENU LOCK
REC TALLY
OPTION KEY
M19
IMPORT FROM USB
EFFECTIVE FUNCTION
FIRMWARE
M20
VERSION
UPDATE FROM USB
EXPORT OSS LICENSE TO USB

FILE menu


OPERATOR FILE
F01
IMPORT FROM USB
EXPORT TO USB
PRESET
STORE PRESET FILE
CLEAR PRESET FILE
SCENE FILE
F02
1
2
3
4
5
STORE
01
STANDARD
IMPORT FROM USB
EXPORT TO USB
FILE ID
CAM CODE
DATE
DISSOLVE
SPEED
REFERENCE
F03
STORE FILE
STANDARD
RESET REFERENCE FILE
FACTORY RESET
IMPORT FROM USB
EXPORT TO USB
FILE ID
CAM CODE
DATE
LENS FILE
F04
STORE FILE
No.
NAME
LENGTH
F NO
CENTER MARKER
H POS
V POS
STORE
IMPORT FROM USB
EXPORT TO USB
OHB FILE
F05
STORE FILE
CLEAR OHB FILE
MATRIX FILE
F06
CUSTOM PRESET MATRIX
STORE FILE
1
2
3
4
5
CLEAR ALL
IMPORT FROM USB
EXPORT TO USB
FILE ID
CAM CODE
DATE
BOX CURSOR FILE
F07
1:
2:
3:
4:
5:
6:
7:
8:
9:
10:
STORE
IMPORT FROM USB
EXPORT TO USB

DIAGNOSIS menu



OPERATION Menu

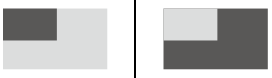
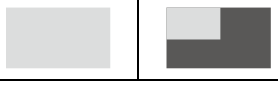
OPERATION Page name Page No.	Item	Setting	Description / Remarks
<VF DISPLAY> 01 (U08)	EX	**ON**, OFF, 3S	
	ZOOM	ON, **OFF**, 3S	
	DISP	**LEFT**, RIGT	
	FORM	**999**, mm	Sets the ZOOM display format. **999:** Displayed in the range 0 to 999 (no units). **mm:** Displayed in millimeters.
	FOCUS	ON, **OFF**, 3S	Valid only when a serial lens is used.
	FORM	**999**, m, ft	Sets the FOCUS display format. **999:** Displayed in the range 0 to 999 (no units). **m:** Displayed in meters. **ft:** Displayed in feet.
	ND	**ON**, OFF, 3S	
	CC	**ON**, OFF, 3S	
	5600K	**ON**, OFF, 3S	
	IRIS	**ON**, OFF, 3S	
	WHITE	ON, **OFF**, 3S	
	D.EXT	**ON**, OFF, 3S	
	GAIN	**ON**, OFF, 3S	
	SHUTTER	**ON**, OFF, 3S	
	BATT	ON, **OFF**, 3S	
	RETURN	**ON**, OFF, 3S	
	TALK	**ON**, OFF, 3S	
	AUDIO	**ON**, OFF	Displays the level of the audio signals that are input on AUDIO IN CH1 and AUDIO IN CH2.
	D.CONTRAST	ON, **OFF**, 3S	
	MESSAGE	**ALL**, WRN, AT, OFF	**ALL:** Displays all messages. **WRN:** Displays warning messages and higher. **AT:** Displays auto setup messages and higher.
	REC	ON, **OFF**	Displays “REC” when the VTR S/S button is pressed to switch to recording state.
	FOCUS NAME	OFF, 1S, 3S, 5S, **ON**	Sets whether to show/hide the marker name and sets the display time.
	VOLUME	**ON**, OFF	Temporarily displays the current volume setting.

OPERATION			
Page name **Page No.**	**Item**	**Setting**	**Description / Remarks**
<'!' IND> 02 (U09)	ND	**ON**, OFF	[IND]: Turns the '!' indication *(see page 32)* on/off. [NORMAL]: Specifies the conditions under which the '!' indication is not to be displayed even if [IND] is ON. (By specifying the standard conditions beforehand, non-standard conditions can be notified with the '!' indication when a non-standard condition is selected.) For example, with the default setting of ND, the '!' indication is displayed when an ND filter other than 1 is selected. ---: When a CCU is connected (cannot be changed)
		1, 2, 3, 4, 5, 6, 7, 8, 9 (combination allowed)	
	CC	**ON**, OFF	
		B, C, D (combination allowed)	
	WHITE	**ON**, OFF, ---	
		P, **A**, **B** (combination allowed)	
	5600K	**ON**, OFF, ---	
		ON, **OFF**	
	GAIN	**ON**, OFF, ---	
		L, M, H (combination allowed)	
	SHUTTER	**ON**, OFF, ---	
		ON, **OFF**	
	FAN	**ON**, OFF	
		AUTO1, AUTO2, MIN, MAX	
	EXT	**ON**, OFF	
	D.EXT	**ON**, OFF	
	D.CONTRAST	**ON**, OFF	
<VF MARKER> 03 (U10)	MARKER	**ON**, OFF	Sets the display of all markers ON/OFF.
		WHITE, BLACK, DOT	
	LEVEL	MIN, 1 to 10, **4**	
	CENTER	ON, **OFF**	
		1, 2, 3, 4	**1:** Full cross **2:** Full cross with a hole **3:** Center **4:** Center with a hole
	SAFETY ZONE	ON, **OFF**	
		80.0, **90.0**, 92.5, 95.0%	
	EFFECT	ON, **OFF**	
	ASPECT	ON, **OFF**	
		16:9, 15:9, 14:9, 13:9, **4:3**	
	MASK	ON, **OFF**	
		0 to 15, **12**	Set the level to darken outside the aspect area.
	SAFETY	ON, **OFF**	Sets the safety marker in aspect mode.
		80.0, **90.0**, 92.5, 95.0%	
<VF DETAIL> 04 (U02)	VF DETAIL	**ON**, OFF	
		0 to 100%, (0 to 100%), **25%**	
	CRISP	–99 to +99, **0**	
	FREQUENCY	**9M**, 14M, 18M	
	FLICKER	ON, **OFF**	
	AREA	10 to 100%, **100%**	
	ZOOM LINK	**ON**, OFF	
		0 to 100%, **50%**	
	COLOR DETAIL	ON, **OFF**	
		YELLOW, RED, **BLUE**	
	COLOR	ON, **OFF**	
	PEAK COLOR	ON, **OFF**	
	CHROMA LEVEL	100%, 50%, **25%**, 0%	
	RETURN DISABLE	ON, **OFF**	Selects whether to set VF DETAIL to OFF for RETURN display.
	DYNAMIC FOCUS	**OFF**, ON, (OFF)	

OPERATION			
Page name **Page No.**	**Item**	**Setting**	**Description / Remarks**
<DYNAMIC FOCUS> 05	DYNAMIC FOCUS	**OFF**, ON, (OFF)	Turns the dynamic focus function ON/OFF. **(OFF):** Displayed for formats other than 4K format.
	FREQUENCY	**EXTRA-LOW**, LOW, MID, HIGH, (AUTO)	Sets the bandwidth of the 4K resolution high-frequency signal to detect. **(AUTO):** Displayed when ZOOM LINK is set to ON.
	ZOOM LINK	ON, **OFF**	
		MODE1, MODE2, MODE3, MODE4	Sets characteristics according to the zoom position.
		0 to 100%, **50%** (5% increments)	Sets the level at the WIDE position mark.
	CRISP	**0** to 99%	Adjust to eliminate minute components of the detected signal.
	LEVEL	**LOW**, MIDDLE, HIGH, VERY-HIGH	Sets the brightness level of the marking signal.
	PEAK COLOR	OFF, RED, BLUE, GREEN, BROWN, PURPLE, **YELLOW**	
	THRESHOLD	**0** to 99%	Sets the threshold level for adding color specified using PEAK COLOR.
	COLOR LEVEL	0 to 99%, **50%**	Sets the saturation of the color of the PEAK COLOR indicator.
<FOCUS POSITION METER1> 06	FOCUS POSITION METER	**OFF**, ON	Shows/hides the focus position meter.
	NEAR LIMIT	**0** to 999	Sets the NEAR edge of the focus position meter.
	FAR LIMIT	0 to **999**	Sets the FAR edge of the focus position meter.
	POSITION	**TOP**, RIGHT, BOTTOM, LEFT	Sets the display position of the focus position meter. **TOP:** Displayed at the top of the screen. **RIGHT:** Displayed on the right side of the screen. **BOTTOM:** Displayed at the bottom of the screen. **LEFT:** Displayed on the left side of the screen.
	NEAR/FAR POSITION	**NORMAL**, REVERSE	Sets the near/far display orientation of the focus position meter. Set to REVERSE to flip the NEAR edge and FAR edge.
	SIZE	**NORMAL**, HALF	Sets the display size of the focus position meter.
	RULED LINE	**OFF**, ON	Shows/hides ruled lines.
	INDEX COLOR	BLACK, **WHITE**	Sets the index color.
	INDEX WIDTH	**1** to 5	Sets the index width.
	MARKER WIDTH	**1** to 9	Sets the width of the marker axis portion.
	CURRENT FOCUS DIST		Displays the current focus distance (display only).

OPERATION			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<FOCUS POSITION METER2> 07	ADJUSTED SIGN		
	SENSE	1 to 5, **2**	Sets the adjustment sensitivity. Increasing the value increases the sensitivity.
	NAME DISP	OFF, 1S, 3S, 5S, **ON**	Sets whether to show/hide the marker name and sets the display time.
	FRAME DISP	OFF, 1S, 3S, 5S, **ON**	Sets whether to show/hide the adjustment frame and sets the display time.
	FRAME WIDTH	1 to 5, **2**	Sets the width of the adjustment frame.
	MARKER CONFIG		
	[REG] MKR1, 2, 3	Execute using ENTER.	Registers a marker at the current focus position.
	[DISP] MKR1, 2, 3	**OFF**, ON	Shows/hides markers.
	[COLOR] MKR1, 2, 3	**RED**, **GREEN**, **BLUE**, YELLOW, ORANGE, PURPLE, GRAY, BLACK, WHITE	Sets the color of the triangular part of the marker. By default, MKR1 is RED, MKR2 is GREEN, and MKR3 is BLUE.
	[NAME] MKR1, 2, 3	Max. 8 characters (Default value: MARKER 1 to 3)	Sets the text of the marker name. See *"To specify a character string" (page 34).*
	[POS] MKR1, 2, 3	**0** to 999	Sets the position of the marker.
	CURRENT FOCUS DIST		Displays the current focus distance (display only).
<FOCUS ASSIST> 08 (U03)	INDICATOR	ON, **OFF**	
	MODE	**BOX**, B&W, COL	
		BTM, LEFT, TOP, RIGHT	
	LEVEL	MIN, 1 to 10, **4**	
		QUICK, SMOOTH	
	GAIN	0 to 99, **50**	
	OFFSET	0 to 99, **50**	
	AREA MARKER	ON, **OFF**	
	SIZE	SMALL, **MIDDLE**, LARGE	
	POSITION	LEFT, **CENTER**, RIGHT	
	POSITION H	0 to 99, **50**	
	POSITION V	0 to 99, **50**	
<ZEBRA> 09 (U12)	ZEBRA	ON, **OFF**	
		1, 2, 1&2	
	ZEBRA1		
	LEVEL	50 to 109%, **70%**	
	WIDTH	0 to 30%, **10%**	
	ZEBRA2	50 to 109%, **100%**	
<CURSOR> 10 (U11)	CURSOR	**OFF**, ON	
	LEVEL	**WHITE**, BLACK, DOT	
		MIN, 1 to 10, **4**	
	BOX/CROSS	**BOX**, CROSS	
	H POSITION	0 to 99, **50**	
	V POSITION	0 to 99, **50**	
	WIDTH	0 to 99, **50**	
	HEIGHT	0 to 99, **50**	
	BOX MEMORY	1/2/3/4: **OFF**, ON	
	H POSI	1/2/3/4: 0 to 99, **50**	
	V POSI	1/2/3/4: 0 to 99, **50**	
	WIDTH	1/2/3/4: 0 to 99, **50**	
	HEIGHT	1/2/3/4: 0 to 99, **50**	

OPERATION			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<BOX CURSOR FILE> 11	1:		BOX CURSOR FILE selection and FILE name input. Align the cursor to the left of the number to select the BOX CURSOR FILE. Align the cursor to the right of the number to enter the BOX CURSOR FILE name. See *"To specify a character string" (page 34).*
	2:		
	3:		
	4:		
	5:		
	6:		
	7:		
	8:		
	9:		
	10:		
	STORE		Stores a BOX CURSOR FILE name in the camera.
	IMPORT FROM USB		Transfers a BOX CURSOR FILE from a USB flash drive to the camera.
	EXPORT TO USB		Transfers a BOX CURSOR FILE from the camera to a USB flash drive.
<VF DYNAMIC CONTRAST> 12 (U07)	DYNAMIC CONTRAST	**OFF**, ON	Turns on/off the contrast enhancement function for the picture displayed in the viewfinder.
	HIGHLIGHT	**OFF**, ON	Sets whether to enhance the contrast for high-brightness areas.
	GAIN	0% to 100%, **30%**	Sets the intensity of contrast enhancement.
	FILTER	**NARROW**, MIDDLE, WIDE	Sets the frequency response of the filter for enhancing contrast.
	UMBRA	**OFF**, ON	Sets whether to enhance the contrast for low-brightness areas.
	GAIN	0% to 100%, **30%**	Sets the intensity of contrast enhancement.
	FILTER	WIDE	Set to WIDE (fixed).
	FOGGY	**OFF**, ON	Sets whether to enhance the contrast for mid-brightness areas.
	GAIN	0% to 100%, **30%**	Sets the intensity of contrast enhancement.
	FILTER	**NARROW**, MIDDLE, WIDE	Sets the frequency response of the filter for enhancing contrast.
<SPIRIT LEVEL> 13	INDICATOR	ON, **OFF**	
	MODE	**1**, 2	Switches the display method of the indicator.
	REVERSE	**OFF**, ON	Inverts the movement of the indicator horizontally.
	SCALE	50% to 150%, **100%**	Adjusts the horizontal width of the indicator.
	H POSITION	0 to 99, **50**	
	V POSITION	0 to 99, **97**	
	ANGLE		Displays the inclination angle (display only).
	OFFSET	−90 to +90, **0**	
	SET ZERO ANGLE	Execute using ENTER.	Designates the current angle as level (0°).
	CLEAR	Execute using ENTER.	Sets OFFSET to 0.

OPERATION			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<VF OUT> 14 (U01)	VF OUT	**COLOR**, Y, R, G, B	
	CHARACTER LEVEL	1 to 5, **4**	
	PinP	**OFF**, RETURN, HD PROMPTER	
	POSITION	**1**, 2, 3, 4	
	SIZE	1/2.5, **1/3**, 1/4	
	MODE	When PinP is set to OFF: --- PinP RETURN: 1, 2, 3, 4 PinP HD PROMPTER: 1, 2	: Main picture, : Return picture, : HD Prompter picture **PinP: OFF** Mode / RET SW OFF / RET SW ON ---  **PinP: RETURN** Mode / RET SW OFF / RET SW ON 1  2  3  4  **PinP: HD PROMPTER** Mode / RET SW OFF / RET SW ON 1  2  Cannot be used during standalone operation.
	MIX VF	**OFF**, ON	Turns on/off the function that makes the return video semi-transparent and displays it together with the camera image in the viewfinder.
	MODE	**MAIN&RET**, MAIN, RET	**MAIN&RET:** Displays semi-transparent return video when displaying the camera image. Displays semi-transparent camera image when displaying the return video. **MAIN:** Displays semi-transparent return video when displaying the camera image. No mixing is applied when displaying the return video. **RET:** Displays semi-transparent camera image when displaying the return video. No mixing is applied when displaying the camera image.
	LEVEL	0 to 99, **10**	Percentage mix of return video and camera image (%)

OPERATION			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<SWITCH ASSIGN1> 15 (U04)	GAIN	L: –6, –3, **0**, 3, 6, 9, 12 dB	
		M: –6, –3, 0, 3, **6**, 9, 12 dB	
		H: –6, –3, 0, 3, 6, 9, **12** dB	
	COLOR TEMP.	**5600K** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the COLOR TEMP. button.
	ASSIGN1	**OFF** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns functions to the ASSIGN 1 button, ASSIGN 2 button, and ASSIGN 3 button, respectively.
	ASSIGN2		
	ASSIGN3		
<SWITCH ASSIGN2> 16 (U05)	FRONT RET	**RETURN2 SW** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the RET button at the front.
	REAR ENC SW	**OFF** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the assignable button of the PGM LEVEL knob at the rear.
<LENS SWITCH> 17	VTR S/S	**RETURN2 SW** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the VTR button on the lens. The characters are highlighted when the button is pressed.
	RET1	**RETURN1 SW** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the RET1 button of a lens demand unit. The characters are highlighted when the button is pressed.
	RET2	**RETURN2 SW** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the RET2 button of a lens demand controller. The characters are highlighted when the button is pressed.
	RET3	**RETURN3 SW** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the RET3 button of a lens demand unit. The characters are highlighted when the button is pressed.
	RET4	**OFF** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the RET4 button of a lens demand unit. The characters are highlighted when the button is pressed.
	RET5	**OFF** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the RET5 button of a lens demand unit. The characters are highlighted when the button is pressed.
	RET6	**OFF** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the RET6 button of a lens demand unit. The characters are highlighted when the button is pressed.
	RET7	**OFF** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the RET7 button of a lens demand unit. The characters are highlighted when the button is pressed.
	RET8	**OFF** For settings, see *"Functions assignable to switches" (page 55)*.	Assigns a function to the RET8 button of a lens demand unit. The characters are highlighted when the button is pressed.

OPERATION			
Page name **Page No.**	**Item**	**Setting**	**Description / Remarks**
<VOLUME ASSIGN> 18 (U06)	FRONT VOLUME	MIC1 GAIN, MIC2 GAIN, **MIC1&2 GAIN**, **INTERCOM**, EARPHONE, OFF	INTERCOM is the default function assigned to the INTERCOM LEVEL knob at the front when a CCU is connected. MIC1&2 GAIN is the default in standalone operation mode. **MIC1 GAIN:** Adjusts the gain when a microphone is connected to AUDIO IN CH1. **MIC2 GAIN:** Adjusts the gain when a microphone is connected to AUDIO IN CH2. **MIC1 & 2 GAIN:** Adjusts the gain when microphones are connected to AUDIO IN CH1 and AUDIO IN CH2. **INTERCOM:** Adjusts the volume level of the intercom headset connected to the INTERCOM connector. When a function is assigned to the INTERCOM knob at the rear, the PGM volume does not change and adjustment is made using the PGM LEVEL knob instead. **EARPHONE:** Adjusts the volume of the earphone. When a function is assigned to the INTERCOM knob at the rear, the PGM volume does not change and adjustment is made using the PGM LEVEL knob instead. **OFF:** Nothing changes when you touch the knob. When connected with a CCU, only INTERCOM, EARPHONE, and OFF are selectable. In standalone operation mode, all selection options are selectable.
	REAR VOLUME	MIC1 GAIN, MIC2 GAIN, MIC1&2 GAIN, **INTERCOM**, EARPHONE, OFF	Assigns a function to the INTERCOM knob at the rear. **MIC1 GAIN:** Adjusts the gain when a microphone is connected to AUDIO IN CH1. **MIC2 GAIN:** Adjusts the gain when a microphone is connected to AUDIO IN CH2. **MIC1 & 2 GAIN:** Adjusts the gain when microphones are connected to AUDIO IN CH1 and AUDIO IN CH2. **INTERCOM:** Adjusts the volume level of the intercom headset connected to the INTERCOM connector. When a function is assigned to the INTERCOM knob at the rear, the PGM volume does not change and adjustment is made using the PGM LEVEL knob instead. **EARPHONE:** Adjusts the volume of the earphone. When a function is assigned to the INTERCOM knob at the rear, the PGM volume does not change and adjustment is made using the PGM LEVEL knob instead. **OFF:** Nothing changes when you touch the knob. When connected with a CCU, only INTERCOM, EARPHONE, and OFF are selectable. In standalone operation mode, all selection options are selectable.

OPERATION			
Page name **Page No.**	**Item**	**Setting**	**Description / Remarks**
<PIN ASSIGN> 19	DC OUT PIN 2	**INPUT**, OUTPUT	Assigns the function to pin 2 of the DC OUT connector.
		OFF For settings, see *"Functions assignable to switches" (page 55)*.	Selection options when DC OUT PIN 2 is set to INPUT
		R TALLY OUT, G TALLY OUT, TALLY OUT	Selection options when DC OUT PIN 2 is set to OUTPUT **R TALLY OUT:** Output is on when red tally is lit. **G TALLY OUT:** Output is on when green tally is lit. **TALLY OUT:** Output is on when either red tally or green tally is lit.
<HEADSET MIC> 20 (U13)	INTERCOM	**DYNAMIC**, CARBON, MANUAL	
	LEVEL	–60 dBu, –50 dBu, –40 dBu, –30 dBu, –20 dBu, **(–60 dBu)**, (–20 dBu)	Settings in ( ): With DYNAMIC or CARBON (cannot be changed) For DYNAMIC, set to –60 dBu (fixed). For CARBON, set to –20 dBu (fixed).
		–6, **0**, 6 dB	Input gain
	POWER	ON, OFF, (ON), **(OFF)**	Settings in ( ): With DYNAMIC or CARBON (cannot be changed)
	UNBAL	**ON**, OFF, (ON), (OFF)	Settings in ( ): With CARBON (cannot be changed)
	EARPHONE	ON, **OFF**	
	LEVEL	–34 dBu, **–40 dBu**, –46 dBu	

OPERATION			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<INTERCOM> 21 (U14)	RECEIVE SELECT	**SEPARATE**, MIX	Sets the headset audio. **SEPARATE:** Sets separate audio emitted from left and right. **MIX:** Sets the same audio emitted from left and right.
	ENG	---, **LEFT**, RIGHT, BOTH	When INTERCOM TYPE is set to CE, this sets whether the ENG line audio is emitted on left or right. Displayed only when a CCU is connected.
		0 to **99**	When INTERCOM TYPE is set to CE, this sets the ENG line audio level. Displayed only when a CCU is connected.
	PROD	---, **LEFT**, RIGHT, BOTH	When INTERCOM TYPE is set to CE, this sets whether the PROD line audio is emitted on left or right. Displayed only when a CCU is connected.
		0 to **99**	When INTERCOM TYPE is set to CE, this sets the PROD line audio level. Displayed only when a CCU is connected.
	ENG/PROD	---, **LEFT**, RIGHT, BOTH	When INTERCOM TYPE is set to UCJ, this sets whether the ENG/PROD line audio is emitted on left or right. Displayed only when a CCU is connected.
		0 to **99**	When INTERCOM TYPE is set to UCJ, this sets the ENG/PROD line audio level. Displayed only when a CCU is connected.
	PGM	---, LEFT, **RIGHT**, BOTH	Sets whether the PGM audio is emitted on left or right. Displayed only when a CCU is connected.
		0 to **99**	Sets the PGM volume. Displayed only when a CCU is connected.
	SDI I/O(CH1)	---, LEFT, **RIGHT**, BOTH	Sets whether the audio (CH1) embedded in the SDI signal input on SDI I/O is emitted on left or right. Displayed only in standalone operation.
		0 to **99**	Sets the level of the audio (CH1) embedded in the SDI signal input on SDI I/O. Displayed only in standalone operation.
	SDI I/O(CH2)	---, LEFT, **RIGHT**, BOTH	Sets whether the audio (CH2) embedded in the SDI signal input on SDI I/O is emitted on left or right. Displayed only in standalone operation.
		0 to **99**	Sets the level of the audio (CH2) embedded in the SDI signal input on SDI I/O. Displayed only in standalone operation.
	SIDE TONE	MUTE, 1 to 99, **50**	Sets the audio level of the side tone (function to hear your local audio).
	INTERCOM TYPE	UCJ, **CE**	Sets the operating mode of the intercom function. **UCJ:** Enables monitoring of audio on either the ENG line or PROD line only. Select the line to monitor using the INTERCOM MIC switch. **CE:** Enables simultaneous monitoring of audio on both the ENG line and PROD line. Select the line to monitor using the INTERCOM MIC switch.

OPERATION			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<EARPHONE> 22 (U15)	RECEIVE SELECT	**SEPARATE**, MIX	Sets the earphone audio. **SEPARATE:** Sets separate audio emitted from left and right. **MIX:** Sets the same audio emitted from left and right.
	ENG	---, **LEFT**, RIGHT, BOTH	When INTERCOM TYPE is set to CE, this sets whether the ENG line audio is emitted on left or right. Displayed only when a CCU is connected.
		0 to **99**	When INTERCOM TYPE is set to CE, this sets the ENG line audio level. Displayed only when a CCU is connected.
	PROD	---, **LEFT**, RIGHT, BOTH	When INTERCOM TYPE is set to CE, this sets whether the PROD line audio is emitted on left or right. Displayed only when a CCU is connected.
		0 to **99**	When INTERCOM TYPE is set to CE, this sets the PROD line audio level. Displayed only when a CCU is connected.
	ENG/PROD	---, **LEFT**, RIGHT, BOTH	When INTERCOM TYPE is set to UCJ, this sets whether the ENG/PROD line audio is emitted on left or right. Displayed only when a CCU is connected.
		0 to **99**	When INTERCOM TYPE is set to UCJ, this sets the ENG/PROD line audio level. Displayed only when a CCU is connected.
	PGM	---, LEFT, **RIGHT**, BOTH	Sets whether the PGM audio is emitted on left or right. Displayed only when a CCU is connected.
		0 to **99**	Sets the PGM volume. Displayed only when a CCU is connected.
	SDI I/O(CH1)	---, LEFT, **RIGHT**, BOTH	Sets whether the audio (CH1) embedded in the SDI signal input on SDI I/O is emitted on left or right. Displayed only in standalone operation.
		0 to **99**	Sets the level of the audio (CH1) embedded in the SDI signal input on SDI I/O. Displayed only in standalone operation.
	SDI I/O(CH2)	---, LEFT, **RIGHT**, BOTH	Sets whether the audio (CH2) embedded in the SDI signal input on SDI I/O is emitted on left or right. Displayed only in standalone operation.
		0 to **99**	Sets the level of the audio (CH2) embedded in the SDI signal input on SDI I/O. Displayed only in standalone operation.
	AUDIO IN CH1	**---**, LEFT, RIGHT, BOTH	Sets whether the audio input on AUDIO IN CH1 is emitted on left or right.
		0 to **99**	Sets the level of the audio input on AUDIO IN CH1.
	AUDIO IN CH2	**---**, LEFT, RIGHT, BOTH	Sets whether the audio input on AUDIO IN CH2 is emitted on left or right.
		0 to **99**	Sets the level of the audio input on AUDIO IN CH2.
	SIDE TONE	MUTE, 1 to 99, **50**	Sets the audio level of the side tone (function to hear your local audio).
	INTERCOM TYPE	UCJ, **CE**	Sets the operating mode of the intercom function. **UCJ:** Enables monitoring of audio on either the ENG line or PROD line only. Select the line to monitor using the INTERCOM MIC switch. **CE:** Enables simultaneous monitoring of audio on both the ENG line and PROD line. Select the line to monitor using the INTERCOM MIC switch.

OPERATION			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<TLCS> 23	TLCS	**OFF**, ON	Turns the TLCS function ON/OFF.
	MODE	BACKLIGHT, **STANDARD**, SPOTLIGHT	Sets the TLCS mode. **BACKLIGHT:** Backlighting **STANDARD:** Normal lighting **SPOTLIGHT:** Subject is illuminated against a dark background
	SPEED	–99 to +99, **0**	Sets the tracking speed of the TLCS function.
	LEVEL	–99 to +99, **0**	Sets the tracking level of the TLCS function.
	AUTO GAIN	OFF, **ON**	Sets whether to use gain in TLCS.
	LIMIT	3dB to 48dB, **12dB**	Sets the upper limit of the gain.
	CHANGE POINT	F5.6, F4, **F2.8**	Sets the F value at which brightness adjustment switches from iris to gain.
	AUTO SHUTTER	OFF, **ON**	Sets whether to use the electronic shutter in TLCS.
	LIMIT	1/100, 1/150, 1/200, **1/250**, 1/500, 1/1000, 1/2000	Sets the lower limit of exposure of the electronic shutter.
	CHANGE POINT	F5.6, F8, F11	Sets the F value at which brightness adjustment switches from iris to electronic shutter.
<OPERATOR FILE> 24	IMPORT FROM USB	Execute using ENTER.	Loads the operator file from a USB flash drive.
	EXPORT TO USB	Execute using ENTER.	Writes the current settings of the operator file items to a USB flash drive.
	PRESET	Execute using ENTER.	Recalls operator file data stored in internal memory.

Functions assignable to switches

Setting	Function
OFF	No function assigned.
RETURN1 SW	Video input on RETURN1 on the CCU is output to the viewfinder while the switch is pressed.
RETURN2 SW	Video input on the channel selected by RET2 SEL from among the RETURN signals on the CCU is output to the viewfinder while the switch is pressed.
RETURN3 SW	Video input on RETURN3 on the CCU is output to the viewfinder while the switch is pressed.
RETURN4 SW	Video input on RETURN4 on the CCU is output to the viewfinder while the switch is pressed.
INTERCOM MIC ON	Output the intercom headset microphone audio on the ENG or PROD line, whichever is selected by the INTERCOM MIC switch. Enabled when INTERCOM TYPE is set to UCJ.
ENG MIC ON	Output the intercom headset microphone audio on the ENG line. Enabled when INTERCOM TYPE is set to CE.
PROD MIC ON	Output the intercom headset microphone audio on the PROD line. Enabled when INTERCOM TYPE is set to CE.
D.EXTENDER	Switch the digital extender. Switches in the sequence OFF → 2× magnification → 4× magnification → OFF.
D.EXTENDERx2	Switch the 2× digital extender ON/OFF.
D.EXTENDERx4	Switch the 4× digital extender ON/OFF.
ND FILTER	Switch the ND filter electrically. Switches in the sequence CLEAR → 1/4 ND → 1/16 ND → 1/64 ND → CLEAR.
ELECTRICAL CC	Switch the electrical CC filter. Switches in the sequence 3200K → 4300K → 6300K → 3200K.
5600K	Switch the 5600K electrical CC filter ON/OFF.
MIX VF	Switch the MIX VF function ON/OFF.
SPIRIT LEVEL	Switch the electronic spirit level indicator ON/OFF.
PinP	Switch the PinP display ON/OFF.
VF ASSIGN SW1	Viewfinder operation function 1
VF ASSIGN SW2	Viewfinder operation function 2
RET1 SW TOGGLE	Set whether to output the video input on RETURN1 on the CCU to the viewfinder.
RET2 SW TOGGLE	Set whether to output the video input on the channel selected by RET2 SEL from among the RETURN signals on the CCU to the viewfinder.

Setting	Function
RET3 SW TOGGLE	Set whether to output the video input on RETURN3 on the CCU to the viewfinder.
RET4 SW TOGGLE	Set whether to output the video input on RETURN4 on the CCU to the viewfinder.
VTR S/S	Switch the REC (recording) status ON/OFF. Enabled in standalone operation mode only. When SDI OUT is set to MAIN on the <SDI OUT> page in the MAINTENANCE menu, the REC signal is embedded as metadata in the SDI signal that is output from SDI OUT. When the REC item is set to ON on the <VF DISPLAY> page in the OPERATION menu, “REC” is displayed on the DISPLAY screen when in the recording state. When the REC TALLY item is set to ON on the <OTHERS> page in the MAINTENANCE menu, the tally indicator is lit on the viewfinder and handle when in the recording state.
TALLY R	Switch the red tally indicator on the viewfinder and handle ON/OFF. Enabled in standalone operation mode only.
TALLY G	Switch the green tally indicator on the viewfinder and handle ON/OFF. Enabled in standalone operation mode only.
FAN MAX	Set whether to set the fan to maximum speed.
MARKER	Switch the marker display ON/OFF.
CURSOR ALL OFF	Switch the cursor display ON/OFF. All cursors are hidden if you press the switch during cursor display. Press the switch again to restore the state that existed before you pressed the switch.
AWB	Execute the Auto White Balance function.
ATW	Switch the ATW function ON/OFF.
TLCS	Switch the TLCS function ON/OFF.
CALL	Turn on the CALL lamp on the CCU and remote control panel while the switch is pressed.
ZOOM(T)	Zoom the lens in the telephoto direction while the switch is pressed. Enabled when the zoom servo/manual selector knob of the lens is in the SERVO position.
ZOOM(W)	Zoom the lens in the wide angle direction while the switch is pressed. Enabled when the zoom servo/manual selector knob of the lens is in the SERVO position.
VF DETAIL	Switch the VF DETAIL function ON/OFF.
DYNAMIC FOCUS	Switch the DYNAMIC FOCUS function ON/OFF.
DYNAMIC CONTRAST	Switch the DYNAMIC CONTRAST function ON/OFF.
FOCUS ASSIST	Switch the FOCUS ASSIST INDICATOR display ON/OFF.
FOCUS POS METER	Switch the FOCUS POSITION METER display ON/OFF.
FOCUS POS METER MKR1	Register the FOCUS POSITION METER marker 1 position.
FOCUS POS METER MKR2	Register the FOCUS POSITION METER marker 2 position.
FOCUS POS METER MKR3	Register the FOCUS POSITION METER marker 3 position.

- When the digital extender is turned on for the first time after startup, the screen may be distorted, but this is not a malfunction. The digital extender does not operate in 4K formats.
- An “:N/A” suffix is displayed for disabled items due to the format and connection conditions.

PAINT Menu

PAINT Page name Page No.	Item	Setting	Description / Remarks
<SW STATUS> P01	FLARE	**ON**, OFF	
	GAMMA	**ON**, OFF	
	BLK GAM	ON, **OFF**	
	KNEE	**ON**, OFF	
	WHT CLIP	**ON**, OFF	
	DETAIL	**ON**, OFF	
	LVL DEP	**ON**, OFF	
	SKIN DTL	ON, **OFF**	
	MATRIX	**ON**, OFF	
<VIDEO LEVEL> P02	WHITE	R/G/B: –99 to +99, **0**	R, G, B, and M (master) values can be independently set. (M cannot be set for WHITE.)
	BLACK	R/G/B/M: –99 to +99, **0.0**	
	FLARE	R/G/B: –99 to +99, **0**	
	GAMMA	M: –99.9 to +99.9, **0**	
	FLARE	**ON**, OFF	
	TEST	**OFF**, SAW, 10STEP	
<COLOR TEMP> P03	WHITE	R/G/B: –99 to +99, **0**	
	AUTO WHITE BALANCE	Execute using ENTER.	
	COLOR TEMP	0 K to 65535 K, **3200 K**	
	BALANCE	–99 to +99, **0**	
	ATW	ON, **OFF**	
	SPEED	1, **2**, 3, 4, 5	
	MASTER WHITE GAIN	–6 dB to +12 dB, **0.0 dB**	Sets gain using continuous variable control.
	MASTER GAIN	–6, –3, **0**, 3, 6, 9, 12 dB	Sets gain in step value changes.
<GAMMA> P04	LEVEL	R/G/B/M: –99 to +99, **0**	R, G, B, and M (master) values can be independently set.
	COARSE	0.35 to 0.90 (0.05 steps), **0.45**	
	TABLE	**STANDARD**, HYPER	
		1, 2, **3**, 4, 5, 6, 7	When STANDARD or USER is selected (only 1 to 5 are available for USER): **1:** Equivalent to a camcorder **2:** ×4.5 gain **3:** ×3.5 gain **4:** Equivalent to SMPTE-240M **5:** Equivalent to ITU-R709 **6:** ×5.0 gain **7:** ×5.0–709
		1, 2, 3, **4**	When HYPER is selected: **1:** 325% to 100% **2:** 460% to 100% **3:** 325% to 109% **4:** 460% to 109%
	GAMMA	**ON**, OFF	
	TEST	**OFF**, SAW, 10STEP	
<BLACK GAMMA> P05	LEVEL	R/G/B/M: –99 to +99, **0**	R, G, B, and M (master) values can be independently set.
	RANGE	LOW, L.MID, H.MID, **HIGH**	
		ON, **OFF**	
	TEST	**OFF**, SAW, 10STEP	

PAINT			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<SATURATION> P06	SATURATION	–99 to +99, **0**	
		ON, **OFF**	
	LOW KEY SAT	–99 to +99, **0**	
	RANGE	LOW, L.MID, H.MID, **HIGH**	
		ON, **OFF**	
	TEST	**OFF**, SAW, 10STEP	
<KNEE> P07	K POINT	R/G/B/M: –99 to +99, **0**	R, G, B, and M (master) values can be independently set. Absolute values are displayed in ABS mode except for M (master).
	K SLOPE	R/G/B/M: –99 to +99, **0**	
	KNEE	**ON**, OFF	
	KNEE MAX	ON, **OFF**	
	KNEE SAT	–99 to +99, **0**	
		ON, **OFF**	
	AUTO KNEE	**OFF**, AUTO, (OFF)	**(OFF):** Displayed only for 4K/HDR format.
	POINT LIMIT	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	SLOPE	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	SOFT KNEE	ON, **OFF**	Turns on/off the function for smoothing the knee point of the Knee function.
	RADIUS	0 to +99, **0**	Sets the smoothing of the knee point.
	ABS		Highlighted: ABS (Absolute) mode
<WHITE CLIP> P08	W CLIP	–99 to +99, **0**	
		ON, OFF	
	ABS		Highlighted: ABS (Absolute) mode
<DETAIL 1> P09	DETAIL	**ON**, OFF	
	LEVEL	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	LIMITER [M]	–99 to +99, **0**	
	LIMITER [WHT]	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	LIMITER [BLK]	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	CRISP	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	LEVEL DEPEND	–99 to +99, **0**	Absolute value is displayed in ABS mode.
		ON, OFF	
	ABS		Highlighted: ABS (Absolute) mode
<DETAIL 2> P10	H/V RATIO	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	FREQ	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	MIX RATIO	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	KNEE APT	–99 to +99, **0**	Absolute value is displayed in ABS mode.
		ON, **OFF**	
	DTL H/V MODE	**H/V**, V Only	
	INDEPENDENT	ON, **OFF**	
	ABS		Highlighted: ABS (Absolute) mode

PAINT			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<HD DETAIL> P11	LEVEL	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	LIMITER [M]	–99 to +99, **0**	
	LIMITER [WHT]	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	LIMITER [BLK]	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	CRISP	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	LEVEL DEPEND	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	H/V RATIO	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	FREQ	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	MIX RATIO	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	KNEE APT	–99 to +99, **0**	Absolute value is displayed in ABS mode.
		ON, **OFF**	
	ABS		Highlighted: ABS (Absolute value) mode
<4K DETAIL> P12	LEVEL	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	LIMITER [M]	–99 to +99, **0**	
	LIMITER [WHT]	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	LIMITER [BLK]	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	CRISP	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	LEVEL DEPEND	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	H/V RATIO	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	FREQ	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	MIX RATIO	–99 to +99, **0**	Absolute value is displayed in ABS mode.
	KNEE APT	–99 to +99, **0**	Absolute value is displayed in ABS mode.
		ON, **OFF**	
	ABS		Highlighted: ABS (Absolute value) mode
<SD DETAIL> P13	SD DETAIL	**OFF**, ON	Turns the SD detail function ON/OFF.
	LEVEL	–99 to +99, **0**	Sets the SD detail strength.
	CRISP	–99 to +99, **0**	Sets the strength of the effect at which SD detail generated by noise is not applied.
	LEVEL DEPEND	–99 to +99, **0**	Sets the strength of the effect at which SD detail is not applied to dark areas.
	H/V RATIO	–99 to +99, **0**	Sets the mix ratio between the SD detail signal level applied in the horizontal direction and SD detail signal level applied in the vertical direction.
	FREQ	–99 to +99, **0**	Sets the frequency response of the filter for extracting the SD detail signal.
<SKIN DETAIL> P14	SKIN DTL	ON, **OFF**	
	SKIN GATE	**OFF**, 1, 2, 3, (MAT)	**1**, **2**, **3:** The skin gate function can be turned on for the specified channel only. **(MAT):** Displayed when GATE of <MULTI MATRIX> is ON.
	NATURAL SKINDTL	**OFF**, ON	
	ZOOM LINK	**OFF**, ON	
	TELE	0 to **99**	
	WIDE	**0** to 99	
	CH SW	1: (ON), 2/3: ON, **OFF**	Sets the skin tone detail function independently for each channel (Channel 1 is always set to ON). When ABS, LEVEL is displayed in an absolute value.
	HUE	1/2/3: Execute using ENTER.	
	PHASE	1/2/3: **0** to 359	
	WIDTH	1/2/3: 0 to 90, **29**	
	SAT	1/2/3: –99 to +99, **–89**	
	LEVEL	1/2/3: –99 to +99, **0**	
	Y LIMIT	1/2/3: **0** to 99	
	ABS		Highlighted: ABS (Absolute value) mode

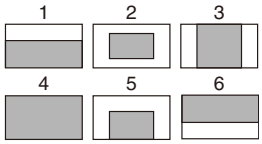
PAINT			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<USER MATRIX> P15	R-G	–99 to +99, **0**	
	R-B	–99 to +99, **0**	
	G-R	–99 to +99, **0**	
	G-B	–99 to +99, **0**	
	B-R	–99 to +99, **0**	
	B-G	–99 to +99, **0**	
	MATRIX	**ON**, OFF	
	PRESET	---, ON, OFF	
		---, SMPTE-240M, ITU-709, SMPTE-WIDE, NTSC, EBU, ITU-601, CUSTOM1, CUSTOM2, CUSTOM3, CUSTOM4, CUSTOM5	
	USER	---, ON, OFF	
	MULTI	---, ON, OFF	
	ADAPTIVE MATRIX	**OFF**, ON	
	LEVEL	0 to 7, **0**	
<MULTI MATRIX> P16	PHASE	**0**, 23, 45, 68, 90, 113, 135, 158, 180, 203, 225, 248, 270, 293, 315, 338	Selects the axis (angle) in PHASE for adjusting the multimatrix function, and sets HUE and SAT. (HUE and SAT can be adjusted independently for 16 axes.)
	HUE	–99 to +99, **0**	
	SAT	–99 to +99, **0**	
	ALL CLEAR	Execute using ENTER.	
	GATE	ON, **OFF**, (SKIN)	**(SKIN):** Displayed when SKIN GATE of <SKIN DETAIL> is ON.
	MATRIX	**ON**, OFF	
	PRESET	---, ON, OFF	
		---, SMPTE-240M, ITU-709, SMPTE-WIDE, NTSC, EBU, ITU-601, CUSTOM1, CUSTOM2, CUSTOM3, CUSTOM4, CUSTOM5	
	USER	---, ON, OFF	
	MULTI	---, ON, OFF	

PAINT			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<SHUTTER> P17	SHUTTER	ON, **OFF**, (ON), (OFF)	Settings in ( ): When a remote control unit/panel or a CCU is not connected (cannot be changed)
		When imaging frequency is 60.00 Hz or 59.94 Hz: **1/100**, 1/125, 1/250, 1/500, 1/1000, 1/2000, ECS, SLS When imaging frequency is 50 Hz: 1/60, **1/125**, 1/250, 1/500, 1/1000, 1/2000, ECS, SLS When imaging frequency is 30.00 Hz or 29.97 Hz: 1/40, 1/60, **1/100**, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000, ECS, SLS When imaging frequency is 25 Hz: 1/33, 1/50, **1/100**, 1/125, 1/250, 1/500, 1/1000, 1/2000, ECS, SLS When imaging frequency is 24 Hz or 23.98 Hz: 1/32, 1/48, 1/96, **1/100**, 1/125, 1/250, 1/500, 1/1000, 1/2000, ECS, SLS	Selects the shutter speed and shutter mode. **ECS:** Adjusts the exposure time continuously. The ECS FREQ setting is used. **SLS:** Slow shutter. The sensitivity can be increased by long exposure times of 2 frames or more. The SLS FRAME setting is used.
	ECS FREQ	When imaging frequency is 60.00 Hz: **60.13** Hz to 4600 Hz When imaging frequency is 59.94 Hz: **60.07** Hz to 4600 Hz When imaging frequency is 50 Hz: **50.12** Hz to 4600 Hz When imaging frequency is 30.00 Hz: **30.02** Hz to 2700 Hz When imaging frequency is 29.97 Hz: **29.99** Hz to 2700 Hz When imaging frequency is 25 Hz: **25.02** Hz to 2300 Hz When imaging frequency is 24 Hz: **24.02** Hz to 2200 Hz When imaging frequency is 23.98 Hz: **23.99** Hz to 2200 Hz	
	SLS FRAME	**2F**, 3F, 4F, 5F, 6F, 7F, 8F	Sets the number of exposure frames when using the slow shutter function.
<NOISE SUPPRESSION> P18	NOISE SUPPRESSION	ON, **OFF**	Turns the noise reduction function ON/OFF.
<FLICKER REDUCTION> P19	REDUCTION	**OFF**, ON, (OFF)	Turns the flicker correction function ON/OFF. (OFF) display: When slow shutter is enabled (cannot be changed)
	POWER LINE FREQUENCY	**50Hz**, 60Hz	Specifies the frequency of the lighting power source.

PAINT			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<HDR OPERATION> P20	HDR MODE	**OFF**, LIVE HDR	Displays the CCU setting.
	SDR GAIN	0.0 to –15.0 dB, **–6.0 dB**	Enabled only when LIVE HDR is selected. Gain setting applied to the SDR output.
	HDR CONTRAST	100 to 566%, **200%**	Enabled only when LIVE HDR is selected (display only). Sets the percentage in HDR which is equivalent to 100% brightness in SDR. Varies depending on SDR GAIN.
	HDR TARGET WHITE	99 to 765nit, **228nit**	Enabled only when LIVE HDR is selected (display only). Sets the number of nits in HDR which is equivalent to 100% brightness in SDR. Varies depending on SDR GAIN and HDR LOOK.
	HDR BLACK OFFSET	–10.0 to 30.0, **0.0**	Enabled only when LIVE HDR is selected. HDR output black offset
	HDR KNEE	**OFF**, ON	Enabled only when LIVE HDR is selected. KNEE setting applied for HDR
	POINT	–99 to 99, **0**	
	SLOPE	–99 to 99, **0**	
	HDR WHITE CLIP	**OFF**, ON	Enabled only when LIVE HDR is selected.
	LEVEL	–99 to 99, **0**	
	HDR BLACK CLIP	**OFF**, ON	Enabled only when LIVE HDR is selected. Sets whether to clip at 0% and lower in the HDR output. Set to OFF (fixed) when <OUTPUT FORMAT> ⟶ FREQUENCY ⟶ OETF is set to S-Log3.
	HDR BLACK COMPRESSION	**OFF**, ON	Enabled only when LIVE HDR is selected. Sets whether to compress low-luminance areas in the HDR output.
	SR LIVE LOCK	**OFF**, ON	Switches the lock function ON/OFF to prevent accidental changes to the following SR Live related paint items • GAMMA • KNEE • SDR GAIN • BLACK • HDR BLACK OFFSET • WHITE CLIP • HDR KNEE • HDR BLACK COMPRESSION
<OPTICAL FILTER> P21	ND	**1**, 2, 3, 4	Sets the ND filter to use.
	CC	**B**, C, D	Sets the CC filter to use.

PAINT			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<SCENE FILE> P22	1		Stores and recalls scene files (paint data): When storing a scene file in camera memory, specify the file number after executing STORE. When recalling, only specify the number.
	2		
	3		
	4		
	5		
	STORE	Execute using ENTER.	
	01	**01** to 32	
	STANDARD	Execute using ENTER.	Recalls the standard paint data.
	IMPORT FROM USB	Execute using ENTER.	Loads 32 scene files from a USB flash drive to internal memory.
	EXPORT TO USB	Execute using ENTER.	Writes 32 scene files in the camera's memory to a USB flash drive.
	FILE ID	Max. 14 characters	Enter a comment for the scene files to be written to a USB flash drive. See *"To specify a character string" (page 34)*.
	CAM CODE	Camera code	Display only
	DATE	Date	Display only
	DISSOLVE	**OFF**, ON	Switches scene files seamlessly.
	SPEED	0.2 to 2.8 (0.2 steps), 3 to 10 (1 steps), **0.2**	

MAINTENANCE Menu

MAINTENANCE Page name Page No.	Item	Setting	Description / Remarks
<AUTO SETUP> M01	AUTO BLACK	Execute using ENTER.	
	AUTO WHITE	Execute using ENTER.	
	AUTO LEVEL	Execute using ENTER.	
	TEST	**OFF**, SAW, 10STEP	
<WHITE SHADING> M02	V SAW	R/G/B: –99 to +99, **0**	R, G, and B values can be independently set.
	V PARA	R/G/B: –99 to +99, **0**	
	H SAW	R/G/B: –99 to +99, **0**	
	H PARA	R/G/B: –99 to +99, **0**	
	WHITE	R/G/B: –99 to +99, **0**	
<BLACK SHADING> M03	V SAW	R/G/B: –99 to +99, **0**	R, G, and B values can be independently set. M (master) value can also be set for BLACK.
	V PARA	R/G/B: –99 to +99, **0**	
	H SAW	R/G/B: –99 to +99, **0**	
	H PARA	R/G/B: –99 to +99, **0**	
	BLK SET	R/G/B: –99 to +99, **0**	
	BLACK	R/G/B: –99 to +99, **0** M: –99.9 to +99.9, **0.0**	
	MASTER GAIN	–6, –3, **0**, 3, 6, 9, 12 dB	Sets gain in step value changes.
<OHB MATRIX> M04	OHB MATRIX	**ON**, OFF	
	MATRIX	**ON**, OFF	
<AUTO IRIS> M05	AUTO IRIS	ON, **OFF**, (ON), (OFF)	Settings in ( ): When a remote control unit/panel or a CCU is not connected (cannot be changed)
	WINDOW	**1**, 2, 3, 4, 5, 6	Selects the auto iris detection window.  The shaded parts indicate the area where light detection occurs.
	OVERRIDE	–99 to 99, **0**, ---	Set the override to temporarily change the reference value for brightness of the automatic iris level in the range of ±2 steps. –99: Two steps to fully closed iris. +99: Two steps to fully open iris ---: OFF The setting returns to "---" when the power is turned off.
	IRIS LEVEL	–99 to +99, **0**	±2 stops
	APL RATIO	–99 to +99, **65**	
	IRIS GAIN	–99 to +99, **0**	
	IRIS CLOSE	ON, **OFF**	

MAINTENANCE			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<LENS1> M06	F NO. DISP	**CONTROL**, RETURN	Selects the iris indication on the panel when AUTO IRIS is set to OFF: **CONTROL:** Displays the value from the camera. **RETURN:** Displays the value returned from the lens. (When AUTO IRIS is set to ON, the value returned from the lens is always displayed.)
	AF DISPLAY	ON, **OFF**	
	ALAC	**AUTO**, OFF	With AUTO selected, the status is displayed at the right. (ACTIVE): Compensation is in progress. (WAIT): Waiting for completion of lens initialization. (STOP): Compensation is turned off for a non-applicable lens.
	ARIA	**AUTO**, OFF	With AUTO selected, the status is displayed at the right. (ACTIVE): Compensation is in progress. (WAIT): Waiting for completion of lens initialization. (STOP): Compensation is turned off for a non-applicable lens.
	GAIN LIMIT	0 to 18 dB, **OFF**	Sets the maximum gain to compensate for F drop (No limit when set to OFF).
<LENS2> M07	REMOTE CONTROL	**OFF**, ON, (OFF)	Lens remote control from MSU/RCP on/off setting. Same function as the Active button on the Zoom/ Focus Control screen of the MSU/RCP. (OFF): When lens is not supported
	CONTROL MODE	**ZOOM&FOCUS**, FOCUS	**ZOOM & FOCUS:** Control ZOOM and FOCUS from an MSU/RCP (control by lens demand is not supported) **FOCUS:** Control FOCUS from an MSU/RCP. ZOOM is controlled by lens demand.
<MIC GAIN> M08	MIC1	20, 30, 40, 50, **60** dB	Can be modified only in standalone operation. Displayed only when assigned to a volume on the <VOLUME ASSIGN> page in the OPERATION menu.
	MIC2	20, 30, 40, 50, **60** dB	
<CALL/TALLY> M09	CCU CALL	OFF, **ON**	Selects whether TALLY lights for CALL signal.
	CAM CALL	**OFF**, ON	
	TALLY GUARD		Selects whether to prevent changes while TALLY is lit.
	FILTER DISC	**OFF**, ON	
<OUTPUT FORMAT> M10 (U16)	CURRENT	Display only	Displays the current format.
	RESOLUTION	3840×2160, **1920×1080**, 1280×720	Not displayed when a CCU is connected. Sets the system format. **Note** The HZC-UHD9 software option is required in order to select 3840×2160 for RESOLUTION.
	FREQUENCY	60.00P, **59.94P**, 50P, 30P, 29.97P, 25P, 24P, 23.98P, 59.94i, 50i, 29.97PsF, 25PsF, 24PsF, 23.98PsF	
	OETF	**SDR**, S-Log3, HLG	Not displayed when a CCU is connected. Sets the camera OETF.
	LOOK	-----, Live, Mild, Natural	Not displayed when a CCU is connected. Sets the Look of the HDR output. "----" when OETF is set to SDR.
	COLOR	**BT.709**, BT.2020	Not displayed when a CCU is connected. Camera color gamut setting Set to BT.709 (fixed) when OETF is set to SDR. BT.709 or BT.2020 can be selected when OETF is set to S-Log3 or HLG.
	60.00Hz	**DISABLE**, ENABLE	Not displayed when a CCU is connected. Sets whether to enable formats for shooting at 60.00 Hz.

MAINTENANCE			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<SYNC OUT> M11	OUTPUT	**HD-SYNC**, SD-SYNC	Selects the signal to output from SYNC OUT.
	SYNC-OUT		
	V-PHASE	–999 to +999, **0**	
	H-PHASE	–999 to +999, **0**	
<SDI OUT> M12 (U17)	SDI OUT	OFF, VF, **MAIN**, RET, HD PROMPTER	Selects the signal to output from the SDI OUT connector.
		4K/12G/HDR, 4K/12G/SDR, 4K/6G/HDR, 4K/6G/SDR, HD/3G-A/HDR, HD/3G-A/SDR, HD/3G-B/HDR, HD/3G-B/SDR, **HD/1.5G/HDR**, HD/1.5G/SDR, SD	Selects the format of the signal to output from the SDI OUT connector. For details, see *"SDI Output Formats" (page 78)*.
	EMB AUDIO	**OFF**, MIC, PGM	Selects the type of audio signal to embed in the SDI OUT signal. **MIC:** Embeds the audio signal that is input on AUDIO IN CH1, CH2. **PGM:** When a CCU is connected, embeds the PGM and audio signal on the ENG line or PROD line. (For the ENG line and PROD line, the voice audio during a call is also mixed.) In standalone operation mode, the audio signal that is embedded in the SDI signal that is input on SDI I/O is embedded in the output. Can be selected only when SDI OUT is set to VF or RET.
	ASPECT	**SQ**, EC	Sets the SD-SDI image aspect ratio. **SQ:** Compress 16:9 image horizontally to 4:3. **EC:** Crop 16:9 image on left/right sides to 4:3.
	SDI I/O	**VF OUT**, HD PROMPTER OUT, HD TRUNK IN, HD RETURN IN, SD RETURN IN	Sets the role of the SDI I/O connectors. **VF OUT:** Use as the signal connector to output the video displayed in the viewfinder. **HD PROMPTER OUT:** Use as the output signal connector of the HD PROMPTER function. Enabled when connected with a CCU. **HD TRUNK IN:** Use as the input signal connector of the HD TRUNK function. Enabled when connected with a CCU. Restricted depending on the format. For details, see *"SDI Output Formats" (page 78)*. **HD RETURN IN:** Use as the HD-SDI return signal input connector. Enabled in standalone operation mode. **SD RETURN IN:** Use as the SD-SDI return signal input connector. Enabled in standalone operation mode.
	ASPECT	**SQ**, EC	Sets the aspect ratio of the input SD-SDI image. Displayed only when SD RETURN IN is selected. **SQ:** Compress 16:9 image horizontally to 4:3. **EC:** Crop 16:9 image on left/right sides to 4:3.
<METADATA> M13	LENS METADATA	ON, **OFF**	Selects whether to embed lens information in SDI OUT.
<TRUNK> M14	TRUNK	**ON**, OFF	
	NETWORK TRUNK		Display only
	LINK		

MAINTENANCE			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<GENLOCK> M15	REFERENCE	Synchronization status	Display only
	GENLOCK	**ENABLE**, DISABLE	Not displayed when a CCU is connected.
	STATUS		
	FORMAT		
	PHASE		
	V	–1024 to 1023, **0**	
	H	–1700 to 1700, **0**	
<DATE> M16	DATE/TIME	2000 to 2037/01 to 12/00 to 31 00 to 23 : 00 to 59	
	DATE FORMAT	1 Y/Mn/D, 2 Mn/D, 3 D/M/Y 4 D/M, **5 M/D/Y**, 6 M/D	**Y:** Year **Mn:** Month (numeric) **M:** Month (English abbreviation) **D:** Day
<BATTERY ALARM> M17	BEFORE END	**11.5** to 17.0 V	
	END	**11.0** to 11.5 V	
<OTHERS> M18	FAN MODE	OFF, **AUTO1**, AUTO2, MIN, MAX	**AUTO1:** Normal rotation **AUTO2:** Slow rotation
	CAM BARS	ON, **OFF**, (OFF)	**(OFF):** Displayed only for 4K/HDR format.
	WHITE SETUP MODE	AWB, **A.LVL**	
	STANDALONE PAINT SWITCH	**ENABLE**, DISABLE	When set to DISABLE, disables operation of the unit's switches, such as the WHITE BAL switch, even when a CCU or control panel is not connected.
	HD DOWNCONV FILTER	**1**, 2, 3, 4, 1(V:0.3), 1(V:0.6)	In standalone operation mode, this sets the type of filter when down-converting from 4K to HD.
	TOP MENU LOCK	**OFF**, ON	When operated on the camera body, this turns the TOP MENU screen display function ON/OFF. When set to ON, the TOP MENU is not displayed after the unit is next powered on. To set to OFF, use the camera menu control function from a remote control panel and set to OFF.
	REC TALLY	OFF, **ON**	Switches the tally indicator display function ON/OFF for when recording state is activated after the VTR S/S button is pressed. Displayed only in standalone operation.
<OPTION KEY> M19	IMPORT FROM USB	Execute using ENTER.	Reads the install key from a USB flash drive.
	EFFECTIVE FUNCTION		Displayed only when option function is installed.
<FIRMWARE> M20	VERSION	Display only	Displays the firmware version, date, and comments.
	UPDATE FROM USB	Execute using ENTER.	Updates the firmware from a USB flash drive. **Update method** 1. Copy "hxcfz90_vx.xx.pkg" to the root folder of a USB flash drive, and connect the drive to the USB connector of the unit. 2. Select UPDATE FROM USB, and press the ENTER button. 3. When "READY TO INSTALL" is displayed, select EXEC and press the ENTER button. **Notes** • Do not turn off the unit until the update has been completed. • For details about obtaining a data file for batch updates, contact a Sony sales representative. • For recommended USB flash drives, see *"Supported USB Flash Drives" (page 73)*.
	EXPORT OSS LICENSE TO USB	Execute using ENTER.	Copies the OSS license document to a USB flash drive.

FILE Menu

Seven types of files can be used for easy adjustments of the camera: Operator, Scene, Reference, Lens, OHB, Matrix, and BOX cursor files.
You can store the items set with the OPERATION menu and customized USER menu in the Operator file.

For the specific items included in these files, refer to the Maintenance Manual.

FILE			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<OPERATOR FILE> F01	IMPORT FROM USB	Execute using ENTER.	Loads an operator file from a USB flash drive.
	EXPORT TO USB	Execute using ENTER.	Writes the current settings of the operator file items to a USB flash drive.
	PRESET	Execute using ENTER.	Recalls operator file data stored in internal memory.
	STORE PRESET FILE	Execute using ENTER.	Stores the current settings of the operator file items in the operator file in internal memory.
	CLEAR PRESET FILE	Execute using ENTER.	Restores the operator file data stored in memory in the unit to the factory defaults.
<SCENE FILE> F02	1		Stores and recalls scene files (paint data): When storing a scene file in camera memory, specify the file number after executing STORE. When recalling, only specify the number.
	2		
	3		
	4		
	5		
	STORE	Execute using ENTER.	
	01	**01** to 32	
	STANDARD	Execute using ENTER.	Recalls the standard paint data.
	IMPORT FROM USB	Execute using ENTER.	Loads 32 scene files from a USB flash drive to internal memory.
	EXPORT TO USB	Execute using ENTER.	Writes 32 scene files in the camera's memory to a USB flash drive.
	FILE ID	Max. 14 characters	Enter a comment for the scene files to be written to a USB flash drive. See *"To specify a character string" (page 34)*.
	CAM CODE	Camera code	Display only
	DATE	Date	Display only
	DISSOLVE	**OFF**, ON	Switches scene files seamlessly.
	SPEED	0.2 to 2.8 (0.2 steps), 3 to 10 (1 steps), **0.2**	
<REFERENCE> F03	STORE FILE	Execute using ENTER.	Stores the current settings of the reference file items in the reference file in internal memory.
	STANDARD	Execute using ENTER.	Recalls the reference file stored in internal memory.
	RESET REFERENCE FILE	Execute using ENTER.	Resets the reference file stored in internal memory to the factory defaults.
	FACTORY RESET	Execute using ENTER.	Resets all settings to the factory defaults.
	IMPORT FROM USB	Execute using ENTER.	Loads a reference file from a USB flash drive.
	EXPORT TO USB	Execute using ENTER.	Writes the current settings of the reference file items to a USB flash drive.
	FILE ID	Max. 14 characters	Enter a comment in the reference file to be written to a USB flash drive. See *"To specify a character string" (page 34)*.
	CAM CODE	Camera code	Display only
	DATE	Date	Display only

FILE			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<LENS FILE> F04	STORE FILE	Execute using ENTER.	The center marker is not included.
	No.	1 to 17, **1**	1 to 16: When using a non-serial lens (When using a large lens, this setting follows the internal setting of the lens.) 17: When using a serial lens
	NAME		Configurable only when using a non-serial lens
	LENGTH	**SHORT**, FULL	Sets the length of the lens name used for matching the attached lens with a registered lens file. **SHORT:** Lens name omitting the portion not related to optical characteristics **FULL:** Full lens name
	F NO	F1.0 to F3.4, **F1.7**	Configurable only when using a non-serial lens
	CENTER MARKER		Sets and stores the center marker position. H POS: Increasing the value moves the position to the right. V POS: Increasing the value moves the position downwards.
	H POS	–48 to +48, **0**	
	V POS	–27 to +27, **0**	
	STORE	Execute using ENTER.	
	IMPORT FROM USB	Execute using ENTER.	Loads a lens file from a USB flash drive.
	EXPORT TO USB	Execute using ENTER.	Writes the current settings of the lens file to a USB flash drive.
<OHB FILE> F05	STORE FILE	Execute using ENTER.	Stores the offset values of items specific to the CMOS image sensor (once stored, the values do not need to be stored again if the sensor is reinstalled).
	CLEAR OHB FILE	Execute using ENTER.	Resets the OHB file to the factory default state.
<MATRIX FILE> F06	CUSTOM PRESET MATRIX		Stores and recalls matrix preset files: When storing a preset file in camera memory, specify the file number.
	STORE FILE	Execute using ENTER.	
	1		
	2		
	3		
	4		
	5		
	CLEAR ALL	Execute using ENTER.	Clears all the files.
	IMPORT FROM USB	Execute using ENTER.	Loads five preset files from a USB flash drive to internal memory.
	EXPORT TO USB	Execute using ENTER.	Writes five preset files in the camera's memory to a USB flash drive.
	FILE ID	Max. 14 characters	Enters a comment for the preset files to be written to a USB flash drive. See *"To specify a character string" (page 34)*.
	CAM CODE	Camera code	Display only
	DATE	Date	Display only

FILE			
Page name Page No.	**Item**	**Setting**	**Description / Remarks**
<BOX CURSOR FILE> F07	1:		BOX CURSOR FILE selection and FILE name input. Align the cursor to the left of the number to select the BOX CURSOR FILE. Align the cursor to the right of the number to enter the BOX CURSOR FILE name. See *"To specify a character string" (page 34)*.
	2:		
	3:		
	4:		
	5:		
	6:		
	7:		
	8:		
	9:		
	10:		
	STORE		Stores a BOX CURSOR FILE name in the camera.
	IMPORT FROM USB		Transfers a BOX CURSOR FILE from a USB flash drive to the camera.
	EXPORT TO USB		Transfers a BOX CURSOR FILE from the camera to a USB flash drive.

DIAGNOSIS Menu

This menu is for viewing only; camera settings cannot be made using this menu.
However, some items set the conditions for viewing.

DIAGNOSIS Page name Page No.	Item	Indication	Description / Remarks
<OPTICAL CONDITION> D01	CCU → CAM	GREEN, YELLOW, RED, NG, NO SIGNAL	**NO SIGNAL:** When CCU is not connected
	CAM → CCU	GREEN, YELLOW, RED, NG, NO SIGNAL	
	REFLECTION	OK, NG, --	**--:** When CCU is not connected
	CABLE LENGTH	x.x km	Displays the camera cable length (Displayed only when a CCU is connected).
<BOARD STATUS> D02	OHB	OK, NG	
	DPR	OK, NG	
	SY	OK, NG	
	PS	OK, NG	
	HOURS METER	xxxx H	Displays the total working time.
<ROM VERSION> D03 (U18)	CAMERA APP	Vx.xx	
	OS	Vx.xx	
	UPDATER	Vx.xx	
	SY	Vx.xx	
	DPR	Vx.xx	
	FDU	Vx.xx	
<SERIAL NO.> D04	MODEL	xxxxxxx	Displays the model name.
	NO.	xxxxxxx	Displays the serial number.
	EFFECTIVE FUNCTION		Displays installed option functions if any option is installed.
<POWER SUPPLY STATUS> D05 **Note** This display simply indicates the power supply status of the camera, and has a margin of error. Use only as a guide.	CABLE LENGTH	x.x km	Displays the cable length that a CCU measured. (Displayed only when a CCU is connected.)
	CABLE MARGIN	x m	Displays the possible cable length extension. (Displayed only when using CCU power delivery.)
	CAM INPUT VOLTAGE	0% to 100%	Displays the ratio of the input voltage on the camera to the output voltage on the CCU.
	CAM CONSUMPTION	0% to 100%	Displays camera power consumption.
	VF,LENS,DC-OUT	Display only	Displays the total current supplied to the viewfinder, lens, and DC OUT connector, and the percentage relative to the upper limit.

Appendix

Usage Precautions

Note on laser beams

Laser beams may damage the CMOS image sensors. If you shoot a scene that includes a laser beam, be careful not to let a laser beam become directed into the CMOS image sensors.

Do not subject to severe shocks

Damage to the case or internal components may result.

After use

Turn the power switch off.

Operation and storage environment

Store in a level, ventilated place.
If the unit gets wet, make sure it is completely dry before storage.
Avoid use or storage in the following places:

- Extremely hot or cold places
- Places with high humidity
- Locations subject to violent vibration
- Near strong magnetic fields
- In places where it receives much direct sunlight, or near heating equipment

On condensation

If the unit is suddenly taken from a cold to a warm location, or if ambient temperature suddenly rises, moisture may form on the outer surface of the unit and/or inside of the unit. This is known as condensation. If condensation occurs, turn off the unit and wait until the condensation clears before operating the unit. Operating the unit while condensation is present may damage the unit.

Parts with limited life span

- The fan and battery are consumable parts that will need periodic replacement.
  When operating at room temperature, a normal replacement cycle will be about 5 years. However, this replacement cycle represents only a general guideline and does not imply that the life expectancy of these parts is guaranteed. For details on parts replacement, contact your dealer.
- The life expectancy of the electrolytic capacitor is about 5 years under normal operating temperatures and normal usage (8 hours per day; 25 days per month).
  If usage exceeds the above normal usage frequency, the life expectancy may be reduced correspondingly.

Phenomena specific to CMOS image sensors

The following phenomena that may appear in images are specific to CMOS (Complementary Metal Oxide Semiconductor) image sensors. They do not indicate a malfunction.

White flecks

Although the CMOS 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 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)

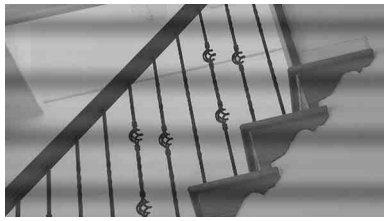
The problem may be alleviated by executing automatic black balance adjustment.

Aliasing

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

Flicker

If shooting under lighting produced by discharge tubes, such as fluorescent, sodium, or mercury-vapor lamps, the screen may flicker, colors may vary, or horizontal stripes may appear distorted.



In this case, set the flicker correction function ON *(see page 61)*.
If the frame rate selected for recording is close to the power-supply frequency, flicker may not be reduced sufficiently even if you activate the flicker correction function. In such cases, use the electronic shutter.

Focal plane

Owing to the characteristics of the pickup elements (CMOS image sensors) for reading video signals, subjects that quickly move across the screen may appear slightly skewed.

Flash bands

The luminance at the top and bottom of the screen may change when shooting a flashlight beam or a light source that quickly flashes.

To prevent electromagnetic interference from portable communications devices

The use of portable telephones and other communications devices near this unit can result in malfunctions and interference with audio and video signals.
It is recommended that the portable communications devices near this unit be powered off.

Do not place this product close to medical devices

This product (including accessories) has magnet(s) which may interfere with pacemakers, programmable shunt valves for hydrocephalus treatment, or other medical devices. Do not place this product close to persons who use such medical devices. Consult your doctor before using this product if you use any such medical device.

Connections to the Internet

This product is used with a leased line or intranet connection. Do not connect to an external network, as security issues may occur.

Care of the unit

If the body of the unit is dirty, clean it with a soft, dry cloth. In extreme cases, use a cloth moistened in a little neutral detergent, then wipe dry.
Do not use organic solvents such as alcohol or thinners, as these may cause discoloration or other damage to the finish of the unit.
Refrain from cleaning using pressurized air devices, such as an air duster or blower, as these may cause dust to enter the optical parts and damage the interior of the unit.

Cleaning the Viewfinder

Use a dust blower to clean any dust from the surface of the screen.

For details about cleaning the viewfinder supplied with the HXC-FZ90S, refer to the operation manual for the HDVF-EL75.

Note

Do not use organic solvents, such as thinners.

Error Messages

If a problem occurs during operation, a warning message is displayed.

Note

To display a message, set the DISPLAY/MENU switch to DISPLAY or MENU.

Message	Description
TEMP WARNING	The internal temperature is extraordinarily high.
FAN STOP	The built-in fan is not rotating properly.
SET CORRECT SYSTEM DATE	The time/date of the internal clock have not been set.
NO USB FLASH DRIVE	A USB flash drive operation was attempted with no USB flash drive connected.
USB FLASH DRIVE ERROR	An error occurred during access to a USB flash drive.
FORMAT ERROR!	An access was attempted with an unformatted USB flash drive.
WRITE PROTECTED	File writing was attempted with a write-protected USB flash drive.
FILE ERROR	An error occurred while reading a file from a USB flash drive.
OTHER MODEL'S FILE	An attempt was made to read a file for another model that is incompatible.
FILE NOT FOUND	The file you attempted to read does not exist in the USB flash drive.
ZOOM/FOCUS CONTROL:RCP/MSU	Zoom and focus controlled from RCP/MSU. Zoom and focus lens demand is disabled.

Supported USB Flash Drives

Connect a USB flash drive to the USB connector to enable saving and loading a configuration data file.

USM-LX series
USM1GLX, USM2GLX, USM4GLX, USM8GLX, USM16GLX, USM32GLX, USM64GLX
USM-L series
USM1GL, USM2GL, USM4GL, USM8GL, USM16GL, USM32GL
USM-N series
USM4GN, USM8GN, USM16GN, USM32GN
USM-M series
USM4GM, USM8GM, USM16GM, USM32GM
USM-P series
USM4GP, USM8GP, USM16GP, USM32GP, USM64GP
USM-R series
USM4GR, USM8GR, USM16GR, USM32GR
USM-Q series
USM8GQ, USM16GQ, USM32GQ, USM64GQ
USM-T series
USM8GT, USM16GT, USM32GT, USM64GT
USM-U series
USM4GU, USM8GU, USM16GU, USM32GU, USM64GU
USM-V series
USM4GV, USM8GV
USM-X series
USM8X, USM16X, USM32X, USM64X
USM-SA1 series
USM8SA1, USM16SA1, USM32SA1, USM64SA1
USM-QX series
USM8GQX, USM16GQX, USM32GQX, USM64GQX, USM128GQX

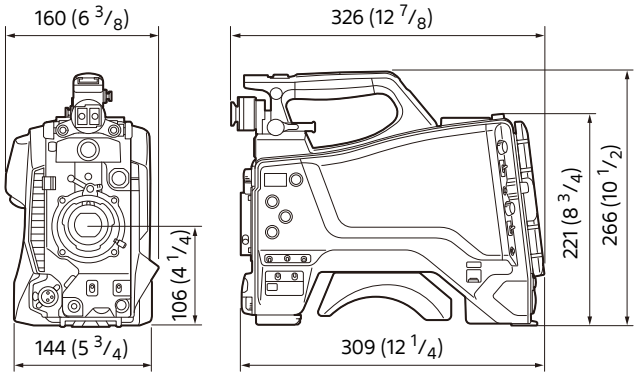
Notes

- Non-recommended USB flash drives may not be recognized when connected to the USB connector.
- USB flash drives must be formatted with the FAT16 or FAT32 file system. The recommended drives are pre-formatted, and can be immediately upon purchase.

Specifications

General	
Power requirements	10.5 V to 17.0 V DC, 9.5 A (max.) 48 V DC, 2.2 A (max.)
Power consumption	56 W (max.) (camera head only)
External load	40 W (max.) (DC OUT, LENS, VF, REMOTE, USB total output power)
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	Approx. 3.8 kg (8 lb 6 oz) (camera head only)

Dimensions Unit: mm (inches)



Camera	
Imaging element	2/3-inch, 4K CMOS image sensor Effective resolution: 3840 (H) × 2160 (V)
Method	Single chip
ND filter	1: Clear 2: 1/4ND 3: 1/16ND 4: 1/64ND
Sensitivity	F10 (System frequency: 59.94) F11 (System frequency: 50) (2000 lx with 89.9% reflectance)
Image S/N	–62 dB
Horizontal resolution	2000 TV lines (screen center), 5% or higher modulation depth
Display (HDVF-EL75 Viewfinder (supplied with HXC-FZ90S))	
Screen size	155.5 × 87.5 mm (7.0 inch)
Aspect ratio	16:9

Inputs/outputs	
CCU	Optoelectric composite connector (1)
AUDIO IN CH1 AUDIO IN CH2	XLR type, 3-pin, female (1 each) When set to MIC: –60 dBu (can be selected up to –20 dBu by menu or HXCU-FZ90 operation), balanced When set to LINE: 0 dBu, balanced
INTERCOM	XLR type, 5-pin, female (1)
(earphone)	4-pole mini jack (1) (2-polo mono, 3-pole stereo, 4-pole CTIA standard, 4-pole OMTP standard)
DC IN	XLR type, 4-pin, male (1) 10.5 V to 17.0 V DC
DC OUT	4-pin, female (1) 10.5 V to 17.0 V DC, 15.75 W (May be limited, depending on load and input conditions.)
SDI I/O	BNC type (1)
SDI OUT	BNC type (1)
SYNC OUT	BNC type (1)
PROMPTER/ GENLOCK	BNC type (1) 1 Vp-p, 75 ohms
LENS	12-pin (1) Lens power supply: 10.5 V to 17.0 V DC, 17 W (max) total with REMOTE connector
NETWORK TRUNK	RJ-45 type 8-pin (1)
VF	Round type, 20-pin (1) 10.5 V to 17.0 V DC, 20 W
REMOTE	8-pin (1) 10.5 V to 17.0 V DC, 17 W (max) total with LENS connector
USB	USB 2.0 Type A, 4-pin (1) (for USB flash drive)
Lens (supplied with HXC-FZ90S)	
Focal length	8.2 mm to 164 mm
Zoom	Servo/Manual selectable
Zoom ratio	20×
Maximum relative aperture	1:1.9
Iris	Auto/Manual selectable F1.9 to F16 and C (close)
Focus	Manual Range: 900 mm to ∞ (Macro mode OFF), 10 mm to ∞ (Macro mode ON, wide angle)
Filter diameter	M82 mm, pitch 0.75 mm
Macro mode	ON/OFF switchable

Supplied accessories

HXC-FZ90H
Lens mount cap (1)
Flange focal length (flange back) adjustment chart (1)
Cable clamp belt (1)
Operating Instructions (CD-ROM) (1)
Before Using This Unit (1 set)
Warranty (1)

HXC-FZ90S
Lens mount cap (1)
Flange focal length (flange back) adjustment chart (1)
Cable clamp belt (1)
Operating Instructions (CD-ROM) (1)
Before Using This Unit (1 set)
Warranty (1)
HDVF-EL75 Viewfinder (1)
Indoor hood (1)
Lens (1)
V-wedge shoe attachment (1)
Hex wrench (1)
Hex socket bolt (4)
Number plate (1)
Connection cable (20-pin) (1)
HDVF-EL75 Operation Manual (CD-ROM) (1)
HDVF-EL75 Operation Guide (1)

Optional accessories

Lens, viewfinder, and related equipment
Lens: 2/3-inch bayonet mount lenses only
HDVF-L10, HDVF-EL740, HDVF-EL760, HDVF-EL75 (supplied with HXC-FZ90S) Viewfinder

Power supply and related equipment
AC-DN10A AC Adaptor
HXCE-FZ90 Power Supply Unit

Audio equipment
ECM-678/674/673/680S Microphone
CAC-12 Microphone Holder

Cable/coupler
CCFN-25/50/100/150/200/250 Hybrid Fiber Cable
CCFN-JC1 Cable Coupler
LEMO optical fiber composite cable

Camera operating software
HZC-UHD9

Other peripheral devices
VCT-14 Tripod Adaptor
Shoulder strap (Part No.: A-6772-374-E)

Related equipment

Camera control unit
HXCU-FZ90 4K/HD Camera Control Unit

Equipment for remote control
RM-B170 Remote Control Unit
RCP-1500/3000 series Remote Control Panel
MSU-1000/3000 series Master Setup Unit

Design and specifications are subject to change without notice.

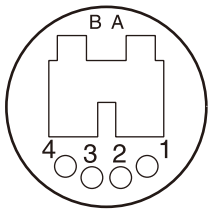
Notes

- 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.
- SONY WILL NOT BE LIABLE FOR CLAIMS OF ANY KIND MADE BY USERS OF THIS UNIT OR MADE BY THIRD PARTIES.
- SONY WILL NOT BE LIABLE FOR THE TERMINATION OR DISCONTINUATION OF ANY SERVICES RELATED TO THIS UNIT THAT MAY RESULT DUE TO CIRCUMSTANCES OF ANY KIND.

Pin Assignment

CCU connector

Neutrik connector model



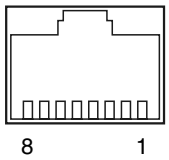
No.	Signal
A	Optical INPUT
B	Optical OUTPUT
1	DC IN (–)
2	NC
3	NC
4	DC IN (+)
Shell	CHASSIS GND

LEMO connector model (optoelectric composite connector)

LEMO standard connector

NETWORK TRUNK connector

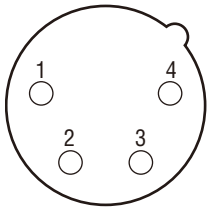
RJ-45 type 8-pin, 10Base-T/100Base-TX/1000Base-T compliant



No.	Signal	Input/ output	Specifications
1	TRD + (0)	IN/OUT	Transmitted/Received Data + (0)
2	TRD – (0)	IN/OUT	Transmitted/Received Data – (0)
3	TRD + (1)	IN/OUT	Transmitted/Received Data + (1)
4	TRD + (2)	IN/OUT	Transmitted/Received Data + (2)

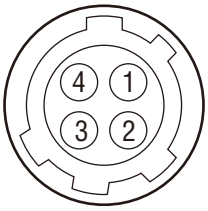
No.	Signal	Input/ output	Specifications
5	TRD – (2)	IN/OUT	Transmitted/Received Data – (2)
6	TRD – (1)	IN/OUT	Transmitted/Received Data – (1)
7	TRD + (3)	IN/OUT	Transmitted/Received Data + (3)
8	TRD – (3)	IN/OUT	Transmitted/Received Data – (3)

DC IN connector



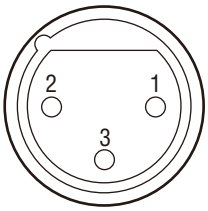
No.	Signal	Input/ output	Specifications
1	EXT DC (C)	–	GND for DC (+)
2	NC	–	No connection
3	NC	–	No connection
4	EXT DC (H)	IN	+10.5 V to +17 V DC

DC OUT connector



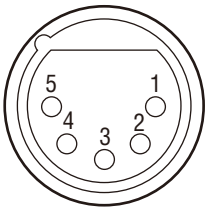
No.	Signal	Input/ output	Specifications
1	UNREG GND	–	GND for UNREG OUT
2	Assignable1	IN/OUT	Digital I/O OUT: Open Collector (max. 10 mA) IN: Contact ON: SHORT OFF: OPEN
3	NC	–	No connection
4	UNREG OUT	OUT	+10.5 V to +17 V DC 1.5 A (max.)

AUDIO IN CH1/2 connector



No.	Signal	Input/ output	Specifications
1	AUDIO CH1/ CH2 (G)	–	–60 dBu, –50 dBu, –40 dBu, –30 dBu, –20 dBu, LINE (0 dBu) selectable, Balanced
2	AUDIO CH1/ CH2 (X)	IN	
3	AUDIO CH1/ CH2 (Y)	IN	

INTERCOM connector

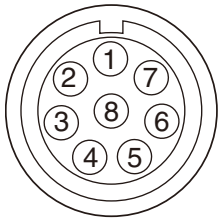


No.	Signal	Input/ output	Specifications
1	Intercom MIC (Y)/ (GND) a)	IN	CARBON: –20 dBu, Unbalanced DYNAMIC: –60 dBu, Balance/ Unbalanced MANUAL
2	Intercom MIC (X)	IN	
3	GND	–	GND
4	Intercom Left	OUT	8 dBu (VR max. 250 Ω load)
5	Intercom Right	OUT	8 dBu (VR max. 250 Ω load)

(0 dBu = 0.775 Vrms)

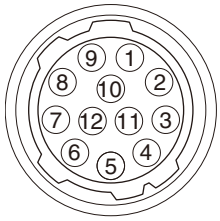
a) When unbalanced

REMOTE connector



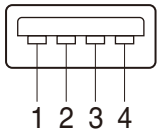
No.	Signal	Input/ output	Specifications
1	TX (+)	OUT	SERIAL DATA OUT
2	TX (–)	OUT	SERIAL DATA OUT
3	RX (+)	IN	SERIAL DATA IN
4	RX (–)	IN	SERIAL DATA IN
5	TX GND	–	GND for TX
6	POWER (+) OUT	OUT	RCP POWER
7	POWER (–) OUT	OUT	GND for POWER
8	VIDEO (X)	OUT	75 Ω, 1.0 V p-p
	CHASSIS GND	–	CHASSIS GND

LENS connector



No.	Signal	Input/ output	Specifications
1	RET VIDEO ENABLE	IN	ENABLE: 0 V DISABLE: +5 V or OPEN
2	VTR CTL	IN	ENABLE: 0 V DISABLE: +5 V or OPEN
3	GND	–	GND for UNREG
4	SERVO MA/ AT	OUT	AUTO: +5 V MANU: 0 V or OPEN
5	IRIS POSITION	OUT	+3.4 V (F16) to +6.2 V (F2.8)
6	UNREG	OUT	+10.5 V to +17 V
7	IRIS POSITION	IN	+3.4 V (F16) to +6.2 V (F2.8)
8	IRIS AT/MA	OUT	AUTO IRIS: 0 V MANUAL IRIS: +5 V
9	EXTENDER ON/OFF	IN	EX 2 ON: GND EX 0.8 ON: 30 kΩ to GND OFF: OPEN
10	ZOOM POSITION	IN	WIDE: 2 V TELE: 7 V
11	FOCUS POSI (LENS RX)	IN	∞: 7 V min.: 2 V
12	FOCUS POSI (LENS TX)	OUT	–

USB connector



No.	Signal	Input/ output	Specifications
1	VBUS	OUT	USB Vcc (+5 V)
2	D+	IN/OUT	USB+
3	D–	IN/OUT	USB–
4	GND	–	GND

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Sony Corporation

SDI Output Formats

SDI OUT and SDI I/O combinations when a CCU is connected

○: Supported, –: Not supported

CAMERA FORMAT setting of CCU [a]	SDI OUT selection options										SDI I/O selection options		
	OFF	MAIN				VF		RET		HD PROMPTER	VF OUT	HD PROMPTER OUT	HD TRUNK IN
		HD/3G-A/ SDR	HD/3G-B/ SDR	HD/1.5G/SDR	SD	HD/1.5G/SDR	SD	HD/1.5G/SDR	SD				
UHD/60.00P (4K/HDR)	○	○	○	○	○	○	○	○	○	○	○	○	–
UHD/59.94P (4K/HDR)	○	○	○	○	○	○	○	○	○	○	○	○	–
UHD/50P (4K/HDR)	○	○	○	○	○	○	○	○	○	○	○	○	–
UHD/30.00P (4K/HDR)	○	–	–	○	○	○	○	○	○	○	○	○	–
UHD/29.97P (4K/HDR)	○	–	–	○	○	○	○	○	○	○	○	○	–
UHD/25P (4K/HDR)	○	–	–	○	○	○	○	○	○	○	○	○	–
UHD/24P (4K/HDR)	○	–	–	○	○	○	○	○	○	○	○	○	–
UHD/23.98P (4K/HDR)	○	–	–	○	○	○	○	○	○	○	○	○	–
1080/60.00P (HDR)	○	○	○	○	○	○	○	○	○	○	○	○	–
1080/59.94P (HDR)	○	○	○	○	○	○	○	○	○	○	○	○	–
1080/50P (HDR)	○	○	○	○	○	○	○	○	○	○	○	○	–
1080/29.97PsF (HDR)	○	–	–	○	○	○	○	○	○	○	○	○	–
1080/25PsF (HDR)	○	–	–	○	○	○	○	○	○	○	○	○	–
1080/24PsF (HDR)	○	–	–	○	○	○	○	○	○	○	○	○	–
1080/23.98PsF (HDR)	○	–	–	○	○	○	○	○	○	○	○	○	–
1080/60.00P	○	○	○	○	○	○	○	○	○	○	○	○	–
1080/59.94P	○	○	○	○	○	○	○	○	○	○	○	○	–
1080/50P	○	○	○	○	○	○	○	○	○	○	○	○	–
1080/29.97PsF	○	–	–	○	○	○	○	○	○	○	○	○	○ [b]
1080/25PsF	○	–	–	○	○	○	○	○	○	○	○	○	○ [b]
1080/24PsF	○	–	–	○	○	○	○	○	○	○	○	○	○ [b]
1080/23.98PsF	○	–	–	○	○	○	○	○	○	○	○	○	○ [b]
1080/59.94i	○	–	–	○	○	○	○	○	○	○	○	○	○ [b]
1080/50i	○	–	–	○	○	○	○	○	○	○	○	○	○ [b]
720/59.94P	○	–	–	○	○	○	○	○	○	○	○	○	○ [b]
720/50P	○	–	–	○	○	○	○	○	○	○	○	○	○ [b]

a) To select UHD format using the CAMERA FORMAT setting of the CCU, the HZC-UHD9 software option must be installed.
b) Disabled when the network trunk is set to 1 Gbps.

SDI OUT and SDI I/O combinations during standalone operation

○: Supported, –: Not supported

OUTPUT FORMAT > RESOLUTION setting [a]	OETF	SDI OUT selection options																SDI I/O selection options		
		OFF	MAIN											VF		RET		VF OUT	HD RETURN IN	SD RETURN IN
			4K/12G/ HDR	4K/12G/ SDR	4K/6G/ HDR	4K/6G/ SDR	HD/ 3G-A/ HDR	HD/ 3G-A/ SDR	HD/ 3G-B/ HDR	HD/ 3G-B/ SDR	HD/1.5G/ HDR	HD/1.5G/ SDR	SD	HD/1.5G/ SDR	SD	HD/1.5G/ SDR	SD			
3840×2160/60.00P	SDR	○	–	○	–	–	–	○	–	○	–	○	○	○	○	○	○	○	○	○
3840×2160/60.00P	S-Log3, HLG	○	○	–	–	–	–	○	–	○	–	○	○	○	○	○	○	○	○	○
3840×2160/59.94P	SDR	○	–	○	–	–	–	○	–	○	–	○	○	○	○	○	○	○	○	○
3840×2160/59.94P	S-Log3, HLG	○	○	–	–	–	–	○	–	○	–	○	○	○	○	○	○	○	○	○
3840×2160/50P	SDR	○	–	○	–	–	–	○	–	○	–	○	○	○	○	○	○	○	○	○
3840×2160/50P	S-Log3, HLG	○	○	–	–	–	–	○	–	○	–	○	○	○	○	○	○	○	○	○
3840×2160/30.00P	SDR	○	–	–	–	○	–	–	–	–	–	○	○	○	○	○	○	○	○	○
3840×2160/30.00P	S-Log3, HLG	○	–	–	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
3840×2160/29.97P	SDR	○	–	–	–	○	–	–	–	–	–	○	○	○	○	○	○	○	○	○
3840×2160/29.97P	S-Log3, HLG	○	–	–	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
3840×2160/25P	SDR	○	–	–	–	○	–	–	–	–	–	○	○	○	○	○	○	○	○	○
3840×2160/25P	S-Log3, HLG	○	–	–	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
3840×2160/24P	SDR	○	–	–	–	○	–	–	–	–	–	○	○	○	○	○	○	○	○	○
3840×2160/24P	S-Log3, HLG	○	–	–	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
3840×2160/23.98P	SDR	○	–	–	–	○	–	–	–	–	–	○	○	○	○	○	○	○	○	○
3840×2160/23.98P	S-Log3, HLG	○	–	–	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
1080/60.00P	SDR	○	–	–	–	–	–	○	–	○	–	○	○	○	○	○	○	○	○	○
1080/60.00P	S-Log3, HLG	○	–	–	–	–	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1080/59.94P	SDR	○	–	–	–	–	–	○	–	○	–	○	○	○	○	○	○	○	○	○
1080/59.94P	S-Log3, HLG	○	–	–	–	–	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1080/50P	SDR	○	–	–	–	–	–	○	–	○	–	○	○	○	○	○	○	○	○	○
1080/50P	S-Log3, HLG	○	–	–	–	–	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1080/29.97PsF	SDR	○	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
1080/29.97PsF	S-Log3, HLG	○	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○
1080/25PsF	SDR	○	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
1080/25PsF	S-Log3, HLG	○	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○
1080/24PsF	SDR	○	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
1080/24PsF	S-Log3, HLG	○	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○
1080/23.98PsF	SDR	○	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
1080/23.98PsF	S-Log3, HLG	○	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○
1080/59.94i	SDR	○	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○

OUTPUT FORMAT > RESOLUTION setting [a]	OETF	SDI OUT selection options																SDI I/O selection options		
		OFF	MAIN											VF		RET		VF OUT	HD RETURN IN	SD RETURN IN
			4K/12G/ HDR	4K/12G/ SDR	4K/6G/ HDR	4K/6G/ SDR	HD/ 3G-A/ HDR	HD/ 3G-A/ SDR	HD/ 3G-B/ HDR	HD/ 3G-B/ SDR	HD/1.5G/ HDR	HD/1.5G/ SDR	SD	HD/1.5G/ SDR	SD	HD/1.5G/ SDR	SD			
1080/50i	SDR	○	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
720/59.94P	SDR	○	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○
720/50P	SDR	○	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○

a) To select 3840x2160 using the OUTPUT FORMAT > RESOLUTION setting, the HZC-UHD9 software option must be installed. Also, 4K video output is supported in standalone operation mode only.