3-chip CCD Portable Color Camera

BVP-70IS/70ISP

SONY

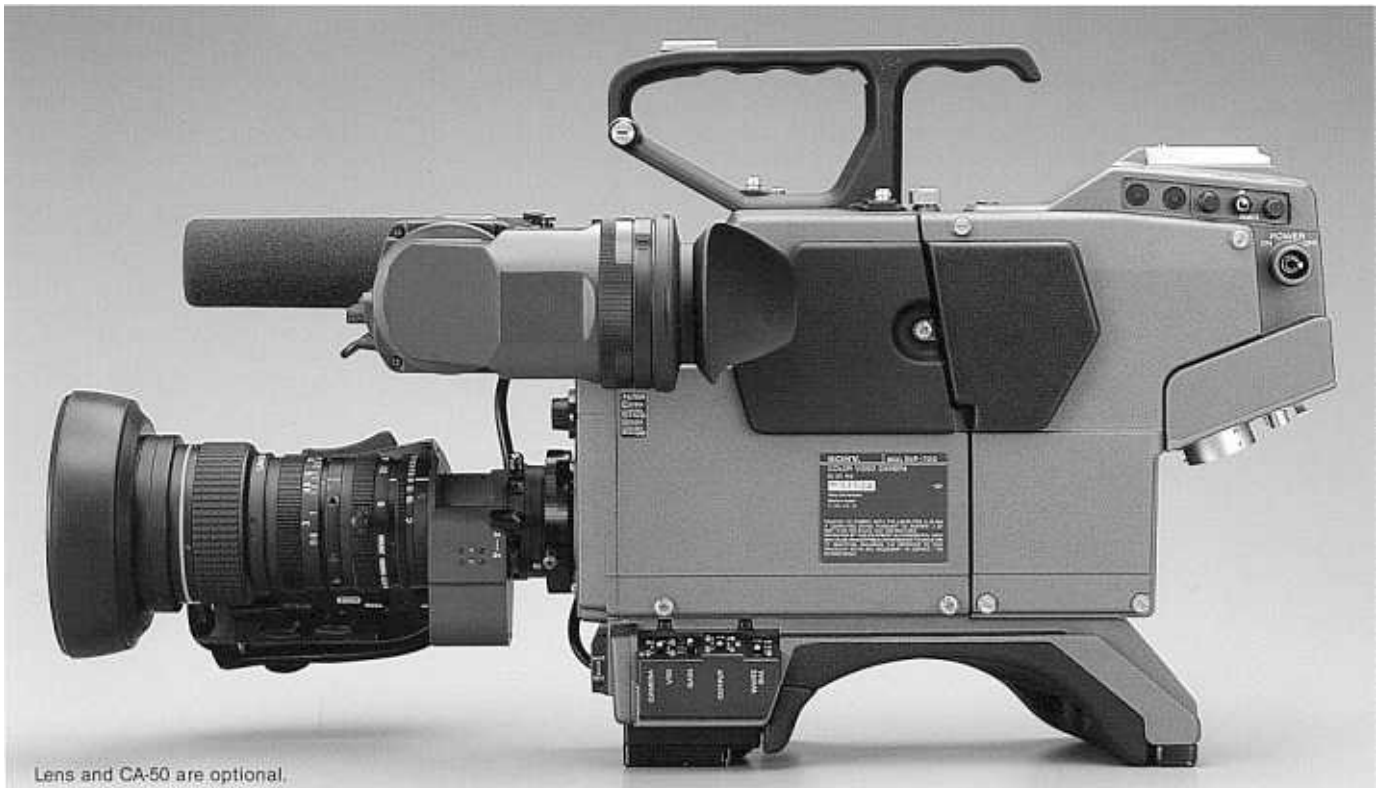The benefits of Sony's extensive and far reaching research into CCD technology and its enormous experience of camera design now culminate in the BVP-70IS/70ISP. Breaking new ground in picture quality, sensitivity and operational features, the BVP-70IS/70ISP opens a new era of portable color cameras.

Incorporating the newly developed Hyper HAD™ sensor, the BVP-70IS/70ISP boasts the incredibly high sensitivity of F8.0. The Frame-Interline-Transfer method used in combination with the structure of this new CCD sensor, virtually eliminates the smear phenomenon which is inherent in conventional CCD cameras. This makes the BVP-70IS/70ISP ideal for picture acquisition even under low light conditions as well as being able to deal with situations where high contrast handling is necessary.

Picture quality of the BVP-70IS/70ISP is remarkable. The camera features a very high horizontal luminance resolution of 700 TV lines, an exceptional signal-to-noise ratio of 62dB (NTSC)/60dB (PAL) and superior color reproduction. An electronic shutter has been included to maximize the BVP-70IS/70ISP's superb picture quality.

Maximum system versatility is yet another benefit that the BVP-70IS/70ISP provides. It can be used stand-alone, assembled as a Betacam SP™ Combo or interfaced with multicore or triax CCU's.

The BVP-70IS/70ISP, providing the highest possible picture quality available, presents the ultimate in current camera performance for advanced ENG operations, high quality EFP and even for studio operations.

Lens and CA-50 are optional.

Outstanding Features

Superior Quality Picture

● High sensitivity

The BVP-70IS/70ISP uses the newly developed FIT Hyper HAD sensor which combines Sony's well proven HAD sensorTM with an OCL (On-Chip-Lens) layer placed on its surface. The structure of the HAD sensor enables a wide aperture ratio while the OCL layer effectively converges incoming light onto each photo sensor. As a result, the BVP-70IS/70ISP achieves an incredibly high sensitivity of F8.0 at 2000 lux.

● Invisible smear level

In addition to use of the Frame-Interline-Transfer method, the HAD sensor structure and OCL layer of the FIT Hyper HAD sensor also significantly contribute to the reduction of vertical smear. The vertical smear phenomenon is virtually eliminated in the BVP-70IS/70ISP due to the very low smear level of −140dB.

● Excellent signal-to-noise ratio

By employing advanced electronic circuitry, the BVP-70IS/70ISP achieves the excellent signal-to-noise ratio of 62dB (NTSC)/60dB (PAL). Dark current is also considerably reduced due to the HAD sensor structure of the Hyper HAD sensor. This gives a corresponding reduction in fixed pattern noise, maintaining low noise characteristics in even high temperatures.

● High resolution

A very high pixel density, of 768(H) × 494(V) (NTSC) or 752(H) × 582(V) (PAL) effective picture elements, allied to precise spatial offset technique, yields a remarkable 700 TV lines of horizontal luminance resolution.

● Superior color reproduction

Improvements to CCD spectral response together with optimum matrix correction have produced a colorimetry which closely approximates to that of Plumbicon™ cameras.

● Other CCD advantages

In addition to the outstanding features described above, the BVP-70IS/70ISP provides a multitude of advantages by using Sony's CCDs.
— No problems of lag and image burn-in
— Impervious to vibration and shock
— Inherent immunity to strong electric or magnetic fields
— Free from registration adjustments

Electronic Shutter

The BVP-70IS/70ISP features a variable speed electronic shutter built into the CCD imager. This enables the BVP-70IS/70ISP to capture clear images of high speed movement, as well as significantly improving dynamic resolution.

The shutter speed can be easily selected with a switch on the camera head. It may also be selected from the CCU-350/350P/355/355P/370/370P.

Shutter Speed

NTSC: $1/100$, $1/125$, $1/250$, $1/500$, $1/1000$, $1/2000$ (seconds)
PAL: $1/60$, $1/125$, $1/250$, $1/500$, $1/1000$, $1/2000$ (seconds)

Dynamic Contrast Control
(Auto knee control)
Picture clarity under difficult scene contrast conditions can be enhanced by use of the DCC circuit and improved aperture correction circuit. Dynamic Contrast Control can be switched ON or OFF at the camera head. With DCC ON, the dynamic range is extended by 600%.

Automatic Iris Control
The iris can be controlled automatically and the response speed is improved by using feedback within the 12-pin lens connector.

Automatic White/Black Balance
The white balance system includes two memories for each optical filter (4 positions). Automatic black balance includes automatic tracking to maintain balance at high gain.

Viewfinder

• High resolution CRT
The 1.5-inch monochrome viewfinder supplied with the BVP-70IS/70ISP features a CRT of 550 TV lines resolution. A crisp picture with a dual peaking adjustment can be observed comfortably through the large lens. The CRT has a quick start heater producing viewable pictures within approximately 1 second after the power is on. In addition, the eye piece can be detached from the viewfinder for further operational convenience.

•Viewfinder indicators
The following viewfinder indicators are available.
— Shutter speed
— Record status indicator (red)
— Filter position (1 to 4)
— Audio level indicator (ch-1)
— Zebra video level indicator
— Gain indicator
— White/black balance confirmation

• Acoustic noise cancellation
The microphone electrically cancels vibration noise. This allows interference-free sound recording, even when the camera is combined with a Betacam™ recorder unit in a difficult shooting environment.

•Safety zone and center marker
The BVP-70IS/70ISP has a generator to display a safety zone and a center marker in the viewfinder. The safety zone can indicate either 80% or 90% of the viewfinder frame according to the selection of the internal slide switch. Mode selection of safety zone only, center marker only, safety zone with center marker, or indications OFF, is by a single, convenient switch located on the camera head.

System Versatility
The BVP-70IS/70ISP can be coupled with a BVV-5/5PS Betacam SP VTR to provide a single-unit Betacam for ENG/EFP use. Furthermore, the BVP-70IS/70ISP can be interfaced with various portable VTRs, such as the Sony D-2, Betacam SP, and U-matic series, using either a CA-3A or CA-50 series Camera Adaptor.
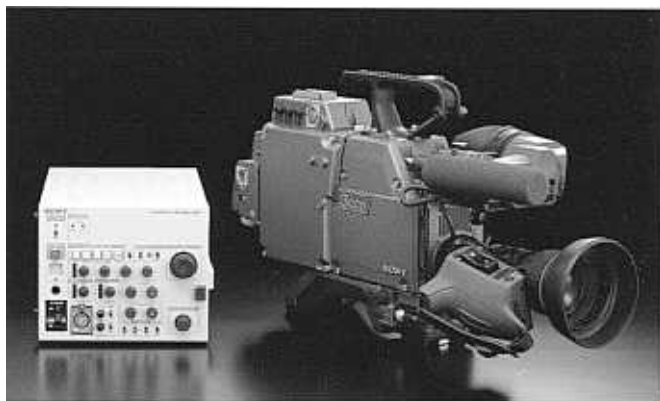Important camera functions can be remotely controlled from the camera control units (in combination with the CA-50 series Camera Adaptors). Thus, the BVP-70IS/70ISP can be fully integrated into the studio/EFP multiple camera systems. For local control, the handy RM-P3 Remote Control Unit provides most of the basic user functions.

•Camera Control Units
When coupled with the CA-50 series Camera Adaptor, the BVP-70IS/70ISP parameters can be remotely controlled from three types of camera control units. The combinations of CCUs and Camera Adaptors are as follows:

    CCU-350/350P—CA-50/50P via Multicore cable
    CCU-355/355P—CA-55/55P via Triax cable
    CCU-370/370P—CA-57/57P via Triax cable

These camera control units can be mounted in a standard 19-inch rack (CCU-370/370P—19″ rack size in width; CCU-350/350P/355/355P—half-rack size in width).

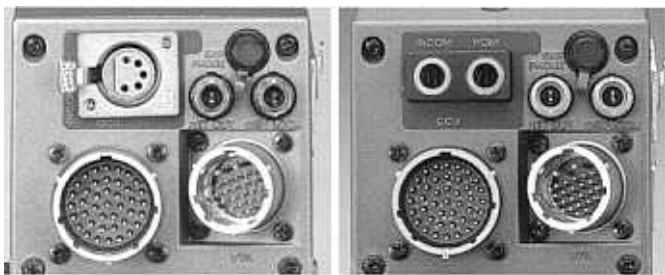BVP-70IS/CA-55 with CCU-355

● Camera Adaptors

The CA-50 series of Camera Adaptors are designed for use with the BVP series of Portable Cameras.

CA-50/50P

The CA-50/50P provides the 41-pin multicore connector to interface with the CCU-350/350P via CCW-B/CCW Multicore Cable. The maximum cable length is 300m.

CA-50   CA-50P

CA-55/55P

The CA-55/55P is furnished with a triax cable interface for use with the CCU-355/355P. Maximum cable lengths are as follows:

    900m with φ8.5mm cable,
    1350m with φ13.2mm cable,
    1800m with φ14.5mm cable.

CA-55   CA-55P

CA-57/57P

The CA-57/57P is furnished with a triax cable interface for use with the CCU-370/370P. Range of operation is dependent upon cable type:

    1500m (1200m)* with φ8.5mm cable
    2250m (1800m)* with φ13.2mm cable
    3000m (2400m)* with φ14.5mm cable
    *For return video

CA-57   CA-57P

These camera adaptors are also equipped with Sony CCZ connectors (26-pin) for connection to portable VTRs.

● BVF-55/55CE Viewfinder

The BVF-55/55CE is a high resolution 5-inch Monochrome Viewfinder which can be mounted on the BVP-70IS/CA-50 series combination for studio/OB operation. The tally facility of the BVF-55/55CE is available in this configuration. The BVF-55/55CE also offers center marker and safety zone indications as a further convenience in studio/OB operation.

● BVF-3 Viewfinder

The compact 3-inch Monochrome Viewfinder, the BVF-3, is designed for increased operational flexibility, particularly when adopting "hand-held" technique.

● RM-P3 Remote Control Unit

Basic remote control of the BVP-70IS/70ISP can be performed by the compact RM-P3 Remote Control Unit, which plugs directly into the camera head. This also allows local video control of a BVW-570IS/570ISP Betacam camcorder.
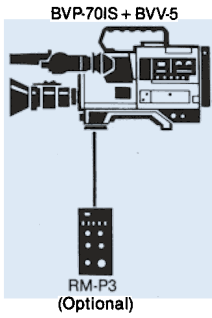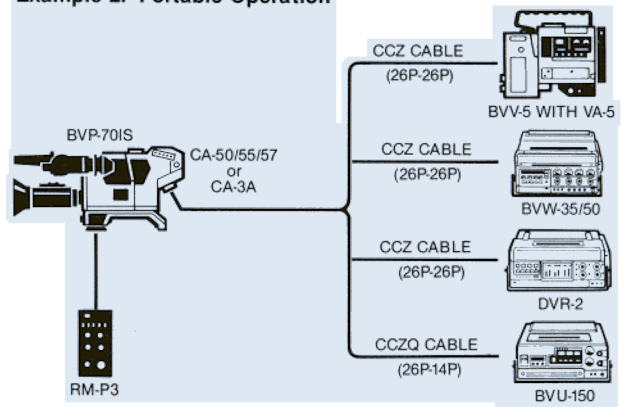

Other Features

- 2H image enhancer.
- Automatic shading compensation for lens extender.
- Adjustable viewfinder position—both laterally and horizontally.
- The supplied VCT-14 Tripod Adaptor allows an external battery to be mounted underneath the on-board VTRs.
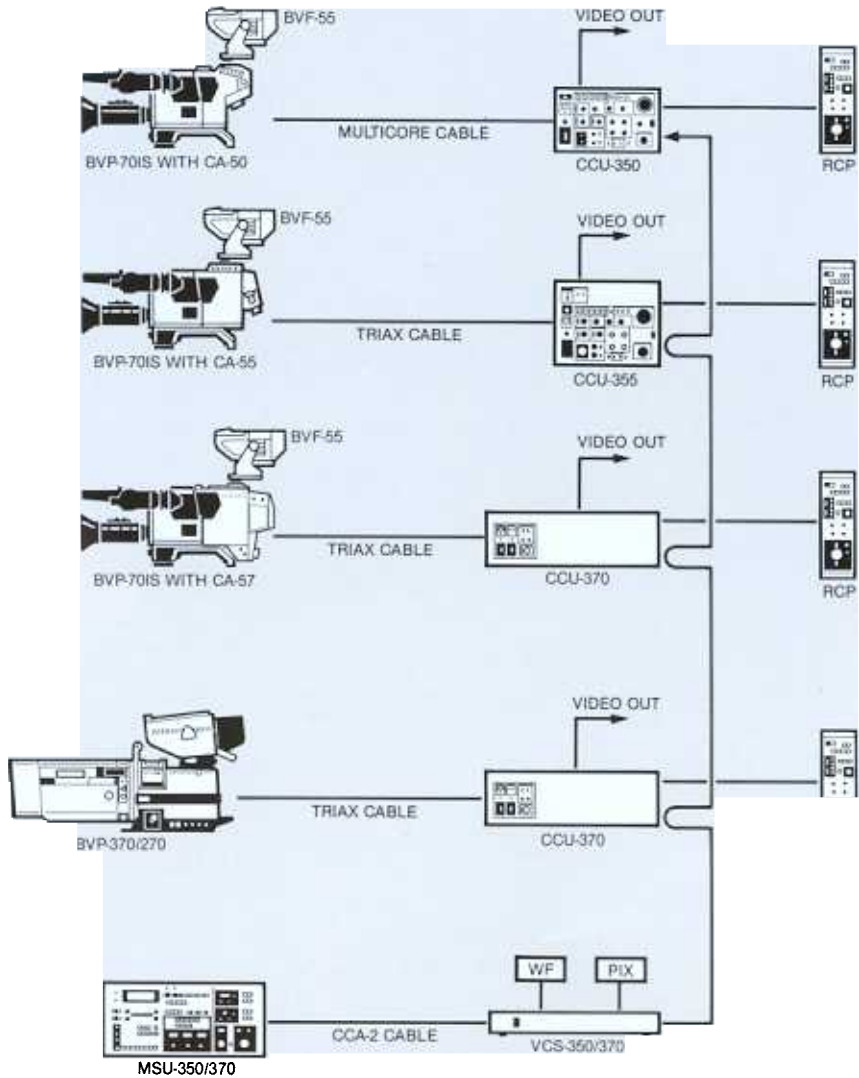
System Connections
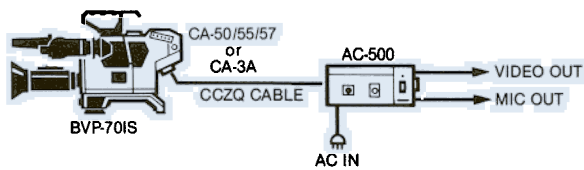
Example 1. Betacam Combination (BVW-570IS)

BVP-70IS + BVV-5

RM-P3
(Optional)

Example 2. Portable Operation

BVP-70IS

CA-50/55/57
or
CA-3A

RM-P3

CCZ CABLE
(26P-26P)
BVV-5 WITH VA-5

CCZ CABLE
(26P-26P)
BVW-35/50

CCZ CABLE
(26P-26P)
DVR-2

CCZQ CABLE
(26P-14P)
BVU-150

Example 3. Multiple Camera Operation

BVF-55

BVP-70IS WITH CA-50

MULTICORE CABLE

VIDEO OUT

CCU-350

RCP

BVF-55

BVP-70IS WITH CA-55

TRIAX CABLE

VIDEO OUT

CCU-355

RCP

BVF-55

BVP-70IS WITH CA-57

TRIAX CABLE

VIDEO OUT

CCU-370

RCP

BVP-370/270

TRIAX CABLE

VIDEO OUT

CCU-370

WF   PIX

VCS-350/370

MSU-350/370

CCA-2 CABLE

Example 4. AC Power Operation

BVP-70IS

CA-50/55/57
or
CA-3A

CCZQ CABLE

AC-500

AC IN

VIDEO OUT

MIC OUT

Optional Accessories

AC-500/500CE
AC Adaptor

BC-1WB
Battery Charger for NP-1B
(for up to four NP-1Bs)

BC-410/410CE
Battery Charger for up to four
NP-1Bs and four BP-90As

BP-90A
Ni-Cd Rechargeable Battery

NP-1B
Ni-Cd Rechargeable Battery

DC-210
Battery Case for BP-90A

DC-300
Battery Case for BP-90A

DC-310
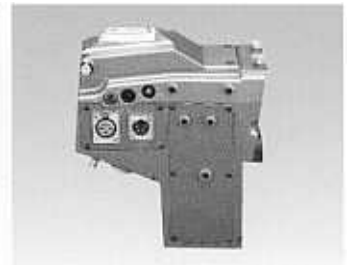Battery Case for NP-1B
(for up to two NP-1Bs)

BVF-3
3″ Viewfinder

BVF-55/55CE
5″ Viewfinder

CA-3A
Camera Adaptor

CA-50/50P
Camera Adaptor
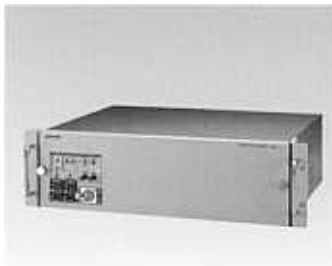
CA-55/55P
Camera Adaptor

CA-57/57P
Camera Adaptor

CCU-350/350P
Camera Control Unit

CCU-355/355P
Camera Control Unit

CCU-370/370P
Camera Control Unit

RM-P3
Remote Control Unit

CAC-GR01
Camera Grip

BKW-401
Viewfinder Rotation Bracket

Connecting cables
- CCZ cable (26-pin—26-pin): CCZ-2 (2m), CCZ-10 (10m)
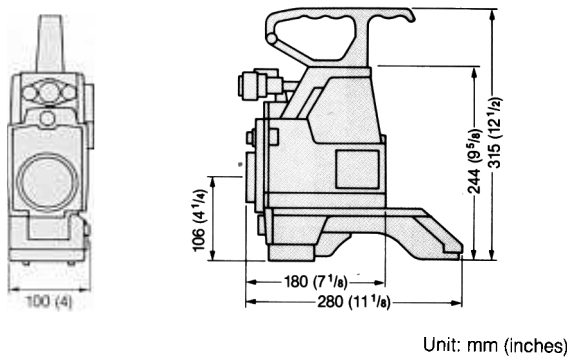- CCZQ cable (26-pin—14-pin): CCZQ-2 (2m), CCZQ-10 (10m)
- CCW-B cable (41-pin—41-pin): CCW-B25 (25m), CCW-B50 (50m), CCW-B100 (100m)
- CCW cable (41-pin—41-pin): CCW-25 (25m), CCW-50 (50m), CCW-100 (100m)
- CCT cable (triax): CCT-50 (50m), CCT-100 (100m), CCT-150 (150m), CCT-300 (300m)
- CCT-K cable (triax): CCT-K50 (50m), CCT-K100 (100m), CCT-K150 (150m), CCT-K300 (300m)

Specifications

BVP-70IS/70ISP

Camera

Pick-up device	3-chip $^2/_3''$ Frame-Interline-Transfer CCD
Picture elements	BVP-70IS: 768(h) × 494(v) BVP-70ISP: 752(h) × 582(v)
Optical filters	
Lens mount	
Video output	1.0Vp-p, 75 ohms, sync negative Two outputs (TEST OUT, VTR connector)
Connectors	
VTR	50-pin
TEST OUT	BNC type
LENS	12-pin
REMOTE	6-pin
Sensitivity	F8.0 at 2000 lux (3200K, 89.9% reflectance)
Minimum illumination	Approx. 7.5 lux (F1.4 lens, +18dB gain)
Video signal-to-noise ratio	BVP-70IS: 62dB (typical) BVP-70ISP: 60dB (typical)
Horizontal resolution	700 TV lines (luminance at center)
Registration	0.05% (all zones without lens)
Geometric distortion	Below measurable level (without lens)
Power requirements	DC 12V (10.5V to 17V)
Power consumption	14 W
Operating temperature	−20°C to +45°C (−4°F to +113°F)
Storage temperature	−20°C to +60°C (−4°F to +140°F)
Weight	Approx 3.4 kg (7 lb 8 oz) with viewfinder

Viewfinder

Picture tube	1.5-inch monochrome
Warm-up time	1 second
Controls	BRIGHT control, CONTR control, AUDIO LEVEL CH-1 control, PEAKING volume, TALLY ON/OFF switch, ZEBRA ON/OFF switch AUDIO/FILTER selector
Horizontal resolution	550 TV lines

Microphone

Supplied accessories

Tripod adaptor (VCT-14) × 1
Extension board × 1
Extractor × 1
50-pin connector cap × 1
Rain cover × 1
Cap for handle hole × 1
Operation and maintenance manual × 1

Dimensions

Unit: mm (inches)

CA-50/50P

Connectors	
MIC IN	XLR 3-pin, 600 ohms, balanced
DC IN	XLR 4-pin, 10.5V to 17V
DC OUT	4-pin, 10.5V to 17V
GENLOCK IN	BNC, 1.0Vp-p, 75 ohms
RET OUT	BNC, 1.0Vp-p, 75 ohms
EARPHONE	Mini jack, 8 ohms
CAMERA	50-pin
VTR	26-pin (CCZ type)
CCU	41-pin (CCW-B or CCW type)
INCOM/PGM	Headset XLR 5-pin (NTSC) Headset double jack (PAL)
Power consumption	2 W
Weight	Approx. 1.5 kg (3 lb 5 oz)
Dimensions	

Unit: mm (inches)

CA-55/55P

Connectors	
MIC IN	XLR 3-pin, 600 ohms, balanced
DC IN	XLR 4-pin, 10.5V to 17V
DC OUT	4-pin, 10.5V to 17V 5-pin, 120V
GENLOCK IN	BNC, 1.0Vp-p, 75 ohms
RET OUT	BNC, 1.0Vp-p, 75 ohms
RETURN CONTROL	6-pin
EARPHONE	Mini jack, 8 ohms
CAMERA	50-pin
VTR	26-pin (CCZ type)
CCU	KINGS type (NTSC) FISCHER type (PAL)
INCOM/PGM	Headset XLR 5-pin (NTSC) Headset double jack (PAL)
Power consumption	7.5 W
Weight	Approx. 3 kg (6 lb 10 oz)
Dimensions	

Unit: mm (inches)

CA-57/57P

Connectors	
MIC IN	XLR 3-pin, 600 ohms, balanced
DC IN	XLR 4-pin, 10.5V to 17V
DC OUT	4-pin, 10.5V to 17V
GENLOCK IN	BNC, 1.0Vp-p, 75 ohms
RET OUT	BNC, 1.0Vp-p, 75 ohms
RETURN CONTROL	6-pin
DATA	12-pin
EXTERNAL IN/OUT	20-pin
EARPHONE	Mini jack, 8 ohms
CAMERA	50-pin
VTR	26-pin (CCZ type)
CCU	KINGS type (NTSC) FISCHER type (PAL)
INCOM/PGM	Headset XLR 5-pin (NTSC) Headset double jack (PAL)
Power consumption	13.0 W
Weight	Approx. 3.2 kg (7 lb 1 oz)
Dimensions	

Unit: mm (inches)

Design and specifications subject to change without notice.
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