Panasonic

AK-HC3800
Studio Handy Camera

AK-HC3800G (Tajimi connector model)
AK-HC3800GS (LEMO connector model)

A Studio and EFP Camera System for Broadcast Use That Delivers High-End Image Quality and Enables Long-Distance Optical Fiber Transmission at Low Cost.

This cost-effective HD camera system with optical fiber transmission capability meets the high-end TV program production needs of broadcast studios.

The developed AK-HC3800 Studio Handy Camera is equipped with a high-sensitivity, high-quality 2/3 type 2.2 megapixel 3CCD and a high-precision 16 bit A/D image processing circuit. The advanced digital functions such as Chromatic Aberration Compensation (CAC), Digital Extender, Film Rec Gamma, Dynamic Range Stretch (DRS) and etc.

realize high image quality and versatile operations. By using the AK-HC3800 together with the AK-HCU200 Camera Control Unit, AK-HRP200G Remote Operation Panel and AK-HVF70G 17.8 cm (7 inches) LCD Color Viewfinder, an optical fiber transmission studio camera system that achieves high image quality, uncompressed and long-distance transmission, can be configured at a low cost. The camera and camera control unit can be connected for long-distance transmission of video signals over approximately 1,200 m (1,312 yards) when power is supplied from the camera control unit.

The camera control unit and remote operation panel are connected either by a dedicated cable or an IP connection. Overall, the system offers excellent cost-performance and easy set-up.

* The photo shows a system example of the AK-HC3800GS (LEMO connector model).
* For studio zoom lens use, the lens support devices recommended by each lens manufacturer are required. The AK-HBU3500 build-up unit is not supported.

AK-HC3800

AK-HC3800G (Tajimi connector model)
AK-HC3800GS (LEMO connector model)

Studio Handy Camera

High Quality Images Achieved by a Highly Developed DSP.
Advanced Digital Technology Allows Compact, Lightweight Lenses to Meet Studio Production Needs.

3CCD with High Sensitivity, Low Noise and Low Smear

The 2/3 type 2.2 megapixel 3CCD enables the standard sensitivity of F11 (2,000 lx/59.94 Hz) which is one of the highest sensitivity in this range of cameras. A high S/N ratio of 60 dB (at 59.94 Hz) produces high quality images with low noise and low smear. Panasonic's single-channel transfer system and spatial-offset processing technologies also improve signal modulation depth and reduce moire.

Output signal gain without spatial-offset processing

Output signal gain with spatial-offset processing

G CCD
R CCD
B CCD
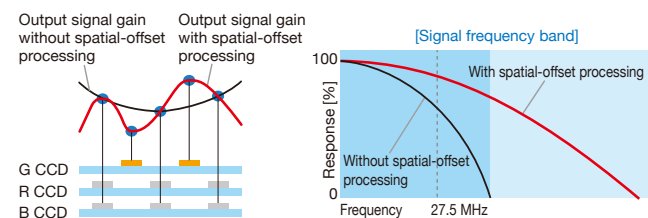
With spatial-offset processing, green samples are offset, allowing change in the object to be more faithfully reproduced.

[Signal frequency band]

With spatial-offset processing

Response [%]

Without spatial-offset processing

Frequency   27.5 MHz

With spatial-offset processing, the depth of modulation of high-frequency signals is greatly improved.

High-Performance DSP Provides 16 bit A/D, 38 bit Processing

HD images are digitized with 74 MHz sampling and 16 bit A/D conversion. Full 38 bit processing within the DSP produces highly detailed, high quality images.

High-Performance DSP

Multi Video Format

For HD, supporting 1080/59.94i, 1080/50i, 1080/23.98p, 25p and 1080/29.97p video format are supported as standard. In addition, 720/59.94p, 720/50p and 1080/23.98PsF video format can also be supported when selected on CCU.

Chromatic Aberration Compensation (CAC)

This exclusive technology sets up a conversation between lens and camera which allows for a highly sophisticated algorithm to be deployed that will automatically compensate the registration error that is caused mainly by lens chromatic aberration, and minimize the circumjacent blur.   * When a CAC-compatible lens is used.

Simulation Showing the CAC (Chromatic Aberration Compensation) Effect

Full screen   CAC OFF   CAC ON

Film Rec Gamma and Scan Reverse Functions

Selectable gamma curves are included in the DSP circuit. The Film Rec mode produces the kind of film tone that you get with Panasonic VARICAM models. The Scan Reverse function is mounted by standard functions that cancels the image inversion that happens when using a HD lens adaptor or shooting with special effects such as 3D rig.

Digital Extender (2x)

This function expands the image by 2x in the digital signal processing circuit, allowing powerful shooting even with a low-magnification lens. HD images retain their superior resolution even with zooming, and — unlike when a lens extender is used — brightness is not reduced.

Dynamic Range Stretch (DRS)

The DRS function automatically suppresses blocked shadows and blown highlights. A gamma curve and knee slope are estimated to match the contrast of each pixel, and applied in real time. When dark, bright, and intermediate shades are all contained in the same scene, this produces excellent gradation for each shade. The images that result are enhanced by a visually wide dynamic range.

An image showing the DRS (Dynamic Range Stretch) effect.

DRS OFF   DRS ON
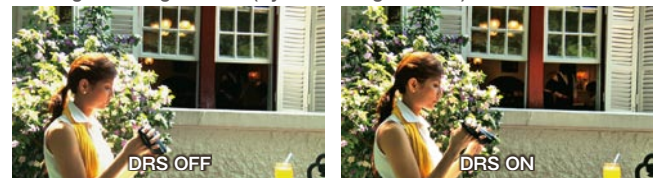
While suppressing washed out colors such as those when shooting garden greenery, it also reduces blocked shadows in dark areas when recording people indoors.

Other Advanced Digital Functions

- 12-axis color correction, linear matrix, and other color correction functions.
- Selectable EBU or NTSC preset matrix.
- A skin tone detail function with two skin tone settings.
- A lens file function (for up to 32 files) to save flare and shading values.
- Camera settings, such as VF settings, can be saved on an SD memory card. SD memory cards can also be used for firmware upgrades.
- Various information, including the color temperature setting, is displayed in the viewfinder.

Rearpanel and Connector

AK-HCU200

Camera Control Unit (CCU)

AK-HCU200P/HCU200E (Tajimi connector model)
AK-HCU200PS/HCU200ES (LEMO connector model)

Allows a High-Quality, Uncompressed, Long-Distance Optical Fiber Transmission Camera System to Be Configured at Low Cost

High-Definition, Long-Distance, Optical Digital Transmission
By connecting the CCU and the AK-HC3800 Studio Handy Camera by optical fiber cable, uncompressed digital signals can be transmitted with high quality. The cable between the camera and the CCU can be extended up to approximately 1,200 m (1,312 yards).[*1]
*1: When power is supplied from the CCU.

HD Multi-Format Supported
The AK-HCU200 is 59.94 Hz/50 Hz switchable, and supports 1080/59.94i, 1080/50i, 1080/29.97PsF,[*2] 1080/25PsF,[*2] 1080/23.98PsF,[*2] 720/59.94p, and 720/50p HD formats.
*2: The 1080/29.97PsF, 1080/25PsF and 1080/23.98PsF formats must be selected at the camera.

Prompter Supported
Two SDI channels and one VBS channel are provided for RET input, and prompter input (analog video signal input) is included as standard. Prompt signals input to the CCU can be output from the prompter terminal on the camera side.

HD/SD Simultaneous Operation
Two SDI OUT and two SDI OUT (PM) lines are provided. In addition to HD video signal output, SD downconverted video signal output (SDI, analog composite) comes as standard. SD monitoring is also possible.

IP Connection Camera Remote
Multiple AK-HRP200G Remote Operation Panels and up to 19 AK-HCU200 Camera

Control Units can be routed through a hub with IP connection. Camera control units on a LAN can be freely controlled by the remote operation panels for highly versatile operation.

Compatibility with ROP/MSU
The AK-HRP935 Remote Operation Panel or AK-MSU935 Master Setup Unit can also be used for serial remote control of the AK-HCU200 camera control unit.[*3]
*3: Only functions that are supported by the CCU can be controlled by the AK-MSU935 or AK-HRP935.

2U Rack Mounting Size
The 2U height of this compact, lightweight unit allows 2U rack mounting.

Setting Up CCU with a PC
When connecting a CCU and PC by IP connection, the CCU set-up menu can be displayed and changed on the PC's web browser.

Bar ID Display Output
Text can be superimposed onto the color bar output signal. Displaying the video source and other information in this way is convenient during system set-up and standby.

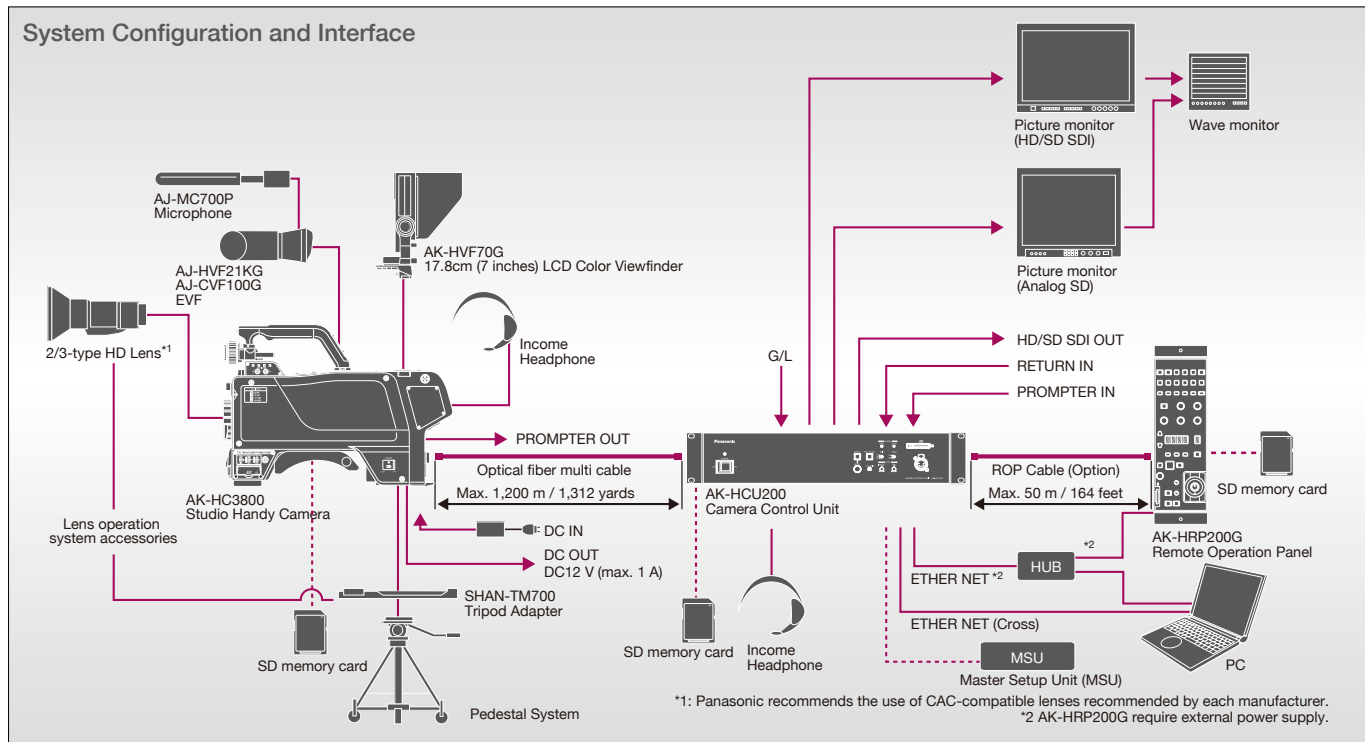**SD Memory Cards Supported**
The SD memory card slot allows CCU setting data to be saved on an SD memory card. Firmware updates can also be handled by SD memory card.

AK-HCU200 front panel and rear panel

System Configuration and Interface

AJ-MC700P Microphone

AJ-HVF21KG AJ-CVF100G EVF

2/3-type HD Lens[*1]

AK-HVF70G 17.8cm (7 inches) LCD Color Viewfinder

Income Headphone

AK-HC3800 Studio Handy Camera

Lens operation system accessories

SHAN-TM700 Tripod Adapter

SD memory card

Pedestal System

PROMPTER OUT

Optical fiber multi cable Max. 1,200 m / 1,312 yards

DC IN

DC OUT DC12 V (max. 1 A)

AK-HCU200 Camera Control Unit

G/L

Income Headphone

SD memory card

Picture monitor (HD/SD SDI)

Wave monitor

Picture monitor (Analog SD)

HD/SD SDI OUT
RETURN IN
PROMPTER IN

ROP Cable (Option) Max. 50 m / 164 feet

ETHER NET [*2]

HUB [*2]

ETHER NET (Cross)

MSU

Master Setup Unit (MSU)

SD memory card

AK-HRP200G Remote Operation Panel

PC

*1: Panasonic recommends the use of CAC-compatible lenses recommended by each manufacturer.
*2 AK-HRP200G require external power supply.

3

AK-HRP200G

Remote Operation Panel (ROP)

A Compact Operation Panel for Serial Connection and for Controlling up to 19 Cameras with IP Connection

Control of up to 19 Cameras with IP Connection*1
The AK-HRP200 supports both serial (1:1) and IP connection.*1 IP connection enables up to 19 cameras to be controlled by a single remote operation panel.
*1: External power supply (DC 12 V) required when LAN cable is used. Power is supplied by the camera control unit in serial connection.

Support a Variety of Cameras
Four connection modes — CCU Serial, CCU IP, Remote Camera Serial, and Remote Camera IP — enable single or combined remote control of studio handy cameras, multi-purpose cameras, HD convertible cameras, and HD integrated cameras.

Applicable Cameras and Connection Modes

	Serial Control	IP Control
AK-HC3800*2	√	√
AK-HC3500*2*3	√	—
AK-HC1800G	√	—
AK-HC1500G	√	—
AW-HE870N/E	√	—
AW-HE120WP/WE/KP/KE	√	√
AW-HE60SN/SE/HN/HE	√	√

*2: Via a camera control unit (CCU). *3: Some functions are not supported.

ROP Menu Setting
The menu can be displayed on a monitor connected to the Camera Control Unit, so detailed camera settings can be made by operating the Remote Operation Panel.

Joystick Control Lever
The joystick control lever enables fine manual iris/pedestal operation.

SD Memory Card Slot
Scene files and user files can be saved with the SD memory card slot. SD memory cards can also be used for firmware upgrades.
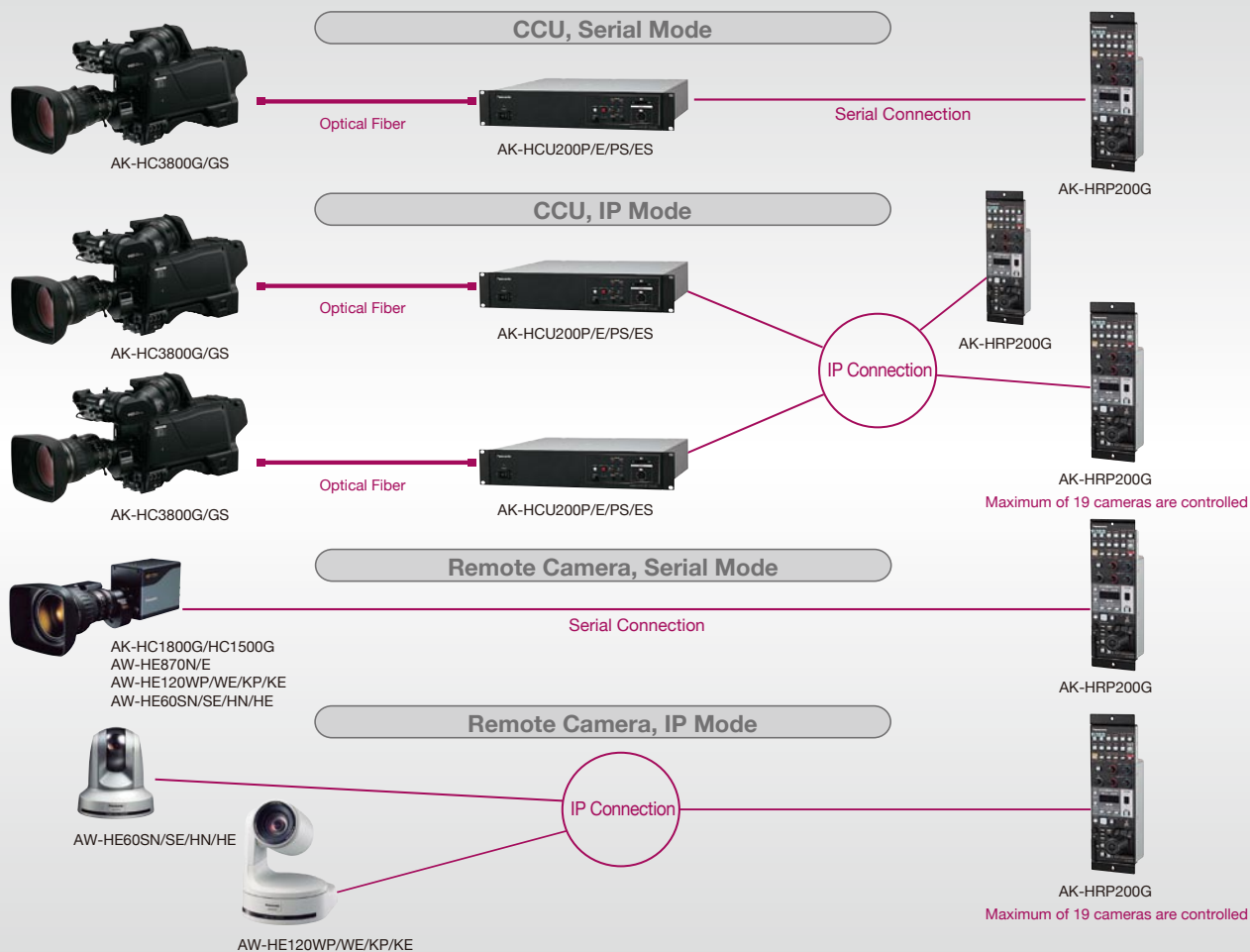
Compact 6U Size
The unit is compact, with a width of 92 mm and a 6U height for easy rack mounting.

AK-HRP200G Rear Panel

4 modes of Serial /IP Connection

CCU, Serial Mode

AK-HC3800G/GS — Optical Fiber — AK-HCU200P/E/PS/ES — Serial Connection — AK-HRP200G

CCU, IP Mode

AK-HC3800G/GS — Optical Fiber — AK-HCU200P/E/PS/ES

AK-HC3800G/GS — Optical Fiber — AK-HCU200P/E/PS/ES

AK-HC3800G/GS — Optical Fiber — AK-HCU200P/E/PS/ES

IP Connection — AK-HRP200G

AK-HRP200G
Maximum of 19 cameras are controlled

Remote Camera, Serial Mode

AK-HC1800G/HC1500G
AW-HE870N/E
AW-HE120WP/WE/KP/KE
AW-HE60SN/SE/HN/HE

Serial Connection — AK-HRP200G

Remote Camera, IP Mode

AW-HE60SN/SE/HN/HE

AW-HE120WP/WE/KP/KE

IP Connection

AK-HRP200G
Maximum of 19 cameras are controlled

AK-HVF70G

17.8 cm (7 inch) LCD Color Viewfinder

Light Weight, Low Power Consumption, and High Resolution Plus Versatile Assist Functions

LCD Viewfinder with Light Weight and Low Power Consumption
The compact, lightweight viewfinder weighs only about 1.6 kg (3.5 lb) (excluding hood, hood weights approx. 200 g (0.44 lb)). Thanks to the LCD panel, the power consumption is only 10W.

High-Resolution WSVGA Monitor
This high-resolution, 17.8 cm (7 inches) color LCD panel displays 1024 pixel x 600 pixel (WSVGA) images.
Its wide viewing angle extends to 130 degrees vertically and 160 degrees horizontally (contrast > 10:1).
Displays approximately 16,200,000 colors.

Focus Assist Functions
The Focus-in-Red function emphasizes the image parts that are in focus by marking their edges in red, and the Pixel-to-Pixel function displays an enlarged image without resizing.

Tilt/Pan
Mounted on the AK-HC3800, the viewfinder can be tilted upward as far as 90 degrees, downward 60 degrees, and panned horizontally 90 degrees.
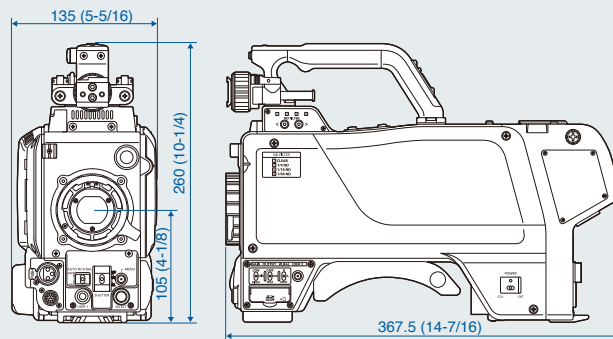
Other Specifications
• Three function switches can be allocated to various functions.
• Contrast, bright, peaking adjustment dials
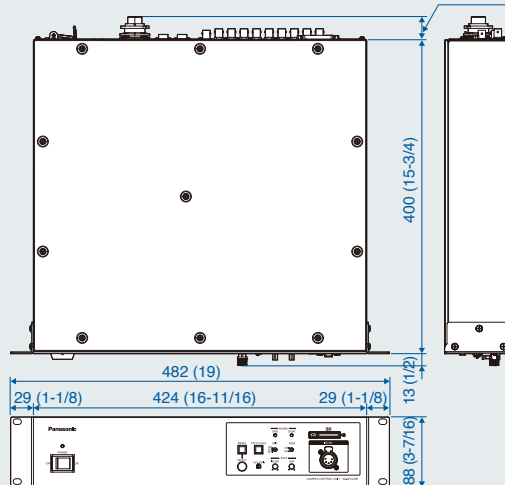• Tally lamps (front/rear)

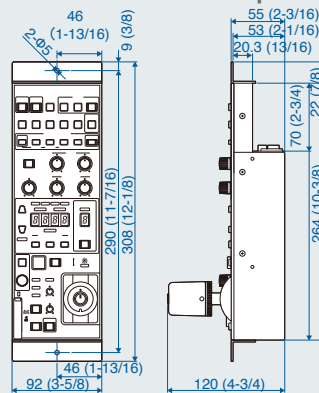# Dimensions   Unit: mm (inches)

AK-HC3800 Studio Handy Camera

135 (5-5/16)
260 (10-1/4)
105 (4-1/8)
367.5 (14-7/16)

AK-HCU200 Camera Control Unit (CCU)

AK-HCU200P/HCU200E:20 (13/16)
AK-HCU200PS/HCU200ES:29 (1-1/4)

400 (15-3/4)
13 (1/2)
482 (19)
29 (1-1/8)   424 (16-11/16)   29 (1-1/8)
88 (3-7/16)

AK-HRP200G Remote Operation Panel (ROP)

46 (1-13/16)
2-Ø5
9 (3/8)
55 (2-3/16)
53 (2-1/16)
20.3 (13/16)
70 (2-3/4)
22 (7/8)
290 (11-7/16)
308 (12-1/8)
264 (10-3/8)
46 (1-13/16)
92 (3-5/8)
120 (4-3/4)

AK-HVF70G 17.8 cm (7 inch) LCD Color Viewfinder

243.5 (9-19/32)
172(6-25/32)
90(3-17/32)
85(3-11/32)
212 (8-11/32)
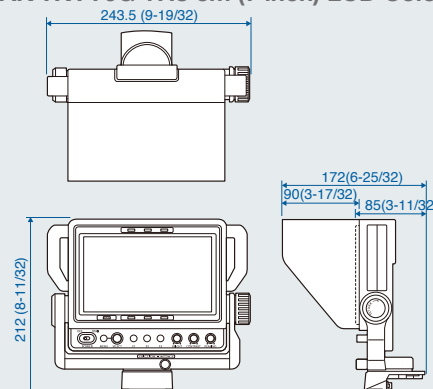
Specifications

As of March, 2014

AK-HC3800 Studio Handy Camera

Power Supply:	12 V DC (during external power supply operation) 190 V DC (when CCU is connected)
Power Consumption:	25 W (during external power supply operation, camera only) 53 W (maximum power during external power supply operation when maximum power supplied for each output connector while all accessories are connected) 60 W (maximum power when CCU is connected and maximum power supplied for each output connector while all accessories are connected)
Operating Temperature:	–10 °C to 45 °C (14°F to 113°F) Preheating required at temperatures below 0°C (32°F)
Storage Temperature:	–20 °C to 60 °C (–4°F to 140°F)
Operating Humidity:	10 % to 85 % (no condensation)
Weight:	Approx. 3.7 kg (approx. 8.16 lb)
Dimensions (W x H x D):	135 mm x 260 mm x 367.5 mm (5-5/16 inches x 10-1/4inches x 14-7/16 inches) excluding protrusions
Pickup Device:	2/3 type 2.2 million pixel IT, CCD x 3
System:	GBR pickup system
Color Separation Optical system:	f/1.4 prism
Optical Filter:	ND: Clear, 1/4, 1/16, 1/64
Lens Mount:	Bayonet type
Output standard:	SMPTE 292M
Sensitivity:	F11 (59.94 Hz) F12 (50 Hz)
Horizontal Resolution:	1100 TV lines
S/N:	60 dB or higher
Horizontal Frequency:	33.716 kHz, 1125 line frame (59.94 Hz) 28.125 kHz, 1125 line frame (50 Hz)
Vertical Frequency:	59.94 Hz or 50 Hz, interlace
MIC Input:	–60 dBu to 4 dBu (XLR 3-pin female x 2) Gain selected by camera menu
Intercom:	XLR 5-pin female x 1 Input: -60 dBu to -20 dBu Output: 100 mW max.
HD SDI Output:	BNC x 2 (HD SDI 1/HD SDI 2) HD signal = 0.8 V [p-p], 75 Ω The HD SDI 2 signal output can be added to the regular images using the camera menu item setting and switched to the VF or RET image output.
Prompter Output:	BNC x 1, VBS signal = 1.0 V [p-p], 75 Ω
DC OUT:	12 V, MAX. 1A
RET CONTROL Terminal:	Round 6 pin x 1
VF:	Round 20 pin x 1, D-Sub 29 pin x 1
Power Switching:	CCU, OFF, EXT
USER 1/2/3:	Functions specified by menu items can be assigned to the switch.
RET A/B Selection:	For selecting the return signal
RET/PTT Switching:	RET, PPT
Output Selection*1:	CAM, BAR, TEST
White Balance Mode*1:	A, B, preset
Shutter Speed Selection*1:	59.94 Hz: 1/48 (23.98p), 1/60 (23.98p, 29.97p), 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 50 Hz: 1/50 (25p), 1/60, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000
Intercom:	MIC ON/OFF, receiving level, or PGM level
MIC Setting:	MIC power, MIC gain, MIC1 selection

*1: When the CCU is connected, the selection functions cannot be used. Control is performed from the ROP.

* When IP connection, 1080/29.97sF, 1080/50PsF, 720/59.94p, and 720/50p format are used, you may need to update AK-HC3800 firmware. For details, see the Panasonic website. http://pro-av.panasonic.net/

AK-HCU200 Camera Control Unit (CCU)

Power Supply:	100 V to 240 V AC, 50Hz/60 Hz
Power Consumption:	170 W (Without CAMERA connected: 32 W)
Capacity for Supplying Power to a Camera:	190 V DC, 0.6 A
Operating Temperature:	0 °C to 40 °C (32 °F to 104 °F)
Operating Humidity:	10 % to 90 % (no condensation)
Dimensions (W x H x D):	424 mm × 88 mm × 400 mm (16-11/16 inches × 3-7/16 inches × 15-3/4 inches) Excluding protrusions
Weight:	Approx. 6.6 kg (approx. 14.6 lb)
Video Output:	HD SDI/SD SDI: 4 lines (2 lines shared with picture monitor output*2) Analog composite: 1 line (1 line shared with picture monitor output*2)
Return Input:	HD SDI/SD SDI: 2 lines (switched depending on the setting) VBS: 1 line
Prompter Input:	1 line, Analog composite
Reference Input:	1 line (1 loop-through line) Black burst/tri-level*3
Microphone Output:	2 lines (XLR, 3-pin, male), 0 dBm/600 Ω
Intercom:	XLR, 5-pin, female Input: –55 dBu to –10 dBu Output: 100 mW (max.)
COMMUNICATION:	Intercom input/output: 2 lines (1/2*2) (0 dBm, 600 Ω, RTS/4W*2) PGM: 1 line, input (0 dBm/600 Ω) Tally input: Red, Green, 1 input each
ROP interface:	RS-422, 1 line, 12 V output
MSU interface:	RS-422, 1 line, GPI for control
LAN port:	1 line (8-pin, RJ45)

*2: Depending on the setting, only one of them can be selected at one time.
*3: The black burst signal and tri-level sync signal of the reference input are recognized automatically.

AK-HRP200G Remote Operation Panel (ROP)

Power Supply:	12 V DC
Power Consumption:	4.2 W
Operating Temperature:	0 °C to 40 °C (32 °F to 104 °F)
Storage Temperature:	–20 °C to 60 °C (–4 °F to 140 °F)
Operating Humidity:	90 % or less
Dimensions (W x H x D):	92 mm x 308 mm x 55 mm (3-5/8 inches x12-1/8 inches x 2-3/16 inches) excluding protrusions
Weight:	Approx. 1.3 kg (approx. 2.87lb)
CCU Control:	• Control signals (camera, CCU control) • Power supply (12 V DC)*4 • Tally control signal
PREVIEW control:	Contact output
Maximum cable length:	50 m (164 ft)

*4: Can be provided from CCU or AC adapter

AK-HVF70G 17.8 cm (7 inch) LCD Color Viewfinder

Power Supply:	DC 12 V (supplied by the camera)
Power Consumption:	10 W
Operating Temperature:	0 °C to 45 °C (32 °F to 113 °F)
Storage Temperature:	–20 °C to 60 °C (–4 °F to 140 °F)
Operating Humidity:	10% to 85% (no condensation)
Dimensions (W x H x D):	243.5 mm x 212 mm x 172 mm (9-19/32 inches x 8-11/32 inches x 6-25/32 inches) (with hood attached) 243.5 mm x 212 mm x 85 mm (9-19/32 inches x 8-11/32 inches x 3-11/32 inches) (without hood)
Weight:	Approx. 1.6 kg (approx. 3.53 lb) (without hood)
Panel Size:	177.8 mm (7.0 inches)
Number of Pixels:	1024 pixel x 600 pixel (WSVGA)
Display Colors:	Approx. 16,200,000 colors
Operation Panel:	POWER switch x 1, MENU button x 1 SELECT dial x1, Function buttons x 3 Picture adjusting knobs x 3 ([BRIGHT], [CONTRAST], [PEAKING])
Connectors:	Camera I/F connector (D-Sub 29-pin x 1)

Weight and dimensions are approximate.
Specifications are subject to change without notice.
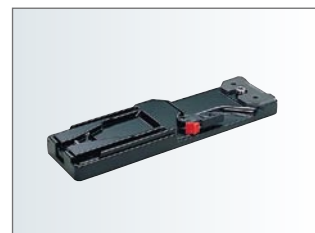
AJ-HVF21KG
50.8 mm (2 inches) HD EVF

AJ-CVF100G
25.4 mm (1 inch) HD Color EVF

AJ-MC700
Microphone Kit

SHAN-TM700
Tripod Adapter

AJ-C10050G
Remote Control Cable
(50 meters / 164 feet)

Panasonic®

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Hong Kong	+852 2313 0888
Czech Republic:	+421 (0) 903 447 757
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Egypt	+20 2 23938151
Finland, Latvia, Lithuania, Estonia	
	+358 (9) 521 52 53
France	+33 (0) 1 47 91 64 00
Germany, Austria, Switzerland	
	+49 (0) 6103 313887
Greece	+30 210 96 92 300
Hungary	+36 (1) 382 60 60
India	+91 1860 425 1860
Indonesia	+65 6277 7784
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	+31 73 640 2729
New Zealand	+64 9 272 0100
Norway	+47 67 91 78 00
Pakistan	+92 5370320 (SNT)
Palestine	+972 2 2988750
Panama	+507 229 2955
Philippines	+65 6277 7284
Poland	+48 (22) 338 1100
Portugal	+351 21 425 77 04
Romania, Albania, Bulgaria, Macedonia	
	+40 (0) 729 164 387
Russia & CIS	+7 495 9804206
Saudi Arabia	+96 626444072
Singapore	+65 6277 7284
Slovak Republic, Croatia, Serbia,	
Bosnia, Montenegro, Slovenia	
	+421 (0) 903 447 757
South Africa	+27 11 3131622
Spain	+34 (93) 425 93 00
Sweden	+46 (8) 680 26 41
Syria	+963 11 2318422/4
Taiwan	+886 2 2227 6214
Thailand	+662 731 8888

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U.K.	+44(0)1344 70 69 13
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ISO 9001
JQA-0443

ISO 14001
JACO
EC98J2010
051
UKAS MANAGEMENT SYSTEMS

Factories of AVC Networks Company have received ISO14001:2004-the Environmental Management System certification. (Except for 3rd party's peripherals.)