Ikegami

HD
High Definition

Full Digital HDTV Camera System

HDK-790E
HDK-79E

Anticipating Digital Broadcasting. Ushering in a New Era. The Heart of the New Evolution.

HDK-790E/HDK-79E

Full Digital HDTV Camera System

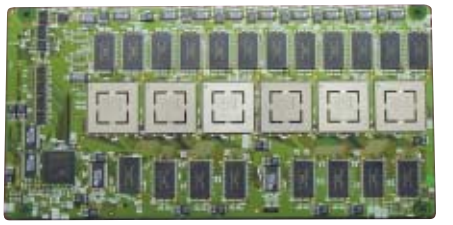
- 0.18μm design rule next generation ASICs.
- 2.2 Million pixel 2/3-inch FIT CCDs
- 12bit A/D Conversion/ 38-bit internal digital processing circuits
- Multi-standard / Simulcast Broadcasting
  (1080/60i, 480/60i interlace output standard, 1080/24p, 720/60p, 480/60p progressive output Option)
- Various Accessories available for different operating styles.

Evolutionary New Features / Designed for DTV

■New Camera Control Unit, the CCU-790A

The Ikegami HDK-series HDTV cameras are designed as a Multi-Use Camera to meet the format requirements of HDTV and SDTV have incorporated next-generation 0.18 μm ASICs into a new Camera Control Unit, the CCU-790A.
Also using newly developed ASICs, an Optional Engine Board has been developed to achieve Frame and Multi-Format Conversion. (24p, 30p, 50p, 720p, 1080i, 480i etc)

CCU-790A


New Engine Board (option)

Multi-standard / Simulcast Broadcasting

■2/3-inch 2,200,000-pixel FIT CCDs

2/3-inch 2,200,000-pixel 1080i FIT CCD image sensors are employed to achieve superb picture quality with a horizontal resolution of 1,000 lines and a S/N ratio of 56dB.

■Simulcast (High-end HDTV and NTSC Camera)

Using a down converter incorporated in the CCU as standard, the HDK-790E/79E can be operated as a high-end NTSC studio camera. A high sampling frequency of 28.64MHz achieves maximum resolution of 900 TV lines in the NTSC format. Both HDTV video and SDTV (NTSC) are provided simultaneously from the CCU and in both digital and analog form. Monitoring video signals (WFM and PM) are likewise provided in both HDTV and SDTV to adapt to different system installations and to permit continued use of conventional monitoring.

12bit Full Digital

■Incorporating a new, next-generation digital process ASIC

Using newly developed full digital process ICs, precision designed at 0.18μm rule, the video signals are digitalized with 12-bit A/D conversion and up to 38-bit internal digital processing (quantization) circuits.

■DTL Correction

A detail correction system, including digitally processed horizontal, vertical and diagonal correction signal for red, green and blue video, is incorporated into the camera head, and obtains noise-free full resolution HDTV picture quality even if the camera is used in stand-alone configuration.

■Independent DTL

With Independent DTL system in the CCU, the type and amount of compensation can be optimized for the different requirements of HDTV and SDTV.


Next-generation digital process ASIC (0.18μm design rule)

Sophisticated features made possible with digital technologies

■Six-axis + Two-axis Color Corrector

Includes a color correction function that enables hue and saturation to be adjusted for each of the six primary colors (R, G, B, Cy, Y, Mg), plus another function to make color correction of two user-selected colors of the subject.

■Enhanced Digital DTL

Improved sensuous expressions such as texture and sheen, and richer reproduction of details in skin tone in dark backgrounds.

■Super KNEE

The Knee system makes corrections without changing the hue of the highlighted parts and produces a more natural highlight appearance, rather than washing it out.

■Clear VF DTL function

This function makes a difference in the edging of the image exclusively in the viewfinder, to make the precise point of focus easier to find, and to make it easier for the cameraperson to focus.

■Wide-band DTL function

Wide-band edging gives the impression that fine parts of subjects or high frequency images have a higher resolution.

Easy to Use, attention to the details

Perfect Match Between Studio and Portable Cameras
The portable and studio cameras use the same CCD, same analog and digital video processing, same optical filters, and in most cases, the same PC boards, providing an unparalleled similarity in performance and function between the two camera types.

HD SDI Output from the Camera Head
HD SDI output is provided from the camera head, and by using VTR connector (option), direct connection is possible with HD digital equipment, such as an HD VTR.

RET Video and Teleprompter Video
The CCU-790A accepts two channels of return video input as standard. It is available with up to 4ch as a factory option. Input signals can be selected from HD-SDI, D1 component and VBS signals. The CCU includes an up converter permitting a SDTV return video signal (D1) to be viewed on the HD viewfinder. The CCU transmits the HD return video signal(each Y, P_B, P_R) and two NTSC Q-TV video signals (Q-TV1*, Q-TV2*) to the camera for teleprompter and external monitoring purposes.

*For the HDK-79E, either Q-TV1 or Q-TV2 can be selected for output.

HDK-790E rear panel

HDK-79E rear panel

Low Center of Gravity
Both the studio and portable cameras are compact with low center-of-gravity. Especially for the portable camera there is excellent balance when operated on the shoulder. Regarding the 7-inch viewfinder for HDK-790E, the position is lower and closer to the optical axis of the camera head.

Return Switch
A Return select switch is located on the handle grip of the portable camera to control the selection when the camera is held off the shoulder, such as on the hip for low angle shots.

Return Switch on the handle grip

High Performance Viewfinders
For the HDK-79E, a 2-inch 16:9 high definition VF for portable application and a 5-inch B/W VF (option) for studio application are available. Employing a magnifying eye-piece in the 2-inch VF, visibility is further improved. For the HDK-790E, 7" B/W VF and 7" color VF (option) are available.
7-inch VF attaches to the camera with a mechanism allowing easy panning and tilting for VF. Cable connection between the camera and the 7-inch VF is integrated into the pan and tilt mechanism and fully protected against possible damage.
In addition, a 6-inch color LCD viewfinder is also available as an option for both studio and portable camera models.

On-Line Diagnostics
An On-line Diagnostic System monitors a range of circuits including video, control, fiber optic transmission, pulse and power supply.

Application of Standard 2/3-inch Lenses
The camera incorporates the HDTV lens mount (BTA-S-1005B type) as standard. But the Ikegami 2/3-inch lens mount can be specified as a factory order option to use lenses from conventional NTSC Ikegami HK-series cameras such as HK-388/377/366/355, etc.

Rotating Camera Cable Connection
The SMPTE standard fiber camera cable connector is provided with a pivoting mount on both the portable and studio camera heads. This permits a natural bend to the cable, even for example, when the portable camera is placed on the ground.

HDK-790E

Strong Hand Grips
HDK-790E has its side handle directly attached to the camera head, which ensures the solid structure of the handle. It also has a loop to attach a rope, by which the camera head can be hoisted.

HDK-79E

State of the Art, Expanding HDTV System Accessories

■CB-79HD/TFA-79HD HDTV Triax System

Ikegami's second generation HDTV triax system is now available for the full studio cameras, the HDK-790E and HDK-725. The TFA-79HD, housed in a rugged weather resistant case, is used together with the CB-79HD at the CCU side for full resolution transmission of HD signals over conventional triax cable.

TFA-79HD (Camera Side)

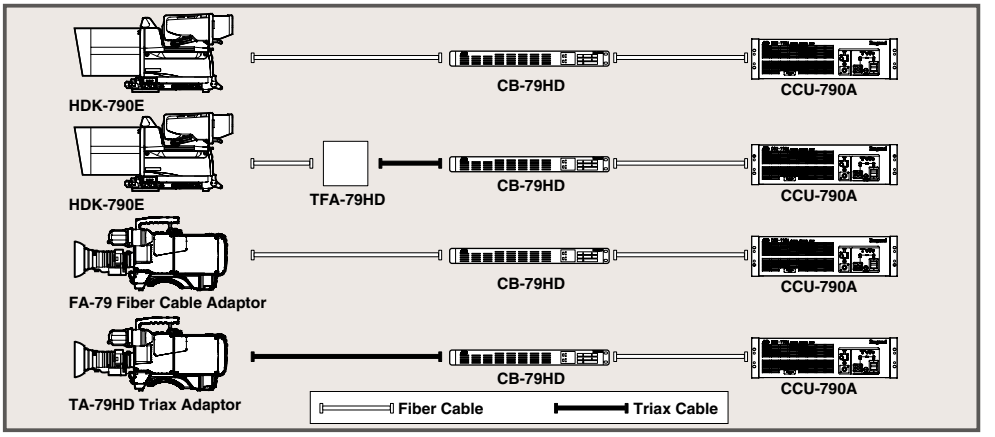
■CB-79HD/TA-79HD Triax Adaptor System

The CB-79HD/TA-79HD HDTV new triax adaptor system is a high performance transmission technology. It is ideally suited for various field applications in the digital era. The system consists of the TA-79HD docking Triax Adaptor and the CB-79HD CCU side Converter Box. The CCU converter box enables use of triax or fiber makes cable without any reconfiguration. Docking type adaptors for triax or fiber make camera configuration quick and easy. No local AC power is necessary because the CCU provides AC power for the full system. The CB-79HD CCU converter box is only 1U rack size providing efficient use of space.

CB-79HD (CCU side)

●Transmission Distance

Up to 850m (2,800ft.)	by 8.8mm diameter triax / Fujikura type II-21479
Up to 1,550m (5,100ft.)	by 14.5mm diameter triax / Fujikura type II-21479
Up to 500m (1,600ft.)	by 9.2mm diameter triax / Belden type 9267
Up to 1,000m (3,300ft.)	by 13.2mm diameter triax / Belden type 9267



TA-79HD Triax Adaptor
(Docking type)

■Control Panel System

The desired control panel which matches the needs of user can be selected, and connected to the CCU.

MCP (Maintenance Control Panel)

An MCP control panel is used for maintenance and fine adjustment purposes. Up to 40 cameras can be controlled from an MCP when the MCP is used with the CSU Camera Select Unit.

CSU-100

MCP-110

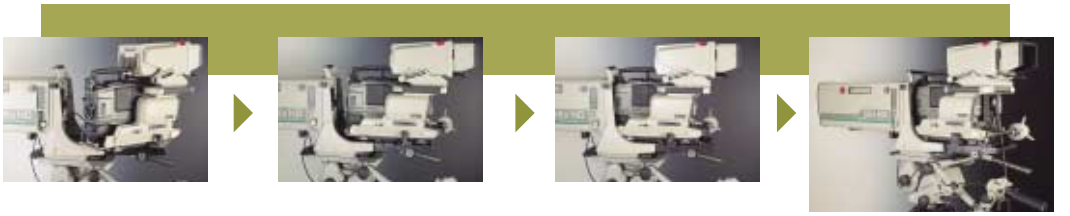
OCP-790

OCP (Operation Control Panel)

An OCP control panel is used for normal operation, and includes the primary operating control functions. The OCP is available in joystick and rotary versions.

■SE-79D System Expander

The SE-79D System Expander enables the use of the 7-inch viewfinder and full studio lenses with the HDK-79E, converting the portable camera into a full facility studio camera. Installation of the camera into the SE-79D is very easy, and conversion back to portable configuration is quick for maximum operating flexibility.



SE-79D System Expander

HD Location Shooting

Provides operation with HDTV VTR similar to location shooting in SDTV.

■Camera Adaptors

There are two kinds of camera adaptors available: the small camera adaptor CA-79D, which best suits local VTR operation, and the fiber adaptor FA-79, which enables the co-use of CCU operation and local VTR operation. You can select the appropriate type of adaptor depending on the desired manner of operation.

■Camera Control Unit for reliable picture production

Configurations available are: the RCU-79, a combination remote control panel and extension device system, and the RCU-70, with the remote control panel detached from the unit. Together with a DC power supply, this system provides complete camera control and system interconnect for high quality field production for location shooting.

HDK-79E+CA-79D

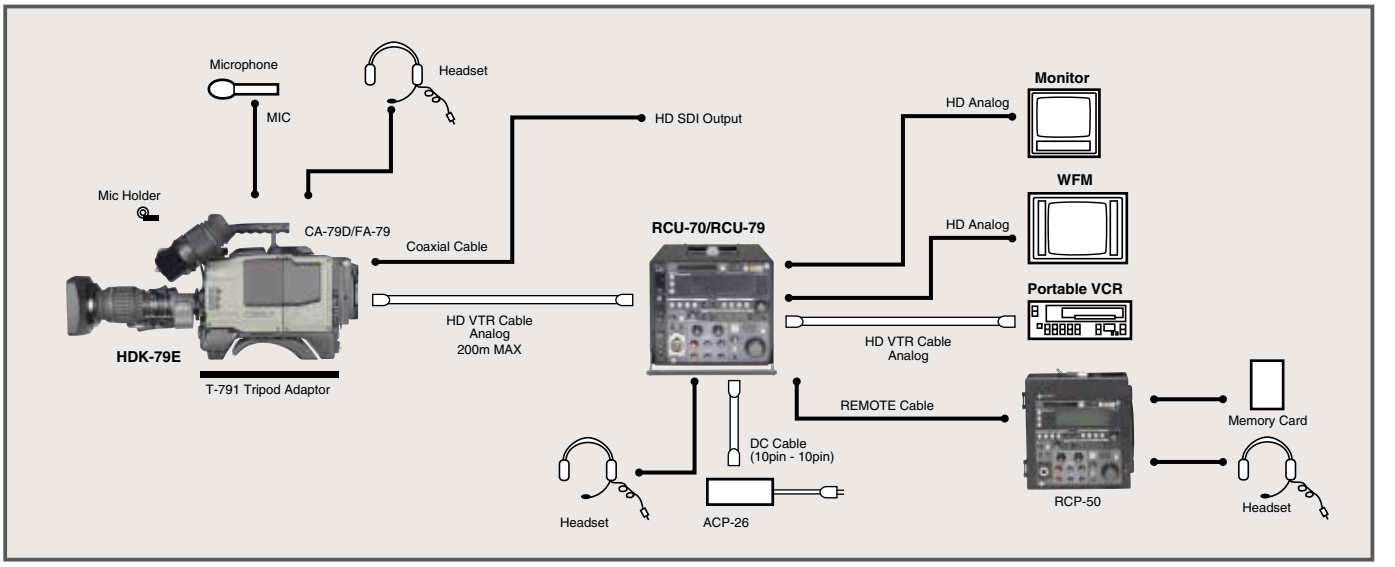
RCU-79 front

RCU-79 rear

Slide mechanism for RCU-79

The VTR connector is provided on the rear side panel of the CA-79D to prevent the cable from being a hindrance in tight locations sites or low-angle shooting.

■HD Location Shooting



Space-Saving Design

Suitable for small-sized HD vans and rental / flight-pack systems.

■BS-79 Half-Rack Base Station

A half-rack base station BS-79 is available, permitting full SMPTE fiber cable extension with a compact base station. It supports HDTV/SDTV simulcast operation with an up converter / down converter built into its half-rack size. It is suitable for small-sized HD vans and rental / flight-pack systems.

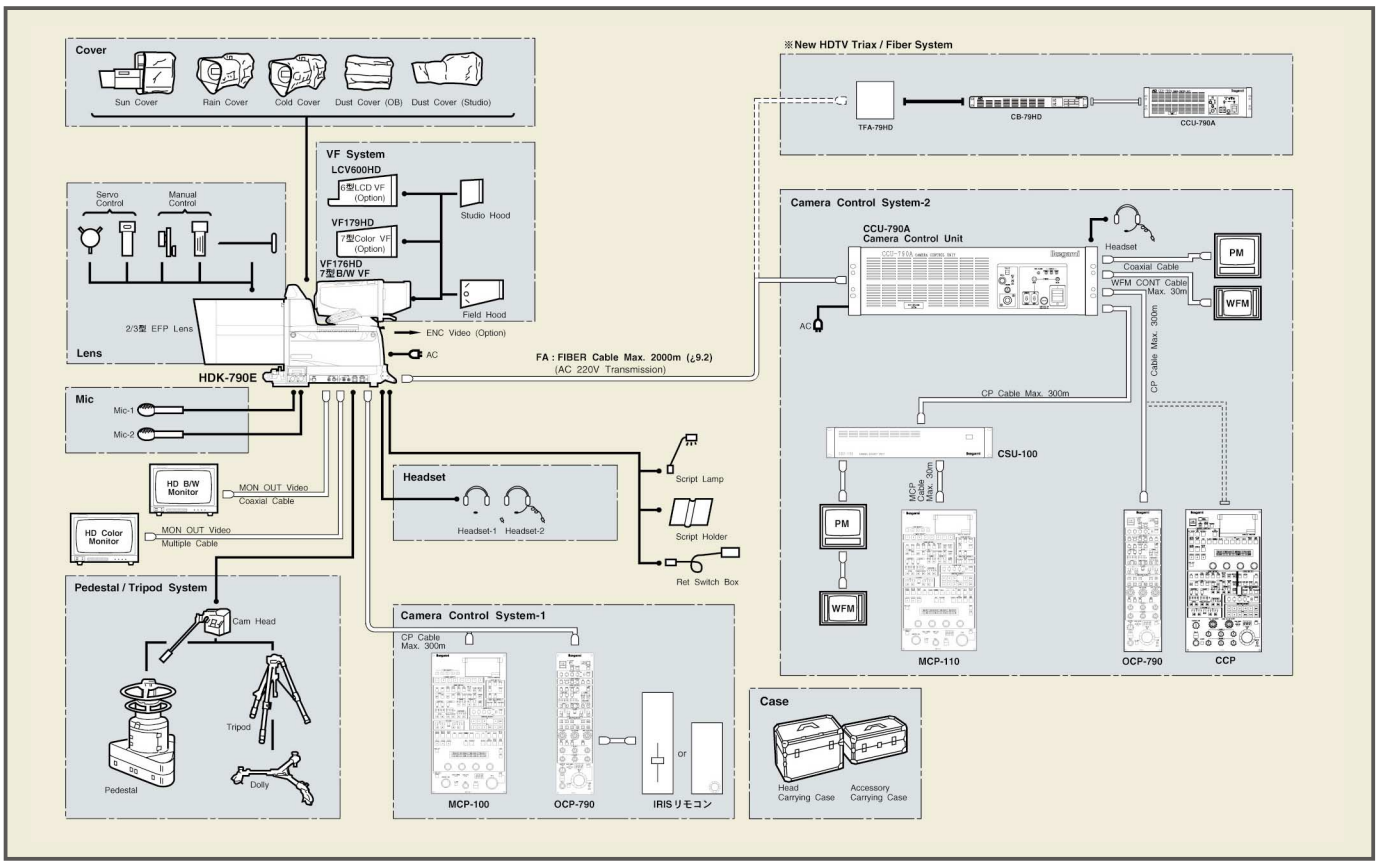
*The HDK-790E and HDK-79E with the System expander can be connected with the BS-79 (factory option / AC operation only)

BS-79 front

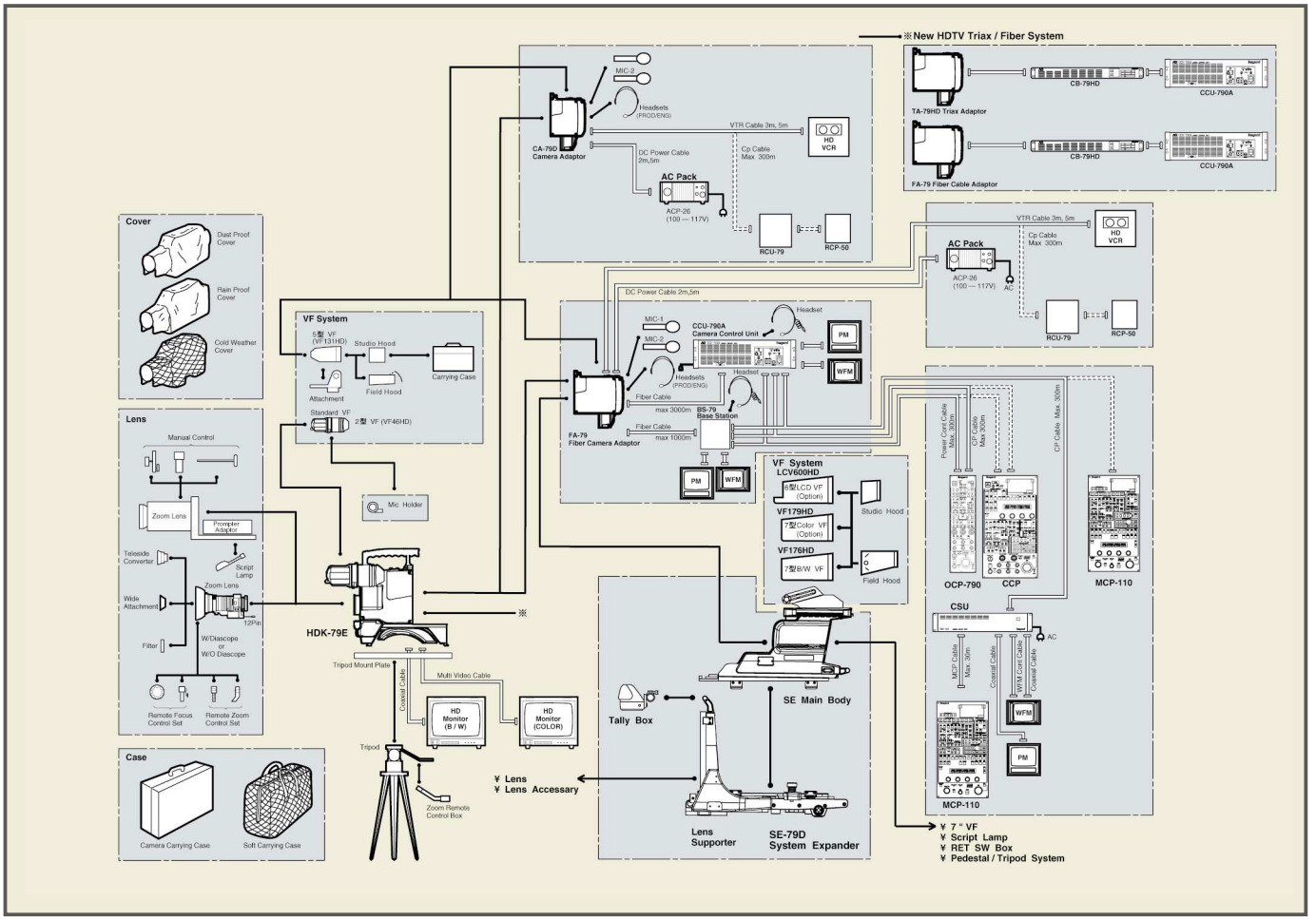
BS-79 rear

■System Applications

HDK-790E



HDK-79E



Ratings

■Scanning System
- ●HDK-790E/79E····· 1125 (59.94Hz or 60Hz, selectable)
- ●CCU-790A····· 1080 lines 59.94 or 60Hz 2:1 interlaced
  480i lines 59.94 Hz 2:1 interlaced
  1080 lines 59.94 Hz 2:1 interlaced 2-3 pull-down (option)
  1080 lines 59.94 Hz 2:1 interlaced variable frame (option)
  1080 lines 29.97 Hz 1:1 non-interlaced (option)
  1080 lines 29.97 Hz SF non-interlaced (option)
  1080 lines 23.98 Hz 1:1 non-interlaced (option)
  1080 lines 23.98 Hz SF non-interlaced (option)
  720 lines 59.94 Hz 1:1 non-interlaced (option)
  720 lines 59.94Hz 1:1 non-interlaced variable frame (option)

■CCD image sensor····· 2/3-inch 2,200,000-pixel FIT CCD
■Optical system····· 2/3-inch 3CCD, f1.4 BaF52
■Lens mount ····· BTA S-1005B (standard) or
2/3-inch Ikegami mount (factory option)

■Viewfinder
- ● HDK-790E····· 7-inch B/W viewfinder (standard) or
  7-inch color viewfinder (option) or
  6-inch color LCD viewfinder (option)
- ● HDK-79E····· 2-inch B/W viewfinder (standard) or
  5-inch B/W viewfinder (option) or
  6-inch color LCD viewfinder (option)

■Input signals
●HDK-790E/79E

External SYNC signal·····	SYNC	0.6Vp-p ±6dB	75Ω	
Audio signal*·····	-60, -50, -40, -30, -20, -10, 0, +4dB 600Ω(2ch, balanced) (after selecting, variable ±5dB available) (*option for HDK-790E)			
Intercom signal·····	2ch (ENG/PROD) (110 type or XLR type)			

●CCU-790A
[HDTV system (SMPTE274M and SMPTE292M)]

Phase reference signal·····	PS/S	0.6Vp-p ±6dB	75Ω	bridged,1ch
Return video signal·····	PS	1.0Vp-p	75Ω	2ch (standard) 4ch (factory option)
	(Input signal is SDI signal)			

[NTSC system]

Return video signal·····	VBS	1.0Vp-p	75Ω	2ch (standard) 4ch (factory option)
	(Input signal is SDI signal)			
External genlock signal·····	VBS/PS/S	1.0Vp-p	75Ω	bridged,1ch
Q-TV signal·····	VBS or PS	1.0Vp-p	75Ω	Single End,2ch

Intercom/Tally

Intercom (ENG/PROD)·····	(4-wire or Clearcom or RTS)		
4-wire·····	0dBm	600Ω	2ch
Clearcom·····	-15dBs	200Ω	2ch
RTS·····	0dBm	200Ω	2ch
Tally·····	contact/voltage	R, G	2ch
Program sound·····	0dBs	600Ω	2ch

■Output signals
● HDK-790E/79E
Video signals

Analog signal·····	R,G,B or Y, P_B, P_R each 1ch, 75Ω(multi-pin connector)			
HD SDI signal·····	Y, P_B, P_R 4:2:2 serial digital 2ch (BNC connector, Camera cable connector) (SMPTE292M)			
Q-TV1,2 signal*·····	Analog signal, 1ch 75Ω(BNC connector) (*HDK-79E: Q-TV1 or 2 selectable)			
Return out·····	HD analog signal 75Ω(BNC connector)			
VTR signal (option)·····	BTA S-1005B			
Monitor signal·····	R,G,B or Y, P_B, P_R select 1ch, 75Ω(BNC connector)			
Intercom signal·····	0dBs 2ch (ENG/PROD) (110 type or XLR type)			

● CCU-790A
[HDTV system]
Analog video signal (SMPTE274M)

	Y, P_B, P_R	75Ω	each	1ch
	(R,G,B signal output is selectable by internal switch)			
HD SDI signal (SMPTE294M)·····		75Ω		3ch
WFM signal·····	R,G,B,Y select	1.0Vp-p	75Ω or HD-SDI 75Ω	2ch (factory option)
PM signal·····	R,G,B,Y select	1.0Vp-p	75Ω	2ch
	HD-SDI		75Ω	2ch (factory option)

[NTSC system]

Composite video signal·····	VBS	1.0Vp-p	75Ω	3ch
Component video signal·····	R,G,B	0.7Vp-p	75Ω each	1ch
	(Y, P_B, P_R signal output is selectable by internal switch)			
Component serial signal (D1) ·····	(SMPTE259M) 270Mbit/s			
	0.8Vp-p		75Ω	4ch
WFM signal·····	R,G,B,Y,ENC select	1.0Vp-p	75Ω or SDI 75Ω	2ch
PM signal·····	R,G,B,Y,ENC select	1.0Vp-p	75Ω or SDI 75Ω	2ch
Phase reference signal·····	sync	0.6Vp-p	75Ω	1ch
				(HD or SD automatically selectable)

[Progressive system (option)]

1080p SDI signal (SMPTE 274M option)	1920 X 1080		75Ω	3ch
	(29.97Hz 1:1, 29.97Hz SF, 23.98Hz 1:1, 23.98Hz SF)			
720p SDI signal (SMPTE 296M option)	1280 X 720		75Ω	3ch (59.94Hz 1:1)
480p serial signal (SMPTE294M, factory option)				
Audio Signal				
Mic·····	0dBm		600Ω	2ch
Digital audio·····	AES 3ID	1Vp-p	75Ω	1ch
	(In conformity with AES/EBU)			

Intercom/Tally

Intercom (ENG/PROD)·····	(4-wire or Clearcom or RTS)			
4-wire·····	0dBm		600Ω	2ch
Clearcom·····	-15dBs		200Ω	2ch
RTS·····	0dBm		200Ω	2ch

■Filter····· 1 2 3 4 5
ND CAP 100% 25% 6.2% 1.6%
CC CROSS 3200K 4300K 6300K 8000K

■Electric color temperature····· 5600K
■Ambient temperature····· HDK-790E/79E : -20˚C～+45˚C (-4˚F～+112˚F)
CCU-790 : -0˚C～+45˚C (+32˚F～+112˚F)
■Relative humidity····· 30%～90% (Non-condensing)
■Operating voltage
- ●HDK-790E····· AC100/110/117/220/240 ±10%
- ●HDK-79E····· 11～16V

■Weight
- ●HDK-790E····· 24kg (53 lbs) (without lens)
  7-inch B/W viewfinder : approx. 4.5kg (10 lbs)
  7-inch color viewfinder (option) : approx. 5kg (11 lbs)
- ●HDK-79E····· 6.0kg (13.2 lbs) (including fiber adaptor, without lens)
  2-inch B/W viewfinder : approx. 0.8kg (1.8 lbs)
- ●CCU-790A····· approx. 30kg (66 lbs)

■Dimensions
- ●HDK-790E····· W310 X H410.5 X D380mm
  (W12 X H16 X D15 inches)
- ●HDK-79E····· W105 X H222 X D375mm
  (W4.1 X H8.7 X D14.8 inches)
- ●CCU-790A····· W438 X H132 X D430mm
  (W17.2 X H52 X D16.9 inches)

Performance

■Sensitivity····· F10/2,000 lx
■S/N
- ●HDTV system····· 56dB
- ●NTSC system····· 64dB

■Modulation depth
- ●HDTV system····· 45% or more (800 TV lines, 27.5MHz)
- ●NTSC system····· 90% or more (400 TV lines, 5MHz)

■Limiting resolution
- ●HDTV system····· 1,000 TV lines
- ●NTSC system····· 900 TV lines

■Video frequency response (Base Station output)
- ●Y output····· Below 60Hz..... Falling
  60Hz～30MHz..... within ±1.0dB
  Over 30MHz..... Falling
- ●P_B, P_R output signal····· Below 60Hz..... Falling
  60Hz～15MHz..... within ±1.0dB
  Over 15MHz..... Falling
- ●NTSC output signal (Ych 100kHz, output signal from external camera control equipment)
  Below 60Hz..... Falling
  60Hz～4.5MHz..... within ±0.5dB
  4.5MHz～8.0MHz... within ±1.0dB
  Over 8MHz..... Falling

■Audio Frequency response (Base Station output)
- ●Y output····· Below 100Hz..... Falling
  100Hz～10kHz..... within ±1.0dB
  Over 10kHz.....Falling

■Contour correction
- Vertical····· 5line
- Horizontal····· Boost frequency, 13MHz～24MHz (HDTV)
  Boost frequency, 2.7MHz～8.9MHz (SDTV)

■Gamma····· OFF, 0.35, 0.4, 0.45
■Gain····· -3dB, 0dB, +3dB, +6dB, +12dB or +18dB (User spec.)
■Power consumption
- ●HDK-790E····· approx. 500VA (including 7-inch color viewfinder and CCU)
- ●HDK-79E····· Head + FA-79 : 36W (on site VTR location)
  Head + CA-79D : 34W
  2-inch VF : 6W

Design and specifications are subject to change without notice.

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