Panasonic

Surgical Image Recording System

AG-MDR25
Memory Card Portable Recorder
Scheduled for release in May, 2017

AG-MDC20GJ
Compact Camera Head
(Special Option for the AG-MDR25)
Scheduled for release in May, 2017

Compact Portable Recorder System
Suitable for Recording High-Quality Medical Video

*The cable is optional.

AG-MDR25
Memory Card Portable Recorder

* Pictures simulated.

AG-MDC20GJ
Compact Camera Head

POVCAM

AVCHD™ Progressive HDMI SDXC™ DOLBY AUDIO™

The New POVCAM Supports Medical Video, Endoscope Images, and IP Networking

AG-MDC20GJ
Compact Camera Head

Optional Cable
(3 m (9.84 ft) / 20 m (65.62 ft))

HDMI OUT
4K (UHD) 29.97p* playback supported

HD SDI OUT
Up to FHD 59.94p* supported

*Please see page 4 for the "Input/Output" of AG-MDR25 Specifications.

TV

Monitor

AG-MDR25
Memory Card Portable Recorder

SDHC/SDXC Memory Card

USB 2.0

PC

HD SDI IN

REMOTE

LAN

HUB

PC

Tablet

Endoscope

Remote Control

Streaming Decoder

FTP Server

* Pictures simulated.

A compact, lightweight, free-style shooting
Inheriting the features of the first-generation POVCAM plus the operating ease of a touch panel.

High-quality images suitable for surgical recording
Featuring an optical 20x zoom lens and surgical-light mode. Captures 4K (UHD)*/FHD progressive, high-resolution images.

Network operation for IP control and IP streaming
LAN connection enables zooming and real-time video monitoring from a PC or tablet.

Reliability for Medical Applications
Complies with medical standards. Lens protector, membrane sheet control section, etc., conform to medical specifications.
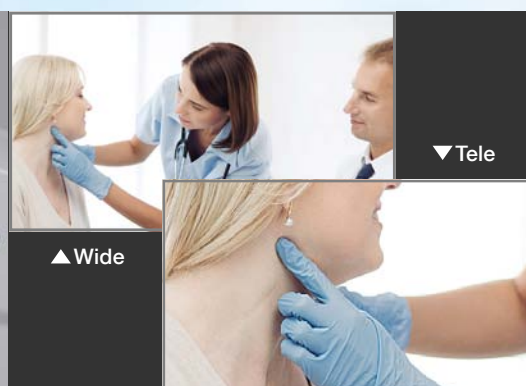
* 4K acquisition is possible only when connected to the AG-MDC20GJ Compact Camera Head. 4K refers to UHD (3840 x 2160) resolution. The maximum resolution in 4K shooting mode via HDMI/SDI output is FHD (1920 x 1080) 59.94i/50i.

Touch Panel LCD (User Button Setting Example) Lens Protector (Standard Equipment) Angle of View Example for 20x Optical Zoom

▼Tele
▲Wide

Compact, Lightweight, Free-Style Shooting Inherited from First-Generation POVCAM

Compact Camera Head for Flexible Installation

• **Free style:** Compact, lightweight design and remote operation allow the camera to be installed in places and angles where it previously couldn't, for free-style operation.
• **Optional cables (3 m (9.84 ft) /20 m (65.62 ft)):** Identical to the first-generation POVCAM cables for easy system replacement.
• **Built-in stereo microphone:** For recording both video and sounds.
• **Scan Reverse mode:** Image inversion for shooting with a ceiling-mounted Camera Head. NEW
• **Scene files:** Auto and three manual setting files allow scene settings to be switched and saved. NEW

Compact, Lightweight, Battery-Drive Recorder

• Light weight, handy size. Improved recorder operation with a touch-panel display and large buttons. NEW
• **KEY LOCK function:** Operation buttons can be temporarily disabled to prevent operating mistakes.
• **Battery operation:** Equipped with a battery socket on the rear panel. Large-capacity battery supported (11,800 mAh/8,850 mAh/5,900 mAh/ 5,800 mAh). NEW
• **DC drive:** Equipped with input terminal for DC12 V power supply. AC adaptor also included. NEW
• **Power Supply Activation mode** on the camera head linked to centralized power supply ON/OFF. NEW
• Threaded sockets provided in two locations, left and right, for arm or rack mounting.

Touch-Panel LCD Monitor NEW

• **High resolution:** 16:9 screen, 3.5-inch, approx. 1.15-megadot panel
• **LCD reverse display:** The image displayed on the LCD monitor can be reversed vertically and horizontally. The camera head can be reversed vertically to match installation conditions.
* When the image is reversed, the recorded image will remain in its original orientation.
• **Touch panel:** Compact size and multifunctional
• **13 User buttons:** In addition to one hard key, 12 User buttons are displayed. Functions can be allocated to each. Four Scene File buttons also allow easy switching of the scene setting.
• **Focus Assist:** Focusing is aided by a Peaking Display (emphasizing in-focus areas by the use of coloring).

Reliably Designed Especially for Medical Applications

Complies with Medical Standards

Medical Electronic Device Safety Standards (IEC 60601-1) and EMC Standards (IEC60601-1-2).
*In AC 240V/60Hz it does not comply with this standard.

Lens Protector

A lens protector (MC Protector/Accessory) for the front panel of the Compact Camera Head is included as standard equipment. Protects the lens from splashes.

Control Section Membrane Sheet

The control section of the Recorder uses switches covered by a membrane sheet. The surface has few bumps and indentations, so cleaning is easy with an ethanol disinfectant.

High-Quality, High-Resolution Images for Recording Surgical Images

29.5 mm[*1] Wide-Angle Optical 20x Zoom Lens NEW

• **29.5 mm[*1] Wide-Angle Optical 20x Zoom Lens:** Achieves 29.5 mm[*1] wide-angle in spite of its compact size.
• **Optical 20x zoom:** Covers a range from 29.5 mm[*1] wide angle to 612 mm[*1] close ups for various applications.
• **Intelligent i.Zoom:** Allows shooting up to 30x in HD format (22x in 4K) with high resolution. Zooms in seamlessly from the optical tele-end.
• **Digital zoom:** This digital zoom (×1.4/×2/×4/×6/×8) allows zooming without any change in brightness. Combining optical zoom + intelligent zoom enables zooming up to a maximum of 240x[*2].
*1: 35 mm equivalent
*2: When using optical 20x zoom + i.Zoom + digital zoom 8x in HD format. The image quality decreases as the digital zoom magnification increases.

High-Resolution 4K (UHD) /FHD Progressive Image Recording NEW

4K PROFESSIONAL

Compact Camera Head features a progressive MOS sensor with a total of 1.276-megapixels. The Recorder supports, in addition to 4K (UHD: 3840 x 2160) 29.97p/23.98p/25p* and FHD (1920 x 1080) 59.94p* images, multi-format image acquisition. (See page 3 "Recording Format")
The high-resolution, progressive sensor also provides a dramatic improvement over the HD image quality of the previous POVCAM model. FHD image acquisition uses the AVCHD format for high image quality and a low data rate.
* 4K acquisition is possible only when connected to the AG-MDC20GJ Compact Camera Head. 4K refers to UHD (3840 x 2160) resolution. The maximum resolution in 4K shooting mode via HDMI/SDI output is FHD (1920 x 1080) 59.94i/50i.

Stable Images with a Five-Axis Hybrid Image Stabilizer NEW

• **Optical image stabilizer (HD/4K):** Equipped with a powerful optical image stabilizer (OIS) system. Images are strongly corrected even in situations where the camera is unstable, such as when mounted onto an arm.
• **Five-Axis Hybrid Image Stabilizer (HD):** In HD mode, electronic image stabilization is added to the optical image stabilizer (OIS) system to detect and correct motions on five axes, including rolling motion. This is effective when shooting while walking.
• **Custom O.I.S:** Set to optimize vibration control (switchable) when the camera is fixed to the ceiling or a universal head.

Adjustable Image Quality Under a Surgical Light

• **Surgical Light mode:** Equipped with a Color Reproduction Matrix mode for use under a surgical light. NEW
• **16-Axis independent color correction:** Special surgical colors can be adjusted. NEW
• **Optical ND filter:** The optical ND filter can be manually switched (CLEAR, 1/4, 1/16, 1/64). Resolution degradation from closing down the iris is prevented even in the bright lighting of a surgical light. NEW
• **Dynamic Range Stretch (DRS):** This function suppresses blocked shadows and blown highlights to produce excellent gradation for each shade when dark, bright and intermediate shades are all contained in the same scene.
• **Gain/iris:** A maximum gain increase of 36 dB is possible. Iris adjustment can also be adjusted independently from the gain.
• **Shutter:** The Slow Shutter function with Synchro Scan functions are supported.

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Five-Axis Hybrid Image Stabilizer Diagram

IP Control (Tablet Screen Example)

IP Control (Web Browser Screen Example)

• **Other image adjustments:** Detail, V-detail, Detail coring, Skin tone detail, White balance, Color temperature, Chroma level, Chroma phase, Master pedestal, Gamma, Black gamma, Knee, and NR control
• **Auto Focus + Custom AF:** Auto focus stability can be adjusted to match surgical conditions.

Double SD Memory Card Slots (SDXC Memory Card) and Relay Recording

Double SD Memory Card Slots (SDXC Memory Card) NEW

Large-capacity SDXC/SDHC Memory Cards supported. Double SD Memory Card Slots and a Relay Recording function enable two memory cards to be consecutively used. Hot Swapping also makes it possible to exchange cards while recording. Combined with the high data compression efficiency of the AVCHD format, this enables a maximum of 22 hours* of recording in the high-quality PS mode and a maximum of 112 hours* of recording in the extended (HE) mode.

*1: When using two 128-GB SDXC Memory Cards. Extended clips are automatically split every 10 hours, causing the recording to stop for several seconds.

Versatile Recording/Playback Functions

• **Producing photos from video:** Single-frame image files can be converted from recorded video images. These can be used for high-quality photos. NEW
• **Pre Rec:** Constantly records images and sounds from approximately 3 seconds before ordinary recording starts, to prevent missing decisive moments.
• **Time stamp:** Date and time information can be superimposed onto images. Usable for extended research activities and nature observations.
• **Resume playback:** When the Stop key is pressed during playback, the stop position is stored in memory. Simply press the Play key to start playing again from the stop position.

* Turning off the power resets the memory. This function is disabled in the factory default setting.

• **Clip operation:** This function allows fast forward, rewind, clip forward, clip reverse, and frame by frame playback operation.

Versatile Interfaces Support IP Streaming and IP Control

LAN Terminal for IP Streaming and IP Control NEW

The LAN terminal supports video and audio streaming distribution to networks, as well as file transfers and external control. Access from PCs and tablets is achieved by web browser, with no special app required. Control is also possible by a Panasonic remote camera system IP controller for integrated system operation. Open IP commands make it easy for users to design original systems.
• **IP control:** Remote control from a PC, tablet or IP controller enables Rec Start/Stop, Clip Delete, and compact Camera Head control (Zoom, Focus, Iris, and Menu Settings).
• **IP streaming:** Video and Audio IP streaming supported. Signals can be received and monitored by PCs, tablets, and IP decoders.
• **File transfer:** Recorded clips can be downloaded from a network PC.

SDI Input Records Endoscope and Other Images, and SDI/HDMI Output Supports Various Applications

• **SDI input:** An SDI input with 3G-SDI support is equipped. This lets you connect to an endoscope or other video device and record multi-format images, including FHD (1920 x 1080) 59.94p/50p/23.98p/25p progressive images.
• **SDI output:** 3G-SDI compatible SDI output is equipped. FHD (1920 x 1080) 59.94p/50p/23.98p progressive images can be output to an external monitor.
• **HDMI output:** HDMI output of 4K (UHD)*1/FHD images is supported. Combined with SDI output and IP streaming, this enables simultaneous output*2 to maximum of three systems. NEW

*1: HDMI output of 4K (UHD) video is available only for playback of 4K (UHD) recording clips.
*2: Simultaneous output is not supported for all video formats. Conditions exist for the input/ output signals and recording format.

Versatile Interfaces

• **REMOTE terminal:** External control is enabled for Rec Start/Stop, Zoom, Focus, and Iris settings. NEW
• **Audio input:** A stereo mini-jack is equipped. LINE/MIC switchable.
• **USB 2.0:** PC connection is possible in Mass Storage mode (miniB terminal).

Recording Format

Rec. Mode		Image Size	Bit Rate	Frame Rate 59.94 Hz	Frame Rate 50.00 Hz	Audio	Recording Time (approx.)
MP4*		4K (UHD) 3840×2160	50 Mbps (VBR)	29.97p 23.98p	25p	LPCM 1.5Mbps	5 hour 20 minutes
AVCHD	PS	1920×1080	25 Mbps (VBR)	59.94p	50p	Doiby Audio 384kbps	11 hours
	PH		21 Mbps (VBR)	59.94i 23.98p	50i		12 hour 30 minutes
	HA		17 Mbps (VBR)	59.94i	50i	Doiby Audio 256kbps	17 hours
	HE	1440×1080	5 Mbps (VBR)	59.94i	50i		56 hours
	PH	1280×720	21 Mbps (VBR)	59.94p	50p	Doiby Audio 384kbps	12 hour 30 minutes
	PM		8 Mbps (VBR)	59.94p	50p	Doiby Audio 256kbps	35 hours

*When using the AG-MDC20GJ.

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AG-MDR25 Specifications

As of April, 2017

General

Power:	DC 7.28 V (with battery), DC 12 V (with AC adaptor)
Power consumption:	In standalone condition: 1.1 A (with battery), 0.7 A (with AC adaptor) With the optional AG-MDC20GJ Camera Head: 2.2 A (with battery), 1.4 A (with AC adaptor)
Operating temperature:	0 °C to 40 °C (32 °F to 104 °F)
Operating humidity:	10 % to 80 % (no condensation)
Weight:	Approx. 590 g (1.3 lbs)
Dimensions: (W x H x D)	100 mm x 53.5 mm x 104 mm (excluding protrusion) (3-15/16 inches x 2-3/32 inches x 5-1/2 inches)

Memory Card Recorder

Recording media:	SDHC memory card (4 GB to 32 GB) , SDXC memory card (48 GB to 128 GB) MP4: more than Class10, AVCHD: more than Class4
Recording slot:	2 Slots
System format:	59.94 Hz / 50.00 Hz
Motion recording:	Recording system: MP4, AVCHD Recording mode/Recording time: Please see page 3 for the "Recording Format" table
Still picture recording:	Recording system: JPEG (DCF/Exif2.2)

Digital Video/Digital Audio

Output video signal:	8 bit 4:2:2
Recording video signal:	8 bit 4:2:0
Video compression:	MP4: MPEG-4, AVCHD: AVC/H.264 High Profile
Recording audio signal:	48 kHz/16 bit 2 CH
Audio compression:	MP4: LPCM, AVCHD: Dolby Audio
Headroom:	12 dB

Video Input/Output

SDI IN:	BNC x 1, 0.8 V [p-p], 75 Ω, 3 G/1.5 G HD SDI supported Input format:1080/59.94p LEVEL-A/LEVEL-B, 1080/50p LEVEL-A/LEVEL-B, 1080/29.97PsF/25PsF/23.98PsF, 1080/59.94i/50i, 720/59.94p/50p
SDI OUT:	BNC x 1, 0.8 V [p-p], 75 Ω, 3 G/1.5 G HD SDI supported Output format: same as input format
HDMI OUT:	Type A connector x 1, VIERA Link not supported Output format: 2160/29.97p/25p/23.98p, 1080/59.94p/50p/ 29.97p/25p/23.98p/59.94i/50i, 720/59.94p/50p, 480/59.94p, 576/50p

Audio Input/Output

MIC/LINE IN:	3.5 mm diameter, stereo mini jack (MIC IN and LINE IN) MIC: –60 dBV (sensitivity –40 dB equivalent, 0 dB=1 V/Pa 1 kHz), plug in power supported LINE : –10 dBV
SDI OUT:	2 CH (LPCM) , switchable gain: 0 dB/–6 dB/–12 dB
HDMI OUT:	2 CH (LPCM)
Headphone:	3.5 mm diameter, stereo mini jack x 1
Speaker:	20 mm diameter, round x 1

External Terminal

CAMERA:	20 pin dedicated interface
LAN:	IP control LAN connector (RJ-45) Straight/cross cable auto-detect function
REMOTE:	2.5 mm diameter stereo mini jack x 1 (ZOOM, S/S) 3.5 mm diameter mini jack x 1 (FOCUS, IRIS)
USB 2.0:	Type Mini-B connector, mass storage (read/write)
DC IN 12 V:	DC 12 V (11.4 V to 12.6 V) EIAJ Type4

Monitor

LCD monitor:	3.5-type LCD monitor, approx. 1,150,000 dots

Network

Video compression:	MP4:MPEG-4, AVCHD:AVC/H.264 High Profile
Audio compression:	AAC-LC (48kHz, 16 bit, 2 CH, 128 kbps)
Transfer mode: (JPEG)	Resolution 640 x 360: Frame rate (59.94 Hz) : 30 fps, 15 fps, 5 fps Frame rate (50.00 Hz) : 25 fps, 12.5 fps, 5 fps
Transfer mode: (H.264)	Resolution 3840 x 2160/640 x 360: Frame rate (59.94 Hz) : 30 fps, 15 fps, 5 fps Frame rate (50.00 Hz) : 25 fps, 12.5 fps, 5 fps Resolution 1920 x 1080/1280 x 720: Frame rate (59.94 Hz) : 60 fps, 30 fps, 15 fps, 5 fps Frame rate (50.00 Hz) : 50 fps, 25 fps, 12.5 fps, 5 fps *By the conditions, the frame rate is lower than setting.
Supported protocol:	TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, DHCP, DNS, NTP, IGMP, UPnP, ICMP, ARP, RTSPoverTCP, RTSPoverHTTP, SSL (TLS) , MultiCast/UniCast
IP connector cable:	LAN cable* (moer than category 5) max. 100 m *STP (Shielded Twisted Pair) recommend

Supported OS

Windows:	Microsoft® Windows 10 (32 bit/64 bit) , Internet Explorer 11 Microsoft® Windows 7 (32 bit/64 bit) SP1, Internet Explorer 11
Mac:	MacOS v10.12 Safari10, OS X v10.11 Safari10

Supported Browser

iOS device:	iPhone/iPad/iPod touch, iOS 10, standard browser
Android:	Android OS 4.4, standard browser

Supported Controller

Controller:	AW-RP50, AW-RP120G, AK-HRP200G *Depending on a model, upgrade is required.

AC Adapter

Rated input voltage:	AC 100 V – 240 V, 50 Hz/60 Hz, 1.2 A
Input capacitance:	79 VA (AC 100 V) , 99 VA (AC 240 V)
Rated output:	DC 12 V, 3.0 A
Operating temperature:	0 °C to 40 °C (32 °F to 104 °F)
Operating humidity:	10 % to 90 % (no condensation)
Weight:	Approx. 225 g (0.496 lbs)
Dimensions:	115 mm (W) x 37 mm (H) x 57 mm (D) (excluding DC code) (4-1/2 inches × 1-7/16 inches × 2-1/4 inches)

AG-MDC20GJ Specifications

As of April, 2017

General

Power:	DC 9 V (supplied from the AG-UMR20)
Power consumption:	0.6 A
Operating temperature:	0 °C to 40 °C (32 °F to 104 °F)
Operating humidity:	10 % to 80 % (no condensation)
Weight:	Body: approx. 325 g (0.717 lbs) Shooting: approx. 333 g (0.734 lbs) (including Protector)
Dimensions: (W x H x D)	Body: 64 mm x 72 mm x 131 mm (excluding protrusion) (2-17/32 inches x 2-27/32 inches x 5-5/32 inches) Shooting:64 mm x 72 mm x 134.5 mm (including protrusion) (2-17/32 inches x 2-27/32 inches x 5-9/32 inches)

Camera

Pickup device:	1/2.3-type MOS MOS solid state image sensor (Total pixels: approx. 12.76 megapixels)
Lens:	Zoom: optical 20x motorized zoom Fvalue: F1.8 to F3.6, Focal length: f= 4.08 mm to 81.6 mm 35 mm conversion: 29.5 mm to 612.0 mm (Hybrid O.I.S mode "OFF") Filter diameter : 49 mm, ND filter: CLEAR, 1/4, 1/16, 1/64 (built-in) Shortest shooting distance: 1.5 m (4.9 ft) at zoom range, 3 cm (0.1 ft) at wide angle IR cut filter : incorporates the ON/OFF control function
Zoom:	i. Zoom: x30 (HD), x22 (4K) Digital zoom: x1.4, x2, x4, x6, x8
Image stabilizer:	Optical image stabilizer (HD/4K) 5-Axis hybrid image stabilizer (HD)
Gain setting:	Automatic, manual 0 dB to 30 dB(1 dB step), Super Gain 33 dB, 36 dB *At auto mode, 3 dB to 30 dB (3 dB steps) can be selected with AGC limit setting.
White balance:	ATW, ATW LOCK, AWB A, AWB B, P3200K, P5600K, VAR (2000 K to 15000 K)
Shutter speed:	59.94i/59.94p mode: 1/60 sec., 1/100 sec., 1/120 sec., 1/180 sec., 1/250 sec., 1/350 sec., 1/500 sec., 1/750 sec., 1/1000 sec., 1/1500 sec., 1/2000 sec., 1/3000 sec., 1/4000 sec., 1/8000 sec. 29.97p mode: 1/30 sec., 1/50 sec., 1/60 sec., 1/100 sec., 1/120 sec., 1/180 sec. to 1/8000 sec. (same as above) 23.98p mode: 1/24 sec., 1/48 sec., 1/50 sec., 1/60 sec., 1/100 sec., 1/120 sec., 1/180 sec. to 1/8000 sec. (same as above) 50i/50p mode: 1/50 sec., 1/60 sec., 1/100 sec., 1/125 sec., 1/180 sec. to 1/8000 sec. (same as above) 25.00p mode: 1/25 sec., 1/50 sec., 1/60 sec., 1/100 sec., 1/125 sec., 1/180 sec. to 1/8000 sec. (same as above)
Slow shutter:	59.94i/59.94p mode: 1/2 sec., 1/4 sec., 1/8 sec., 1/15 sec., 1/30 sec. 29.97p mode: 1/2 sec., 1/4 sec., 1/8 sec., 1/15 sec. 23.98p mode: 1/2 sec., 1/3 sec., 1/6 sec., 1/12 sec. 50i/50p mode: 1/2 sec., 1/3 sec., 1/6 sec., 1/12 sec., 1/25 sec. 25.00p mode: 1/2 sec., 1/3 sec., 1/6 sec., 1/12 sec.
Synchro scan:	59.94i/59.94p mode: 1/60.0 sec. to 1/285.6 sec. 29.97p mode: 1/30.0 sec. to 1/206.5 sec. 23.98p mode: 1/24.0 sec. to 1/280.1 sec. 50i/50p mode: 1/50.0 sec. to 1/209.2 sec. 25p mode: 1/25.0 sec. to 1/224.3 sec.
Minimum illumination:	0.2 lx (slow shutter: 1/2 sec., gain: +36 dB)
Horizontal resolution: (Typ, Center)	1,300 TV (HDMI output 2160/29.97p, when 25.00p playback) 1,000 TV (HDMI output 1080/59.94p, when 50.00p playback)

Input/Output

AUDIO IN:	Built-in microphone (2 CH stereo)
Connecter:	20 pin dedicated interface (to the AG-MDR25)

4

Options

As of April, 2017

AG-C20003G 3 m (9.84 ft)
AG-C20020G 20 m (65.62 ft)
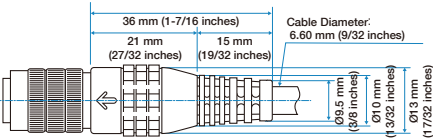Camera Head Option Cable

SDHC/SDXC Memory Card

AG-VBR118G (11,800 mAh)
AG-VBR89G (8,850 mAh)
AG-VBR59 (5,900 mAh)
Battery Pack

AG-BRD50
Battery Charger

VW-VBD58 (5,800 mAh)
Battery Pack
AG-B23
Battery Charger

Camera Head Option Cable Dimensions

36 mm (1-7/16 inches)
21 mm (27/32 inches)
15 mm (19/32 inches)
Cable Diameter: 6.60 mm (9/32 inches)
Ø9.5 mm (3/8 inches)
Ø10 mm (13/32 inches)
Ø13 mm (17/32 inches)

Battery Pack Charge Capacity and Charge Time

Product Number	Voltage/Capacity	Charge time*
AG-VBR118G	7.28 V 11800 mAh 86 Wh	Approx. 280 min.
AG-VBR89G	7.28 V 8850 mAh 65 Wh	Approx. 240 min.
AG-VBR59	7.28 V 5900 mAh 43 Wh	Approx. 200 min.
VW-VBD58	7.2 V 5800 mAh 42 Wh	Approx. 320 min.

*When using the AG-BRD50.

Please refer to the latest Non-linear Compatibilty Information, Download and Service Information, etc. at the following Panasonic website:

http://pro-av.panasonic.net/

Panasonic®

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UKAS MANAGEMENT SYSTEMS
051

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