SONY

(Images simulated)

HXR-MC1/ACC

HD Point of View Camera Recorder with Accessory Kit

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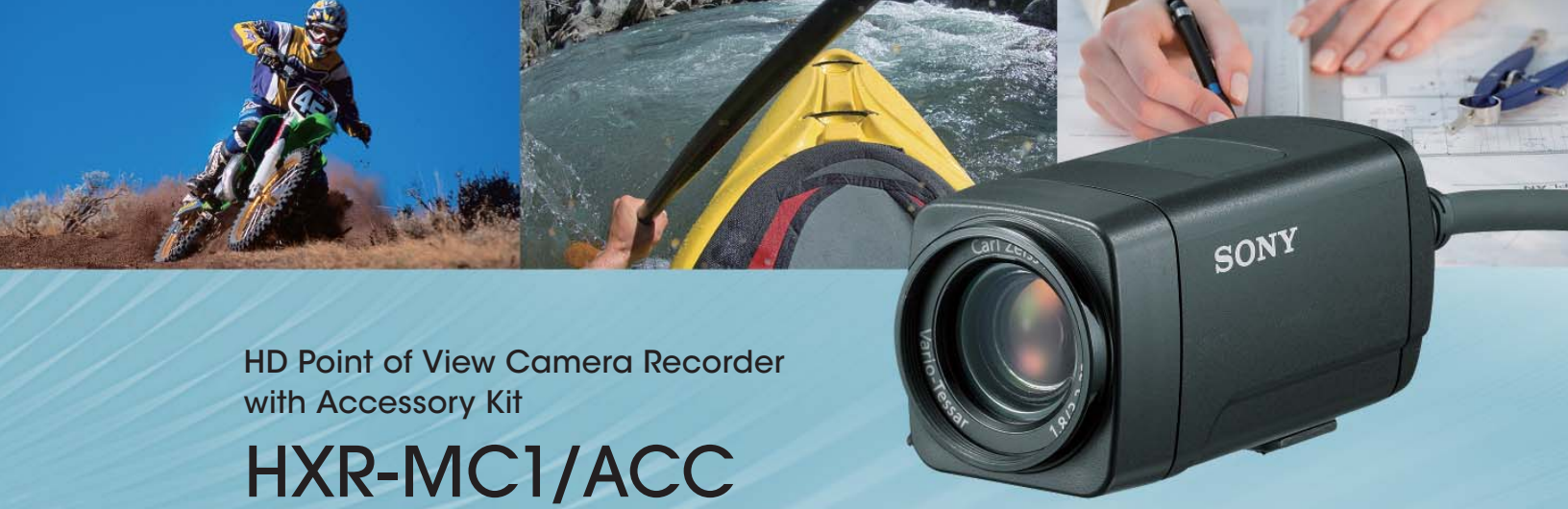
MEMORY STICK

Exmor™



HD Point of View Camera Recorder with Accessory Kit

HXR-MC1/ACC

Sony is proud to present a stunning HD camera to put the last piece of the HD video production puzzle in place. The HXR-MC1/ACC is an easy-to-use HD camera system, consisting of a small camera unit and a handheld controlling unit with LCD panel and recording function. HXRMC1/ACC also comes with basic accessory kit that contains items of frequent use, such as wide conversion lens, remote commander unit, battery pack, AC adapter/Charger.

This all-in-one tiny camera system needs no extra equipment, just take it out and just start shooting. Also, the camera unit is splash-proof*, allowing easy usage under tough conditions, such as outdoor shooting or water-side shooting**. The range of HD shooting will expand using this one-and-only camera. Moreover, the unique style of the HXR-MC1/ACC enables shooting in unordinary conditions and angles, such as shooting sports scenes from the user's point of view and onboard shooting in motor sports. Thanks to the LCD panel equipped main unit, once the shot is taken, the user can check the material immediately. The possibility is up to the creators.

* Camera unit conforms to IEC60529 IPX2.
** Not to be immersed or come in continuous contact with water.

(Simulated images)

1080i Compact HD Camera. Splash-proof Specification Suited for Outdoor Use

Even though it is equipped with a full HD shooting (1920x1080i), 10x optical zoom and built-in microphone, the HXR-MC1 camera body is compact, measuring only 1 1/2 x 1 11/16 x 3 1/2 inch (37 x 42.5 x 86.5 mm). It can take 1080i HD or SD images and sound in places that no ordinary camcorder can access.
It is possible to attach it to various devices such as helmets by utilizing the screw hole at the bottom of the unit*1, and capture HD or SD images from angles that you have never experienced before.
And the camera is splash-proof, making it suitable for outdoor use as well. It can be used at the water's edge.*2

*1 Sony does not provide any special mounting hardware.

*2 Only the camera unit conforms to IEC60529 IPX2. Under no circumstances should it be used in water. Do not allow the control unit to get wet, as it has no splash-proof features.

All-in-one Recording Unit Expanding the Shooting Field with Battery Operation

Recording and playback are possible within the control unit of the HXR-MC1/ACC. You don't need any external recording facility. Maximum battery operation of up to 405 minutes* is available thanks to the use of the Exmor™ CMOS sensor and various low-power consumption technologies. Shoot anytime, anywhere without having to worry about power supply.

* Continuous recording with the optional NP-FH100 battery (LCD backlight =OFF). It operates for about 200 minutes in ordinary use with frequent recording start/stop, zooming etc,

Remote Monitoring and Control

As the control unit has a 2.7-inch (16:9) (viewable area, measured diagonally), 210,000 pixels LCD panel that uses Clear Photo LCD Plus™, the images captured by the HXR-MC1/ACC camera are at your fingertips to be checked. All the menu settings can be done using the touch screen LCD panel. The control unit is also equipped with a recording button, zoom lever, and manual control dial. So you can control the camera remotely while watching the images. With the HXR-MC1/ACC, it's easy to shoot in ways where shooting with traditional camcorders was once impossible. No special equipment such as external monitors or remote control devices are needed.

(Onscreen image simulated)

Applications

Sports Shooting

If you're shooting while taking part in extreme sports such as skydiving, paragliding or skateboarding, it is hard to check the images you're recording. With the HXR-MC1/ACC, even if you attach the
camera to your helmet, you can easily check the angles using the LCD panel of the control unit and adjust the angle of view with the zoom lever. Once the recording to Memory Stick PRO Duo™ has started, all you have to do is to enable the control unit's HOLD switch to prevent operating error, put the control unit into your backpack or a pocket, and get going.

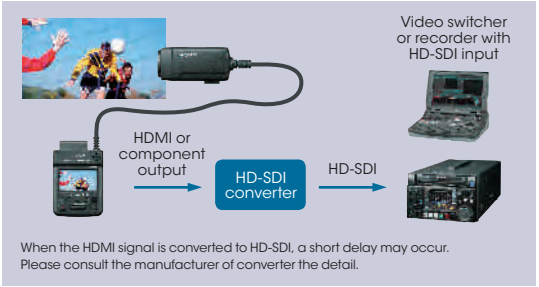
Motor Sports

With the HXR-MC1/ACC, it's possible to capture powerful visuals in which the ground comes toward you just as though you're riding a motorcycle or driving a racing car. The HXR-MC1/ACC's tiny camera increases your choice of where to mount it. You can even shoot inside the cramped interior of a car by using an optional wide conversion lens.

(Simulated Images)

Live Relay / Recording

The control unit of the HXR-MC1/ACC has connectors for both HDMI™ output and analog video output. By using a commercially available HDMI/HD-SDI converter or an A/D converter, you can also make live relays or recordings using HD-SDI signals. If you use visuals that close in on the subject, such as images taken by the HXR-MC1/ACC on the posts of a soccer goal or a close shot of a musician's hands, you can achieve even more powerful live images. The HDMI and analog video connector outputs SD signals when the recording mode of HXR-MC1/ACC is set in SD.



When the HDMI signal is converted to HD-SDI, a short delay may occur. Please consult the manufacturer of converter the detail.

Shooting Small Animals and Insects

The small size of the HXR-MC1/ACC camera makes it ideal for capturing animals or insects in their natural surroundings. It is possible to record continuously for about 405 minutes (6 hours 45 minutes)*. You can also shoot the world of insects by sliding the camera through the grass.

* Continuous recording with the optional NP-FH100 battery (LCD backlight =OFF). It operates for about 200 minutes in ordinary use with frequent recording start/stop, zooming etc,

(Simulated Images)

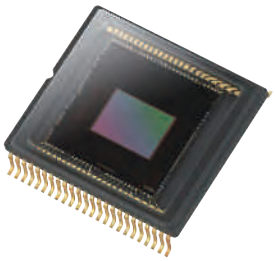
Images From Operators' Sightlines

Images taken by the HXR-MC1/ACC camera from the sightlines of operators with special skills, such as process engineers can be used as simulation material or as a training video to help others acquire such skills. Also the recorded video can be used later on to help the user analyze the actions or the action pathways made by a person or object carrying the camera.

Notes:
- The LCD panel does not display all captured area.
- When the camera unit receives a sudden and very strong shock, the internal lens may move, which may cause a momentary shift of focus position. The use of shock absorbers are recommended under these circumstances.
- Sony does not provide any special mounting hardware. As for the positions and methods of installing the camera and the control unit, users should keep safety concerns in mind and confirm safety on their own in advance. Sony will not take responsibility for any problems arising from the installation of the HXR-MC1/ACC camera.

Exmor CMOS Sensor – Cutting Edge Image Sensor Technology

The same Exmor CMOS sensor, which is also in professional camcorders and high-end D-SLR cameras, is used in the HXR-MC1/ACC. It achieves low noise by multiple micro A/D (analog to digital) converters. The image sensor in the HXR-MC1/ACC is also uses a ClearVid™ pixel array which has 45-degree rotated pixels. This unique layout offers high picture quality with low-light sensitivity.



Exmor™ CMOS Sensor

Long-time Recording to Memory Stick PRO Duo Media by Efficient Video Compression for HD and SD

Memory Stick PRO Duo media is the optimal recording media for the compact HXR-MC1/ACC control unit. The camera's highly efficient compression methods used in both HD and SD modes achieve long recording times, which make the most of Memory Stick PRO Duo media's storage capacity.
In HD recording mode, video is recorded in AVCHD, which uses MPEG-4 AVC/H.264 compression – the same method used in Blu-ray Disc™ technology.
If SD recording mode is selected, video is recorded in MPEG-2.

AVCHD

(Onscreen image simulated)

Recording time (approximate)

HD Mode	2GB Memory Stick PRO Duo media	4GB Memory Stick PRO Duo media	8GB Memory Stick PRO Duo media	16GB Memory Stick PRO Duo media
AVCHD 16M (FH) (1920x1080i)	10 minutes	25 minutes	55 minutes	110 minutes
AVCHD 9M (HQ) (1440x1080i)	25 minutes	55 minutes	115 minutes	230 minutes
AVCHD 7M (SP) (1440x1080i)	30 minutes	65 minutes	140 minutes	280 minutes
AVCHD 5M (LP) (1440x1080i)	40 minutes	85 minutes	180 minutes	355 minutes
SD Mode	**2GB** Memory Stick PRO Duo media	**4GB** Memory Stick PRO Duo media	**8GB** Memory Stick PRO Duo media	**16GB** Memory Stick PRO Duo media
9M (HQ)	25 minutes	55 minutes	115 minutes	230 minutes
6M (SP)	40 minutes	80 minutes	170 minutes	340 minutes
3M (LP)	80 minutes	160 minutes	325 minutes	655 minutes

*MPEG-2 format is used for recording in SD Mode

Types of Memory Stick media you can use with your camcorder

For recording movies, it is recommended that you use a Memory Stick PRO Duo™ media of 1 GB or larger marked with:

MEMORY STICK PRO DUO (Memory Stick PRO Duo media)*1

MEMORY STICK PRO-HG DUO™ (Memory Stick PRO-HG Duo media)*2

*1 Marked with Mark2 or not, either can be used.
*2 Marked with HX or not, either can be used.

A Memory Stick PRO Duo media of up to 16 GB will operate with the HXR-MC1/ACC camera.

Other Functions of HXR-MC1/ACC

Still Picture Recording

Still picture approximately 4M pixels (2304x1728) can be recorded (when recording at 4:3).

Dual Recording

The dual recording function allows high-resolution still picture recording even when shooting a movie. A high-resolution still picture of approximately 2.3M pixels can be recorded simply by pushing the PHOTO button of the control unit during movie shooting.

Creating Still Pictures out of Movies

It is possible to create still pictures of approximately 2.1M pixels from recorded pictures. Even after shooting a movie, it is possible to render any decisive moment into a still picture.

Smooth Slow Recording Function

By capturing images with 4 times the number of fields compared to the normal rate of shooting per second, it is possible to record high-speed movements that would be impossible for the human eye to catch completely*.

* Simultaneous sound recording is not available. The picture quality becomes lower than when shot in normal mode.

Equipped with Touch Screen LCD Panel with HOME and OPTION MENU

The HXR-MC1/ACC is equipped with Sony's unique touch panel LCD panel, so setup during shooting or video operation can be carried out easily simply by touching the LCD panel. You can shoot, play back video, change settings, and edit pictures by selecting a category from the "HOME MENU", which is the doorway to the features. Also with "OPTION MENU", you can directly access to the detailed camera settings and make the settings easily by displaying functions available according to the situation, such as during shooting or playback. There are functions that can be operated comfortably even by beginners, such as the "Help" function, which gives you the contents of each item.

Visual Index

You can quickly locate the scene you want to see using the function that allows you to display a list of the scenes you have shot in the form of pictures (thumbnails). Simply by touching the scene you want to see among the list of thumbnails displayed, you can easily play it back. If one piece of shooting is one file, the first scene of each file is the thumbnail.

Film Roll Index

The HXR-MC1/ACC is equipped with the "Film Roll Index", which can display the index at certain intervals, not only the beginning of each scene but also the contents of a movie scene. This makes it easier for you to search for a scene you want to watch. The index display intervals can be selected from 3 seconds, 6 seconds, 12 seconds, 1 minute and 5 minutes.

File Splits

With the HXR-MC1/ACC, it is possible to delete unwanted parts by splitting a file on the control unit.

Play List

You can create a "Play List" by selecting your favorites from the original movies.

Main unit

Camera unit

Camera unit front view

Camera unit bottom view

Accessories

Accessory kit
Optimal accessories for shooting with the HXR-MC1 have been assembled into a kit.

Contents of the kit

- **NP-FH70: Rechargeable Battery Pack**
  Compact large-capacity battery that supports extended shooting.
- **AC-VQH10: AC Adapter/ Charger**
  A quick charger that can sequentially charge two rolls of H-series batteries.
- **VCL-HG0730A: Wide Conversion Lens**
  A roughly 0.7x wide conversion lens.
- **RM-AV2: Remote Commander® Unit**
  A remote controller that puts zoom, Rec start/stop at your fingertips.
- **Exclusive Case**
  A case for efficient storage of HXR-MC1/ACC and accessories built exclusively for the kit.

Editing AVCHD Format

AVCHD format can record high-resolution HD images with a smaller file size compared to the conventional compression method, by using an efficient compression method. But in order to be able to play back and edit on the computer, the load on the CPU becomes larger due to the complicated calculation. So, currently, methods such as MPEG-2 are superior in terms of convenience for editing. The following are some methods to edit materials shot with the HXR-MC1/ACC. Please select whichever is best suited for your environment and purpose of shooting. For non-linear editing software and supporting peripheral devices, please consult the vendors of each product you are using.

Non-linear Editing Software Supporting AVCHD Native Editing

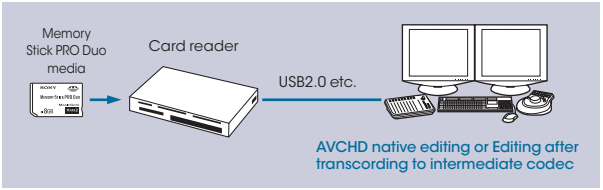
- If you use non-linear editing software that supports AVCHD native editing, you can edit an AVCHD file by transferring it to a computer at high speed.
- The load on the computer during AVCHD editing is relatively big, but it is still possible to edit while maintaining quality at the time of shooting without converting to another compression method*.

* Parts where effects have been added will be compressed again.

File Conversion Into Intermediate Codec for Editing

- Some non-linear editing software uses a unique compression method called intermediate codec, which is optimum for each piece of software.
- Work efficiency can be improved during editing* by converting AVCHD files into intermediate codec before editing.

* The conversion speed into intermediate codec and the post-conversion file size vary depending on computer specifications, software type, intermediate codec editing.



Use of HDMI Output

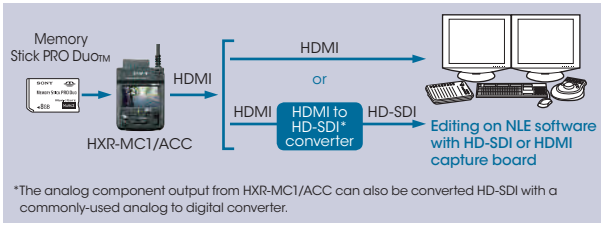
- By using a commercially available video capture card that supports HDMI and non-linear editing software supporting the card, it is possible to capture HD signals from the HDMI* output terminal of the HXR-MC1/ACC onto the computer for editing.

* HDMI is the abbreviation of High-Definition Multimedia Interface. It is a standard interface used to transfer HD data, mostly used in connecting consumer audio visual devices. HDMI doesn't contain timecode data.

- Or by using a commercially available HDMI to HD-SDI converter, a video capture card that supports HD-SDI,and non-linear editing software supporting them, it is possible to capture the HD signals onto the computer for editing*.

* The timecode data in the HD-SDI signal is generated by the converter.

- The captured images and sound will become a file formatted in accordance with the settings of the non-linear editing software.
- Or you can edit after copying to a recorder that has an HD-SDI input, such as an HDCAM® or XDCAM HD®.
- These ways take actual time for capturing or copying, but after that, you can edit in the same condition using normal HD editing.



*The analog component output from HXR-MC1/ACC can also be converted HD-SDI with a commonly-used analog to digital converter.

SD Editing

The HXR-MC1/ACC has a down-conversion function. The down-converted SD signal such as composite or S-video from HD recordings can be captured by a video recorder which has SD input connectors like HVR-M15AU/M25AU/M35U. These VTRs can make DVCAM tapes for SD editing. Or the MPEG-2 files recorded in the SD mode of HXR-MC1/ACC can be transferred to computer and edited on compatible non-linear editing software.

*4:3 mode or squeeze mode is available in SD recording

*Letterbox mode or squeeze mode can be selected in down-conversion from HD to SD signal

*HXR-MC1/ACC is not equipped with an i-LINK® connector

*The project settings and editing capability depend on the type of the software. For the detail, please consult the instruction manual or reseller of your software

PMB (Bundled PC Application Software For Windows® XP and Vista™)

With AVCHD or MPEG-2 files shot using simple operations*, you can display a list of, playback, trim and write data onto Blu-ray Disc or DVD disc with the attached software "PMB".

System requirements

OS: Microsoft Windows XP® SP3*1/Windows Vista™ SP1*2
*1 64-bit editions and Starter (Edition) are not supported. *2 Starter (Edition) is not supported. Standard installation is required.
Operation is not assured if the above OS has been upgraded or in a multi-boot environment.
CPU: Intel Pentium 4 2.8 GHz or faster (Intel Pentium 4 3.6 GHz or faster, Intel Pentium D 2.8 GHz or faster, Intel Core Duo™ 1.66 GHz or faster, or Intel Core 2 Duo 1.66 GHz or faster is recommended.)
• Intel Pentium® III 1 GHz or faster enables the following operations:
• Importing the contents to the computer • One Touch Disc Burn • Creating a Blu-ray disc/AVCHD format disc/DVD-video (Intel Pentium 4, 2.8 GHz or faster, is required when creating a DVD video by converting high definition image quality (HD) to standard definition image quality (SD).)
• Copying a disc
Memory: For Windows XP: 512 MB or more (1 GB or more is recommended.)
For processing SD (standard definition) image quality content only, 256 MB of memory or more is necessary. For Windows Vista: 1 GB or more
Hard disk: Disk volume required for installation: Approximately 500 MB (10 GB or more may be necessary when creating AVCHD format discs. 50 GB maximum may be necessary when creating Blu-ray discs.)
Display: Minimum 1,024 × 768 dots
Others: USB port (this must be provided as standard, Hi-Speed USB (USB 2.0 compatible) is recommended), Blu-ray disc/DVD burner (CD-ROM drive is necessary for installation)
Either NTFS or exFAT file system is recommended as the hard disk file system.

Attention

This camcorder captures high definition footage in the AVCHD format. Using the enclosed PC software, high definition footage can be copied onto DVD media. However, DVD media containing AVCHD footage should not be used with DVD based players or recorders, as the DVD player/ recorder may fail to eject the media and may erase its contents without warning.
DVD media containing AVCHD footage may be played on a compatible Blu-ray Disc player/recorder or other compatible device.

Notes

• Operation is not assured on all types of computer environment.

Specifications

Camera head		
Imaging Device		1/5 inch-type Exmor™ CMOS sensor with ClearVid™ array Pixel Gross: Approx. 2,360K Video Actual: Approx. 1,430K(16:9)
Optics/Lens	Lens Type	Carl Zeiss® Vario-Tessar®, Optical Zoom: 10x (Digital Zoom: 120x) f = 3.2 - 32.0mm 35mm Equivalent: 43 - 507mm (16:9 Camera Mode) F1.8 - 2.3 Filter Diameter 30mm
Microphone		Stereo Microphone
Splash-proof performance		IEC60529 IPX2 *1
Control unit		
Video Signal		NTSC color, EIA standards 1080/60i specification
LCD Screen		2.7 inch-type (viewable area, measured diagonally) wide touch panel Clear Photo™ LCD Plus display (211K Pixels)
Minimum Illumination		5 lx (Auto Slow Shutter ON, 1/30 Shutter Speed)
White Balance		[AUTO], [INDOOR] (3,200K), [OUTDOOR] (5,800K), [ONE PUSH]
Video Format(s) Supported	HD: AVCHD	Video codec: MPEG 4 AVC / H.264, Audio codec: Dolby® Digital 2ch
	SD: MPEG 2-PS	Video codec: MPEG 2, Audio codec: Dolby® Digital 2ch (Video aspect ratio 16:9 or 4:3)
Video recording average bitrate/VBR (Resolution, Frame rate)	HD: AVCHD	FH mode: Approx. 16Mbps (1920 x 1080, 60i), HQ mode: Approx. 9Mbps (1440 x 1080, 60i), SP mode: Approx. 7Mbps (1440 x 1080, 60i), LP mode: Approx. 5Mbps (1440 x 1080, 60i) *2
	SD: MPEG 2-PS	HQ mode: Approx. 9Mbps (720 x 480, 60i), SP mode: Approx. 6Mbps (720 x 480, 60i), LP mode: Approx. 3Mbps (720 x 480, 60i) *2
Still Format Supported		Exif Ver.2.2 *3
Still Resolution	Still Mode	4 megapixel 4:3 (2,304 x 1,728), 3 megapixel 16:9 (2,304 x 1,296), 1.9 megapixel 4:3 (1,600 x 1,200), 0.3 megapixel 4:3 (640 x 480)
	Movie Mode	2.3 megapixel 16:9 (2,016 x 1,134), 1.7 megapixel 4:3 (1,512 x 1,134)
	Playback Mode	2.1 megapixel 16:9 (1,920 x 1,080), 0.3 megapixel 4:3 (640 x 480), 0.2 megapixel 16:9 (640 x 360)
Supported Media		Memory Stick PRO Duo™ / Memory Stick PRO-HG Duo™ (1GB or larger)
Inputs and Outputs		
A/V R*4	COMPONENT OUT	Component A/V cable -> Pin plug x 3 (480i or 1080i, To use with COMPOSITE output is impossible.
	AUDIO OUT	Component A/V cable -> Pin plug x 2)
	COMPOSITE OUT	A/V connecting cable -> Pin plug x 1 (To use with COMPONENT output is impossible.)
	AUDIO OUT	A/V connecting cable -> Pin plug x 2
HDMI OUT		HDMI Connection x 1
USB Port		mini B / USB2.0 Hi-Speed
Memory Stick™ slot		Memory Stick PRO Duo slot x 1
Remote Control Terminal		
A/V R (*4)		(When using optional remote commander, it is possible to control. / To use with COMPONENT or COMPOSITE output is impossible.)
Power, etc		
Power Requirements		DC6.8V,7.2V (battery pack), DC8.4V (AC Adaptor)
Power Consumption		4.0W (AVCHD recording, LCD back light ON, Recording mode: Initial condition)
Operating temperature		32 °F to 104 °F (0 °C to 40 °C)
Storage temperature		-4 °F to +140 °F (-20 °C to +60 °C)
Dimentions (W/H/D)	Including the projecting parts (excluding cable bush)	Control unit: 3 1/4 x 4 1/4 x 1 11/16 inch (81 x 107 x 42mm) Camera head: 1 1/2 x 1 11/16 x 3 1/2 inch (37 x 42.5 x 86.5mm)
	Iincluding the projecting parts, and supplied battery and controller hook attached. (Excluding cable bush)	Control unit: 3 1/4 x 4 7/8 x 1 7/8 inch (81 x 122 x 47mm) Camera head: 1 1/2 x 1 11/16 x 3 1/2 inch (37 x 42.5 x 86.5mm)
Cable length		110 1/8 inch (2.8m) (between control unit and camera head, not detachable)
Weight		Approx. 1lb. 1oz. (500g) (Including control unit , camera head and cable. Excluding battery, controller hook and recording media)
Weight (with accesories)		Approx. 1lb. 4oz. (580g) (including supplied battery, controller hook and recording media)
Supplied items		AC Adaptor, Power cord, Component A/V cable, A/V connecting cable, USB cable, Rechargeable battery pack(NP-FH60), Controller hook, Cable clamper, CD-ROM (Video Camera Application Softwar), CD-ROM (Manuals for Digital HD Video Camera Recorder), Operating Guide Accessory kit (NP-FH70 Rechargeable Battery Pack, AC-VQH10 AC Adapter/Charger, VCL-HG0730A Wide Conversion 0.7x Lens, RM-AV2 Remote Commander Unit, soft carrying case)

*1 Only the camera head conforms to IEC60529 IPX2. Never immerse the camera head in water. The control unit is not splash-proof, do not wet the control unit.

*2 "60i" actually means "59.94i".

*3 "Exif" is a file format for still images, established by JEITA (Japan Electronics and Information Technology Association).
Files in this format can have additional information such as your camcoder's setting information at the time of recording.

*4 Only one A/V R terminal exists. Optional Remote Commander Unit, supplied Component A/V cable or A/V connecting cable can be attached to this terminal.
To use these simultaneously is impossible.

SONY

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