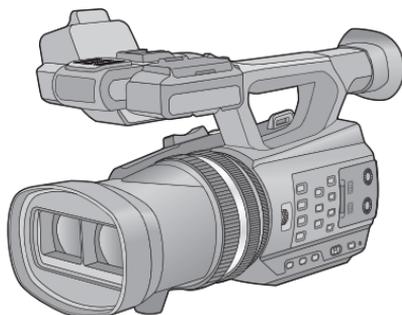


Panasonic®

Basic Operating Instructions Instrucciones básicas de funcionamiento High Definition Video Camera Videocámara de alta definición

Model No. **HDC-Z10000**



Before use, please read these instructions completely.
Antes de usarla, lea completamente estas instrucciones.

More detailed instructions on the operation of this unit are contained in "Operating Instructions (PDF format)" in the supplied CD-ROM. Install it on your PC to read it.



En el CD-ROM suministrado encontrará las "Instrucciones de funcionamiento (formato PDF)" donde puede encontrar información más detallada sobre el funcionamiento de esta unidad.

AVCHD™
3D/Progressive

HDMI

SD™
XC

DOLBY
DIGITAL
5.1 CREATOR

3D
FULL HD

E

Web Site: <http://www.panasonic-europe.com>

VQT3V01

Information for Your Safety

Dear Customer,

We would like to take this opportunity to thank you for purchasing this Panasonic High Definition Video Camera. Please read these Operating Instructions carefully and keep them handy for future reference. Please note that the actual controls and components, menu items, etc. of your High Definition Video Camera may look somewhat different from those shown in the illustrations in these Operating Instructions.

For the United Kingdom customers

■ Caution for AC mains lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience. A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

CAUTION!

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as stated below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral, Brown: Live.

As these colours may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Black or Blue.

The wire which is coloured Brown must be connected to the terminal which is marked with the letter L or coloured Brown or Red.

WARNING: DO NOT CONNECT EITHER WIRE TO THE EARTH TERMINAL WHICH IS MARKED WITH THE LETTER E, BY THE EARTH SYMBOL  OR COLOURED GREEN OR GREEN/YELLOW.

THIS PLUG IS NOT WATERPROOF—KEEP DRY.

Before use

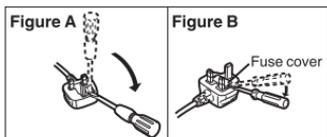
Remove the connector cover.

How to replace the fuse

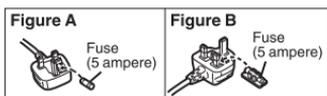
The location of the fuse differ according to the type of AC mains plug (figures A and B). Confirm the AC mains plug fitted and follow the instructions below.

Illustrations may differ from actual AC mains plug.

1. Open the fuse cover with a screwdriver.



2. Replace the fuse and close or attach the fuse cover.



WARNING:

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK OR PRODUCT DAMAGE,

- DO NOT EXPOSE THIS APPARATUS TO RAIN, MOISTURE, DRIPPING OR SPLASHING AND THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.
- USE ONLY THE RECOMMENDED ACCESSORIES.
- DO NOT REMOVE THE COVER (OR BACK); THERE ARE NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

CAUTION!

- DO NOT INSTALL OR PLACE THIS UNIT IN A BOOKCASE, BUILT-IN CABINET OR IN ANOTHER CONFINED SPACE. ENSURE THE UNIT IS WELL VENTILATED. TO PREVENT RISK OF ELECTRIC SHOCK OR FIRE HAZARD DUE TO OVERHEATING, ENSURE THAT CURTAINS AND ANY OTHER MATERIALS DO NOT OBSTRUCT THE VENTILATION VENTS.
- DO NOT OBSTRUCT THE UNIT'S VENTILATION OPENINGS WITH NEWSPAPERS, TABLECLOTHS, CURTAINS, AND SIMILAR ITEMS.
- DO NOT PLACE SOURCES OF NAKED FLAMES, SUCH AS LIGHTED CANDLES, ON THE UNIT.
- DISPOSE OF BATTERIES IN AN ENVIRONMENTALLY FRIENDLY MANNER.

The socket outlet shall be installed near the equipment and easily accessible. The mains plug of the power supply cord shall remain readily operable. To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from AC receptacle.

■ Concerning the battery

Warning

Risk of fire, explosion and burns. Do not disassemble.

Do not heat the batteries above the following temperatures or incinerate.

Button-type battery	60 °C
Battery pack	60 °C

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Warning

Keep the Button-Type battery out of the reach of children. Never put Button-Type battery in mouth. If swallowed call your doctor.

Button-type battery: CR2025

■ EMC Electric and magnetic compatibility

This symbol (CE) is located on the rating plate.

■ Product identification marking

Product	Location
High Definition Video Camera	Bottom
Battery charger	Bottom
AC adaptor	Bottom

■ Information for Users on Collection and Disposal of Old Equipment and used Batteries



These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries should not be mixed with general household waste.

For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points, in accordance with your

national legislation and the Directives 2002/96/EC and 2006/66/EC.

By disposing of these products and batteries correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

For more information about collection and recycling of old products and batteries, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items. Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.



For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

[Information on Disposal in other Countries outside the European Union]

These symbols are only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.



Note for the battery symbol (bottom two symbol examples):

This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

■ Cautions for use

Keep this unit as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).

- If you use this unit on top of or near a TV, the pictures and/or sound on this unit may be disrupted by electromagnetic wave radiation.
- Do not use this unit near cell phones because doing so may result in noise adversely affecting the pictures and/or sound.
- Recorded data may be damaged, or pictures may be distorted, by strong magnetic fields created by speakers or large motors.
- Electromagnetic wave radiation generated by microprocessors may adversely affect this unit, disturbing the pictures and/or sound.
- If this unit is adversely affected by electromagnetic equipment and stops functioning properly, turn this unit off and remove the battery or disconnect AC adaptor. Then reinsert the battery or reconnect AC adaptor and turn this unit on.

Do not use this unit near radio transmitters or high-voltage lines.

- If you record near radio transmitters or high-voltage lines, the recorded pictures and/or sound may be adversely affected.

About connecting to a PC

- Do not use any other USB cables except the supplied one.

About using a headphone

- Excessive sound pressure from earphones and headphones can cause hearing loss.
- Listening at full volume for long periods may damage the user's ears.

About using external microphones

- Keep the microphone holder screw, microphone holder adaptor and INPUT terminal cap out of reach of children to prevent swallowing.

■ Features

This unit is a single body twin lens type 3D high-definition video camera. With the adoption of twin lens format, the convergence point can be adjusted within this unit, allowing to record natural and deep 3D video. (→ 27)

■ About the recording format for recording motion pictures

You can record motion pictures with AVCHD recording formats using this unit. (→ 26)

- AVCHD 3D and AVCHD Progressive supported.

AVCHD 3D:

It is possible to record powerful, life-like 3D full high definition images.

A 3D compatible television compatible to the frame sequential format is required to view the 3D full high definition images. (→ 35)

AVCHD Progressive:

It is possible to record 2D video with highest quality (1080/50p) possible with this unit.

■ About the 1080/24p Recording Mode

When [24p SELECT] is set to [ON], the images are recorded in 1080/24p. (→ 25)

- It is not possible to use 1080/24p and other Recording Formats on the same SD card. When switching to 1080/24p, please use a separate SD card.
- The scenes recorded in 1080/24p cannot be played back by the PAL system equipment.

■ Indemnity about recorded content

Panasonic does not accept any responsibility for damages directly or indirectly due to any type of problems that result in loss of recording or edited content, and does not guarantee any content if recording or editing does not work properly. Likewise, the above also applies in a case where any type of repair is made to the unit.

■ Cards that you can use with this unit

SD Memory Card, SDHC Memory Card and SDXC Memory Card

- 4 GB or more Memory Cards that do not have the SDHC logo or 48 GB or more Memory Cards that do not have the SDXC logo are not based on SD Memory Card Specifications.
- Refer to page 18 for more details on SD cards.

■ For the purposes of these operating instructions

- The battery pack is referred to as the "Battery".
- SD Memory Card, SDHC Memory Card and SDXC Memory Card are referred to as the "SD card".
- Function that can be used for Recording Mode: 
- Function that can be used for Playback Mode: 
- Pages for reference are indicated by an arrow, for example: → 00

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**For the United Kingdom and Ireland
customers**

■ Sales and Support Information

Customer Communications Centre

- For customers within the UK: 0844 844 3899
- For customers within Ireland: 01 289 8333
- For further support on your product, please visit our website:
www.panasonic.co.uk

Direct Sales at Panasonic UK

- Order accessory and consumable items for your product with ease and confidence by phoning our Customer Communications Centre Monday–Thursday 9:00 a.m.–5:30 p.m., Friday 9:30 a.m.– 5:30 p.m. (Excluding public holidays)
- Or go on line through our Internet Accessory ordering application at www.pas-europe.com.
- Most major credit and debit cards accepted.
- All enquiries transactions and distribution facilities are provided directly by Panasonic UK.
- It couldn't be simpler!
- Also available through our Internet is direct shopping for a wide range of finished products. Take a browse on our website for further details.

Accessories

Check the accessories before using this unit.

Keep the accessories out of reach of children to prevent swallowing.

Product numbers correct as of Oct. 2011. These may be subject to change.

Battery pack

CGA-D54s



AV multi cable

K1HY12YY0008



Battery charger

DE-A88D



Lens cap

VYK5H20



AC adaptor

VSK0726



VYC1083

Microphone holder

VYC1079



AC cable (2 cables)

K2CT39A00002

- The United Kingdom and Ireland



INPUT terminal cap

(2 caps)

VJF1468



AC cable (2 cables)

K2CQ29A00002

- Areas other than the United Kingdom and Ireland



VYC0890

Microphone holder adaptor



Eye cup

VMG2030



Microphone holder screws

6 mm length (2 screws)



Remote control (Battery built-in)

N2QAEC000024



12 mm length (2 screws)



Stylus pen

VGQ0C14



Optional accessories

Some optional accessories may not be available in some countries.

Battery pack (lithium/CGA-D54s)

HDMI cable (RP-CHES15)

SD/SDHC/SDXC Memory Card
(Refer to page 18)

CD-ROM

Software



CD-ROM

Operating Instructions
VFF0879

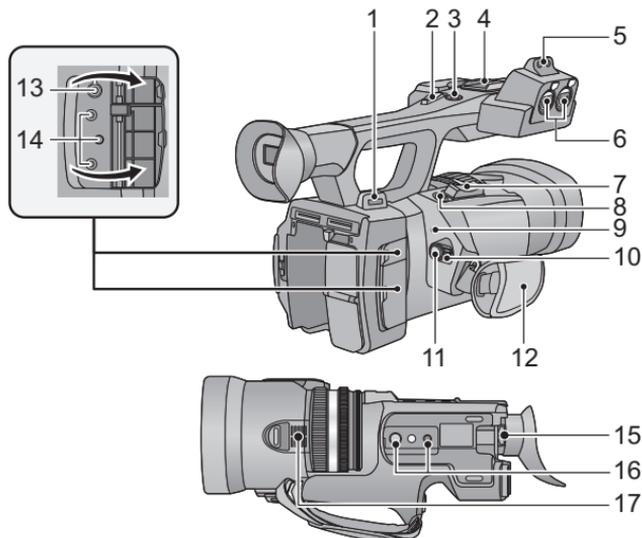


USB cable

K2KYYYY00141



Names and Functions of Main Parts



- 1 **Shoulder strap fixture**
- 2 **Sub zoom lever (→ 29)**
 - This lever functions in the same manner as the zoom lever.
- 3 **Sub recording start/stop button**
 - This button functions in the same manner as the recording start/stop button.
- 4 **Accessory shoe**
- 5 **Microphone holder attachment part**
- 6 **Audio input terminals 1, 2 (XLR 3 pin) [AUDIO INPUT1,2]**
- 7 **Zoom lever [T/W] (In Recording Mode) (→ 29)**
Volume lever [+VOL-]/Thumbnail display switch [Q/] (In Playback Mode)
- 8 **Photoshot button [] (→ 28)**
- 9 **Status indicator (→ 20)**
- 10 **Power switch (→ 20)**
- 11 **Recording start/stop button (→ 26)**
- 12 **Grip belt (→ 13)**
- 13 **Headphone terminal []**
- 14 **Camera remote jack [CAM REMOTE] [CONV.] (2.5 mm super mini jack)**

It is possible to adjust the convergence point connecting with the remote control (optional).

- Operations on the remote control (optional) will be given priority.

[CAM REMOTE] (3.5 mm mini jack)

It is possible to adjust the focus or iris connecting with the remote control (optional).

- It is not possible to use the remote control (optional) in the Intelligent Auto Mode.

[ZOOM S/S] (2.5 mm super mini jack)

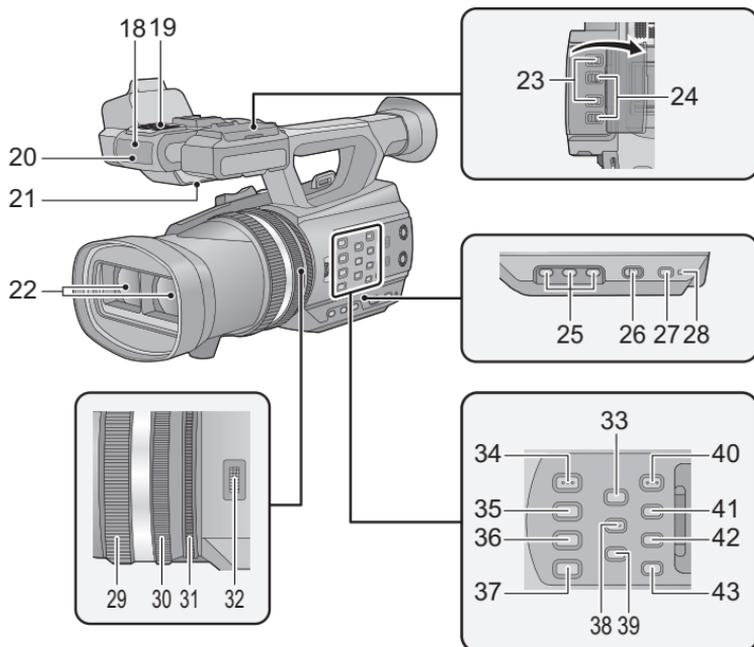
It is possible to operate zoom operation or recording start/stop connecting with the remote control (optional).

- Do not connect any equipment except the remote control (optional) to the camera remote jack. Brightness of the image may change or it may not focus when an equipment other than the remote control (optional) is connected.

15 **Eyepiece corrector lever (→ 22)**

16 **Tripod receptacle**

17 **Inlet (cooling fan)**

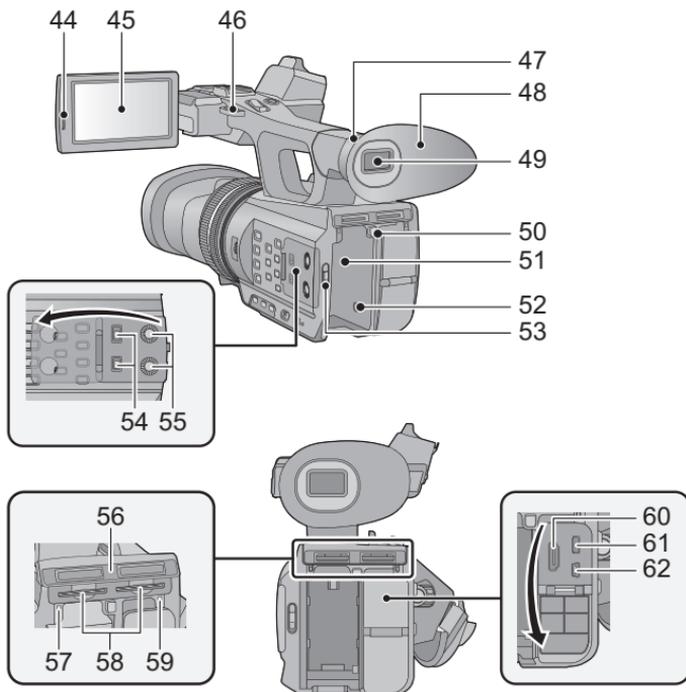


- 18 Wireless remote control sensor
- 19 Internal microphones
- 20 Recording lamp
- 21 Speaker
- 22 Lens (→ 13)
- 23 INPUT 1, 2 (LINE/MIC) switches
- 24 INPUT 1, 2 (+48V) switches
- 25 User 1, 2, 3 buttons
[USER1, USER2, USER3] (→ 32)
- 26 Intelligent auto/Manual switch
[iA/MANU] (→ 29)
- 27 Quick start button [QUICK START]
- 28 Quick start lamp
- 29 Focus ring (→ 30)
- 30 Zoom ring (→ 29)
- 31 Iris ring (→ 31)
- 32 Convergence dial [CONV.] (→ 27)
- 33 3D guide button [3D GUIDE] (→ 28)
- 34 Iris auto/Manual button [IRIS A/M]
(→ 31)
- 35 Focus auto/Manual button
[FOCUS A/M/∞] (→ 30)

36 Optical image stabilizer button [O.I.S.]

- In 3D Recording Mode, you can use Optical Image Stabilization. In 2D Recording Mode, you can use Hybrid Optical Image Stabilization (Hybrid O.I.S.).

- 37 White balance button [W.B.] (→ 30)
- 38 Zebra button [ZEBRA]
- 39 Colour Bar Screen button [BARS]
- 40 Menu button [MENU] (→ 24)
- 41 Display/Mode check button [DISP/MODE CHK]
- 42 Counter button [COUNTER]
- 43 Counter reset button [RESET]



44 LCD monitor extract part [PULL]
(→ 21)

45 LCD monitor (Touch screen) (→ 22)

46 Shoulder strap fixture

47 Eye cup attachment part (→ 13)

48 Eye cup (→ 13)

49 Viewfinder (→ 22)

50 Battery release button [PUSH] (→ 15)

51 Battery holder (→ 15)

52 DC input terminal [DC IN] (→ 17)

• Do not use any other AC adaptors except the supplied one.

53 Mode switch (→ 20)

54 CH1, CH2 switches [CH1, CH2]

55 Audio control knobs [CH1, CH2]

56 SD Card slot cover (→ 19)

57 Access lamp (card 1) (→ 19)

**58 Card slot 1 (left)/
Card slot 2 (right)** (→ 19)

59 Access lamp (card 2) (→ 19)

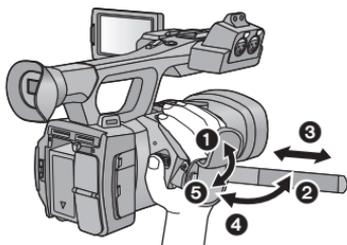
60 HDMI connector [HDMI] (→ 35)

61 AV multi connector [AV MULTI] (→ 35)

• Use the AV multi cable (only the supplied cable).

62 USB terminal [USB 2.0]

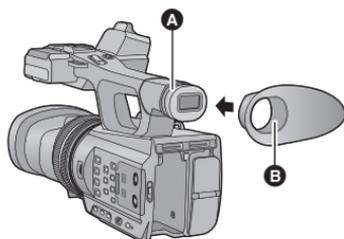
■ Adjust the length of the grip belt so that it fits your hand.



- 1, 2 Flip the belt cover and the belt.
- 3 Adjust the length.
- 4, 5 Replace the belt.

■ Attaching the eye cup

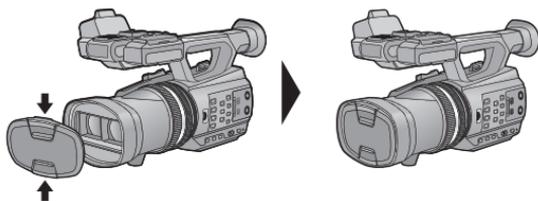
Attach by aligning the notch of the eye cup attachment part with the protrusion at the inside of the eye cup.



- A Notch
- B Protrusion

■ Attaching the lens cap

Protect the lens surface with the lens cap while the unit is not used.



Attach or remove it by pinching on it.

Power supply

■ About batteries that you can use with this unit

The battery that can be used with this unit is CGA-D54s.

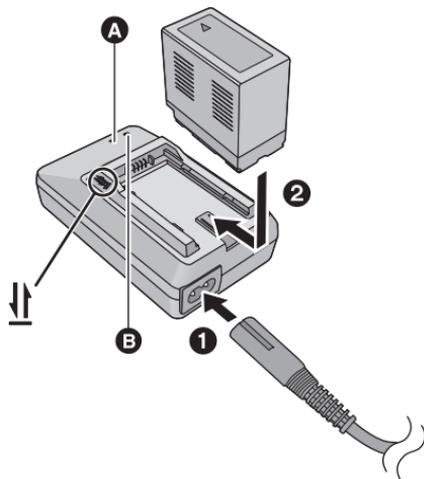
It has been found that counterfeit battery packs which look very similar to the genuine product are made available to purchase in some markets. Some of these battery packs are not adequately protected with internal protection to meet the requirements of appropriate safety standards. There is a possibility that these battery packs may lead to fire or explosion. Please be advised that we are not liable for any accident or failure occurring as a result of use of a counterfeit battery pack. To ensure that safe products are used we would recommend that a genuine Panasonic battery pack is used.

Charging the battery

When this unit is purchased, the battery is not charged. Charge the battery fully before using this unit for the first time.

Important:

- Do not use the AC cable with any other equipment as it is designed only for this unit. Also, do not use the AC cable from other equipment with this unit.
- It is recommended to charge the battery in a temperature between 10 °C and 30 °C. (The battery temperature should also be the same.)



Charging lamp [CHARGE] **A**

Lights up:

Charging (Battery charging time: → 16)

Goes off:

Charging completed

Flashing:

Be sure to connect the unit correctly

Power lamp **B**

- This will light up when the AC cable is connected.

- Insert the plugs as far as they will go.

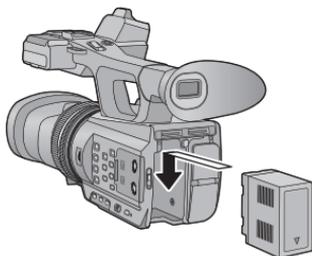
1 Connect the AC cable to the battery charger and the AC outlet.

2 Insert the battery into the battery charger by aligning the arrows.

- We recommend using Panasonic batteries (→ 9, 16).
- If you use other batteries, we cannot guarantee the quality of this product.
- Do not heat or expose to flame.
- Do not leave the battery(ies) in an automobile exposed to direct sunlight for a long period of time with doors and windows closed.

Inserting/removing the battery

Install the battery by inserting it in the direction shown in the figure.

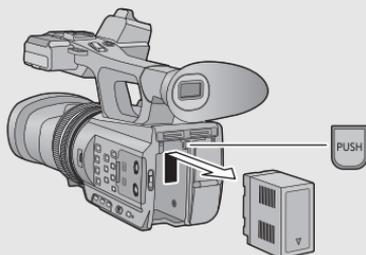


Insert the battery until it clicks and locks.

Removing the battery

Make sure that the power switch is set to OFF and the status indicator is turned off, and then remove by holding onto it taking care not to drop. (→ 20)

While pushing the PUSH button, remove the battery.



Charging and recording time

■ Charging/Recording time

- Temperature: 25 °C/humidity: 60%RH
- When using the viewfinder (times in parentheses are when using the LCD monitor)

Battery model number [Voltage/Capacity (minimum)]	Charging time	3D/2D Recording Mode	Recording format	Maximum continuously recordable time	Actual recordable time
Supplied battery/ CGA-D54s (optional) [7.2 V/5400 mAh]	5 h 30 min	3D Recording Mode	1080/50i	4 h 45 min (4 h 20 min)	2 h 55 min (2 h 40 min)
			1080/25p	4 h 50 min (4 h 20 min)	3 h (2 h 40 min)
			1080/24p	4 h 50 min (4 h 20 min)	3 h (2 h 40 min)
		2D Recording Mode	1080/50p	6 h 15 min (5 h 50 min)	3 h 55 min (3 h 40 min)
			1080/25p	7 h (6 h 20 min)	4 h 20 min (3 h 55 min)
			1080/24p	7 h (6 h 20 min)	4 h 20 min (3 h 55 min)
			PH, HA, HE	6 h 40 min (6 h 5 min)	4 h 10 min (3 h 45 min)

- These times are approximations.
- **The indicated charging time is for when the battery has been discharged completely. Charging time and recordable time vary depending on the usage conditions such as high/low temperature.**

- The actual recordable time refers to the recordable time when repeatedly starting/stopping recording, turning the unit on/off, moving the zoom lever etc.
- The batteries heat up after use or charging. This is not a malfunction.

Battery capacity indication

- The display changes as the battery capacity reduces.



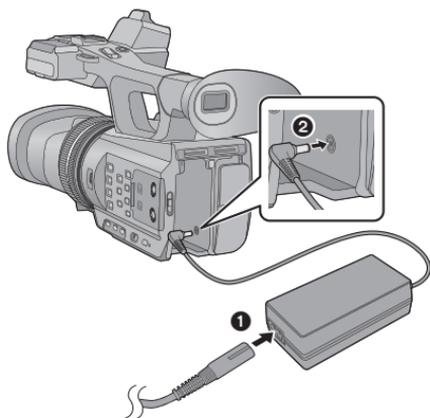
If the battery discharges, then  will flash red.

Connecting to the AC outlet

The unit is in the standby condition when the AC adaptor is connected. The primary circuit is always “live” as long as the AC adaptor is connected to an electrical outlet.

Important:

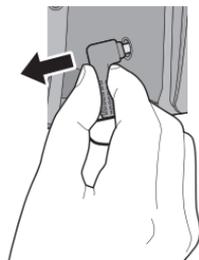
- Use the supplied AC adaptor. Do not use the AC adaptor of another device.
- Do not use the AC cable with any other equipment as it is designed only for this unit. Also, do not use the AC cable from other equipment with this unit.



1 Connect the AC cable to the AC adaptor and the AC outlet.

2 Connect the AC adaptor to the DC input terminal [DC IN].

■ Removing the AC adaptor



- Insert the plugs as far as they will go.

- Make sure to set the power switch to OFF and the status indicator is turned off when disconnecting the AC adaptor.

Preparation of SD cards

The unit can record motion pictures or still pictures to an SD card.

This unit (an SDXC compatible device) is compatible with SD Memory Cards, SDHC Memory Cards and SDXC Memory Cards. When using an SDHC Memory Card/SDXC Memory Card with other equipment, check the equipment is compatible with these Memory Cards.

Cards that you can use with this unit

Use SD cards conforming to Class 4 or higher of the SD Speed Class Rating* for motion picture recording.

Card type	Capacity
SD Memory Card	512 MB/1 GB/2 GB
SDHC Memory Card	4 GB/6 GB/8 GB/12 GB/16 GB/24 GB/32 GB
SDXC Memory Card	48 GB/64 GB

* SD Speed Class Rating is the speed standard regarding continuous writing. e.g.:
Check via the label on the card, etc.



- Please confirm the latest information about SD Memory Cards/SDHC Memory Cards/SDXC Memory Cards that can be used for motion picture recording on the following website.

http://panasonic.jp/support/global/cs/e_cam

(This website is in English only.)

- Operation of the SD Memory Cards 256 MB or less is not guaranteed. Also, the SD Memory Card 32 MB or less cannot be used for the motion picture recording.
- 4 GB or more Memory Cards that do not have the SDHC logo or 48 GB or more Memory Cards that do not have the SDXC logo are not based on SD Memory Card Specifications.
- When the write-protect switch **A** on SD card is locked, no recording, deletion or editing will be possible on the card.
- Keep the Memory Card out of reach of children to prevent swallowing.

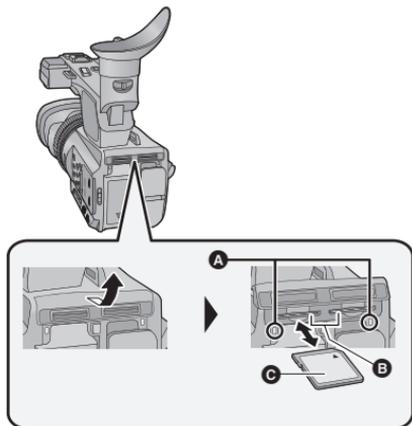


Inserting/removing an SD card

When using a non Panasonic SD card for the first time, or one which was previously used on another equipment, it is necessary to format the SD card. (→ 25) When the SD card is formatted, all of the recorded data is deleted. Once the data is deleted, it cannot be restored.

Caution:

Check that the access lamp has gone off.



Access lamp **A**

- When this unit is accessing the SD card, the access lamp lights up.

1 Open the SD card slot cover and insert (remove) the SD card into (from) the card slot **B**.

- One SD card can be inserted into each of the card slot 1 and the card slot 2.
- Face the label side **C** in the direction shown in the illustration and press it straight in as far as it will go.
- Press the centre of the SD card and then pull it straight out.

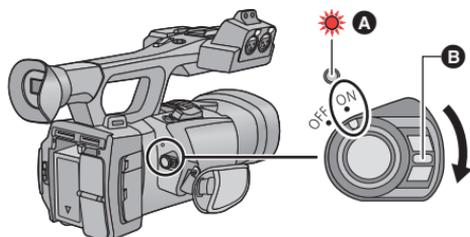
2 Securely close the SD card slot cover.

- Securely close it until it clicks.

- Do not touch the terminals on the back of the SD card.
- Do not apply strong shocks, bend, or drop the SD card.
- Electrical noise, static electricity or the failure of this unit or the SD card may damage or erase the data stored on the SD card.
- When the card access lamp is lit, do not:
 - Remove the SD card
 - Turn the unit off
 - Insert and remove the USB cable
 - Expose the unit to vibrations or shockPerforming the above while the lamp is on may result in damage to data/SD card or this unit.
- Do not expose the terminals of the SD card to water, dirt or dust.
- Do not place SD cards in the following areas:
 - In direct sunlight
 - In very dusty or humid areas
 - Near a heater
 - Locations susceptible to significant difference in temperature (condensation can occur.)
 - Where static electricity or electromagnetic waves occur
- To protect SD cards, return them to their cases when you are not using them.
- About disposing of or giving away the SD card.
(Refer to the Operating Instructions (PDF format))

Turning the unit on/off

Set the power switch to ON while pressing the lock release button **B** to turn on the unit.



To turn off the unit

Set the power switch to OFF while pressing the lock release button. The status indicator goes off.

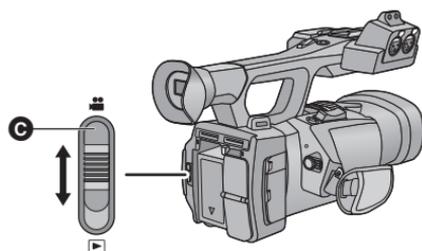
A The status indicator lights on.

- To turn on the unit again after the [ECONOMY (BATT)] or [ECONOMY (AC)] is activated, set the power switch to OFF once, and then to ON again.

Selecting a mode

Change the mode to recording or playback.

Operate the mode switch to change the mode to  or .



C Mode switch

	Recording Mode (→ 26, 28)
	Playback Mode (→ 34)

Using the LCD monitor/Viewfinder

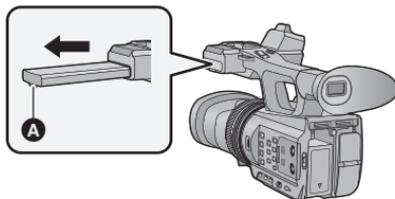
The viewfinder is turned off and the LCD monitor is turned on when the LCD monitor is extracted. The viewfinder is turned on when the LCD monitor is retracted.

It is possible to check the images recorded during 3D recording or scenes recorded in 3D as 3D when LCD monitor is used.

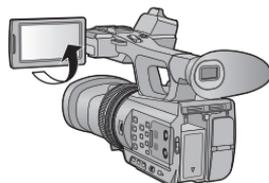
Using the LCD monitor

1 Extract the LCD monitor in the direction as indicated in the figure.

- Hold the LCD monitor extract part **A** when pulling out.

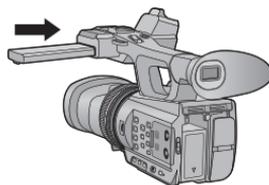


2 Rotate to the position that is easy to view.



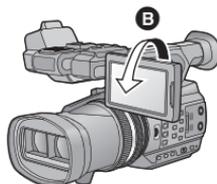
To retract the LCD monitor

Retract as shown in the figure with the LCD facing downward.



Range of rotation of the LCD monitor

- It can rotate up to 270° **B** towards the lens.



- There are differences in the way that different people experience 3D images. Check from a position directly in front of and at around 30 cm from the LCD monitor, where you can easily see picture.

How to use the touch screen

You can operate by directly touching the LCD monitor (touch screen) with your finger. It is easier to use the stylus pen (supplied) for detailed operation or if it is hard to operate with your fingers.

■ Touch

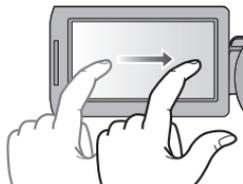
Touch and release the touch screen to select icon or picture.

- Touch the centre of the icon.
- Touching the touch screen will not operate while you are touching another part of the touch screen.



■ Slide while touching

Move your finger while pressing on the touch screen.



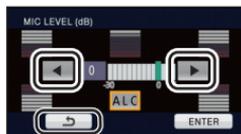
■ About the operation icons



These icons are used to switch the menu and thumbnail display page, for item selection and setting etc.



Touch to return to the previous screen such as when setting menus.



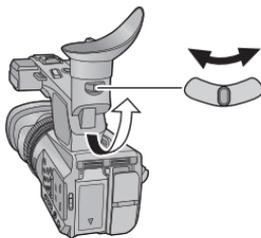
Viewfinder adjustment

- These settings will not affect the images actually recorded.

Adjusting the field of view

It adjusts the field of view to show the image on the viewfinder clearly.

- 1 Adjust the viewfinder to suit your vision so that you can see the display images clearly.**
 - Be careful not to trap your fingers when moving the viewfinder.
 - The viewfinder can be lifted vertically up to approximately 90°.
 - Retract the LCD monitor and turn on the viewfinder.
- 2 Adjust the focus by rotating the eyepiece corrector lever.**



Setting date and time

When the unit is turned on for the first time, a message asking you to set the date and time will appear.

Select [YES] and perform steps 2 to 3 below to set the date and time.

1 Select the menu. (→ 24)



: [OTHER FUNCTION] → [CLOCK SET] → [YES]

2 Touch the date or time to be set, then set the desired value using / .

- The year can be set between 2000 and 2039.
- The 24-hour system is used to display the time.



3 Touch [ENTER].

- The screen may switch to the setting screen for the [TIME ZONE]. Touch the screen and set the [TIME ZONE].
- Touch [EXIT] to complete the setting.

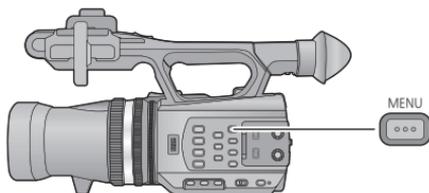
-
- The date and time function is driven by a built-in lithium battery.
 - If the time display becomes [- -], the built-in lithium battery needs to be charged. To recharge the built-in lithium battery, connect the AC adaptor or attach a charged battery to this unit. Leave the unit as it is for approx. 24 hours and the battery will maintain the date and time for approx. 6 months. (The battery is still being recharged even if the unit is off.)
 - Display method of clock can be changed by setting the [DATE/TIME] or [DATE FORMAT].

For the United Kingdom and Ireland customers

WARNING

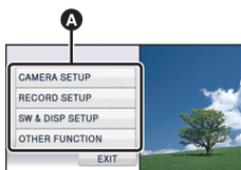
THE LITHIUM BATTERY IN THIS EQUIPMENT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. WHEN NECESSARY, CONTACT YOUR LOCAL PANASONIC SUPPLIER.

Using the menu screen

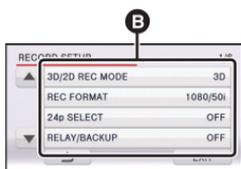


1 Press the MENU button .

2 Touch the top menu **A**.



3 Touch the submenu **B**.



4 Touch the desired item to enter the setting.



5 Touch [EXIT] to exit the menu setting.

- Next (Previous) page can be displayed by touching  / .

1080/24p Recording Mode

It is possible to change the 1080/24p Mode.

 : [RECORD SETUP] → [24p SELECT] → [ON] or [OFF]

- This unit will restart when [ON] is touched.
- It is not possible to use 1080/24p and other Recording Formats on the same SD card. When switching to 1080/24p, please use a separate SD card.

Formatting cards

If you use the SD cards for the first time for recording with this unit, format the cards. Please be aware that if a medium is formatted, then all the data recorded on the medium will be erased and cannot be restored. Back up important data on a PC, disc etc.

- When using two SD cards, format both SD cards.

1 Select the menu.

 : [OTHER FUNCTION] → [FORMAT CARD]

2 Touch [SD CARD 1] or [SD CARD 2].

- When formatting is complete, touch [EXIT] to exit the message screen.
- Do not turn this unit off or remove the SD card, while formatting. Do not expose the unit to vibrations or shock.

Use this unit to format media.

Do not format an SD card using any other equipment such as a PC. Otherwise it may not be possible to use the card on this unit.

Language Selection

You can select the language on the screen display and the menu screen.

1 Select the menu.

 : [OTHER FUNCTION] → [LANGUAGE]

2 Touch the desired setting language.



Selecting a media to record

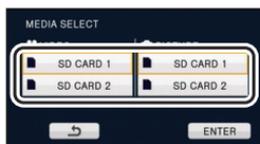
[SD CARD 1] and [SD CARD 2] can be selected separately to record motion pictures or still pictures.

1 Select the menu.

MENU : [SW & DISP SETUP] → [MEDIA SELECT] → [YES]

2 Touch the media to record motion pictures or still pictures.

- The media is selected separately for motion pictures or still pictures and is then highlighted in yellow.



3 Touch [ENTER].



Recording motion pictures

You can record life-like and powerful 3D full high definition quality video.

- This unit can record a 3D full high definition quality video in AVCHD 3D recording format.
- Refer to page 35 for the 3D full high definition quality video is viewed with 3D compatible TV.
- During 3D recording the video can be viewed in 3D using the LCD monitor.

1 Change the mode to

- Extract the LCD monitor.

2 Select the menu.

MENU : [RECORD SETUP] →
[3D/2D REC MODE] → desired setting

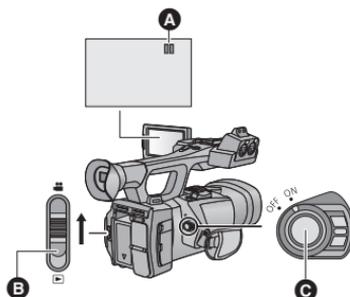
[3D]: You can record with 3D Recording Mode.

[2D]: You can record with 2D Recording Mode.

- appears when [3D/2D REC MODE] is set to [3D].

3 Press the recording start/stop button to start recording.

- Recording will stop when you press the recording start/stop button again.



- A** When you begin recording, changes to .
- B** Mode switch

■ About the convergence point

Convergence point is a position that becomes the reference plane of the 3D image. When viewing the 3D image, a subject located closer than the convergence point is displayed in front of the screen, and a subject located farther than the convergence point is displayed behind the screen.

■ Adjusting the convergence point

To ensure that the 3D image can be safely viewed, pay attention to the following points when adjusting the convergence point.

- The image may cause tiredness or discomfort when adjustment of the convergence point is frequently performed, or the position of the subject is further away in front or rear of the convergence point or at the edge of the image.
- Stop the operation when you feel fatigue, discomfort, or otherwise strange while adjusting.

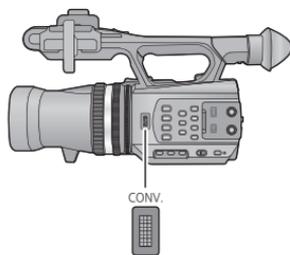
It is recommended to prepare for recording, such as adjust the convergence point in accordance with the position of the subject in advance, determine the construction of the image to record, etc., to record an image that is effective as 3D video. It is also recommended to adjust the convergence point again when the distance between this unit and the subject is changed significantly.

1 Display the convergence.

MENU : [SW & DISP SETUP] → [CONVERGENCE] → [ON]

2 Rotate the CONV. dial to adjust the convergence point.

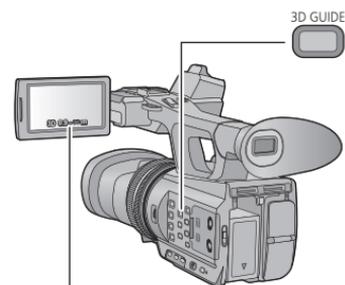
- This can be set between C00 and C99. Position of the convergence point will be set further when the number is larger.
- The subject at the position of the convergence point will not shoot out or recess from the screen. (It will be seen in the same way as 2D image.)
- Adjust by checking on the 3D video or 3D guide display on the LCD monitor. (→ 28)
- When zooming, it may be necessary to readjust the convergence point.



■ 3D guide display

The 3D guide display is a guideline of distance between the subject and this unit to effectively reproduce the subject as a 3D image.

- The values of the 3D guide display will change according to the zoom magnification and convergence point settings.



3D 0.9-∞ m

A

3D GUIDE button

Press the button to switch on/off of the 3D guide display.

- A 3D guide display

Recording



Recording still pictures

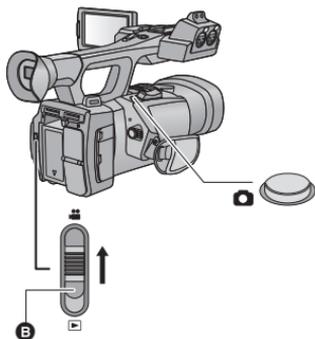
3D still pictures and 2D still pictures in [**2.1M**] (1920×1080)] (16:9) are recorded for 3D Recording Mode, and 2D still pictures in [**3M**] (2304×1296)] (16:9) are recorded for 2D Recording Mode.

1 Change the mode to .

- Extract the LCD monitor.

2 Press the button.

- Remaining number of recordable pictures is displayed while still pictures are being recorded.

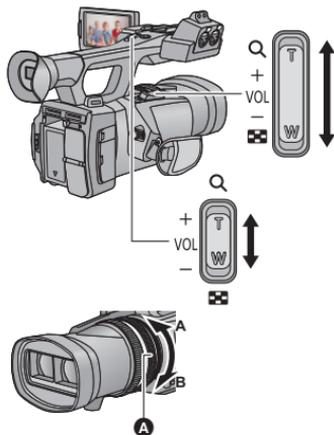


B Mode switch

Using the zoom

It can be zoomed up to 10× for the 3D Recording Mode, and up to 12× for the 2D Recording Mode.

- It can zoom up to 23× when the [i.Zoom] is set to [ON] during the 2D Recording Mode.
- Zoom magnification can be checked in the screen display of Z00 to Z99. The value gets larger when zoomed in, and the value gets smaller when zoomed out. **Z**99 is displayed during the i.Zoom.



Zoom lever/Sub zoom lever

T side:

Close-up recording (zoom in)

W side:

Wide-angle recording (zoom out)

Ring Zoom

Zoom by rotating the ring.

A side:

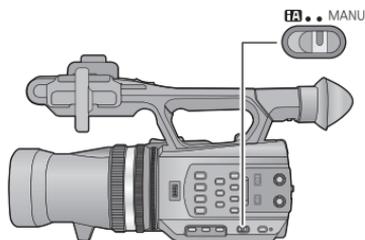
Wide-angle recording (zoom out)

B side:

Close-up recording (zoom in)

A Zoom ring

Intelligent Auto Mode/Manual Mode

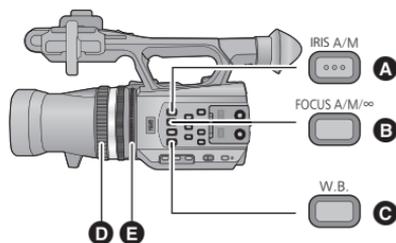


iA/MANU switch

Slide the switch to change the Intelligent Auto Mode/Manual Mode.

- **MNL** is displayed in the Manual Mode.
- The modes appropriate for the condition are set just by pointing the unit to what you want to record in the Intelligent Auto Mode.

Manual Recording



- A** IRIS A/M button
- B** FOCUS A/M/∞ button
- C** W.B. button
- D** Focus ring
- E** Iris ring

Focus

Perform focus adjustments using the focus ring. If auto focusing is difficult due to the conditions, then use Manual Focus.

- **Switch to Manual Mode.** (→ 29)

1 Press the FOCUS A/M/∞ button to switch to Manual Focus.

- It will switch to MF from AF.

2 Adjust the focus by rotating the focus ring.

White Balance

Automatic White Balance function may not reproduce natural colours depending on the scenes or lighting conditions. If so, you can adjust the White Balance manually.

Switch the modes of White Balance by pressing the W.B. button.

- Select the optimal mode by confirming the colour on the screen.

Iris adjustment

Perform Iris/Gain adjustments using the iris ring.
Adjust it when the screen is too bright or too dark.

- Switch to Manual Mode. (→ 29)

1 Press the IRIS A/M button to switch to Manual Iris Mode.

- [STD] disappears.
- The gain is displayed in dB.

2 Adjust the iris by rotating the iris ring.



- A Gain value
- B Iris value
- C Auto iris icon*

* It is displayed in Auto Iris Mode.

Manual shutter speed

Adjust the shutter speed when recording fast-moving subjects.

- Switch to Manual Mode. (→ 29)

1 Touch the LCD monitor to display the operation icons and touch [SHTR].

2 Touch [▲]/[▼] to adjust settings.

- When [AUTO] is touched, the shutter speed is set automatically.
- Touch [SHTR] to complete the adjustment.

USER button

Each of the USER button can register one function from the 18 available functions.

- There are three USER buttons (USER1 to USER3) on the main body and four USER button icons (USER4 to USER7) displayed on the LCD monitor.

Setting the USER button

1 Select the menu.

MENU: [SW & DISP SETUP] → [USER BUTTON SETUP]

2 Touch the USER button you wish to set.



- A USER1 button
- B USER2 button
- C USER3 button
- D USER4 button
- E USER5 button
- F USER6 button
- G USER7 button

- The USER button number and currently set function name are displayed. (For example, a display of 1. [FA] means that Focus Assist has been assigned to USER1 button.)

3 Touch the item to register

- For the functions of the USER button that can be registered, refer to page 33.
- Touch [INH] (Inhibit) if not registering.
- Next (Previous) page can be displayed by touching / .
- To continuously set other USER buttons, repeat steps 2-3.

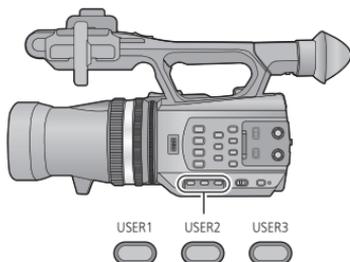
4 Touch [EXIT] to complete the setting.

- There are some functions that cannot be used depending on the position of the mode switch. (→ 33)
- Setting will be common for the recording mode and the playback mode.

Using the USER button

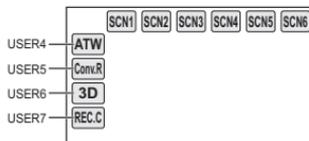
To use the set USER button, press USER1 to USER3 button or touch the USER4 to USER7 button icon displayed when you touch the LCD monitor.

(When you use the USER1 to USER3)

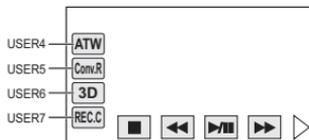


(When you use the USER4 to USER7)

(In Recording Mode)



(In Playback Mode)



Functions of the USER button

■ List of USER button function

Icon	Item	Function
[P.AF] ^{*1}	[PUSH AF]	Push AF
[B.Light] ^{*1}	[BACKLIGHT]	Backlight Compensation
[S.Light] ^{*1}	[SPOTLIGHT]	Spotlight
[B.FD] ^{*1}	[BLACK FADE]	Black Fade
[W.FD] ^{*1}	[WHITE FADE]	White Fade
[ATW] ^{*1}	[ATW]	ATW
[ATW.L] ^{*1}	[ATW LOCK]	ATW Lock
[FA] ^{*1}	[FA]	Focus Assist
[D.ZM] ^{*1}	[D.ZOOM]	Digital Zoom
[PARA] ^{*2}	[PARALLAX]	Playback parallax adjustment
[HIST] ^{*1}	[HISTOGRAM]	Histogram
[3D]	[3D]	3D Display
[R-Img] ^{*1}	[R-IMAGE]	R-image
[MACR] ^{*1}	[3D MACRO]	3D Macro
[Conv.R] ^{*1}	[CONV.RESET]	Convergence Reset
[REC.C] ^{*1}	[REC CHECK]	Recording Check
[LstDel] ^{*1}	[LAST SCN DEL]	Last Scene Delete
[3D o/p]	[3D OUTPUT]	3D video output selection

*1 It is not possible to use in Playback Mode.

*2 It is not possible to use in Recording Mode.



Motion picture/Still picture playback



1 Change the mode to .

2 Touch the play mode select icon **A**.

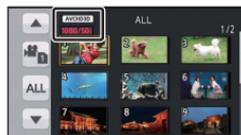
3 Select the [MEDIA] and [VIDEO/PICTURE] you wish to play back.

- Touch [ENTER].

- An icon is displayed in the thumbnail display when video item is touched. (,

4 Touch the scene or the still picture to be played back.

- The recording format of the selected scene is displayed in the thumbnail display of the motion pictures. (, , etc.)
- is displayed on the 3D still picture in the thumbnail display of the still pictures.
- Next (Previous) page can be displayed by touching / .



5 Select the playback operation by touching the operation icon.



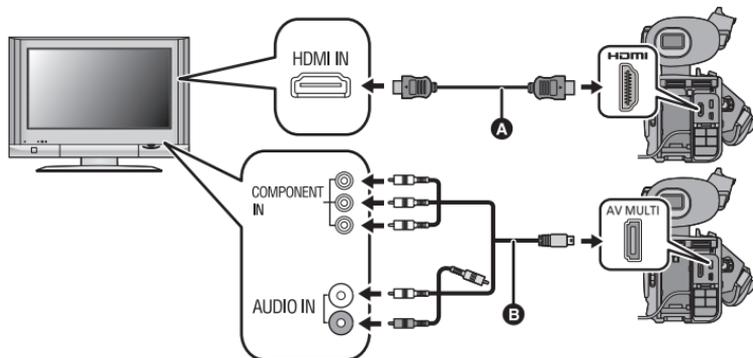
B Operation icon

- If you touch the screen while an operation icon is being displayed or do not touch the icon for a certain period, it will disappear. To display again, touch the screen.

Motion picture playback	Still picture playback
: Playback/Pause	: Slide show (playback of the still pictures in numerical order) start/pause.
: Rewind playback	: Plays back the previous picture.
: Fast forward playback	: Plays back the next picture.
: Stops the playback and shows the thumbnails.	: Stops the playback and shows the thumbnails.
: Display the direct playback bar	

Watching Video/Pictures on your TV

1 Connect this unit to a TV.



A HDMI cable (optional)

- Be sure to connect to the HDMI terminal.
- Check that the plugs are inserted as far as they go.
- Please use "High Speed HDMI Cables" that have the HDMI logo (as shown on the cover). Cables not conforming to the HDMI standard will not work. Panasonic HDMI cable is recommended. Part No.: RP-CHES15 (1.5 m)
- Connect the unit to a 3D compatible television compatible to the frame sequential format using a HDMI cable (optional) and play back scenes recorded in 3D to enjoy life-like and powerful 3D full high definition images.

B AV multi cable (supplied)

- Do not use any other AV multi cables except the supplied one.
- Check that the plugs are inserted as far as they go.
- If you set [COMPONENT OUT] to [1080i] and connect this unit to the component terminal of a 3D-compatible TV using an AV multi cable, you will be able to enjoy side-by-side format 3D image.
- When connecting to the component terminal of the TV, the yellow plug of the AV multi cable is not required.

2 Select the video input on the TV.

3 Change the mode to to play back.

Specifications

High Definition Video Camera

Information for your safety

Power source:	DC 12 V (When using AC adaptor) DC 7.2 V (When using battery)
Power consumption:	16.7 W

Recording format:

AVCHD format version 2.0 compliant
(AVCHD 3D/Progressive)

Motion picture compression:

3D Recording Mode; MPEG-4 MVC/H.264
2D Recording Mode; MPEG-4 AVC/H.264

Audio compression:

Dolby Digital (5.1 ch/2 ch), Linear PCM (2 ch)

Recording mode and transfer rate:

3D Recording Mode

[1080/50i], [1080/25p], [1080/24p]; Maximum 28 Mbps (VBR)

2D Recording Mode

[1080/50p]; Maximum 28 Mbps (VBR)

[PH], [1080/25p], [1080/24p]; Maximum 24 Mbps (VBR)

[HA]; Average 17 Mbps (VBR)

[HE]; Average 5 Mbps (VBR)

Refer to the operating instructions (PDF format) for the recordable time and picture size.

Still picture recording format:

3D still pictures; MPO corresponding

2D still pictures; JPEG corresponding (Design rule for Camera File system, based on Exif 2.2 standard)

Refer to the operating instructions (PDF format) for the picture size and number of recordable pictures.

Recording media:

SD Memory Card (FAT12 and FAT16 system compliant)

SDHC Memory Card (FAT32 system compliant)

SDXC Memory Card (exFAT system compliant)

Refer to page 18 for details on SD cards usable in this unit.

Image sensor:

1/4.1 type (1/4.1") 3MOS image sensor ×2

Total; 9150 K (3050 K×3) ×2

Effective pixels;

3D Recording Mode

Motion picture/Still picture; 6210 K (2070 K×3) (16:9) ×2

2D Recording Mode

Motion picture/Still picture; 6570 K (2190 K×3) (16:9)

Lens:

Auto Iris optical zoom (Full range AF)

F value (focal length)

3D Recording Mode; F1.5 to F2.7 (Focal length; 2.84 mm to 28.4 mm)

2D Recording Mode; F1.5 to F2.8 (Focal length; 2.84 mm to 34.1 mm)

35 mm equivalent;

3D Recording Mode

Motion picture/Still picture; 32 mm to 320 mm (16:9)

2D Recording Mode

Motion picture/Still picture; 29.8 mm to 368.8 mm (16:9)

Minimum focus distance;

3D Recording Mode

Approx. 30 cm (Wide)/Approx. 1.2 m (Tele)

2D Recording Mode

Approx. 3.5 cm (Wide)/Approx. 1.2 m (Tele)

Zoom:

3D Recording Mode; 10× optical zoom

2D Recording Mode; 12× optical zoom, 23× i.Zoom, 2×/5×/10× digital zoom

Image stabilizer function:

3D Recording Mode; Optical (Power O.I.S.)

2D Recording Mode; Optical (Hybrid Optical Image Stabilizer, Active Mode)

Convergence point adjustment:

Approx. 45 cm to Approx. 40 m

Monitor:

8.8 cm (3.5") wide LCD monitor (Approx. 1152 K dots)

Viewfinder:

1.15 cm (0.45") wide EVF (Approx. 1226 K dots)

Microphone:

5.1 channel surround microphone (with a zoom microphone/focus microphone function)/
stereo microphone

Speaker:

1 round speaker, dynamic type

White balance adjustment:

Auto tracking white balance system

Standard illumination:

1,400 lx

Minimum required illumination:

Approx. 5 lx (1/25 with [AUTO SLOW SHTR] is set to [ON])

AV multi connector video output level:

Component video output level;

Y; 1.0 Vp-p, 75 Ω

Pb; 0.7 Vp-p, 75 Ω

Pr; 0.7 Vp-p, 75 Ω

AV video output level;

1.0 Vp-p, 75 Ω

HDMI connector video output level:

HDMI™ (x.v.Colour™) 1080p/1080i/576p/480p

AV multi connector audio output level (Line):

2 ch

HDMI connector audio output level:

Dolby Digital/Linear PCM

Headphone output:

3.5 mm stereo mini jack

XLR audio input terminals:

XLR (3 pin) ×2 (INPUT1/INPUT2)

LINE; 0 dBu

MIC; -50 dBu/-60 dBu (switch with the menu)

USB:

Reader function (No copyright protection support)

Hi-Speed USB (USB 2.0), USB terminal Type Mini B

Dimensions:

145 mm (W)×195 mm (H)×350 mm (D)

Mass:

Approx. 1600 g

[without battery (supplied) and an SD card (optional)]

Mass in operation:

Approx. 1880 g

[with battery (supplied) and an SD card (optional)]

Operating temperature:

0 °C to 40 °C

Operating humidity:

10%RH to 80%RH

Battery operation time:

See page 16

AC adaptor

Information for your safety

Power source:	AC 110 V to 240 V, 50/60 Hz
Power consumption:	42 W
DC output:	DC 12 V, 2.5 A

Dimensions:

115 mm (W)×37 mm (H)×57 mm (D)

Mass:

Approx. 210 g

Battery charger

Information for your safety

Power source:	AC 100 V to 240 V, 50/60 Hz
Power consumption:	0.4 A
DC output:	DC 8.4 V, 1.2 A

Dimensions:

70 mm (W)×44.5 mm (H)×116 mm (D)

Mass:

Approx. 160 g

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This product is licensed under the AVC patent portfolio license for the personal and non-commercial use of a consumer to (i) encode video in compliance with the AVC Standard ("AVC Video") and/or (ii) decode AVC Video that was encoded by a consumer engaged in a personal and non-commercial activity and/or was obtained from a video provider licensed to provide AVC Video. No license is granted or shall be implied for any other use. Additional information may be obtained from MPEG LA, LLC. See <http://www.mpegla.com>.

Reading the Operating Instructions (PDF format)

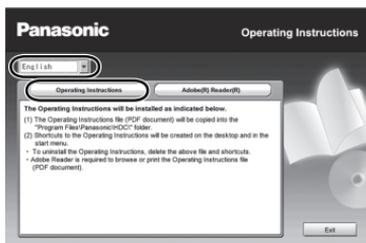
More detailed instructions on the operation of this unit are contained in “Operating Instructions (PDF format)” in the supplied CD-ROM. Install it on your PC to read it.

■ For Windows

1 Turn the PC on and insert the CD-ROM containing the Operating Instructions (supplied).

2 Select the desired language and then click [Operating Instructions] to install.

(Example: When an English language OS)



3 Double click the “Operating Instructions” shortcut icon on the desktop.

■ When the Operating Instructions (PDF format) will not open

You will need Adobe Acrobat Reader 5.0 or later or Adobe Reader 7.0 or later to browse or print the Operating Instructions (PDF format).

Download and install a version of Adobe Reader that you can use with your OS from the following Web Site.

<http://get.adobe.com/reader/othersversions>

If using the following OS

- Windows XP SP3
- Windows Vista SP2
- Windows 7

Insert the CD-ROM containing the Operating Instructions (supplied), click [Adobe(R) Reader(R)] and then follow the messages on the screen to install.

■ To uninstall the Operating Instructions (PDF format)

Delete the PDF file from the “Program Files\Panasonic\HDC\” folder.

- When the contents in the Program Files folder cannot be displayed, click the [Show the contents of this folder] to display them.

■ For Mac

1 Turn the PC on and insert the CD-ROM containing the Operating Instructions (supplied).

2 Open the “Manual” folder in the CD-ROM and then copy the PDF file with the desired language inside the folder.

3 Double click the PDF file to open it.