

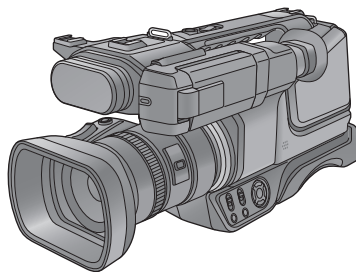
# Panasonic®

## Operating Instructions **Vol.1**

### Memory Card Camera-Recorder

Model No. **AG-AC8P**

 **Register now!!**  
This product is eligible for the AVCCAM 3 Year Warranty Repair Program.  
For details, see page 9.  
[http://panasonic.biz/sav/pass\\_e/](http://panasonic.biz/sav/pass_e/)



## **Vol.1**

### **Please read first**

This document explains basic operations of the unit. For more detailed explanation, please refer to "Operating Instructions Vol.2" (PDF file) which is recorded in the enclosed CD-ROM.

Please read these instructions carefully before using this product, and save this manual for future use.



F0913TC0  
Printed in Japan

**ENGLISH**

VQT5D95

**Confidential** until  
2013/9/30

## Information for Your Safety

### WARNING:

To reduce the risk of fire, electric shock or product damage,

- Do not expose this unit to rain, moisture, dripping or splashing.
- Do not place objects filled with liquids, such as vases, on this unit.
- Use only the recommended accessories.
- Do not remove covers.
- Do not repair this unit by yourself. Refer servicing to qualified service personnel.

### CAUTION!

To reduce the risk of fire, electric shock or product damage,

- Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure this unit is well ventilated.
- Do not obstruct this unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.
- Do not place sources of naked flames, such as lighted candles, on this unit.

**FCC NOTICE (USA)**

**Declaration of Conformity**

Model Number: AG-AC8P  
 Trade Name: Panasonic  
 Responsible Party: Panasonic Corporation of North America  
 Two Riverfront Plaza Newark NJ 07102  
 Support contact: 1-800-524-1448

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

To assure continued compliance, follow the attached installation instructions and do not make any unauthorized modifications.

**CAUTION:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.


The user may find the booklet "Something About Interference" available from FCC local regional offices helpful.

**FCC Warning:**

To assure continued FCC emission limit compliance, follow the attached installation instructions and the user must use only shielded interface cables with ferrite core when connecting to host computer or peripheral devices. Also, any unauthorized changes or modifications to this equipment could void the user's authority to operate this device.

**NOTIFICATION (Canada)**

CAN ICES-3(B)/NMB-3(B)

 indicates safety information.

**THE FOLLOWING APPLIES ONLY IN THE U.S.A.**



## AC adaptor

This AC adaptor operates on AC between 110 V and 240 V.

But

- In the U.S.A. and Canada, the AC adaptor must be connected to a 120 V AC power supply only.
- When connecting to an AC supply outside of the U.S.A. or Canada, use a plug adaptor to suit the AC outlet configuration.
- When connecting to a supply of greater than AC 125 V, ensure the cord you use is suited to the voltage of the AC supply and the rated current of the AC adaptor.
- Contact an electrical parts distributor for assistance in selecting a suitable AC plug adaptor or AC cord set.

The power plug is the disconnecting device. Install this unit so that the power plug can be unplugged from the socket outlet immediately.

## ■ Concerning the battery

### Battery pack (Lithium ion battery pack)

- Use the specified unit to recharge the battery pack.
- Do not use the battery pack with equipment other than the specified unit.
- Do not get dirt, sand, liquids, or other foreign matter on the terminals.
- Do not touch the plug terminals (+ and -) with metal objects.
- Do not disassemble, remodel, heat or throw into fire.

If any electrolyte should come into contact with your hands or clothes, wash it off thoroughly with water.

If any electrolyte should come into contact with your eyes, never rub the eyes. Rinse eyes thoroughly with water, and then consult a doctor.

### Warning

Risk of fire, explosion and burns. Do not disassemble, heat above 60 °C (140 °F) or incinerate.

### CAUTION

- Danger of explosion if battery is incorrectly replaced. Replace only with the type recommended by the manufacturer.
- When disposing of the batteries, please contact your local authorities or dealer and ask for the correct method of disposal.



■ **Product identification marking**

Product	Location
Memory Card Camera-Recorder	Bottom
AC adaptor	Bottom

Conforms to UL STD 60065.

Certified to CAN-CSA STD C22.2 No.60065.

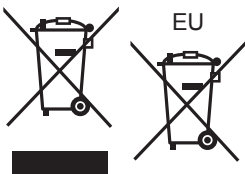
**U.S.A./CANADA CONSUMERS: ATTENTION:**



A lithium ion battery that is recyclable powers the product you have purchased. Please call 1-800-8-BATTERY for information on how to recycle this battery.

-If you see this symbol-

**Information on Disposal in other Countries outside the European Union**



This symbol is only valid in the European Union. If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

## IMPORTANT SAFETY INSTRUCTIONS

Read these operating instructions carefully before using the unit. Follow the safety instructions on the unit and the applicable safety instructions listed below. Keep these operating instructions handy for future reference.

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



## Brazil Only Brasil Apenas

### <Manuseio de baterias usadas>



#### BRASIL

Após o uso, as pilhas e/ou baterias deverão ser entregues ao estabelecimento comercial ou rede de assistência técnica autorizada.

Cobrir os terminais positivo (+) e negativo (-) com uma fita isolante adesiva, antes de depositar numa caixa destinada para o recolhimento. O contato entre partes metálicas pode causar vazamentos, gerar calor, romper a blindagem e produzir fogo.

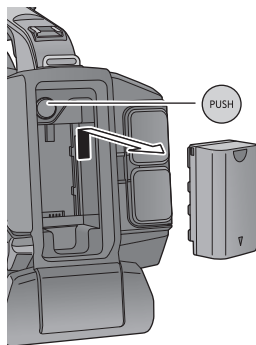
Não desmonte, não remova o invólucro, nem amasse a bateria. O gás liberado pela bateria pode irritar a garganta, danificar o lacre do invólucro ou o vazamento provocar calor, ruptura da blindagem e produzir fogo devido ao curto circuito dos terminais. Não incinere nem aqueça as baterias, elas não podem ficar expostas a temperaturas superiores a 100°C (212°F). O gás liberado pela bateria pode irritar a garganta, danificar o lacre do invólucro ou o vazamento provocar calor, ruptura da blindagem e produzir fogo devido ao curto circuito dos terminais provocado internamente.

Evite o contato com o líquido que vazar das baterias. Caso isto ocorra, lave bem a parte afetada com bastante água. Caso haja irritação, consulte um médico.

### Para remover a bateria

#### Bateria Principal de Energia

Pressione o botão para liberar a bateria.



## ■ 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 connecting to a TV**

- Do not use any other AV cables except the supplied one.
- 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-CHE15 (1.5 m) (4.9 feet)

**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 the recording format for recording motion pictures

You can record motion pictures with AVCHD recording formats using this unit. (→ 27)

- AVCHD Progressive (1080/60p) supported.

**AVCHD Progressive:**

It is possible to record video with highest quality (1080/60p) possible with this unit.

## ■ 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 (including any other non-built-in memory related component).

## ■ About Condensation (When the lens, the viewfinder or LCD Monitor is fogged up)

Condensation occurs when there is a change in temperature or humidity, such as when the unit is taken from outside or a cold room to a warm room. Please be careful, as it may cause the lens, the viewfinder or LCD monitor to become soiled, moldy, or damaged.

When taking the unit to a place which has a different temperature, if the unit is accustomed to the room temperature of the destination for about one hour, condensation can be prevented. (When the difference in temperature is severe, place the unit in a plastic bag or the like, remove air from the bag, and seal the bag.) When condensation has occurred, remove the battery and/or the AC adapter and leave the unit like that for about one hour. When the unit becomes accustomed to the surrounding temperature, fogging will disappear naturally.

## ■ Caution regarding laser beams

- The lens may suffer damage if struck by a laser beam. Make sure that laser beams do not strike the lens when shooting in an environment where laser devices are used.

■ **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 21 for more details on SD cards.


■ **For the purposes of this owner's manual**


- SD Memory Card, SDHC Memory Card and SDXC Memory Card are referred to as the "SD card".

- Function that can be used for Motion Picture Recording Mode: 

Function that can be used for Still Picture Recording Mode: 

- Function that can be used for the Playback Mode: 

Function that can be used for the Playback Mode (motion pictures only): 

Function that can be used for the Playback Mode (still pictures only): 

- Scene(s) recorded in 1080/60p or 1080/60i: "AVCHD scene(s)"
- Pages for reference are indicated by an arrow, for example: → 00

**AVCCAM 3 Year Warranty Repair Program\*1**

Thank you for purchasing this Panasonic AVCCAM device. Register as a user for this device to receive a special service warranty up to three years of free warranty repairs.



Customers who register as users on the website will receive an extended warranty repair valid for up to three years.

	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year
AVCCAM device*2	Basic warranty*3	Extended warranty repair*4	

\*1: Please note that this extended warranty is not available in some countries/regions.  
 \*2: Not all models eligible for extended warranty coverage. \*3: The basic warranty period may vary depending on the country/region. \*4: Not all repair work is covered by this extended warranty.



**Free 3 years of Warranty Repairs**  
 Make sure to save the "Registration Notice" e-mail during the warranty period.

Details about user registration and the extended warranty:

 [http://panasonic.biz/sav/pass\\_e](http://panasonic.biz/sav/pass_e)

Please note, this is a site that is not maintained by Panasonic Canada Inc. The Panasonic Canada Inc. privacy policy does not apply and is not applicable in relation to any information submitted. This link is provided to you for convenience.

# Contents

## ■ How to open the owner's manual (PDF format)

When you insert the CD-ROM and open the [INDEX.pdf] in the CD-ROM, the Owner's Manual list will be displayed. Click the document name of the Owner's Manual you would like to open.

- Adobe Reader is required to view the PDF file. Please download it from the web site of Adobe Systems Incorporated.

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## Accessories

Check the accessories before using this unit.

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

Product numbers correct as of Sep. 2013. These may be subject to change.

### Battery pack



### AC adaptor



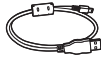
### AC cable



### AV cable



### USB cable



### Eye cup



### Lens cap



### External microphone



### CD-ROM

Operating Instructions



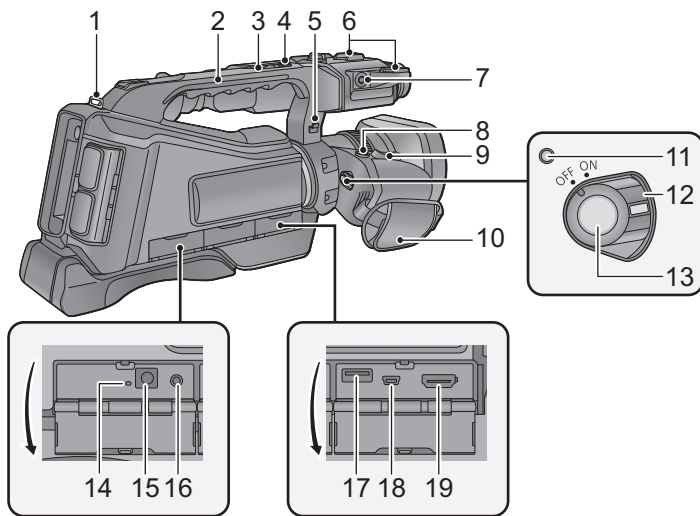
### Optional accessories





Some optional accessories may not be available in some countries.

Battery pack (lithium/CGA-D54)
HDMI cable (RP-CHE15)
Stereo microphone (VW-VMS10)
Wide conversion lens (VW-W4907H)
Filter kit (VW-LF49N)
LED video light (VW-LED1)

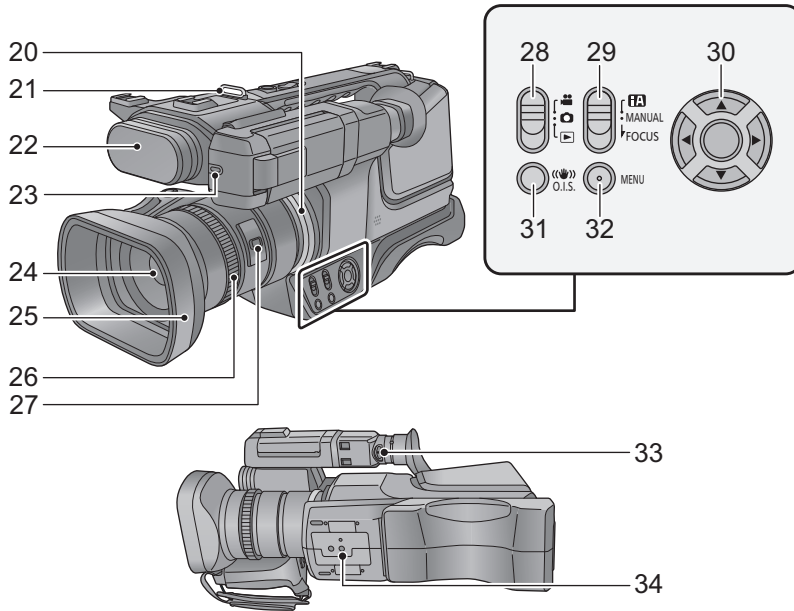
## Preparation

## Names and Functions of Main Parts

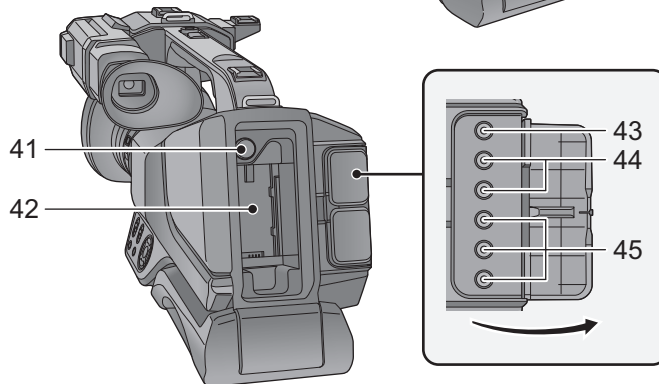
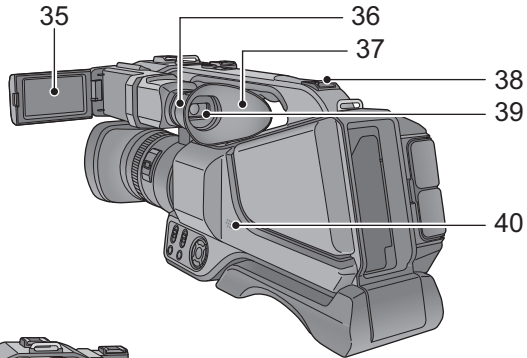


- |  |   |
|--|---|
| <p><b>1 Shoulder strap fixture</b></p> <p><b>2 Handle</b></p> <p><b>3 Sub zoom lever [W/T] (→ 29)</b></p> <ul style="list-style-type: none"> <li>This lever functions in the same manner as the zoom lever.</li> </ul> <p><b>4 Sub recording start/stop button</b></p> <ul style="list-style-type: none"> <li>This button functions in the same manner as the recording start/stop button.</li> </ul> <p><b>5 Microphone cable holder</b></p> <p><b>6 Accessory shoe</b></p> <p><b>7 External microphone terminal [EXT MIC] (→ 17)</b></p> <ul style="list-style-type: none"> <li>A compatible plug-in powered microphone can be used as an external microphone.</li> <li>When the unit is connected with the AC adaptor, sometimes noise may be heard depending on the microphone type. In this case, please switch to the battery for the power supply and the noise will stop.</li> </ul> <p><b>8 Photoshot button [  ] (→ 27)</b></p> | <p><b>9 Zoom lever [W/T] (In Recording Mode) (→ 29)</b></p> <p><b>Volume lever [+VOL-]/Thumbnail display switch [  /  ] (In Playback Mode)</b></p> <p><b>10 Grip belt (→ 16)</b></p> <p><b>11 Status indicator (→ 22)</b></p> <p><b>12 Power switch (→ 22)</b></p> <p><b>13 Recording start/stop button (→ 27)</b></p> <p><b>14 Charging lamp [CHG] (→ 19)</b></p> <p><b>15 DC input terminal [DC IN] (→ 19)</b></p> <ul style="list-style-type: none"> <li>Do not use any other AC adaptors except the supplied one.</li> </ul> <p><b>16 Headphone terminal [  ]</b></p> <p><b>17 USB terminal [HOST]/[USB 2.0]</b></p> <p><b>18 USB terminal [DEVICE]/[USB 2.0]</b></p> <p><b>19 HDMI terminal [HDMI] (→ 32)</b></p> |
|--|---|

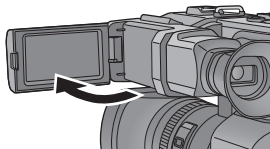




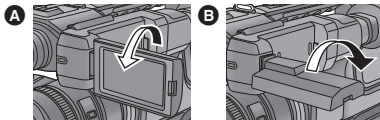
- 20 Ring LED
  - 21 Shoulder strap fixture
  - 22 Internal microphones
  - 23 Recording lamp
  - 24 Lens (→ 16)
  - 25 Lens hood
  - 26 Multi manual ring (→ 30)
  - 27 Camera function button  
[CAMERA FUNCTION] (→ 30)
  - 28 Mode switch
  - 29 Intelligent auto/Manual/Manual focus  
switch [Intelligent auto/Manual/Manual  
focus] (→ 28)
  - 30 Cursor button
  - 31 Optical Image Stabilizer button  
[[O.I.S.]]
  - 32 Menu button [MENU] (→ 25)
  - 33 Eyepiece corrector lever (→ 23)
  - 34 Tripod receptacle
- Attaching a tripod with a screw length of  
5.5 mm (0.22 ") or more may damage the  
unit.



**35 LCD monitor (Touch screen) (→ 22)**



- It can open up to 90°.



- It can rotate up to 180° **A** towards the lens or 90° **B** towards the opposite direction.

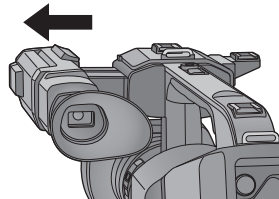
**36 Eye cup attachment part (→ 16)**

**37 Eye cup (→ 16)**

**38 Accessory shoe**

**39 Viewfinder (→ 23)**

- Extend the viewfinder before use.



**40 Speaker**

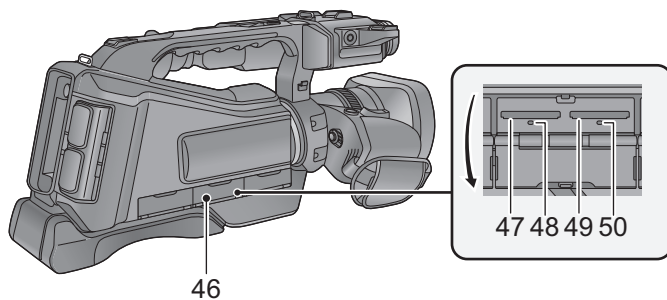
**41 Battery release button [PUSH] (→ 18)**

**42 Battery holder (→ 18)**

**43 Video output terminal [VIDEO OUT] (→ 32)**

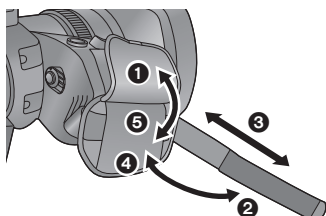
**44 Audio output terminal [AUDIO OUT] (→ 32)**

**45 Component terminal [Y]/[PB/CB]/[PR/CR] (→ 32)**



- 46 SD card cover (→ 21)
- 47 Card slot 2 (left) (→ 21)
- 48 Access lamp (card 2) (→ 21)
- 49 Card slot 1 (right) (→ 21)
- 50 Access lamp (card 1) (→ 21)

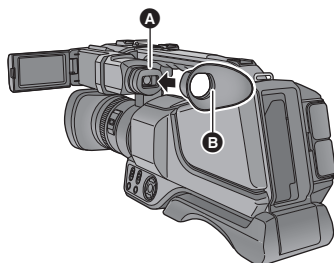
### ■ Adjust the length of the grip belt so that it fits your hand.



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

### ■ Attaching the eye cup

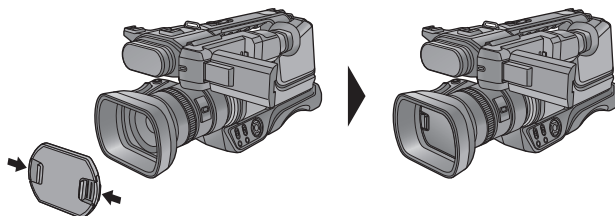
Attach by aligning the notch of the eye cup attachment part with the protrusion at the inside of the eye cup.



- A Notch
- B Protrusion

### ■ Attaching the lens cap

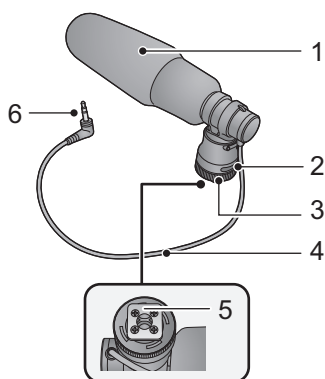
Protect the lens surface with the lens cap while the unit is not used.



Attach or remove it by pinching on it.

## ■ About the external stereo microphone

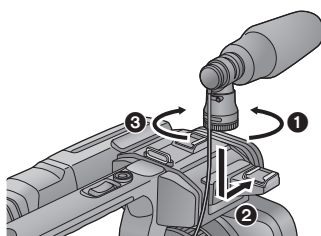
### External stereo microphone



- 1 Microphone condenser
- 2 Cable Holder
- 3 Lock ring
- 4 Mini plug and Cable
- 5 Shoe
- 6 Plug section

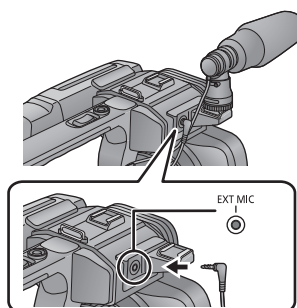
## Attaching the external stereo microphone to the unit

### 1 Attach the microphone to the accessory shoe.



- ① Loosen the lock ring.
- ② Attach the microphone.
- ③ Firmly tighten the lock ring.
- Do not apply excessive force on the lock ring.
- Make sure that the microphone is securely attached.

### 2 Connect the plug to the external microphone terminal.



- Check that the unit is turned off. Connecting or removing the microphone while the unit is turned on may cause malfunction.
- You can fasten the excess cable by tucking it into the cable holder.
- When removing the microphone, disconnect the plug, and then remove the microphone in reverse order of attaching.
- Hold the lock ring when mounting or removing the microphone.

Preparation

## Power supply

### ■ About batteries that you can use with this unit

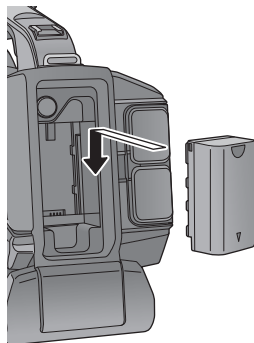
The battery that can be used with this unit is VW-VBD29/CGA-D54.

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.

## Inserting/removing the battery

- Set the power switch to OFF to turn off the unit. (→ 22)

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

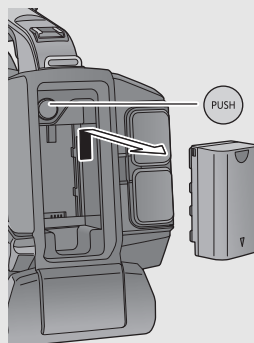


Insert the battery until it clicks and locks.

### Removing the battery

Be sure to set the power switch to OFF and the status indicator goes off. Then remove the battery while supporting the unit to prevent it from dropping.

**While pressing the battery release button, remove the battery.**



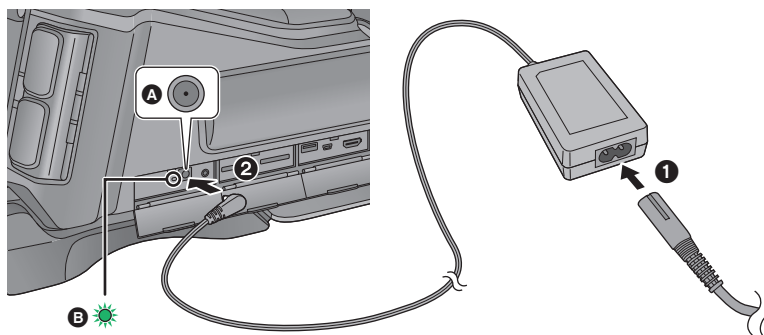
## Charging the battery

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

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.
- The battery can be charged if the unit is turned on.
- It is recommended to charge the battery in a temperature between 10 °C and 30 °C (50 °F and 86 °F). (The battery temperature should also be the same.)



- A** DC input terminal  
**B** Charging lamp

**1** Connect the AC cable to the AC adaptor, then the AC outlet.

**2** Connect the AC adaptor to the DC input terminal.

- As the charging lamp lights up green, charging starts. It will turn off when the charging is completed.
- When the charging lamp is flashing at approximately 4 second intervals (off for approx. 2 seconds, on for approx. 2 seconds), the battery is over discharged or the temperature of the battery is too high or low. It can be charged, but it may take a few hours to complete the charging normally. When the charging lamp is flashing at approximately 0.5 second intervals (off for approx. 0.25 seconds, on for approx. 0.25 seconds), the battery is not charged.

### ■ Connecting to the AC outlet

It is possible to use this unit with power supplied from the AC outlet by turning on the unit with the AC adaptor connected.

When recording for a long time, keep the AC adaptor connected and use it together with the battery. This allows you to continue the recording even if a power failure occurs or the AC adaptor is unplugged from the AC outlet by accident.

- We recommend using Panasonic batteries (→ 11, 20).

- 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 a car exposed to direct sunlight for a long period of time with doors and windows closed.

## Charging and recording time

### ■ Charging/Recording time










- Temperature: 25 °C (77 °F)/humidity: 60%RH
- When using the viewfinder (times in parentheses are when using the LCD monitor)
- These charging times are for when the unit is turned off.

Battery model number [Voltage/Capacity (minimum)]	Charging time	Recording format	Maximum continuous recordable time	Actual recordable time
Supplied battery/ [7.2 V/2900 mAh]	4 h	[PS 1080/60p]	5 h 5 min (4 h 50 min)	3 h 5 min (3 h)
		[PH 1080/60i]	5 h 20 min (5 h 5 min)	3 h 15 min (3 h 5 min)
		[HA 1080/60i]/ [HG 1080/60i]	5 h 20 min (5 h 5 min)	3 h 20 min (3 h 10 min)
		[HE 1080/60i]	5 h 30 min (5 h 15 min)	3 h 25 min (3 h 15 min)
		[PM 720/60p]	5 h 25 min (5 h 5 min)	3 h 20 min (3 h 10 min)
		[SA 480/60i]	5 h 40 min (5 h 20 min)	3 h 30 min (3 h 20 min)

- “h” is an abbreviation for hour, “min” for minute.
- 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.**
- If the unit is turned on, charging will take twice to three times longer than the table above.

- 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.
- If the unit is charged while it is turned on,  will be displayed on the screen.  will disappear after charging is complete.
- As long as the charging lamp is flashing, charging is not complete even after  has disappeared.



## Preparation

## Recording to a card

The unit can record still pictures or motion pictures to an SD card. To record to an SD card, read the following.

### 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.

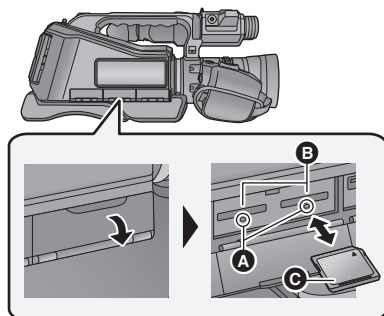
- Keep the Memory Card out of reach of children to prevent swallowing.

### Inserting/removing an SD card

When using an SD card not from Panasonic, or one previously used on other equipment, for the first time on this unit, format the SD card. (→ 26) 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 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.

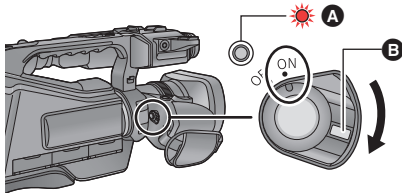
#### 2 Securely close the SD card cover.

- Securely close it until it clicks.

## Preparation

## 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.

## Preparation

## Using the LCD monitor/Viewfinder

The viewfinder is turned off and the LCD monitor is turned on when the LCD monitor is opened. The viewfinder is turned on when the LCD monitor is closed.

### How to use the touch screen

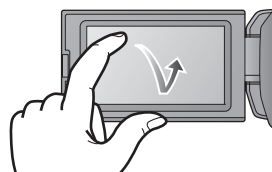
You can operate by directly touching the LCD monitor (touch screen) with your finger.

- The unit supports both operations using the cursor buttons and operations using the touch screen. Select the optimal method according to the situation.
- In this operating instructions, the majority of functions are described on the basis of operations using the cursor buttons.

**■ Touch**

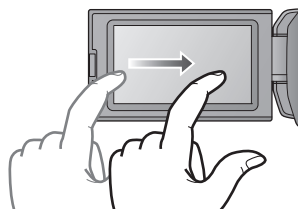
Touch and release the touch screen to select icon or picture.

- 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

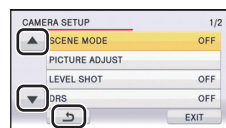
- To operate the following icons using the cursor buttons, select the desired icon using the cursor buttons and then press the button in the centre. (Excluding some functions)



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



This icon is used to return to the previous screen such as when setting menus.



- Do not touch on the LCD monitor with hard pointed tips, such as ball point pens.

## Viewfinder adjustment

- These settings will not affect the images actually recorded.

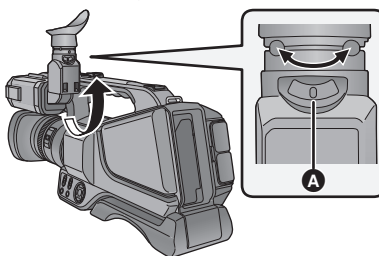
### Adjusting the field of view

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°.
- Close the LCD monitor and turn on the viewfinder.

#### 2 Adjust the focus by operating the eyepiece corrector lever.



A Eyepiece corrector lever

Preparation

## Setting date and time

The clock is not set at the time of purchase. Make sure to set the clock.

### 1 Select the menu. (→ 25)

 MENU : [OTHER FUNCTION] → [CLOCK SET]

### 2 Select the date and time to be set using the cursor button right or left, then adjust the desired value using the cursor button up or down.

- The year can be set between 2000 and 2039.



Example: For USA



### 3 Select [ENTER] using the cursor button right or left, then press the button in the centre.

- The screen may switch to the setting screen for the [TIME ZONE]. Using cursor button and set the [TIME ZONE].
- Select [EXIT], then press the button in the centre or press the MENU button to complete the setting.



- 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 to set the date and time.

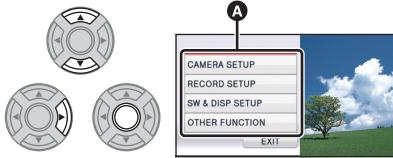
Preparation

## Using the menu screen

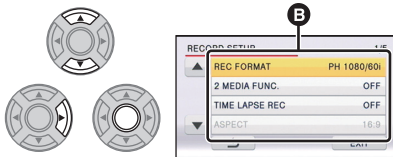
- You can also perform operations by touch operation. (→ 22)



**1** Press the MENU button.  MENU

**2** Select the desired top menu **A** using the cursor button, then press the cursor button right or press the button in the centre.

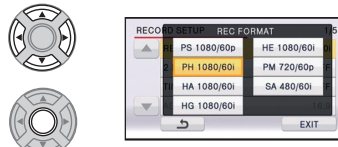


**3** Select the submenu item **B**, then press the cursor button right or press the button in the centre.



- Next (previous) page can be displayed by using  / .


**4** Select the desired item, then press the button in the centre to enter the setting.



**5** Select [EXIT], then press the button in the centre or press the MENU button to exit the menu setting.

## Language selection



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

 MENU : [OTHER FUNCTIONS] →  
[LANGUAGE] → desired language

Basic

## Selecting a media to record

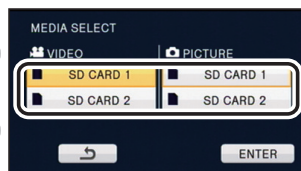
[SD CARD 1] and [SD CARD 2] can be selected separately to record motion pictures or still pictures.

- 1 Change the mode to  or .
- 2 Select the menu. (→ 25)

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

- 3 Select the media you want to record motion pictures or still pictures on by using the cursor button, and press the button in the centre.

- The media is selected separately to motion pictures or still pictures is highlighted in yellow.




- 4 Select [ENTER] and press the button in the centre.

## 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, DVD disc etc.

- 1 Select the menu.

 MENU : [OTHER FUNCTION] → [FORMAT MEDIA]

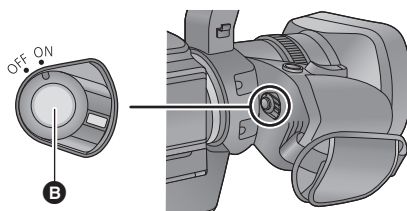
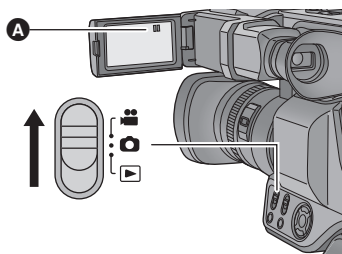
- 2 Select [SD CARD 1] or [SD CARD 2] and press the button in the centre.

Basic



## Recording motion pictures

- 1** Change the mode to .
  - 2** Open the LCD monitor.
  - 3** Press the recording start/stop button to start recording.
- A** When you begin recording, changes to .
- Recording will stop when you press the recording start/stop button again.

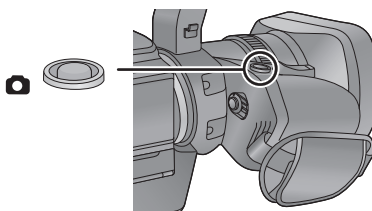
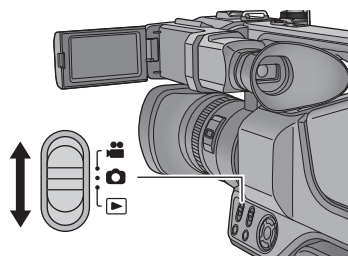


Basic



## Recording still pictures

- 1** Change the mode to .
  - 2** Open the LCD monitor.
- 3** Press the button.

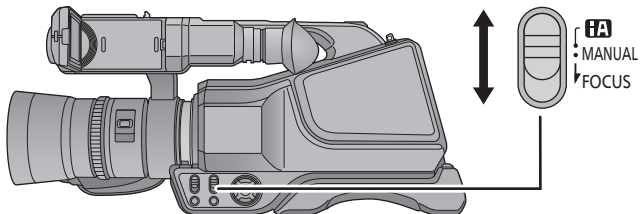


Basic



## Intelligent Auto Mode

The following modes (appropriate for the condition) are set just by pointing the unit to what you want to record.



### Intelligent auto/Manual/Manual focus switch

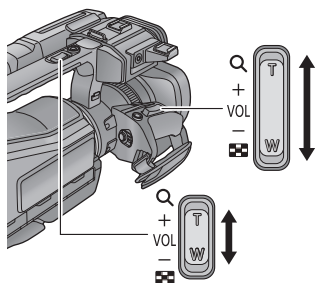
Slide the switch to change the Intelligent Auto Mode/Manual Mode/Manual Focus Mode.



Basic



## Using the zoom



### Zoom lever/Sub zoom lever

#### T side:

Close-up recording (zoom in)

#### W side:

Wide-angle recording (zoom out)



### Ring Zoom

#### T side:

Close-up recording (zoom in)

#### W side:

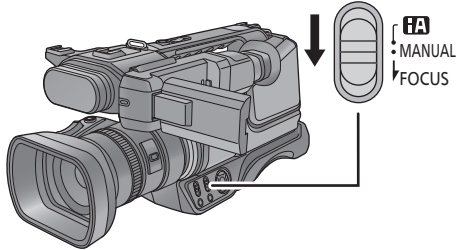
Wide-angle recording (zoom out)

Basic

## Manual recording

Set the Intelligent auto/Manual/Manual focus switch to manual mode.

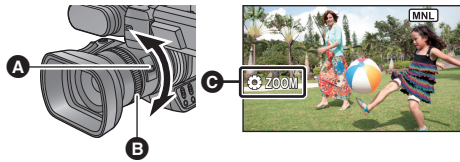
- **MNL** is displayed in the Manual Mode.



### ■ When using the multi manual ring

#### 1 Press the CAMERA FUNCTION button to select the desired item.

- Selected item changes whenever the CAMERA FUNCTION button is pressed.
- The selected ring operation icon is displayed in area **C**.



- A** CAMERA FUNCTION button
- B** Multi manual ring

#### 2 Rotate the multi manual ring to select the setting.

- When a manual icon is displayed, operation using the multi manual ring is not possible.

C Ring operation icons	
FOCUS <sup>*1</sup>	Focus
WB	White Balance
SHUTTER	Manual Shutter Speed
IRIS	Iris/Gain Adjustment
ZOOM <sup>*2</sup>	Zoom

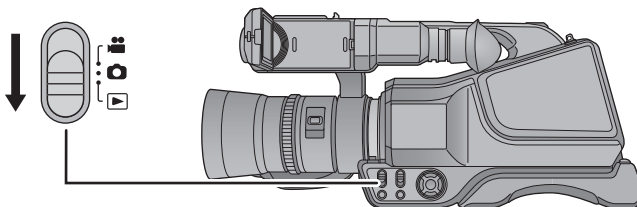
\*1 This can be set only in Manual Focus Mode.

\*2 This can also be operated in Intelligent Auto Mode

Basic

## Motion picture/Still picture playback

- You can also perform operations by touch operation. (→ 22)



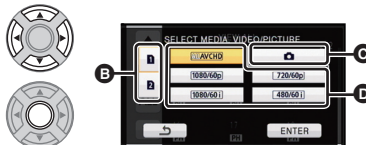
**1** Change the mode to .

**2** Select the play mode select icon **A** using the cursor button, then press the button in the centre.



**3** Select the media type **B** and press the button in the centre.

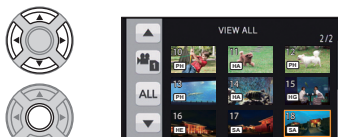
**4** Select the still picture **C** or the recording format of the motion picture **D** you wish to play back and press the button in the centre.



- Select [ENTER] and press the button in the centre.

**5** Select the scene or the still picture to be played back and press the button in the centre.

- The recording format is displayed in the thumbnail display of the motion pictures. ([PH], [HA], etc.)
- Next (previous) page can be displayed by using / .



## 6 Select the playback operation by selecting the operation icon and press the button in the centre.



### E Operation icon

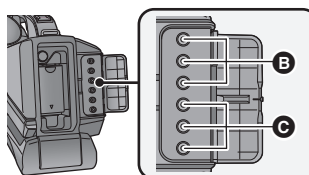
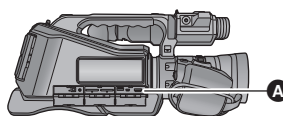
- Operation icons and screen display will disappear when no operation is performed for a specific period of time. To display them again, press the cursor button.

## Watching Video/Pictures on your TV



Connect this unit to a TV using an **HDMI cable (commercially-available) or an AV cable (supplied) or a component cable (commercially-available).**

- When connecting with a component cable, also connect the audio terminals of an AV cable.



- A** HDMI connector
- B** AV connector
- C** Component connector

Others

## Specifications

### Memory Card Camera-Recorder

Information for your safety

**Power source:**

DC 9.3 V (When using AC adaptor)

DC 7.2 V (When using battery)

**Power consumption:**

Recording; 6.7 W

Charging; 10.7 W

**Motion picture recording format:**

AVCHD format version 2.0 compliant (AVCHD Progressive)

**Motion picture compression:**

MPEG-4 AVC/H.264

**Audio compression:**

Dolby® Digital (2 ch)

**Recording mode and transfer rate:**

[PS 1080/60p]; Maximum 28 Mbps (VBR)

[PH 1080/60i]; Maximum 24 Mbps (VBR)

[HA 1080/60i]; Average 17 Mbps (VBR)

[HG 1080/60i]; Average 13 Mbp (VBR)

[HE 1080/60i]; Average 5 Mbps (VBR)

[PM 720/60p]; Average 8 Mbps (VBR)

[SA 480/60i]; Average 9 Mbps (VBR)

Refer to the operating instructions Vol.2 for the picture size and recordable time of a motion picture.

**Still picture recording format:**

JPEG (Design rule for Camera File system, based on Exif 2.2 standard)

Refer to the operating instructions Vol.2 for picture size of a still picture and number of recordable pictures.

**Recording media:**

SD Memory Card

SDHC Memory Card

SDXC Memory Card

Refer to the operating instructions Vol.2 for details on SD cards usable in this unit.

**Image sensor:**

1/4.5" 1MOS image sensor

Effective pixels; 4140 K

Motion picture\*; 3110 K (4:3), 4140 K (16:9)

Still picture; 3240 K (4:3), 3240 K (3:2),

4140 K (16:9)

\* When Level Shot Function is set to off

**Lens:**

Auto Iris, 21× optical zoom, F1.8 to F3.5

Focal length;

2.82 mm to 59.2 mm

Macro (Full range AF)

35 mm equivalent;

Motion picture;

28 mm to 729.6 mm (16:9),

36.2 mm to 893 mm (4:3)

Still picture;

33.9 mm to 712.6 mm (4:3),

33.2 mm to 697.6 mm (3:2),

28 mm to 729.6 mm (16:9)

Minimum focus distance;

Normal; Approx. 3.0 cm (1.2") (Wide/

Approx. 1.5 m (4.9 feet) (Tele)

Tele Macro; Approx. 60 cm (24") (Tele)

Intelligent Auto Macro;

Approx. 1 cm (0.4") (Wide/

Approx. 60 cm (24") (Tele)

**Filter diameter:**

49 mm

**Zoom:**

i.Zoom OFF 26×, 50× i.Zoom, 60×/1500×

digital zoom

(Using image sensor effective area)

**Image stabilizer function:**

Optical (Hybrid Optical Image Stabilizer, Active

Mode (Rotation correction), Tilt correction function)

**Monitor:**

3.0" wide LCD monitor (Approx. 460 K dots)

**Viewfinder:**

0.24" wide EVF (Approx. 263 K dots equivalent)

**Microphone:**

Stereo (with a Zoom Microphone)

**Minimum required illumination:**

Approx. 2 lx (1/30 with Low Light Mode in the Scene Mode)

Approx. 1 lx with the Color Night Rec function

**AV connector video output level:**

1.0 Vp-p, 75 Ω, NTSC system

**Component connector video output level:**

Y; 1.0 Vp-p, 75 Ω

Pb; 0.7 Vp-p, 75 Ω

Pr; 0.7 Vp-p, 75 Ω

**HDMI connector video output level:**

HDMI™ Type A 1080p/1080i/720p/480p

**AV connector audio output level (Line):**

316 mV, 600 Ω, 2 ch

**Headphone output:**

77 mV, 32 Ω (Stereo mini jack)

**HDMI connector audio output level:**

Dolby Digital/Linear PCM

**MIC input:**

−60 dBV (Mic sensitivity −40 dB equivalent,

0 dB=1 V/Pa, 1 kHz)

(Stereo mini jack)

**USB:**

Reader function

SD card; Read only (No copyright protection support)

Hi-Speed USB (USB 2.0),

[HOST]; USB terminal Type A

[DEVICE]; USB terminal Type Mini B

USB host function (for external drive)

**Dimensions:**

205 mm (W)×217 mm (H)×479 mm (D)

[8.07 " (W)×8.54 " (H)×18.85 " (D)]

(including projecting parts)

**Mass (Weight):**

Approx. 2270 g (Approx. 5.00 lbs.)

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

**Mass (Weight) in operation:**

Approx. 2400 g (Approx. 5.28 lbs.)

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

**Operating temperature:**

0 °C to 40 °C (32 °F to 104 °F)

**Operating humidity:**

10%RH to 80%RH

**Battery operation time:**

See page 20

**AC adaptor**

Information for your safety

**Power source:**

AC 110 V to 240 V, 50/60 Hz

**Power consumption:**

16 W

**DC output:**

DC 9.3 V, 1.2 A

**Dimensions:**

52 mm (W)×26 mm (H)×86.3 mm (D)

[2.1 " (W)×1.0 " (H)×3.4 " (D)]

**Mass (Weight):**

Approx. 115 g (Approx. 0.25 lbs.)

Others

## About copyright

### ■ Carefully observe copyright laws

#### IMPORTANT

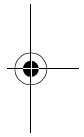
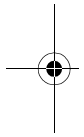
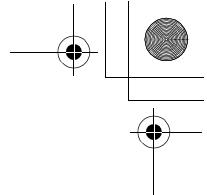
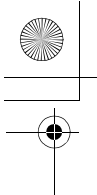
**“Unauthorized recording of copyrighted television programs, video tapes and other materials may infringe the right of copyright owners and be contrary to copyright laws.”**

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- Other names of systems and products mentioned in these instructions are usually the registered trademarks or trademarks of the manufacturers who developed the system or product concerned.

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>.

- Separate license contracts must be obtained from MPEG LA where SD Memory Cards containing information recorded with this product are to be distributed to end users for commercial purposes. “End user” refers to persons or organizations handling such contents for personal use.



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