Panasonic®

Basic Operating Instructions
Dual Camera

Model No. **HX-WA20**

Before use, please read these instructions completely.

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.

HƏMI   SƏ XC   VIΞRΛ Link

Information for Your Safety

WARNING:

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

● Do not let water or other liquids drip or splash inside the unit.
● Do not expose accessories (battery pack, AC adaptor, SD memory card and etc.) to rain, moisture, dripping or splashing.
● Do not place objects filled with liquids, such as vases, on accessories.
● 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.

The socket outlet shall be installed near the equipment and shall be easily accessible.

■ Concerning the battery

Warning

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

CAUTION

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

For EG only

■ EMC Electric and magnetic compatibility

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

Use only the recommended accessories.

- Always use a genuine Panasonic HDMI micro cable (RP-CHEU15: optional).

■ Product identification marking

Product	Location
Dual Camera	Inner side of LCD monitor

-If you see this symbol-

■ 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.

Cd

4 VQT4F52

∎ Cautions for use

For Australia and New Zealand

In the event of abnormal operation (e.g. if the unit emits smoke or an unusual smell), immediately stop operating the unit and consult the Panasonic Customer Care Centre on 132600.

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 recording formats and compatibility of the unit

- The unit is an MP4 format (MPEG-4 AVC file standard) Dual Camera for recording high-definition motion pictures.
- AVCHD and MPEG2 motion pictures are different formats, and are not therefore supported by the 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).

∎ 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 26 for more details on SD cards.

∎ For the purposes of these operating instructions

● SD Memory Card, SDHC Memory Card and SDXC Memory Card are referred to as the "SD card".
● Functions that can be used for motion picture recording/motion picture playback are indicated by VIDEO in these operating instructions.
● Functions that can be used for still picture recording/still picture playback are indicated by PHOTO in these operating instructions.
● Functions that can be used for audio recording/audio playback are indicated by AUDIO in these operating instructions.
● Pages for reference are indicated by an arrow, for example: → 00
● "File" is used to mean "scene", "still picture" and "audio file".

Contents

Preparation

Basic

Others

(Important) About the Waterproof and Dustproof Performance of this unit

Waterproof/Dustproof Performance

This unit's waterproof/dustproof rating complies with the "IP58" rating. Provided the care and maintenance guidelines described in this document are strictly followed, this unit can operate underwater, to a depth not exceeding 3 m for a time not exceeding 60 minutes. *

This does not guarantee no destruction, no malfunction, or waterproofing in all conditions.

* This means that this unit can be used underwater for specified time in specified pressure in accordance with the handling method established by Panasonic.

■ Handling of this unit

● Waterproofing is not guaranteed if the unit is subject to an impact as a result of being hit or dropped etc. If an impact to this unit occurs, it should be inspected (subject to a fee) by a Panasonic's Service Centre to verify that the waterproofing is still effective.
● The waterproof performance may be degraded due to the strong water pressure when this unit is used deeper than 3 m underwater.
● When this unit is splashed with detergent, soap, hot spring, bath additive, sun oil, sun screen, chemical, etc., wipe it off immediately.
● Waterproof function of this unit is for sea water and fresh water only.
● Any malfunction caused by customer misuse, or mishandling will not be covered by the warranty.
● The inside of this unit is not waterproof. Water leakage will cause malfunction.
● Supplied accessories such as battery pack etc. are not waterproof. (excluding handstrap)
● Cards are not waterproof. Do not handle with a wet hand. Also, do not insert wet card into this unit.

- Do not leave this unit for a long period of time in places where temperature is very low (at ski resorts or at high altitude etc.) or very high (above 35 °C), inside a car under strong sunlight, close to a heater, on the beach, etc. Waterproof performance may be degraded.

- **Foreign objects may adhere to the inner side of the rear door (around the rubber seal or connecting terminals) when the rear door is opened or closed in places with sand or dust etc. This may result in the impairment of the waterproof performance if the rear door is closed with foreign objects adhered. Be extremely careful since it may result in malfunction etc.**
- **If any foreign object has adhered to the inner side of the rear door, remove with the supplied brush.**
- **If any liquid such as water droplets has adhered to this unit or inner side of the rear door, wipe off with a soft dry cloth. Do not open or close the rear door near the water, when underwater, using wet hands, or when this unit is wet. It may cause water leakage.**

■ When inner side of the lens is fogged (condensation)

It is not a malfunction or failure of this unit. It may be caused by the environment in which this unit is used.
- Be careful of condensation since it causes lens stains, fungus and unit malfunction.

What to do when inner side of the lens is fogged
- Turn off the unit and open the rear door in a place with constant ambient temperature, away from high temperatures, humidity, sand and dust. The fog will disappear naturally in about 2 hours with the rear door open when the temperature of this unit gets close to the ambient temperature.
- Contact Panasonic's Service Centre if the fogging does not disappear.

**Conditions in which inner side of the lens may be fogged**
Condensation may occur and the inner side of the lens may be fogged when this unit is used in areas that undergo a significant change in temperature or in high humidity, such as the following:
- **When this unit is used underwater suddenly after being on a hot beach etc.**
- **When this unit is moved to a warm area from a cold area, such as at a ski resort or at high altitude**
- **When the rear door is opened in a high-humidity environment**

Check before using underwater

Do not open or close the rear door in places with sand and dust, close to water, or with wet hands. Sand or dust adhering may cause water leaks.

1 Open the rear door.
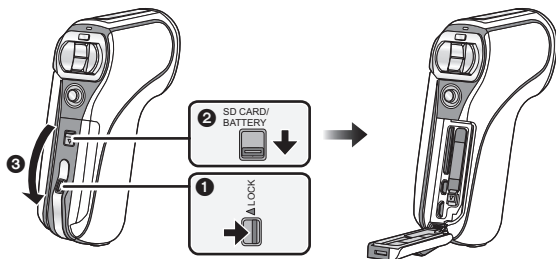
❶ Unlock the LOCK lever.
❷ Slide the open/close lever.
❸ Open the rear door.

2 Check that there are no foreign objects on the inner side of the rear door.

● If there are any foreign objects, such as lint, hair, sand, etc., on the surrounding area, water will leak within a few seconds causing malfunction.

3 If there is foreign matter adhering to the unit, use the supplied brush to remove it.

● Be extremely careful to remove any sand etc. that may adhere to the sides and corners of the rubber seal.
● Keep the brush out of reach of children to prevent swallowing.

● Use the brush end with the short (hard) bristles to remove larger foreign matter or damp sand from the unit.
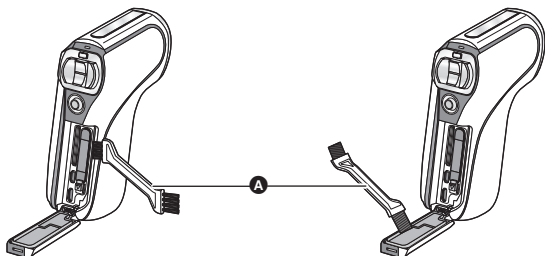
Ⓐ Brush (supplied)

● Wipe it off with a dry soft cloth if there is any liquid. It may cause water leaks and malfunction if you use this unit with liquid adhered.
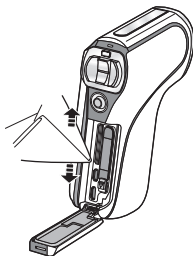
4 Check for cracks and deformation of the rubber seal on the rear door.

● The integrity of the rubber seals may decrease after about 1 year, with use and age. To avoid permanently damaging this unit the seals should be replaced once each year. Please contact Panasonic's Service Centre for related costs and other information.

5 Close the rear door securely.
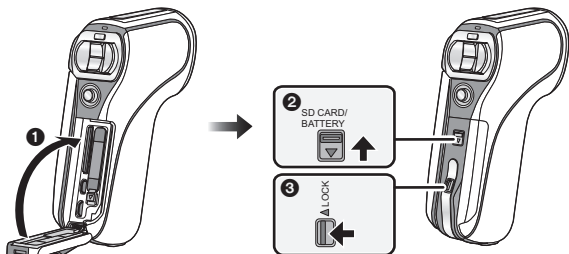
❶ Close the rear door.
❷ Slide the open/close lever.
❸ Lock the LOCK lever.
● Lock securely to the points where the red portion of the open/close lever and LOCK lever are no longer visible.
● To prevent water seeping into this unit, be careful not to trap foreign objects such as liquids, sand, hair or dust etc.

■ About handling the brush
● Before use, check that foreign matter has not adhered to the brush.
● After use, remove any adhered foreign matter and clean in preparation for next use.

Using this unit underwater

- Use this unit underwater at a depth of down to 3 m with the water temperature between 0 °C and 35 °C.
- Do not use this unit at a depth of over 3 m.
- Do not use it in hot water over 35 °C (in the bath or hot spring).
- Do not use this unit underwater not longer than 60 minutes continuously.
- Do not open or close the rear door.
- Do not apply shock to this unit underwater. (Waterproof performance may not be maintained, and there is a chance of water leak.)
- Do not dive into the water holding this unit. Do not use this unit in a location where the water will splash strongly, such as rapid flow or waterfall. (Strong water pressure may be applied, and it may cause malfunction.)
- This unit will sink in the water. Take care not to drop this unit and lose it underwater by securely placing the strap around your wrist or similar measure.
- Attaching a tripod with a 5.5 mm screw or larger may open a hole in this unit through which water will leak.

Caring of this unit after using it underwater

Do not open or close the rear door until the sand and dust is removed by rinsing this unit with water.
Make sure to clean this unit after using it.
- Thoroughly wipe off any water droplets, sand, and saline matter on your hands, body, hair, etc.
- It is recommended to clean this unit indoors, avoiding places where water spray or sand may fall.

Do not leave this unit uncared for longer than 60 minutes after using it underwater.
- Leaving this unit with foreign objects or saline matter on it may cause damage, discolouration, corrosion, unusual odour, or deterioration of the waterproof performance.

1 Rinse with water with the rear door closed.

● After use at the seaside or underwater, soak the unit in fresh water pooled in a shallow container for 10 minutes or less.
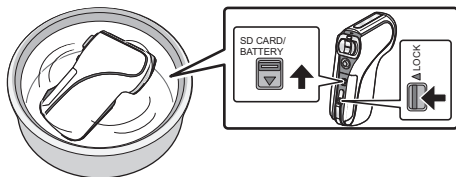

2 Drain water by holding this unit upside down and shaking it lightly a few times.
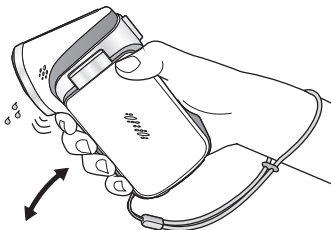
● After using this unit at the seaside or underwater, or after washing it, water will remain at the speaker site of this unit for a while and it may cause lower sound or sound distortion.
● Fasten the strap firmly to prevent this unit from dropping.

3 Wipe off water drops on this unit with a dry soft cloth and dry this unit in a shaded area which is well ventilated.
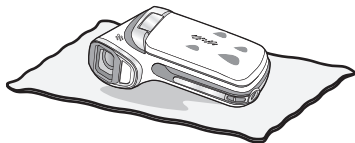
● Dry this unit by standing it on a dry cloth.

- Do not dry this unit with hot air from dryer or similar. It will deteriorate the waterproof performance or cause failure due to deformation.
- Do not use chemicals such as benzine, thinner, alcohol, or cleanser, or soap or detergents.

4 Confirm that there are no water droplets, open the rear door, and wipe off any water droplets or sand left inside using a soft dry cloth.

- Water droplets may adhere to the card when the rear door is opened without thoroughly drying. Also, water may accumulate in the gap around the card compartment, the battery compartment or the terminal connector. Be sure to wipe any water off with a soft dry cloth.
- The water droplets may seep into this unit when the rear door is closed while it is still wet, causing condensation or failure.

■ Wiping moisture from the unit

If there is moisture inside the rear door, wipe every crevice completely clear of moisture.
(This moisture is not due to exposure to water)
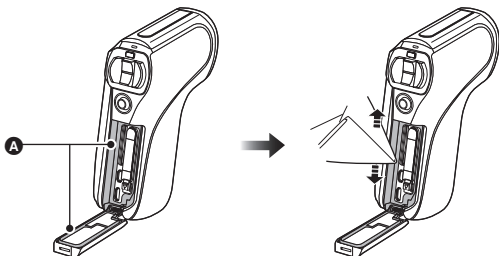
Ⓐ Moisture here

∎ **About the water draining design**

This unit is designed so that water that entered the gaps around the zoom button etc. drains out. For this reason, bubbles may appear when the unit is immersed in water, but this is not a malfunction.

Draining water from the unit

Drainage holes are found on the bottom of the unit. Hold the unit vertically, as shown, to drain off the water.
When draining, attach the hand strap to the unit and secure the hand strap to your wrist to prevent the unit from dropping.
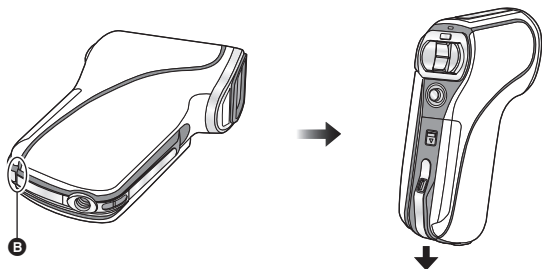
Ⓑ Drainage holes

Accessories

Check the accessories before using this unit.
Keep the accessories out of reach of children to prevent swallowing.
Product numbers correct as of Feb. 2012. These may be subject to change.

Battery pack
VW-VBX090

AC adaptor
(EG/GA)
Ⓐ VSK0751

(GC)
Ⓑ VSK0752

(GN)
Ⓒ VSK0753
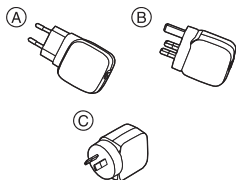
AV cable
VFA0555
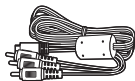
USB cable
VFA0554
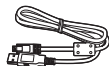
Handstrap
VFC4817
To prevent the unit from dropping, be sure
to attach the handstrap.

Brush
VYC1064

CD-ROM
Software

CD-ROM
(EG)
Operating Instructions
VFF1005

(GC/GA/GN)
Operating Instructions
VFF1006

Optional accessories

Some optional accessories may not be available in some countries.

| Battery pack (lithium/VW-VBX090) |
| HDMI micro cable (RP-CHEU15) |

Power supply

■ About batteries that you can use with this unit

The battery that can be used with this unit is VW-VBX090.

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

● Press the power button to turn off the unit. (→ 31)

1 **Open the rear door.**
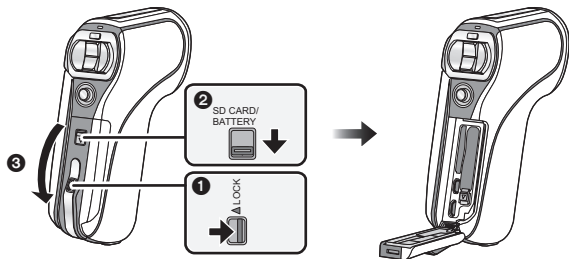
❶ Unlock the LOCK lever.
❷ Slide the open/close lever.
❸ Open the rear door.

2 (To insert the battery pack)
Confirm the orientation of the terminal markings and insert the battery.
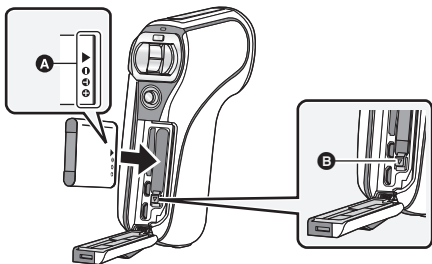
Ⓐ terminal markings
● Confirm that lever Ⓑ is locked on to the battery.
● It is possible to mistakenly insert the battery upside down, so be sure to check the orientation carefully.

(To remove the battery pack)
Push the lever Ⓑ toward the direction of arrow, and pull the battery straight out.
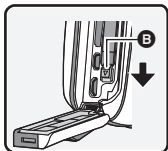
3 **Close the rear door.**
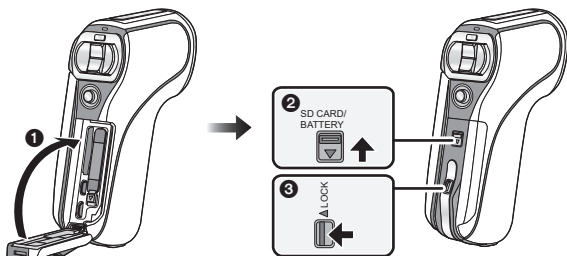
❶ Close the rear door.
❷ Slide the open/close lever.
❸ Lock the LOCK lever.

	Unlocked state	Locked state
Open/close lever	SD CARD/BATTERY	SD CARD/BATTERY
Lock lever	LOCK ❸	LOCK
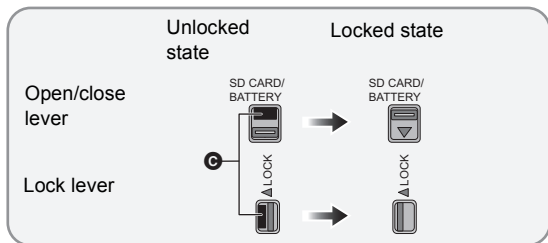
● Lock securely to the points where the red portion ❸ of the open/close lever and LOCK lever are no longer visible.

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:
- **Be sure to use the supplied AC adaptor and USB cable. Do not
  use parts supplied with other equipment.**
- **The AC adaptor and USB cable are for use with this unit only. Do
  not use them with other equipment. Similarly, do not use AC
  adaptors and USB cables from other equipment with this unit.**
- **The battery is charged while the unit is off or in the sleep mode.
  The battery cannot be charged while the unit is recording or
  playing back.**
- **It is recommended to charge the battery in a temperature between
  10 °C and 30 °C. (The battery temperature should also be the same.)**
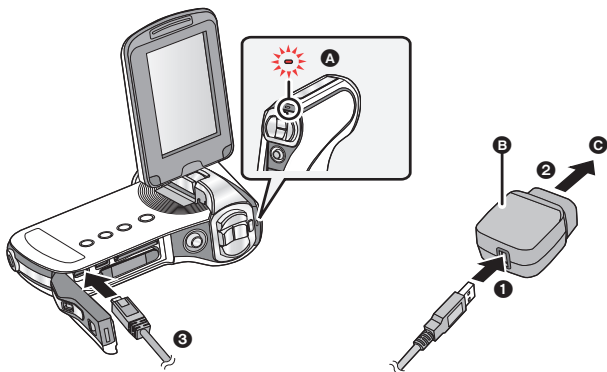
- **Ⓐ** Status indicator
- **Ⓑ** AC adaptor
- **Ⓒ** To the AC outlet
- Insert the plugs as far as they will go.

1 **Connect the USB cable to the AC adaptor.**

● Check that the plug portion of the AC adaptor is not loose or misaligned.

2 **Plug the AC adaptor into the AC outlet.**

3 **Connect the USB cable to the unit.**

● The status indicator flashes red with a period of approximately 2 seconds (approximately 1 second on, 1 second off), and charging begins. It will turn off when the charging is completed.

● Do not use any other AC adaptors except the supplied one.
● Do not use any other USB cables except the supplied one.
● We recommend using Panasonic batteries (→ 18, 19).
● 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/humidity: 60%RH (When using AC adaptor)

Battery model number [Voltage/Capacity (minimum)]	Charging time	Recording mode	Maximum continuous recordable time	Actual recordable time
Supplied battery/ VW-VBX090 (optional) [3.7 V/880 mAh]	2 h 30 min	1080-60i	1 h 10 min	40 min
		1080-30p	1 h 20 min	40 min
		720-60p	1 h 15 min	40 min
		720-30p	1 h 30 min	45 min
		480-30p	1 h 50 min	50 min
		iFrame	1 h 30 min	45 min
		🎤	2 h	—

● 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 button 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.
  ▭▭▭ → ▭▭ → ▭ → ▭ → ▭ (red)
  When the charge is low, ⇉▭⇇ is displayed at the centre of the LCD monitor.
- Depending on the characteristics of the battery, it may not be possible to correctly display the charge remaining on the battery. For instance, at low temperatures, the ▭▭ indicator may turn on earlier. Because the status of the charge remaining indicator changes according to the ambient temperature, conditions of use, etc., the indicator should be considered as an approximate guide.
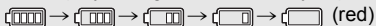
Preparation

Recording to a card

The unit can record motion pictures, still pictures or audio to an SD card or built-in memory. To record to an SD card, read the following.

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. Check via the label on the card, etc.

e.g.:

CLASS④

● 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.)
● To use the Eye-Fi transfer feature, an Eye-Fi X2 series SD card is required.
● Operation of SD Memory Cards with a capacity of 256 MB or less is not guaranteed.
● 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.
● The operation of Memory cards exceeding 64 GB cannot be guaranteed.
● When the write-protect switch Ⓐ 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.
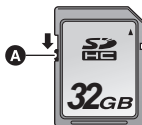
Inserting/removing an SD card

When using an SD card not from Panasonic, or one previously used on other equipment, for the first time on this unit, format the SD card. (→ 42) 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 status indicator has gone off.

1 Open the rear door.
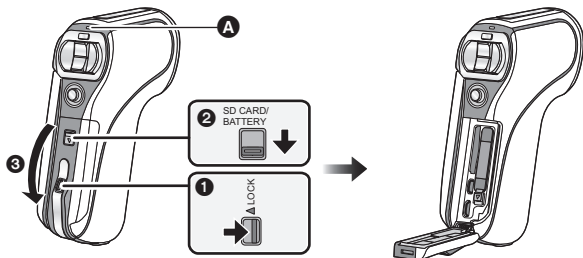
SD CARD/
BATTERY

LOCK

Status indicator Ⓐ

● When this unit is accessing the SD card or built-in memory, the status indicator lights up red.

❶ Unlock the LOCK lever.
❷ Slide the open/close lever.
❸ Open the rear door.

2 Insert (remove) the SD card into (from) the card slot.
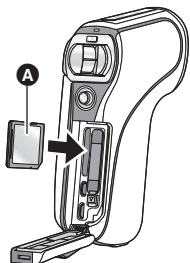
- Face the label side Ⓐ in the direction shown in the illustration and press it straight in as far as it will go.
- Press the centre of the SD card and then pull it straight out.

3 Close the rear door.
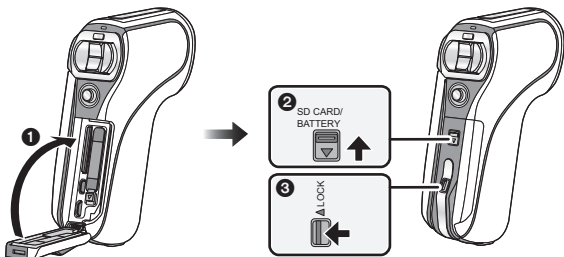
❶ Close the rear door.
❷ Slide the open/close lever.
❸ Lock the LOCK lever.
- Lock securely to the points where the red portion of the open/close lever and LOCK lever are no longer visible.

- Do not touch the terminals on the back of the SD card.
- Do not shock, 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 status indicator illuminates in red, do not:
  - Remove the SD card
  - Turn the unit off
  - Insert and remove the USB cable
  - Expose the unit to vibrations or shock

  Performing the above while the indicator 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 Operation Instructions (PDF format))

Turning the unit on/off

Open the LCD monitor and press the power button to turn on the unit.

The LCD monitor turns on.
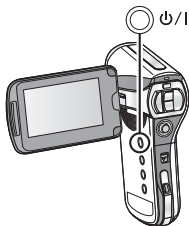
To turn off the unit

Hold down the power button until the LCD monitor goes off.

● Pressing the power button for a short time sends the unit into sleep mode.

Selecting a mode

Change the mode to recording or playback.

Press the REC/▶ button.

● Each press of the REC/▶ button changes the mode.
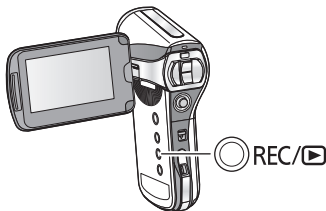
Recording Mode (→ 34, 35, 36)	For recording motion pictures, still pictures and audio
Playback Mode (→ 37)	For playing back motion pictures, still pictures and audio

VQT4F52 **31**

Setting date and time

If the screen to set the date and time appears when you turn on the unit, skip to step 2 and follow the steps to set the date and time.

1 Select the menu. (→ 40)

[MENU]: [⚡1] → [CLOCK SET]

2 Select an item (DATE/TIME/DISP) using the SET button and then tilt the SET button to the right or press the SET button.

⊚ CLOCK SET		
DATE	▷	01. 01. 2012
TIME	▷	00:00
DISP	▷	D / M / Y
	SAVE DATE AND TIME	
MENU ⊡		⊡ ENTER
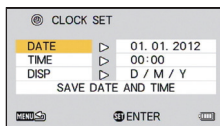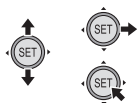
3 (When [DATE] or [TIME] is selected)
Tilt the SET button to the left or right to select the desired item and then up and down to set the numerical values.

e.g.: When [DATE] is selected

⊚ CLOCK SET		
DATE	▷	15. 12. 2012
MENU ⊡		⊡ ENTER
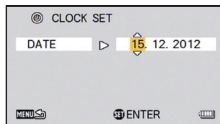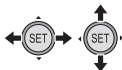
● The year can be set between 2000 and 2039.

(When [DISP] is selected)
Select the year/month/day display method using the SET button.
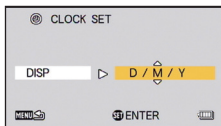
4 **Press the SET button.**

5 **Select [SET DATE AND TIME] using the SET button and then press the SET button.**

● To return to the recording screen or playback screen, press the MENU button.

● At the time of purchase, the [CLOCK SET] are not set.
● If the date and time have not been set or the built-in clock battery has run down, the screen display and recording day/month/year information will appear as follows.
Recording screen display: --.--.---- -:--
Recording day/month/year: 01.01.2012 0:00
● To charge the built-in clock battery, install a fully charged battery in the unit. If you leave the battery in for approximately 2 days, the time settings will be stored for approximately 7 days. (The charging continues even when the unit is turned off)
● [Before using the unit under water] and [Maintenance after use in water] are displayed when setting date and time for the first time after purchase. Please check beforehand to maintain the waterproof performance. Press the MENU button to exit the message screen.

For Australia and New Zealand
WARNING
THE LITHIUM BATTERY IN THIS UNIT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. IF THIS IS NECESSARY, CONTACT THE PANASONIC CUSTOMER CARE CENTRE ON 132600 FOR YOUR NEAREST AUTHORIZED SERVICE CENTRE.

VIDEO

Recording motion pictures

● Motion pictures are recorded to the SD card if one is inserted. If no SD card is inserted, the motion pictures are recorded to the built-in memory.
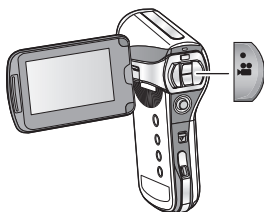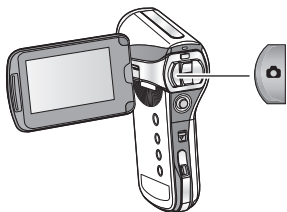
1 **Open the LCD monitor.**

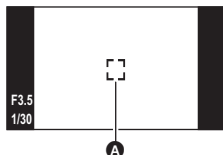*2* **Press the recording start/stop button to start recording.**

Ⓐ When you begin recording, ● appears.

3 **Press the recording start/stop button again to pause recording.**

PHOTO

Recording still pictures

● Still pictures are recorded to SD card if one is inserted. If no SD card is inserted, the still pictures are recorded to the built-in memory.

1 **Open the LCD monitor.**

2 (For auto focus only)
   Press the ⬤ button halfway.

F3.5
1/30

Ⓐ

Ⓐ Focus area (area inside brackets)

3 **Press the ⬤ button fully.**

● If you continue to hold down the ⬤ button, you can check the recorded image on the LCD monitor.

Basic   AUDIO

Recording audio

- Audio is recorded to the SD card if one is inserted. If no SD card is inserted, the audio is recorded to the built-in memory.

1 **Open the LCD monitor.**

2 **Select the menu. (→ 40)**

[MENU]: 🔝 → [REC MODE] → [🎤 (VOICE RECORD)]

3 **Start recording by pressing the recording start/stop button.**

4 **Press the recording start/stop button again to stop recording.**

Basic   VIDEO   PHOTO

Intelligent Auto Mode

The modes (appropriate for the condition) are set just by pointing the unit to what you want to record.
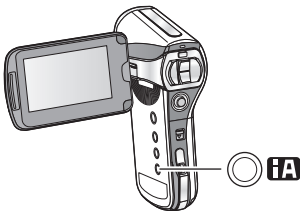
Press the 🎬 button to switch to Intelligent Auto Mode.

`VIDEO` `PHOTO` `AUDIO`

Motion picture/Still picture/Audio playback

○REC/▶
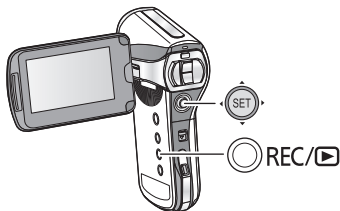
1 **Press the REC/▶ button to change to playback mode.**

2 **Select the file to play back using the SET button and press the SET button.**

Thumbnail display

A   The information for the file in the yellow frame is displayed.

● Tilt and hold the SET button up or down to display the next (or previous) page.

3 Play back using the SET button.

| Motion picture/audio playback		
	SET SET	Playback/Pause
	← SET	Rewind playback
	SET →	Fast forward playback
	SET ↓	Stops the playback and shows the thumbnails.

Ⓑ Operation icon*

* If the operation icon disappears, perform a SET button operation to display it.

Still picture playback		
	↑ SET	Deletes still picture
	← SET	Displays previous file
	SET →	Displays next file
	SET ↓	Stops playback and returns to thumbnail display

Watching Video/Pictures on your TV
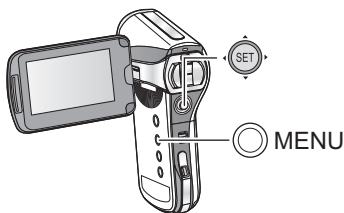
1 Connect this unit to a TV.
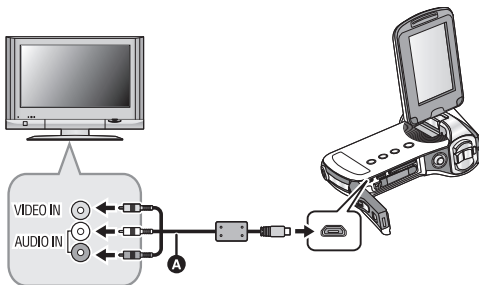
A AV cable (supplied)

● Check that the plugs are inserted as far as they go.
● Do not use any other AV cables except the supplied one.

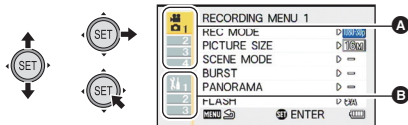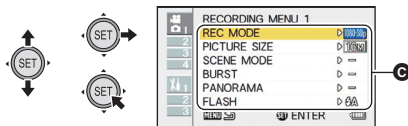## *2* Select the video input on the TV.
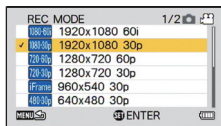
3 Play back from the unit.

Using the menu screen

MENU

1 **Press the MENU button.** ○MENU

2 **Tilt the SET button to the left.** ←(SET)

3 **Select tab Ⓐ or option tab Ⓑ using the SET button, and press down the right side of the SET button or press the SET button.**


```
        RECORDING MENU 1
        REC MODE          ▷ ⅰⅈⅆ ⅈⅆ    Ⓐ
        PICTURE SIZE      ▷ 16m
        SCENE MODE        ▷ ⟳
        BURST             ▷ ⟳
        PANORAMA          ▷ ⟳          Ⓑ
        FLASH             ▷ ⅊Ⅎ
        MENU ⮌          SET ENTER    📶
```

4 **Select from menu items Ⓒ using the SET button, and tilt the SET button to the right, or press the SET button.**


```
        RECORDING MENU 1
        REC MODE          ▷ ⅰⅈⅆ ⅈⅆ
        PICTURE SIZE      ▷ 16m
        SCENE MODE        ▷ ⟳
        BURST             ▷ ⟳          Ⓒ
        PANORAMA          ▷ ⟳
        FLASH             ▷ ⅊Ⅎ
        MENU ⮌          SET ENTER    📶
```
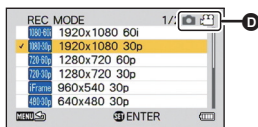
5 **Select the setting content using the SET button and press the SET button to set.**

REC MODE	1/2
1080 60i	1920x1080 60i
1080 30p	1920x1080 30p
720 60p	1280x720 60p
720 30p	1280x720 30p
iFrame	960x540 30p
480 30p	640x480 30p

MENU←⤴   SET ENTER

■ **About applicable mode indicator**

In the recording menu, the recording mode that reflects the currently displayed setting is displayed.

REC MODE	1/:	←Ⓓ
1080 60i	1920x1080 60i	
1080 30p	1920x1080 30p	
720 60p	1280x720 60p	
720 30p	1280x720 30p	
iFrame	960x540 30p	
480 30p	640x480 30p	

MENU←⤴   SET ENTER

Ⓓ Applicable mode indicator

◯ ⁱ⁰⁰ : Setting is applied to still picture and motion picture recording.

◯ ■ : Setting is applied to still picture recording.

■ ⁱ⁰⁰ : Setting is applied to motion picture recording.

To get back to the previous screen
Press the MENU button.

To end the menu setting
Press the MENU button several times.

Language selection

You can select the language on the screen display and the menu screen.
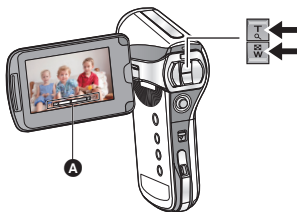
[MENU]: ⚙₂ → **[LANGUAGE]**

Formatting

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.

[MENU]: ![icon]2 → [FORMAT]

Using the zoom

● Set to Recording mode. (→ 31)

Ⓐ Zoom bar

Zoom button

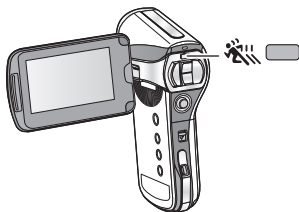|	
T side:	Close-up recording (zoom in)
W side:	Wide-angle recording (zoom out)

● During zoom operations, the zoom bar is displayed.
● i.Zoom and digital zoom can be set in [ZOOM MODE].

[VIDEO]

Recording in Slow Motion Mode

Records slow motion picture with 240 or 480 frames per second.

● **Set to Recording mode. (→ 31)**

1 Set to Slow motion mode.

● Each time you press the 🔅 button, display changes.

🔅240 :	Records a motion picture at 240 frames/second (640×360 pixels)
↓	
🔅480 :	Records a motion picture at 480 frames/second (320×180 pixels)
↓	
Off (cancel the setting)	

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

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

`VIDEO`   `PHOTO`

Recording underwater

The unit can record underwater at depths of down to 3 m (for periods within 60 minutes).

> **Before recording underwater, be sure to read "(Important) About the Waterproof and Dustproof Performance of this unit" (page 9 to 17) and to use the camera correctly. Incorrect use may result water entering the unit and malfunction.**

Record with colour balance and audio that are suitable for recording underwater

When recording underwater, set [SCENE MODE] to ⚲ (UNDER WATER). The colour balance and audio recording will be suitable for recording underwater.

● **Set to Recording mode. (→ 31)**
Select the menu. (→ 40)

[MENU]: 🖹 → [SCENE MODE] → [⚲ (UNDER WATER)]

● When [SCENE MODE] is set to ⚲ (UNDER WATER), [Before using the unit under water] and [Maintenance after use in water] are displayed. Please check beforehand to maintain the waterproof performance. Press the MENU button to exit the message screen.

● After use underwater, wash the unit in fresh water and dry well. (→ 14)
● Do not use the Under Water Mode except when recording underwater.
● When recording underwater, the sound of the unit motor will be recorded at a relatively high volume. However, in Under Water Mode, the sound of the motor is suppressed through the action of an audio filter. (sound quality differs to when recording in other modes)

Specifications

Dual Camera

Information for your safety

Power source:	DC 5.0 V (When using AC adaptor)
	DC 3.7 V (When using battery)
Power consumption:	Recording; Charging;
	4.2 W 4.5 W

Signal system:
1080/60i, 1080/30p, 720/60p, 720/30p, 540/30p, 480/30p, 360/240p,
180/480p

Recording format:
MPEG-4 AVC file format standard (.MP4)

Motion picture compression:
MPEG-4 AVC/H.264, iFrame

Audio compression:
AAC (2 ch)

Recording mode and transfer rate:

[1080·60i] ; Approx. 17 Mbps (VBR)

[1080·30p] ; Approx. 15 Mbps (VBR)

[720·60p] ; Approx. 15 Mbps (VBR)

[720·30p] ; Approx. 9 Mbps (VBR)

[480·30p] ; Approx. 3 Mbps (VBR)

[iFrame] ; Approx. 24 Mbps (VBR)

[240] ; Approx. 18 Mbps (VBR)

[480] ; Approx. 14 Mbps (VBR)

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

Still picture recording format:
JPEG (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 26 for details on SD cards usable in this unit.
Built-in memory; Approx. 64 MB
Image sensor:
1/2.33 type (1/2.33″) 1MOS image sensor
Total; Approx. 16400 K
Effective pixels;
  Motion picture; 9810 K (4:3), 8290 K (16:9)
  Still picture; 9890 K (4:3), 8370 K (16:9)
Lens:
Auto iris
F2.8 to F3.9
Focal length;
4.0 mm to 20.0 mm
35 mm equivalent;
  Motion picture (1080-60i / 1080-30p / 720-60p / 720-30p / 480-30p / iFrame);
  28.0 mm to 280.0 mm
  Motion picture (240);
  28.1 mm to 140.5 mm
  Motion picture (480);
  28.3 mm to 141.5 mm
  Still picture;
  28.0 mm to 140.0 mm
Minimum focus distance;
  Normal; Approx. 10 cm (Wide)/Approx. 1.1 m (Tele)
  Macro; Approx. 1 cm (Wide)/Approx. 80 cm (Tele)
Zoom:
Motion picture; 5× optical zoom, 15× i.Zoom, 120× digital zoom
Still picture; 5× optical zoom, 10× Extra Optical Zoom (when
[PICTURE SIZE] is set to 0.3M or 2M), 120× digital zoom (when
[PICTURE SIZE] is set to 0.3M or 2M)
Image stabiliser function:
Electronic
Monitor:
6.7 cm (2.6″) wide LCD monitor (Approx. 230 K dots)
Microphone:
Stereo

Speaker:
1 round speaker, dynamic type
White balance adjustment:
Auto tracking white balance system
Standard illumination:
1,400 lx
Minimum required illumination:
Approx. 2 lx (1/15 with Low Light mode in the Scene mode)
Approx. 6 lx (Scene mode off 1/30)
USB/AV connector video output level:
1.0 Vp-p, 75 Ω
HDMI micro connector video output level:
HDMI™ 1080i/720p/480p
USB/AV connector audio output level (Line):
155 mV, 220 Ω, 2 ch
HDMI micro connector audio output level:
Linear PCM
USB:
Reader function
  SD card; Read only (No copyright protection support)
  Built-in memory; Read only
Hi-Speed USB (USB 2.0), USB terminal Type micro B (AV output share)
Battery charging function (Charges from USB terminal when the unit is off, 500 mA)
Web camera;
  Compression format; Motion JPEG
  Image size; 640×480/30p (VGA)
Flash:
Available range; Approx. 80 cm to 2.0 m
Dimensions:
93.9 mm (W)×125.6 mm (H)×44.1 mm (D)
(including projecting parts)
Mass:
Approx. 235 g
[without battery (supplied) and an SD card (optional)]
Mass in operation:
Approx. 256 g
[with battery (supplied) and an SD card (optional)]
Operating temperature:
0 °C to 35 °C

Operating humidity:
10%RH to 80%RH
Waterproof performance:
Equivalent to IEC 60529 "IPX8"
Depths less than 3.0 m for 60 minutes or less
Dustproof performance:
Equivalent to IEC 60529 "IP5X"
Battery operation time:
See page 25

AC adaptor
Information for your safety

Power source:	AC 100 V to 240 V, 50/60 Hz
Power consumption:	7 W
DC output:	DC 5.0 V, 1.0 A

(EG/GA)
VSK0751
Dimensions:
48.9 mm (W)×32.8 mm (H)×95.1 mm (D)
Mass:
Approx. 58 g

(GC)
VSK0752
Dimensions:
49.7 mm (W)×49.0 mm (H)×80.9 mm (D)
Mass:
Approx. 64 g

(GN)
VSK0753
Dimensions:
48.9 mm (W)×40.5 mm (H)×76.0 mm (D)
Mass:
Approx. 56 g

About copyright

■ Carefully observe copyright laws

Recording of pre-recorded tapes or discs or other published or broadcast material for purposes other than your own private use may infringe copyright laws. Even for the purpose of private use, recording of certain material may be restricted.

■ Licenses

- SDXC Logo is a trademark of SD-3C, LLC.
- HDMI, the HDMI Logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.
- Microsoft®, Windows® and Windows Vista® are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
- iMovie, iChat, Mac and Mac OS are trademarks of Apple Inc. registered in the U.S. and other countries.
- 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.

Others

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)
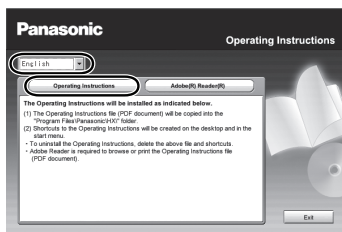
3 **Double click the "Operating Instructions" shortcut icon on the desktop.**

■ **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/otherversions

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\HX\" 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.**

EU