

Panasonic®

Basic Operating Instructions Dual Camera

Model No. **HX-WA10**



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.



VIERA
Link

HDMI

SD
XC™

GC GA GN

VQT3P46

1AG6P1P6323--(S)

Information for Your Safety

Dear Customer,

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

WARNING:

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

- **DO NOT EXPOSE ACCESSORIES (AC ADAPTOR, USB CABLE, BATTERY PACK, SD MEMORY CARD AND ETC.) TO RAIN, MOISTURE, DRIPPING OR SPLASHING AND THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THEM.**
- **USE ONLY THE RECOMMENDED ACCESSORIES.**
- **DO NOT REMOVE THE COVER (OR BACK); THERE ARE NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

CAUTION!

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

THE SOCKET OUTLET SHALL BE INSTALLED NEAR THE EQUIPMENT AND 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 same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

■ Product identification marking

Product	Location
Dual Camera	Battery holder

-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.

■ 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.

IMPORTANT! PLEASE READ

■ About handling the camera

- Opening and closing the battery cover or terminal cover in a sandy or dusty environment may cause water to get inside the camera and result in malfunction, so be especially careful in these environments.
- Do not touch the lens or terminals with dirty hands.
- Do not open or close the battery cover or terminal cover near or in water, or with wet hands.
- If there is moisture inside the battery cover or terminal cover, wipe it completely dry, and use the supplied brush to remove any foreign matter.
- If there is water on the surface of the camera, use a soft dry cloth to wipe it completely dry before opening the camera.
- Avoid dropping or hitting the camera, or subjecting it to strong vibrations or shocks. Do not apply strong pressure to it.
 - The camera may malfunction or lose the ability to record images, or the LCD monitor and/or exterior case may be damaged.
 - The waterproof capability may deteriorate.
- Do not sit with the camera in a pants pocket, or force it into a full briefcase or bag.
- Be careful of accessories etc. dangling from the strap, which may press against the LCD monitor and break it.

■ Condensation (when the lens is cloudy)

- Changes in temperature or humidity may cause water to form on the camera surfaces (condensation). Recorded images may appear washed out. Some possible causes to be aware of are the following.
 - Using the camera in the water immediately after moving from a very warm waterside setting, for example.
 - Moving from cold surroundings, such as a ski slope, to warm surroundings.
 - Opening the battery cover or terminal cover in a humid environment.
- If condensation has formed, try the following countermeasures.
 - Turn off the camera and leave it with the battery door open in a location with a stable ambient temperature for about 2 hours. The cloudiness will dissipate naturally when the camera adjusts to the ambient temperature.
 - If cloudiness persists, open the battery cover and terminal cover in a location away from heat and humidity, and leave the camera for about 2 hours. (Do not open and close the covers near the waterside.)

■ **Be sure to take some test pictures beforehand**

Before those important events, be sure to take some trial pictures to confirm that the images and audio are being properly recorded.

■ **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/HDD related component).

■ **Be aware of copyrights**

Under copyright law, your video and audio recordings cannot be used without permission of the owner except for your personal use.

Note that photography may be restricted even if the purpose is for your personal use only.

■ **Please also read the “CAUTIONS FOR USE” (see page 180 in the Operating Instructions (PDF format)).**

■ **Handling of built-in memory**

This unit is equipped with a 80 MB (approx.) built-in memory. When using this component, pay attention to the following points.

Back up data periodically.

The built-in memory is temporary storage. In order to avoid erasing data due to static electricity, electromagnetic waves, breakage, and failures, back up the data to a computer or DVD disc. (See page 135 in the Operating Instructions (PDF format))

- The status indicator (page 24) illuminates while the SD card or built-in memory is being accessed (reading, recording, playback, deleting etc.). Do not perform the following operations when the lamp illuminates. It may damage the built-in memory or cause a malfunction in the unit.
 - Turn the unit off (remove the battery)
 - Eject the SD card from the camera
 - Insert or remove the USB cable
 - Expose the unit to vibrations or shock
- For disposing of or transferring this unit, please see page 181 in the Operating Instructions (PDF format).

■ Concerning this unit's recording method and compatibility

<Video compatibility>

- This camera is an MP4 standard (MPEG-4AVC/H.264 format) digital movie camera that records high-definition HDTV video.
The AVCHD and MPEG2 video formats are different and are therefore not compatible.
- This camera may degrade or be unable to play back videos recorded or created with other products, and other products may degrade or not be able to play back videos recorded with this camera, even if the products support the MP4 format.

<Photo compatibility>

- This unit is compliant with the unified standard DCF (Design rule for Camera File system) established by JEITA (Japan Electronics and Information Technology Industries Association) and with Exif (Exchangeable Image File Format). Files which do not comply with the DCF standard cannot be played back.
- The file format of images supported by this unit is JPEG. (Not all JPEG format files will be played back.)
- This unit may degrade or not play back images recorded or created on other products, and other products may degrade or not play back images recorded on this unit.

■ About the battery pack

- Never place the battery pack within the reach of infants. In the event that the battery pack is swallowed, consult a doctor immediately.

■ About the photos and illustrations in this manual

- The product images, illustrations, menu displays etc. in this manual may differ slightly from the actual product.

■ For the purposes of these operating instructions

- SD Memory Card, SDHC Memory Card and SDXC Memory Card are referred to as the "SD card".
- Pages for reference are indicated by parentheses, for example: (page 00).

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IMPORTANT: ABOUT THE WATERPROOF PERFORMANCE OF THE CAMERA

- This camera is qualified JIS protection grade 8 (JIS IPX8) for waterproof performance. It is waterproof up to a depth of 3 meters for at least 60 minutes.*
- The supplied accessories are not waterproof (excluding handstrap).

* This means that the camera can be used underwater for a specified time in a specified pressure in accordance with the handling method established by Panasonic. It does not guarantee against destruction or malfunction, or guarantee waterproofing, in all conditions.

Observe the following precautions and avoid using under water pressure exceeding the guaranteed performance, or in an environment with excessive dust or sand.

The waterproof capability is not guaranteed if the camera is subjected to an impact as a result of being hit or dropped, etc.

If an impact to the camera occurs, consult with the store where it was purchased or a service centre, and have it inspected (subject to a fee) to verify that the waterproof capability has not been compromised.

Any damage due to water leakage that was caused by customer misuse or mishandling is not covered by the warranty.

■ Handling of the camera

- Do not leave the camera for a long period of time in places where the temperature is very low (ski resort etc.) or very high (above 35 °C), especially in strong sunlight, in a car sitting outside, close to a heater, on the beach, etc. (The waterproof capability may be degraded.)
- The inside of the camera is not waterproof. Do not open or close the battery cover or terminal cover when you are close to the sea, a lake or a river, or with wet hands.
- The waterproof function of the camera applies only to sea water and fresh water.
- Operation may not be possible, or the audio volume may be low, if snow or water freezes on the zoom switch, speaker or microphone in cold environments such as at a ski resort.

MAINTENANCE AND WATERPROOF PERFORMANCE

■ Before using the camera in water, please check the following

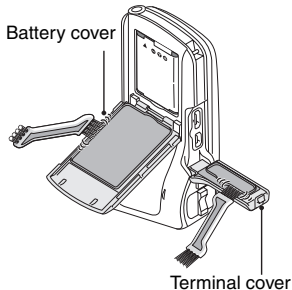
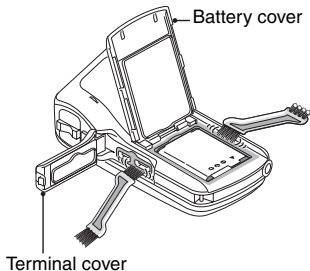
Do not open or close any of the covers in sandy or dusty environments, near the waterside, or with wet hands. Sand or dust adhering to the camera can result in water getting inside.

● Check that there is no foreign matter adhering to the inside of any of the covers.

- If lint, hair, sand or the like is present, water may leak into the camera in seconds and damage it.
- If any liquid is adhering to the camera, wipe it off with a soft dry cloth. Liquid on the camera may leak inside and damage the camera.
- If there is any foreign matter adhering to the camera, use the supplied brush to remove it.
- Take particular care to remove all traces of foreign matter from the sides and corners of the rubber seals, where minute particles of sand or dust may adhere.
- Use the brush end with the short (hard) bristles to remove larger foreign matter or damp sand from the camera.



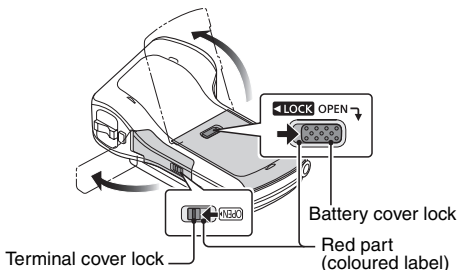
Brush (supplied)



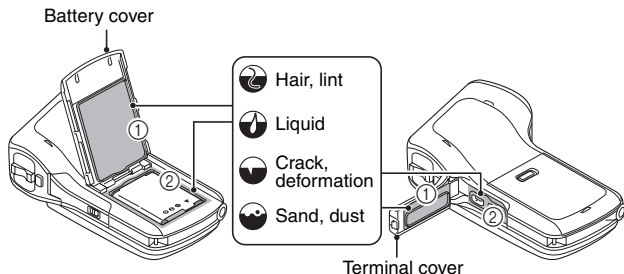
■ Care of the brush

- Before using the brush, check that there is no foreign matter adhering to it.
- After using the brush, shake off any foreign matter and keep it where it will stay clean.

- To prevent water leaking into the camera, please observe the following precautions before using it.
- Check that there is sufficient battery power and card memory remaining.
- Do not open or close the battery cover or terminal cover in places with sand and dust, or with wet hands.
- At the time of purchase, the battery cover lock is in the locked position. When opening the battery cover, first release the lock.



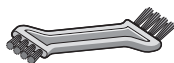
- 1 Check that there is no foreign matter on the inner side of the battery cover or terminal cover (where the rubber seal ① contacts the camera body ②).



- If the rubber seal inside the battery cover or terminal cover is cracked or deformed, consult the store where the camera was purchased or a nearby service centre.

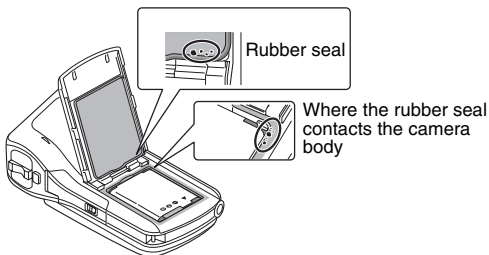
2 If there is foreign matter adhering to the camera, use the supplied brush to remove it.

- If there is any foreign matter, such as lint, hair, sand, etc., on the parts indicated by the text balloons in the illustration, water will leak inside within seconds and may damage the camera.

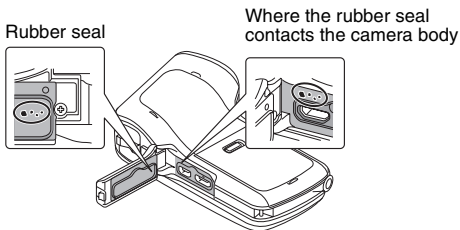


Brush (supplied)

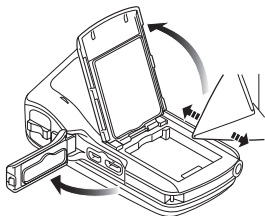
■ Example of foreign matter inside the battery cover



■ Example of foreign matter inside the terminal cover

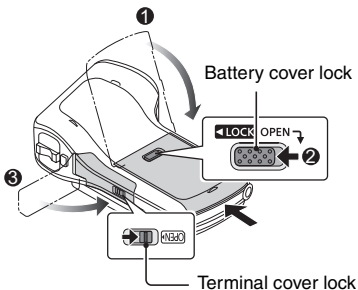


- If there is liquid on the surface, wipe it off with a soft dry cloth.



- The integrity of the rubber seals decreases after about 1 year. It is strongly recommended that you have the seals replaced (subject to a fee) at least once a year at the store where the camera was purchased or at nearby service centre.

-
- 3**
- 1 With the battery cover lock released, press the battery cover to close it.**
 - To prevent water seeping into the camera, make sure that foreign matter such as liquids, sand, hair or dust is trapped between the cover and the camera body.
 - 2 Push the battery cover lock to the left to lock it.**
 - The coloured label is visible when the battery cover lock is not completely closed. Be sure to close the lock completely so that the coloured label is not visible.
 - 3 Close the terminal cover firmly until you hear it “click” shut and the red part of the terminal cover lock is no longer visible.**
 - If the camera is used without the covers securely closed, they may open on their own.



HINT

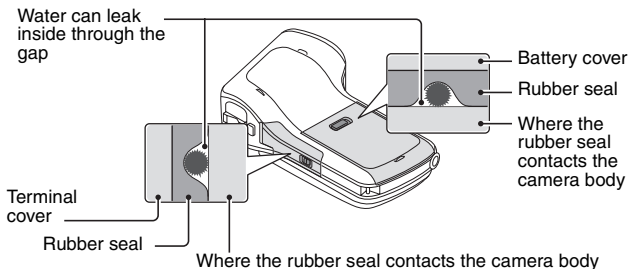
- If there is any foreign matter on the camera, use the supplied brush to remove it.
- If the camera is used in the following environments, foreign matter such as sand or dust may inadvertently get caught in the gap between the battery cover or terminal cover and the body.
 - In the sea or in waters in which sand is suspended.
 - In places with a lot of sand or dust, such as at the beach or in a sandbox.

■ Using the camera underwater

- Use the camera underwater at a depth of up to 3 meters, water temperature from 0 °C to 35 °C, and for not longer than 60 minutes continuously. Before using the camera in water again, make sure that it has been sufficiently dried.
- If there is water or dirt on the camera, wipe it dry with a soft dry cloth and leave it to dry in a well ventilated spot before using again.
- Do not open and close the battery cover or terminal cover while underwater.
- Do not subject the camera to shock underwater. (The waterproof performance may become impaired, and water may seep into the camera.)
- Do not dive into the water holding the camera. Do not use the camera in a location where it might be impacted by forceful splashing, such as in a strong current or a waterfall. (Strong water pressure may cause the camera to malfunction.)
- The camera will sink in water. Take care not to drop the camera and lose it underwater, for example by making sure the hand strap is secured or by some other measure.
- Do not use the camera in water warmer than 35 °C (in the bath or spa).
- If the camera is splashed with detergent, soap, hot water, bath salts, tanning oil, sun screen, chemicals, etc., wipe it off immediately.
- The card and battery are not waterproof. Do not handle them with wet hands. Also, do not insert a wet card or battery in the camera.

■ Causes of water leak

- If the camera is used in any of the following conditions, a gap may appear between the camera body and the battery cover or terminal cover, resulting in water seeping in and causing the camera to malfunction.



- When there is foreign matter, such as lint, hair, sand, etc., between the battery cover or terminal cover and the camera body.
- When the rubber seal has deteriorated.
- When the lock on the battery cover and/or terminal cover is not closed.

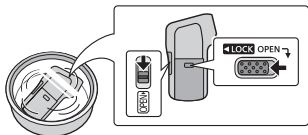
■ Care of the camera after using underwater

The camera must be cleaned after it has been used underwater.

- Rinse the camera in water, and do not open the battery cover or terminal cover until all sand and dust have been removed.
- Do not soak the camera in water for more than 60 minutes.

- 1 With the battery cover and terminal cover closed, rinse the camera with water; or, if it was used in the sea, soak it in a shallow container filled with fresh water for about 10 minutes.**

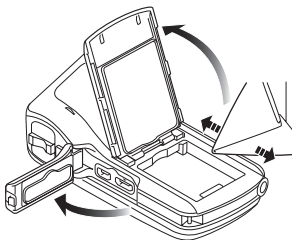
- Leaving the camera with foreign objects or saline matter on it may cause damage, discolouration, corrosion, unusual odor, or deterioration.



2 Wipe off the water, place the camera on a dry cloth and leave it to dry for a while in a well-ventilated shaded spot.

3 Check that there is no water on the camera, and open the battery cover and terminal cover.

- Moisture may easily accumulate in the grooves inside the covers, so take care that no water gets inside.

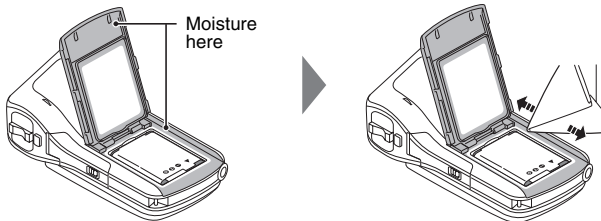


4 Wipe off any water or sand inside the battery cover and terminal cover with the supplied brush or a soft dry cloth.

- After the camera has been used underwater or soaked in fresh water, moisture may collect in the grooves around the card/battery compartment and connection terminals. In addition, water droplets may adhere to the card or battery if the battery cover is opened without sufficiently drying the camera. Be sure to wipe off the water with a soft dry cloth in such cases.
- Do not open or close the battery cover or terminal cover with water droplets still on the camera. The water droplets may seep into the camera, causing condensation and malfunction.

<Wiping moisture from the camera>

- If there is moisture inside the battery cover, wipe every crevice completely clear of moisture.
*This moisture is not due to exposure to water.

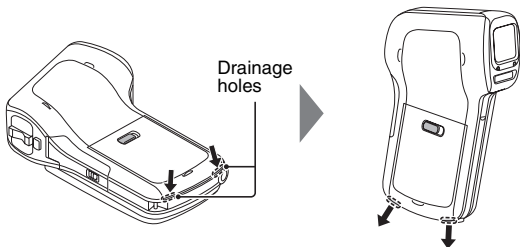


■ About the water draining design

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

<Draining water from the camera>

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



HINT

- Use a soft dry cloth to wipe water and dirt from the camera.
- After use at the seaside or underwater, make sure that the battery cover and terminal cover are securely closed, and soak the camera in a shallow container filled with fresh water for about 10 minutes.
- If the zoom switch does not operate smoothly, it may be due to the adhesion of foreign matter. Using the camera in this condition may cause a malfunction such as locking up, so wash off any foreign objects by soaking the camera in fresh water and rinsing it. After cleaning, check that the zoom switch operates smoothly.
- After soaking or washing the camera, wipe the water from it with a soft dry cloth and dry it in a well ventilated shaded spot.
- After soaking the camera in water, place it on a dry cloth and leave it to dry for a while, and check to make sure that the water has drained from it.
- Do not use hot air from a hairdryer or the like to dry the camera. The waterproof capability will deteriorate due to deformation.
- Do not use chemicals such as benzine, paint thinner, alcohol or cleanser; do not use soap or detergents.

After using in water

After using the camera in water, wash it with fresh water and dry it completely.

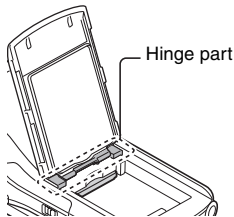
1 Turn off the camera, and close the battery cover and terminal cover securely.

2 Wash the camera with fresh water.

- Fill a shallow basin with fresh water, and immerse the closed camera for about 10 minutes. Rotate the monitor unit several times to clean it completely.

3 Dry the camera.

- Use a dry cloth to wipe off any drops adhering to the camera, and leave it to dry completely in a well-ventilated place away from direct sunlight.
- Do not use a hair dryer or the like to dry the camera. Exposing the camera to high temperatures may cause the camera and/or waterproof seal to become deformed.
- If there is salt, for example, on the unit, the hinge portion of the battery cover or terminal cover may become white. Wipe the affected area with a cotton swab moistened with water until the white deposit is removed. After wiping, use the supplied brush to lightly brush the area.
- If moisture adheres to the microphone or speaker, the volume may decrease and it may become difficult to hear the audio. Place the camera so that the microphone and speaker are facing downward to remove the water, then wipe away the moisture. Allow the camera to dry for a while before using it again.
- Do not insert any pointed object in the microphone or speaker holes. (Doing so may damage the internal waterproof sheet and impair the waterproof functionality.)



HINT

- The sound cannot be recorded clearly when there is water inside the microphone. Wipe off all droplets from the camera.

About the handstrap

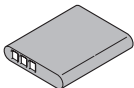
- Wash the handstrap in fresh water after detaching it from the camera.
- After washing, leave it to dry in a place away from direct sunlight.

CHECKING THE INCLUDED ACCESSORIES

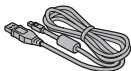


Check the accessories before using this unit.
Product numbers correct as of February, 2011.
These may be subject to change.

- Battery pack**
VW-VBX070



- USB cable**
VFA0544



- AV cable**
VFA0543



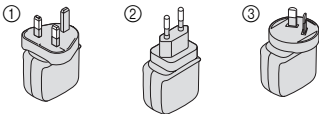
- CD-ROM**
Software



- CD-ROM**
Operating Instructions
VFF0815



- AC adaptor**



- ① **(GC) VSK0752**

Hong Kong Special Administrative Region of China and Saudi Arabia

- ② **(GA) VSK0751**

Areas Other than Hong Kong Special Administrative Region of China, Saudi Arabia

- ③ **(GN) VSK0753**

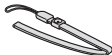
Australia and New Zealand

- Brush**
VYC1064



- Handstrap**

*To prevent the camera from dropping, be sure to attach the handstrap (see page 56 in the Operating Instructions (PDF format)).
VFC4703



- Please dispose of packing materials properly.
- Keep the battery pack and the brush out of reach of children to prevent swallowing.

ABOUT THE CARD

Media cards that can be used with this camera (as of February 2011)

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

This camera is compatible with SDXC devices (SD Memory Card/SDHC Memory Card/SDXC Memory Card compatible devices). If using an SDHC memory card/SDXC memory card in different device, please confirm that it is compatible with the respective memory card.

Card type	Capacity	Video recording	Photo shooting
SD Memory Card	8 MB/16 MB/ 32 MB/64 MB/ 128 MB/256 MB	Operation is not guaranteed.	Operation is not guaranteed.
	512 MB/ 1 GB/ 2 GB	Can be used.	Can be used.
SDHC Memory Card	4 GB/6 GB/ 8 GB/12 GB/ 16 GB/ 24 GB/32 GB		
SDXC Memory Card	48 GB/64 GB		

* The SD Speed class Rating is the speed standard for successive writes. See the card label to confirm the rating.

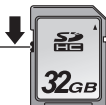
(Example) CLASS 

Please confirm which of our SD Memory Cards/SDHC Memory Cards/SDXC Memory Cards can be used with this product by visiting the support web site at the address below.

http://panasonic.jp/support/global/cs/e_cam
(This website is in English only.)

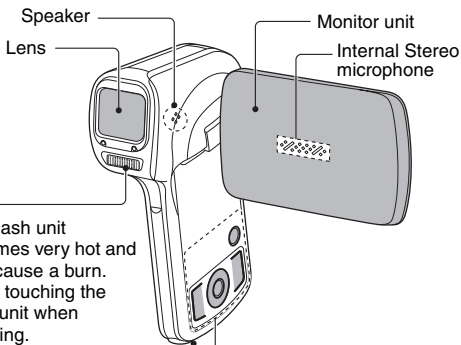
- 4 GB or more Memory Cards that do not have the SDHC logo or 48 GB or more Memory Cards that do not have the SDXC logo are not based on SD Memory Card specifications.
- Cards with capacity larger than 64 GB cannot be used.
- When the write-protect switch on the SD card is locked, no recording, deletion or editing will be possible on the card.
- Keep the Memory Card out of reach of children to prevent swallowing.

Write-protect switch



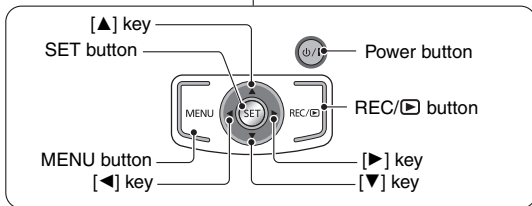
PARTS NAMES

Front

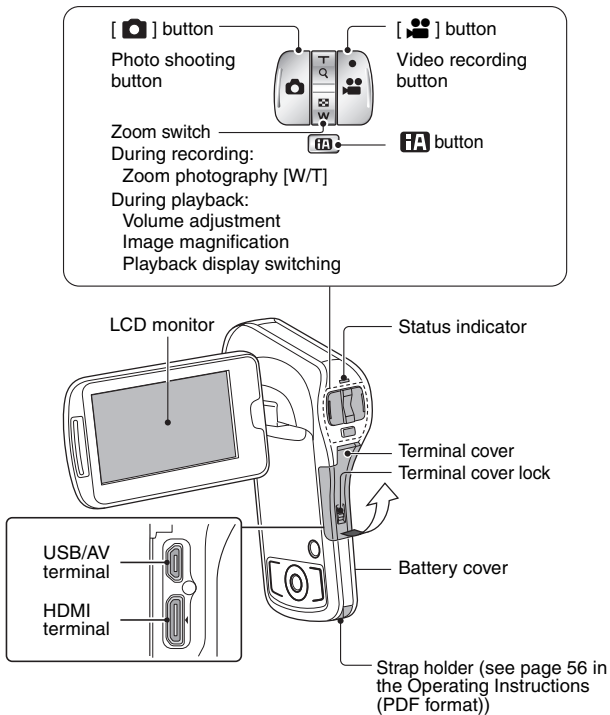


- The flash unit becomes very hot and may cause a burn. Avoid touching the flash unit when shooting.

- * The tripod mounting hole is on the bottom. Attaching to a tripod having a screw length longer than 5.5 mm may damage the camera.

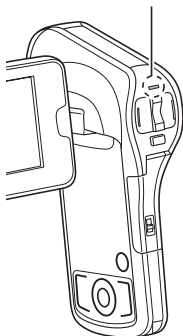


Rear



■ About the status indicator (See page 178 in the Operating Instructions (PDF format) regarding the charging status.)

Status indicator



- The status indicator lights or flashes to show the camera's operating status.

Status indicator status		Camera status
Colour	Lit/flashing	
Red	Lit	Accessing built-in memory or SD card
	Flashing (Faster)	Battery charge error
	Flashing (Fast)	Self-timer is operating
	Flashing (Slow)	Battery is charging
	Flashing (Slower)	
Green	Lit	USB connection
	Flashing	During sleep mode
Orange	Lit	AV cable/ HDMI mini cable connection

CHARGING THE BATTERY PACK








At the time of purchase, the battery pack is not charged. Please charge it fully before using it.

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 equipped with protective devices 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 recommend that a genuine Panasonic battery pack be used.

Guide to charging time and recording capacity

■ Charging/recording time

- Temperature: 25 °C/humidity: 60 %RH
- It is recommended that the battery be recharged in a place where the ambient temperature (and the battery temperature as well) is between 10 °C and 30 °C. (The battery temperature should also be the same.) The indicated charging time is for when the AC adaptor is used for charging.

Battery model number [voltage/capacity (minimum)]	Charging time	Recording mode	Maximum continuous recordable time	Actual recordable time
Supplied battery/ VW-VBX070 (optional) [3.7 V/700 mAh]	Approx. 2 h		Approx. 1 h	Approx. 30 min
				
				
			Approx. 1 h 10 min	Approx. 35 min
			Approx. 1 h 15 min	
			Approx. 1 h 10 min	
			Approx. 1 h 20 min	

- These times are approximations.
- The indicated charging time is for when the battery has been discharged completely. Charging time and recordable time vary depending on the usage conditions such as high/low temperature.
- The actual recordable time refers to the recordable time when repeatedly starting/stopping recording, turning the unit on/off, moving the zoom lever etc.
- The batteries heat up after use or charging. This is not a malfunction.
- See page 127 in the Operating Instructions (PDF format) concerning the remaining battery pack charge.
- Always use genuine Panasonic batteries (VW-VBX070).
- 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 in an automobile exposed to direct sunlight for a long period of time with doors and windows closed.

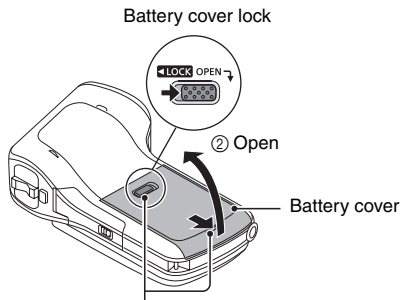
Approximate operating time and number of recordable images

Number of recordable images	Approx. 170 images	By CIPA standard
Recording time	Approx. 85 min	
Playback time	Approx. 180 min	

Recording conditions by CIPA standard

- CIPA is an abbreviation of Camera & Imaging Products Association.
- Using the supplied battery
- Using a Panasonic SD Memory Card (2 GB)

1 Open the battery cover.



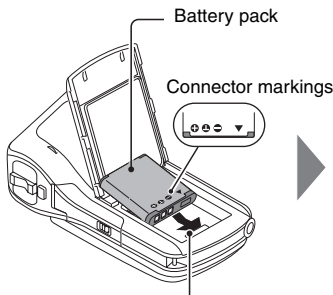
- ① Push the battery cover lock to the right to release it.

2 Insert the battery pack, then replace the battery cover.

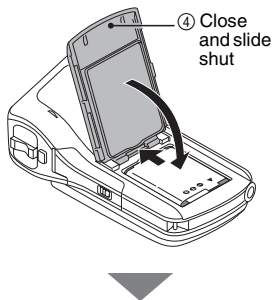
- It is possible to insert the battery incorrectly, so please pay particular attention when inserting that it is correctly oriented.

<To remove the battery pack...>

- Be sure the turn off the camera by pressing the power button until the status indicator (page 24) turns off before removing the battery pack.



- ③ Insert the battery pack while matching the connector markings.



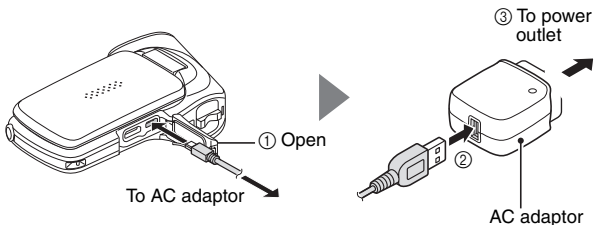
- ⑤ Push the battery cover lock to the left to lock it.
The coloured label is visible when the battery cover lock is not completely closed. Be sure to close the lock completely so that the coloured label is not visible.



3 Use the USB cable (supplied) to connect the camera and the AC adaptor, and then connect the AC adaptor to a power outlet.

- Use only the supplied USB cable. Operation is not guaranteed if a different USB cable is used.
- The AC adaptor is for this camera only. Do not use it with other devices.

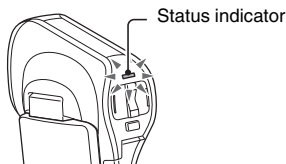
- Recharging takes place only when the camera is turned off or is in the sleep mode (see page 36 in the Operating Instructions (PDF format)). Recharging does not take place when the camera is in the recording mode or playback mode.



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

<During charging...>

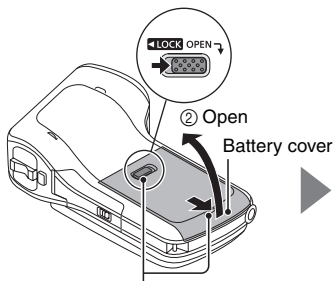
- The status indicator flashes red at 0.5-second intervals if the battery pack is defective or is not installed correctly. Make sure that the battery pack is correctly installed.
- If the battery pack still fails to recharge, it is possible that there is a malfunction in the camera, the battery pack or the AC adaptor. In case the status indicator is flashing fast or slow, please see page 178 in the Operating Instructions (PDF format).
- When charging is completed, the status indicator turns off.
- The charging time is approx. 120 minutes.



INSTALLING THE CARD

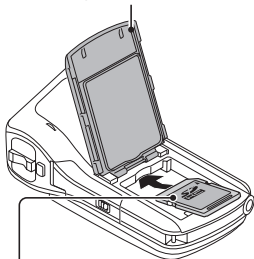
Before using a newly purchased card or one that was used in another device, be sure to format it with this camera (see pages 113 and 124 in the Operating Instructions (PDF format)). If an unformatted card is used, the card itself may become unusable.

Battery cover lock



- ① Push the battery cover lock to the right to release it.

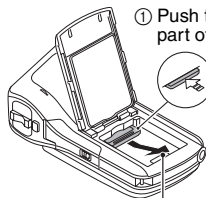
- ④ Insert the battery pack (page 28), then close



- ③ With the label side facing up, push the card straight in until you hear a click.

<When removing the card...>

- To remove the card, press it in, and then release. The card will protrude slightly, and you can then pull it out.



- ② Pull the card out straight.

- ⑤ Push the battery cover lock to the left to lock it. The coloured label is visible when the battery cover lock is not completely closed. Be sure to close the lock completely so that the coloured label is not visible.



HINT**Close the battery cover securely**

- If the battery cover is not closed or is not closed completely, the camera will no longer be waterproof. When closing the battery cover, close it securely while making sure that no foreign object such as sand, hair, dust, etc. is caught in the rubber seal.
- If there is moisture inside the battery cover or terminal cover, after wiping the moisture from all surfaces, use the supplied brush to remove any foreign matter.

Do not attempt to forcibly remove the card

- Doing so may damage the card or the stored files.

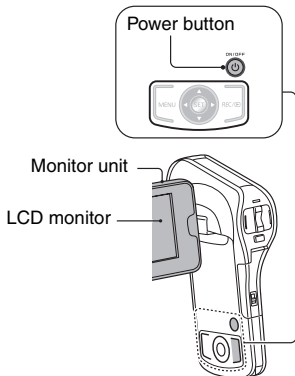
If the status indicator is lit red...

- Never remove the card when the status indicator is flashing red, as doing so may result in loss of files stored in the card.

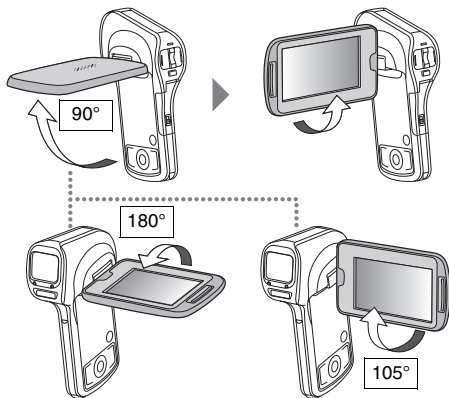
TURNING THE CAMERA ON AND OFF

Turning on the camera

- 1 Open the monitor unit, and press the power button.
 - The LCD monitor turns on.



<How to open the monitor unit>



Turning off the camera

1 Press the power button for at least 1 second.

- The camera turns off.
- If you briefly press the power button, once, the camera will switch to the sleep mode.

DATE AND TIME SETTING

The camera will record the date and time an image or audio recording is taken so that you can display them during playback. Therefore, before capturing images, make sure the correct date and time are set.

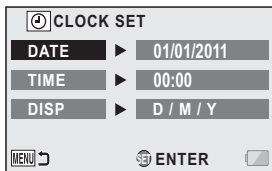
- If the screen to set the date and time appears when you turn on the camera, skip to step **3** and follow the steps to set the date and time.
- To correct the date and time setting, please see under **HINT** on page 36.

Example: To set the clock to 19:30 on 20 December 2011

1 Turn on the camera (page 32), and display Option Setting Menu 1 (see page 109 in the Operating Instructions (PDF format)).

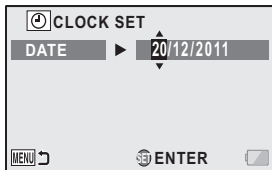
2 Select [CLOCK SET] and press the SET button.

- The Clock Set Screen appears.
- Follow the procedures below to enable or disable the date display during playback, to set the display format for the date, and to set the date and time.



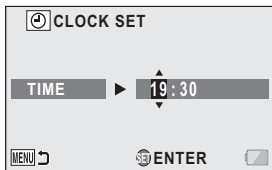
3 Set the date.

- ① Select [DATE].
- ② Press the SET button.
 - The Set Date Screen appears.
- ③ Set the date to "20/12/2011".
 - The date is set in the following order: Set the day → Set the month → Set the year.
 - Press [◀] or [▶] to select day, month or year. Press [▲] or [▼] to make the settings.
- ④ Press the SET button.



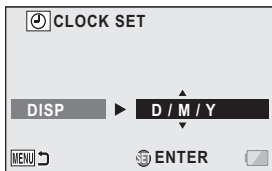
4 Set the clock.

- ① Select [TIME].
- ② Press the SET button.
 - The Set Time Screen appears.
- ③ Set the time to "19:30".
 - The time is set in the following order: Set the hour → Set the minute.
- ④ Press the SET button.



5 Set the order in which the date is displayed during playback.

- ① Select [DISP].
- ② Press the SET button.
 - The Set Date Format Screen appears.
- ③ Press [▲] or [▼].
 - The order of the date display changes.
- ④ Press the SET button.



6 Press the MENU button.

- The date and time setting is completed.
- To display the Recording or Playback Screen, press the MENU button.

HINT**To correct the date and time settings**

- ① Turn on the camera.
- ② Display the Option Setting Menu 1 (see page 109 in the Operating Instructions (PDF format)).
- ③ Select [CLOCK SET] and press the SET button.
 - The screen to set the date and time appears.
 - The current date and time settings are shown.
- ④ Select the line you wish to change, and make the correction.

If the camera's date and time are not set...

- The screen display and capture date information will show as follows:
 - * The date and time format is determined by the [DISP] setting specified on the Clock Set Screen.
- Recording Screen display: --.--.---- --:--
Photo capture date/time information: 01/01/2011 00:00:00
Video/audio file recording date/time information: 01/01/2011 00:00:00

Date and time backup

Under normal conditions, while the battery pack is being replaced, an internal battery will maintain the date and time settings. However, there is a small chance the settings may be lost (the backup will last for about 7 days). It is recommended to check that the date and time settings are still correct after replacing the battery pack and before shooting or recording of any type.

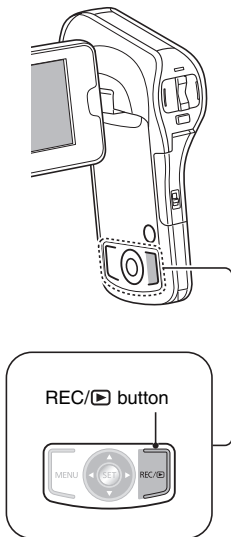
SWITCHING BETWEEN THE RECORDING MODE AND PLAYBACK MODE

Switch between the recording mode (for recording) and the playback mode (for viewing your recorded images).

1 Turn on the camera (page 32).

2 Press the REC/▶ button.

- The mode changes.
- The mode changes each time the REC/▶ button is pressed.



INTELLIGENT AUTO MODE

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












iA button

iA button

Press the button once to activate the Intelligent Auto (iA) mode.

- The **iA** icon appears on the LCD monitor.
- Press it again to cancel the Intelligent Auto mode.

Mode	Scene	Effect
 Portrait	When the subject is a person	Faces are detected and focused automatically, and the brightness is adjusted so it is recorded clearly.
 Landscape	Recording outdoors	The whole landscape will be recorded vividly without whiting out the background sky, which may be very bright.
 ^{*1} Spotlight	Under a spotlight	Very bright subject is recorded clearly.
 ^{*1} Low light	Dark room or twilight	It can record very clearly even in a dark room or twilight.
 ^{*2} Night portrait	Recording night portrait	A subject and the background are recorded with near real-life brightness.

Mode	Scene	Effect	
 *2	Night scenery	Recording night scenery	You can record night scenery vividly by slowing the shutter speed.
 *2	Macro	Recording zooming in on a flower etc.	This allows recording at very close proximity to the object of recording.
 *1  *2	Normal	Other situations	Contrast is adjusted automatically for clear images.

*1 Video recording only

*2 Photo shooting only

HINT

- Depending on the recording conditions, the unit may not enter the desired mode.
- Using a tripod is recommended in Night Portrait, Night Scenery and Low Light modes.
- Faces may not be detected depending on the recording conditions, such as when faces are of certain sizes or at certain tilts.

VIDEO RECORDING

1 Turn on the camera (page 32), and set it to the recording mode (page 37).

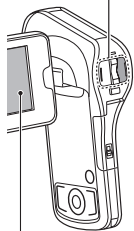
- If the subject is a person, a green double-frame appears around the face (see page 86 in the Operating Instructions (PDF format)).

2 Press the [] button.

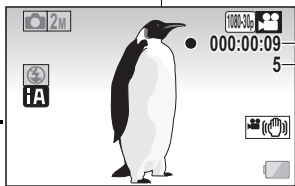
- Recording begins.
- It is not necessary to keep the [] button pressed while recording.
- When the remaining recording time available for the currently recording video becomes 30 seconds or less, a countdown of the remaining recording time appears on the display.
- When the file size of the current recording exceeds 4 GB, the file is saved once, and recording begins in a new file. (4-GB files are automatically created (see page 185 in the Operating Instructions (PDF format)).)

3 End the recording.

- Press the [] button again to stop recording.
- The elapsed recording time returns to 000:00:00 each time recording is stopped.



Elapsed recording time
(hours:minutes:seconds)




Available recording time remaining
(seconds)

TAKING PHOTOS


- 1 Turn on the camera (page 32), and set it to the recording mode (page 37).**

- If the subject is a person, a green double-frame appears around the face (see page 86 in the Operating Instructions (PDF format)).

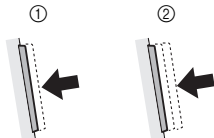
- 2 Press the [] button.**


- ① Press the [] button halfway.**

- The autofocus operates, and the image is focused (focus lock).

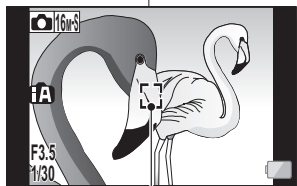
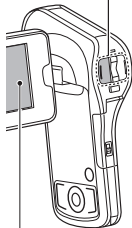
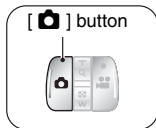
- ② Continue to gently press the [] button all the way.**

- The shutter releases and the image is captured.



- You can view the captured image on the LCD monitor by keeping the [] button depressed when you capture the image.

For shooting hi-speed burst, see page 77 in the Operating Instructions (PDF format).



Target mark

MACRO-PHOTOGRAPHY (ZOOM)

Your camera has two zoom functions: Optical zoom and Digital zoom (see page 49 in the Operating Instructions (PDF format)).

1 Point the camera lens at the subject.

2 Push the zoom switch toward [T/🔍] or [W/📐] to compose the desired image.

[T/🔍]: Zoom in on the subject.

[W/📐]: Zoom out.

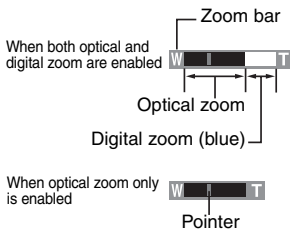
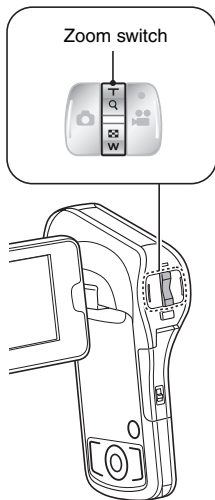
- When the zoom switch is pushed, the zoom bar appears on the LCD monitor.

3 Take the picture.

For video recording, see page 40.

For shooting photos (single), see page 41.

For shooting hi-speed bursts, see page 77 in the Operating Instructions (PDF format).

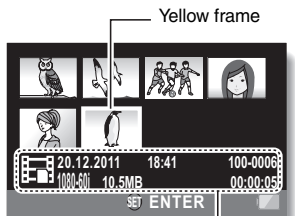


PLAYING BACK VIDEOS AND PHOTOS

1 Set the camera to the playback mode (page 37).

2 Select the image to play back.

- Use the arrow keys to move the yellow frame to the file you wish to play back.
- The image information for the framed image is shown at the bottom of the LCD monitor.

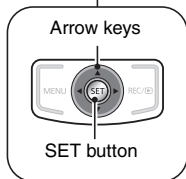
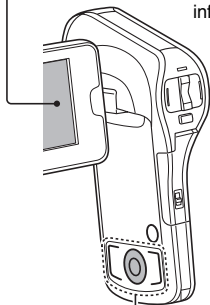


3 Press the SET button.

- The image you selected in step 2 is displayed on the LCD monitor.
- If a video was selected, playback begins.

<Photo file: To return to the screen to select playback files>

Press [▼].




HINT

- Photos can be rotated when they are played back (see pages 50 and 95 in the Operating Instructions (PDF format)).
- If you close the monitor unit, playback stops and the camera switches to the standby mode.

Video playback operation

To do this...		Do this
Normal forward playback		Press the SET button.
Stop playback		During playback, press [▼].
Pause		During playback, press the SET button or press [▲]. During accelerated playback, press [▲].
To play back one image at a time (single-frame step)	During forward playback	After pausing playback, press [▶].
	During reverse playback	After pausing playback, press [◀].
Slow playback	During forward playback	After pausing playback, press and hold [▶].
	During reverse playback	After pausing playback, press and hold [◀].
To accelerate playback	Forward playback (Maximum 15x)	During forward playback, press [▶]. • The forward playback speed changes each time [▶] is pressed. Press [◀] to resume normal playback speed.
	Reverse playback (Maximum 15x)	During forward playback, press [◀]. • The reverse playback speed changes each time [◀] is pressed. Press [▶] to resume normal playback speed.
Return to normal playback speed		Press the SET button.
Volume adjustment	Louder	During playback, push the zoom switch toward the [T/🔍] side.
	Softer	During playback, push the zoom switch toward the [W/🔍] side.

How to save one frame from a video as a photo

- 1 Play back the video. Pause the playback at the point you wish to “snap” a photo.
- 2 Press the [] button.
 - The screen to select the aspect ratio of the photo appears. Select the desired aspect ratio, and press the SET button. Note, however, that if the video aspect ratio is 4:3, you cannot select 16:9.
 - The latest image number is assigned to the photo when it is saved.

HINT

The file size for a video is very large

- Therefore, be aware that if the video is uploaded to a computer to be played back, the computer may not be able to play back the video fast enough, making it appear jerky. (The video will always be displayed properly on the camera LCD monitor or a television.)

If no audio is heard...

- The audio is not played back when the video is played back in the frame-by-frame, slow-motion, fast playback or reverse playback mode.

Deleting images

- 1** Display the file that you want to delete.
- 2** Press [▲].
 - The Confirm Delete Screen appears.
- 3** Select “DELETE”, and press the SET button.
 - The current image is deleted.
 - To return to the Playback Screen, select “EXIT”, and press the SET button.

CONNECTING TO A TV

By connecting the camera to a TV, you can play back files from the installed SD card or the built-in memory on the TV.

HINT

Insert and pull out the cable carefully

- When connecting the cables, make sure that the cable plugs are correctly oriented and that they match the shapes of the terminal sockets on the devices. Push the plugs in straight when connecting them. If undue force is used to connect a cable, it may permanently damage the connector pins in the terminal socket.
- Do not use excessive force when connecting and disconnecting cables.

About image output: The image output destination differs depending on the camera status (see page 116 in the Operating Instructions (PDF format)).

Connection cable	Image output destination	Recording mode		Playback mode
		Standby	Recording	
AV cable (supplied)	Camera LCD monitor	NTSC: × PAL: ○	○	×
	TV	NTSC: ○ PAL: ×	×	○
HDMI mini cable (optional)	Camera LCD monitor	NTSC: × PAL: ×	○	×
	TV	NTSC: ○ PAL: ○	×	○

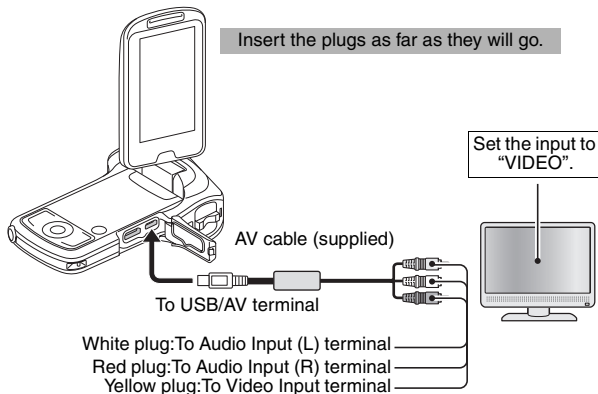
○: Images are output ×: Images are not output

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HDMI

Connecting to a video input terminal

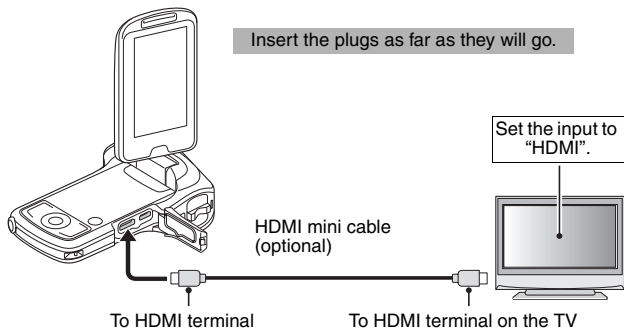
Use the supplied AV cable to connect to a TV.



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

Connecting to the HDMI terminal

Use a separately sold HDMI mini cable to connect to a TV.



- Always use a genuine Panasonic HDMI mini cable (RP-CDHM15, RP-CDHM30; optional).

PLAYING BACK ON A TV

- After connecting the camera to the television, switch the TV input to the terminal to which the camera is connected.
- The same playback procedure as when playing back with the camera is used to play back audio recordings as well.
- The playback method is the same as when viewing images on the camera's LCD monitor. (Use the TV controls to adjust the volume.)

OPTIONAL ACCESSORIES

Product numbers correct as of February, 2011.

These may be subject to change.

- Battery pack (VW-VBX070)
- HDMI mini cable (RP-CDHM15, RP-CDHM30)

SPECIFICATIONS

Specifications are subject to change due to performance upgrades.

Digital Movie Camera

Power source:	DC 5.0 V (when using AC adaptor) 3.7 V (when using battery)
Power consumption:	Recording: 2.3W

Signal system:

1080/60i, 1080/30p, 720/60p, 720/30p, 480/30p, 540/30p

Recording format:

Video: MPEG-4 AVC/H.264 file format compliant, iFrame
Voice memo: MPEG-4 AAC audio

Image sensor:

1/2.3 type (1/2.3") MOS image sensor

Total: Approx. 16,790,000 pixels (16.79 megapixels)

Effective pixels

Video: Approx. 16 Mpx (4:3), Approx. 11.9 Mpx (16:9)

Photo: Approx. 16 Mpx (4:3), Approx. 11.9 Mpx (16:9)

Lens:

Auto iris, 5x power zoom

Macro

F3.5 to F3.7 (f=6.8 mm to 34.0 mm)

35mm equivalent:

Video: 38.1 mm to 457.2 mm (4:3)

41.5 mm to 249.0 mm (60i/60p, 16:9)

41.5 mm to 498.0 mm (30p, 16:9)

Photo: 38.1 mm to 190.5 mm (4:3)

41.5 mm to 207.5 mm (16:9)

Minimum focus distance:

Normal: Approx. 10 cm (Wide)/Approx. 80 cm (Tele)

Intelligent Auto macro: Approx. 1 cm (Wide)/Approx. 80 cm (Tele)

Zoom:

(Photo) 5× optical zoom; (Video) 12× (30p)/6× (60i/60p) advanced zoom
Digital zoom; 120× (video mode, 30p mode), 60× (video mode, 60i/60p mode), 50× (photo mode)

Image stabiliser:

Electronic

Monitor:

6.7 cm (2.6") wide LCD monitor (Approx. 230 K dots)

Microphone:

Internal stereo microphone

Speaker:

1 round speaker, dynamic type

White balance adjustment:

Auto tracking white balance system

Standard illumination:

1,400 lx

Minimum required subject illumination:

Approx. 3 lx (1/15 sec in the scene mode low light setting),

Approx. 9 lx (1/30 sec in the scene mode OFF setting)

AV multi connector video output:

1.0 Vp-p, 75Ω

HDMI mini connector video output:

HDMI™ 1080i/720p/480p

AV multi connector audio output:

155 mV, output impedance 220Ω, 2 ch

HDMI mini connector audio output:

Linear PCM

USB:

Reader/writer function

SD card: Read/Write (No copyright protection support)

Built-in memory: Read/Write

Hi-Speed USB (USB 2.0), micro USB connector

Webcam

Compression: Motion JPEG

Image size: 640×480 pixels

Flash:

Effective range: Approx. 80 cm to 2.1 m

Dimensions (excluding projecting parts):

92.0 mm (W)×123.7 mm (H)×41.2 mm (D)

Mass (weight):

Approx. 232 g (without battery and SD card)

Mass (weight) in operation:

Approx. 250 g (with battery and SD card)

Operating temperature:

0 °C to 35 °C

Operating humidity:

10 %RH to 80 %RH

Water-resistant:

Compliant with JIS protection grade 8 standards (according to tests conducted in-house by Panasonic)

Can be submerged at a maximum depth of 3.0 m, for up to 60 minutes.

Battery operation time:

See page 25

■ Video

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 20 for details concerning SD cards that can be used in this unit.


Built-in memory: Approx. 80 MB


Compression:


MPEG-4 AVC/H.264, iFrame


Recording modes:


 : Approx. 17 Mbps (VBR)

 : Approx. 15 Mbps (VBR)

 : Approx. 15 Mbps (VBR)


 : Approx. 9 Mbps (VBR)


 : Approx. 3 Mbps (VBR)


 : Approx. 24 Mbps (VBR)


Refer to page 185 in the Operating Instructions (PDF format) for recordable times.


Picture size:


 : 1920×1080/60i

 : 1920×1080/30p

 : 1280×720/60p

 : 1280×720/30p

 : 640×480/30p

 : 960×540/30p

Audio compression:

AAC (2 ch)

■ Photo

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 20 for details concerning SD cards that can be used in this unit.

Built-in memory: Approx. 80 MB

Compression:

JPEG (DCF/Exif2.2 standard)

Picture size:**Photo recording (single-shot)**

16M-H: 4608×3456 pixels

16M-S: 4608×3456 pixels

12M: 4608×2592 pixels

2M: 1920×1080 pixels

2M: 1600×1200 pixels

0.9M: 1280×720 pixels

0.3M: 640×480 pixels

Hi-Speed Burst

16M-L: 4608×3456 pixels

2M-L: 1600×1200 pixels

Refer to page 187 in the Operating Instructions (PDF format) for the number of recordable images.

AC adaptor

Power source:	AC 100 V to 240 V, 50/60 Hz
AC input:	130 mA
DC output:	5.0 V, 1.0 A

ABOUT COPYRIGHT

■ Carefully observe 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.

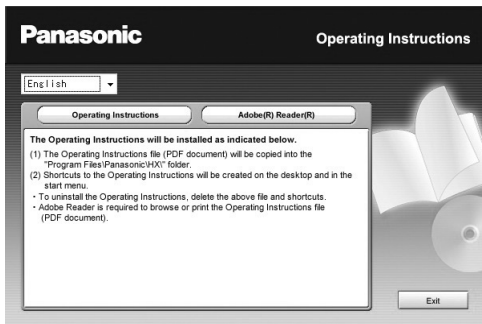
See <http://www.mpegla.com>.

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 computer 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.



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

■ If the Operating Instructions (PDF format) do 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 2000 SP4
- 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.

- If the contents in the Program Files folder are not displayed, click the [Show the contents of this folder] to display them.

■ For Mac

-
- 1** Turn the computer 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.

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Panasonic Corporation

Web site: <http://panasonic.net>

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