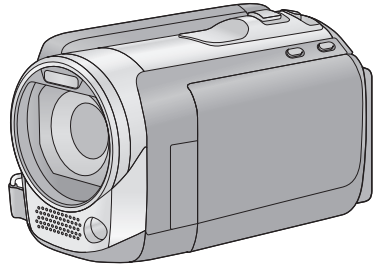
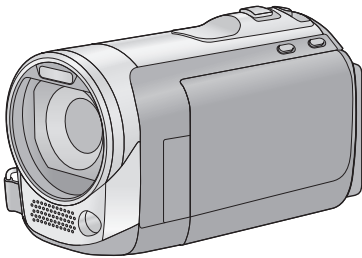


Panasonic®

Operating Instructions High Definition Video Camera

Model No. **HDC-SD60**
HDC-TM60
HDC-HS60



Before use, please read these instructions completely.

Please also refer to Operating Instructions (PDF format) recorded on the CD-ROM containing the Operating Instructions (supplied).

You can learn about advanced operation methods and check the Troubleshooting.



AVCHD™

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VQT2M64

Information for Your Safety

WARNING:

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

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

CAUTION!

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

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

The mains plug of the power supply cord shall remain readily operable.

To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from AC receptacle.

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.

■ **EMC Electric and magnetic compatibility**

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

Use only the recommended accessories.

- Do not use any other AV multi cables and USB cables except the supplied one.
- When you use the cable which are sold separately, please make sure to use the one whose length is less than 3 metres.
- Keep the Memory Card out of reach of children to prevent swallowing.

Product Identification Marking is located on the bottom of units.

■ 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.



Cd

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.

■ Caution for use

Keep the High Definition Video Camera as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).

- If you use the High Definition Video Camera on top of or near a TV, the pictures and sound on the High Definition Video Camera may be disrupted by electromagnetic wave radiation.
- Do not use the High Definition Video Camera near cell phones because doing so may result in noise adversely affecting the pictures and 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 the High Definition Video Camera, disturbing the pictures and sound.

- If the High Definition Video Camera is adversely affected by electromagnetic equipment and stops functioning properly, turn the High Definition Video Camera off and remove the battery or disconnect AC adaptor. Then reinsert the battery or reconnect AC adaptor and turn the High Definition Video Camera on.

Do not use the High Definition Video Camera near radio transmitters or high-voltage lines.

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

About connecting to a PC

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

■ 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).

■ Cards that you can use with this unit

SD Memory Card, SDHC Memory Card and SDXC Memory Card

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

■ For the purposes of these operating instructions

- 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.
- Pages for reference are indicated by an arrow, for example: → 00

These operating instructions are designed for use with models **HDC-SD60**, **HDC-TM60** and **HDC-HS60**. Pictures may be slightly different from the original.

- The illustrations used in these operating instructions show model **HDC-SD60**, however, parts of the explanation refer to different models.
- Depending on the model, some functions are not available.
- Features may vary, so please read carefully.
- Not all models may be available depending on the region of purchase.

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Accessories

Check the accessories before using this unit.

Product numbers correct as of Feb. 2010. These may be subject to change.

Battery pack

VW-VBK180



AC adaptor

VSK0712



AC cable

K2CQ29A00002



AV multi cable

K1HY12YY0004



USB cable

K1HY04YY0032



Stylus pen

VGQ0C14



CD-ROM

Software



CD-ROM

Operating Instructions

VFF0610



Optional accessories

Some optional accessories may not be available in some countries.

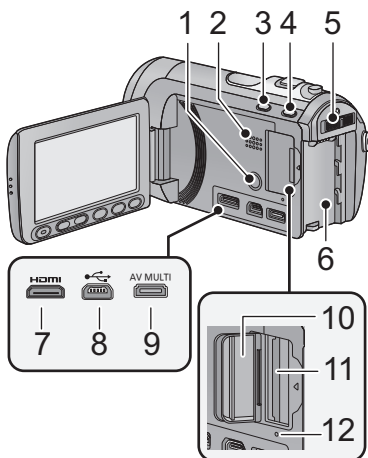
Battery charger (VW-BC10E)
Battery pack (lithium/VW-VBK180)
Battery pack (lithium/VW-VBK360)
HDMI mini cable (RP-CDHM15, RP-CDHM30)
Video DC light (VW-LDC103E)*
Light bulb for video DC light (VZ-LL10E)
Shoe adaptor (VW-SK12E)
DVD burner (VW-BN2)
Accessory kit (VW-ACK180E)

* The shoe adaptor VW-SK12E (optional) is necessary.

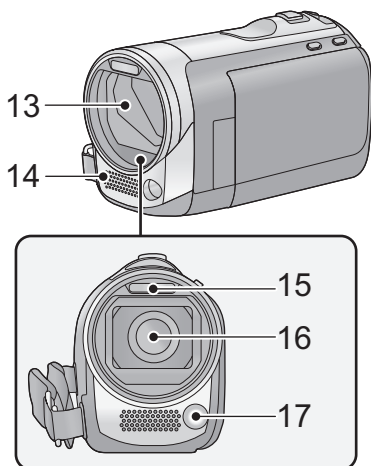
1



Parts identification and handling

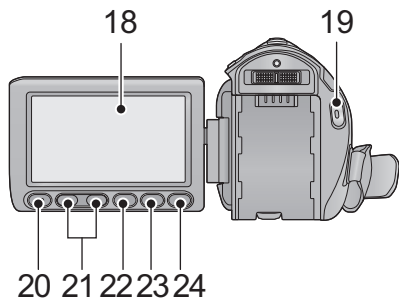
[HDC-SD60]/[HDC-TM60]



- 1 Power button [⏻/⏺] (→ 20)
- 2 Speaker
- 3 Intelligent auto/Manual button [iA/MANUAL] (→ 27)
- 4 Optical image stabilizer button [((⏏))]/O.I.S.] (→ 33)
- 5 Mode switch (→ 21)
- 6 Battery holder (→ 14)
- 7 HDMI mini connector [HDMI] (→ 36)
- 8 USB terminal [↔]
- 9 AV multi connector [AV MULTI] (→ 36)
 - Use the AV multi cable (only the supplied cable).
- 10 SD card cover (→ 19)
- 11 Card slot (→ 19)
- 12 Access lamp [ACCESS] (→ 19)



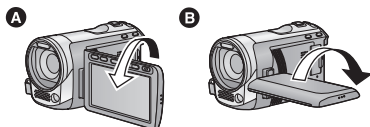
- 13 Lens cover
 - The lens cover opens in  Motion Picture Recording Mode or  Still Picture Recording Mode. (→ 21)
- 14 Internal stereo microphones
- 15 Built-in flash
- 16 Lens
- 17 Video light



18 LCD monitor (Touch screen) (→ 22)



- It can open up to 90°.



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

Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD monitor screen. However, this is not a malfunction and does not affect the recorded picture.

19 Recording start/stop button (→ 25)

20 Sub recording start/stop button

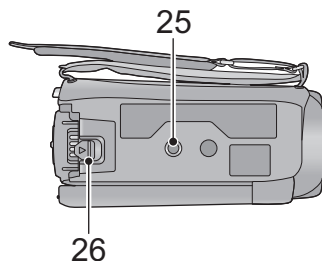
- This button functions in the same manner as the recording start/stop button.

21 Adjust zoom buttons (→ 31)

22 Menu button [MENU] (→ 30)

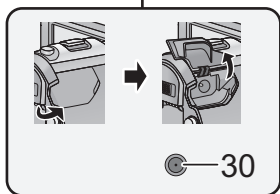
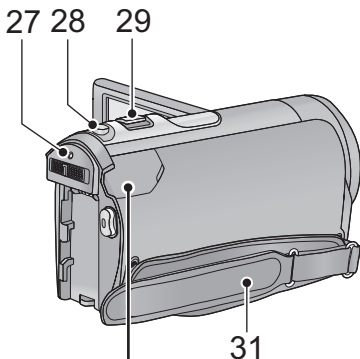
23 Video light button [LIGHT]




24 Delete button [] (→ 34)

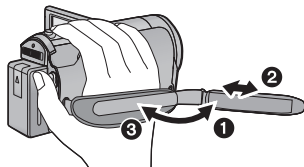


25 Tripod receptacle

26 Battery release lever [BATTERY] (→ 14)

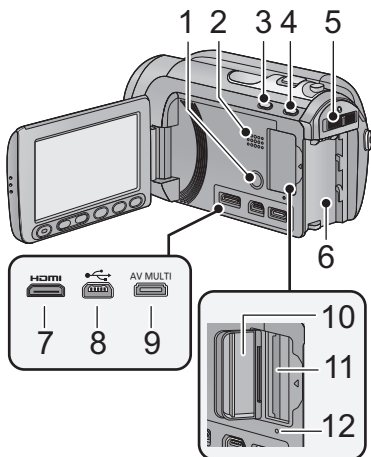


- 27 Status indicator (→ 20)
- 28 Photoshot button [] (→ 26)
- 29 Zoom lever [W/T] (In motion picture recording mode or still picture recording mode) (→ 31)
Thumbnail display switch [ / ]
Volume lever [-VOL+] (In playback mode)
- 30 DC input terminal (→ 15)
 - Do not use any other AC adaptors except the supplied one.
- 31 Grip belt

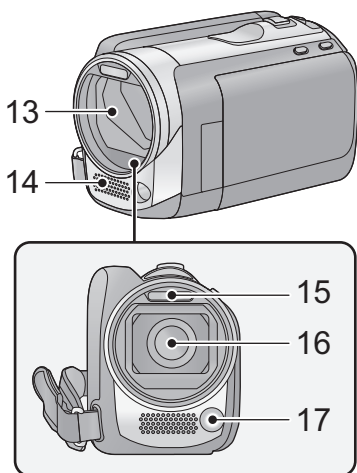




- ❶ Flip the belt.
- ❷ Adjust the length.
- ❸ Replace the belt.

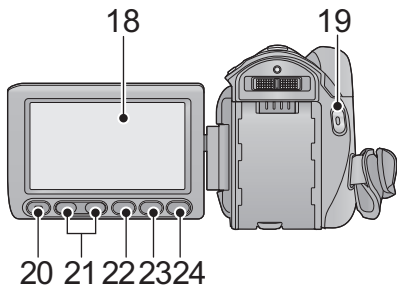
[HDC-HS60]



- 1 Power button [⏻/⏺] (→ 20)
- 2 Speaker
- 3 Intelligent auto/Manual button [iA/MANUAL] (→ 27)
- 4 Optical image stabilizer button [⏏]/O.I.S.] (→ 33)
- 5 Mode switch (→ 21)
- 6 Battery holder (→ 14)
- 7 HDMI mini connector [HDMI] (→ 36)
- 8 USB terminal [↔]
- 9 AV multi connector [AV MULTI] (→ 36)
 - Use the AV multi cable (only the supplied cable).
- 10 SD card cover (→ 19)
- 11 Card slot (→ 19)
- 12 Access lamp [ACCESS] (→ 19)



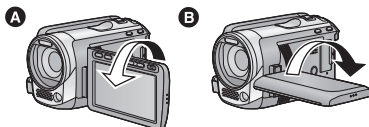
- 13 Lens cover
 - The lens cover opens in  Motion Picture Recording Mode or  Still Picture Recording Mode. (→ 21)
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- 17 Video light



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20 Sub recording start/stop button

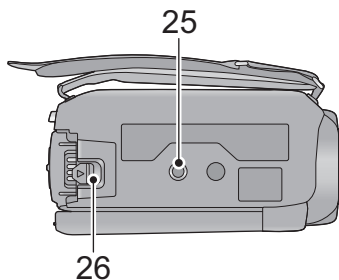
- This button functions in the same manner as the recording start/stop button.

21 Adjust zoom buttons (→ 31)

22 Menu button [MENU] (→ 30)

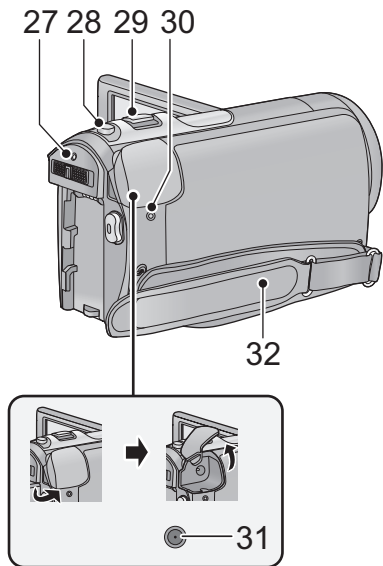
23 Video light button [LIGHT]




24 Delete button [] (→ 34)

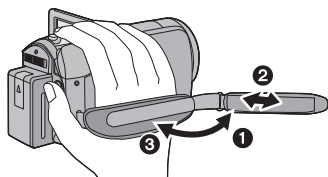


25 Tripod receptacle

26 Battery release lever [BATTERY] (→ 14)



- 27 Status indicator (→ 20)
- 28 Photoshot button [] (→ 26)
- 29 Zoom lever [W/T] (In motion picture recording mode or still picture recording mode) (→ 31)
Thumbnail display switch [ / ]
Volume lever [-VOL+] (In playback mode)
- 30 HDD access lamp [ACCESS HDD]
- 31 DC input terminal (→ 15)
 - Do not use any other AC adaptors except the supplied one.
- 32 Grip belt



- ❶ Flip the belt.
- ❷ Adjust the length.
- ❸ Replace the belt.

■ About batteries that you can use with this unit

The battery that can be used with this unit is VW-VBK180/VW-VBK360.

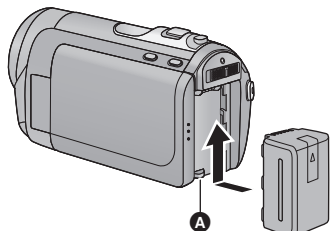
- This unit has a function to distinguish the batteries that can be used, and the batteries (VW-VBK180/VW-VBK360) are compatible with this function. (The batteries that are not compatible to this function cannot be used.)

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 power. (→ 20)

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

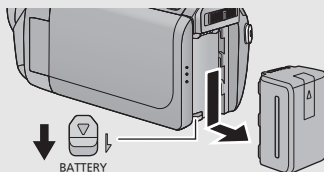


- A** Insert the battery until it clicks and locks.

Removing the battery

Be sure to hold down the power button until the status indicator goes off. Then remove the battery while supporting the unit to prevent it dropping.

Move the battery release lever in the direction indicated by the arrow and remove the battery when unlocked.



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.

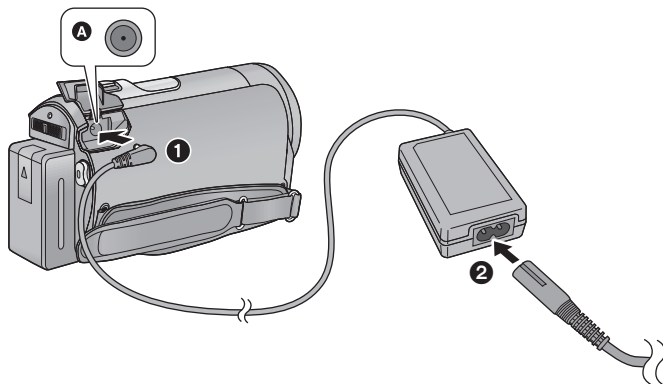
Charging the battery

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

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

Important:

- Use the supplied AC adaptor. Do not use the AC adaptor of another device.
- Do not use the AC cable with any other equipment as it is designed only for this unit. Also, do not use the AC cable from other equipment with this unit.
- The battery can also be charged using a battery charger (VW-BC10E; optional).
- The battery will not be charged if the power is turned on.



A DC input terminal

1 Connect the AC adaptor to the DC input terminal.

2 Connect the AC cable to the AC adaptor, then the AC outlet.

- The status indicator will flash red at an interval of 2 seconds, indicating that charging has begun.

■ Connecting to the AC outlet

If you turn on the unit while charging with the AC adaptor, you can use the unit with power supplied from the outlet.

- We recommend using Panasonic batteries (→ 6, 16, 17).
- If you use other batteries, we cannot guarantee the quality of this product.
- Do not heat or expose to flame.
- Do not leave the battery(ies) in an automobile exposed to direct sunlight for a long period of time with doors and windows closed.

Charging and recording time

■ Charging/Recording time

- Temperature: 25 °C/humidity: 60%

HDC-SD60			
Battery model number [Voltage/Capacity (minimum)]	Charging time	Maximum continuously recordable time	Actual recordable time
Supplied battery/ VW-VBK180 (optional) [3.6 V/1790 mAh]	2 h 50 min	1 h 55 min	1 h
VW-VBK360 (optional) [3.6 V/3580 mAh]	4 h 50 min	3 h 55 min	2 h

HDC-TM60			
Battery model number [Voltage/Capacity (minimum)]	Charging time	Maximum continuously recordable time	Actual recordable time
Supplied battery/ VW-VBK180 (optional) [3.6 V/1790 mAh]	2 h 50 min	1 h 55 min	1 h
VW-VBK360 (optional) [3.6 V/3580 mAh]	4 h 50 min	3 h 55 min	2 h

HDC-HS60

Battery model number [Voltage/ Capacity (minimum)]	Charging time	Recording destination	Recording mode	Maximum continuously recordable time	Actual recordable time
Supplied battery/ VW-VBK180 (optional) [3.6 V/ 1790 mAh]	2 h 50 min	HDD	HA/HG/HX/ HE	1 h 40 min	50 min
		SD	HA	1 h 45 min	50 min
			HG/HX/HE	1 h 45 min	55 min
VW-VBK360 (optional) [3.6 V/ 3580 mAh]	4 h 50 min	HDD	HA	3 h 25 min	1 h 45 min
			HG	3 h 30 min	1 h 45 min
			HX/HE	3 h 30 min	1 h 50 min
		SD	HA/HG/HX/ HE	3 h 35 min	1 h 50 min



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

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

Battery capacity indication

- The display changes as the battery capacity reduces.



If there is less than 3 minutes remaining, then  will become red. If the battery discharges, then  will flash.

- The remaining battery capacity is displayed when using the Panasonic battery that you can use for this unit. The actual time can vary depending on your actual use.
- When using the AC adaptor or batteries made by other companies, the remaining battery capacity will not be shown.

The unit can record still pictures or motion pictures to an SD card, built-in memory or HDD. 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	Motion picture recording	Still picture recording
SD Memory Card	8 MB/16 MB	Cannot be used.	Can be used.
	32 MB/64 MB/ 128 MB/256 MB	Cannot be guaranteed in operation. The recording may suddenly stop during motion picture recording depending on the SD card you use.	
	512 MB/1 GB/ 2 GB	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.

- 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.)

- 4 GB or more Memory Cards that do not have the SDHC logo or 48 GB or more Memory Cards that do not have the SDXC logo are not based on SD Memory Card Specifications.

- When the write-protect switch **A** on SD card is locked, no recording, deletion or editing will be possible on the card.



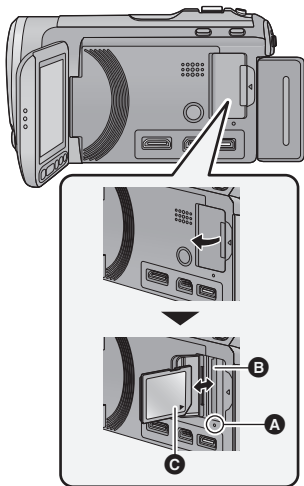
- Keep the Memory Card out of reach of children to prevent swallowing.

Inserting/removing an SD card

When using an SD card not from Panasonic, or one previously used on other equipment, for the first time on this unit, format the SD card. (→ 35) When the SD card is formatted, all of the recorded data is deleted. Once the data is deleted, it cannot be restored.

Caution:

Check that the access lamp has gone off.



Access lamp [ACCESS] **A**

- When this unit is accessing the SD card or built-in memory, the access lamp lights up.

1 Open the LCD monitor.

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

- Face the label side **C** in the direction shown in the illustration and press it straight in as far as it will go.
- Press the centre of the SD card and then pull it straight out.

3 Securely close the SD card cover.

- Securely close it until it clicks.

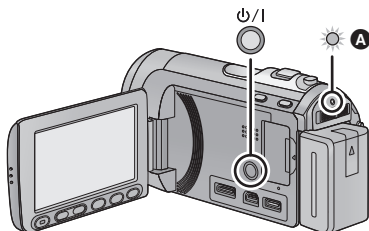
- Do not touch the terminals on the back of the SD card.
- Do not apply strong shocks, bend, or drop the SD card.
- Electrical noise, static electricity or the failure of this unit or the SD card may damage or erase the data stored on the SD card.
- When the card access lamp is lit, do not:
 - Remove the SD card
 - Turn the unit off
 - Insert and remove the USB cable
 - Expose the unit to vibrations or shockPerforming the above while the lamp is on may result in damage to data/SD card or this unit.
- Do not expose the terminals of the SD card to water, garbage 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.

Turning the unit on/off

You can turn the power on and off using the power button or by opening and closing the LCD monitor.

Turning the power on and off with the power button

Press the power button to turn on the power.



To turn off the power

Hold down the power button until the status indicator goes off.

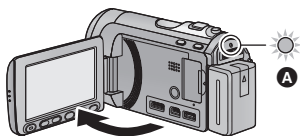
A The status indicator lights.

Turning the power on and off with the LCD monitor

Power is turned on when the LCD monitor is opened, and power is turned off when it is closed.

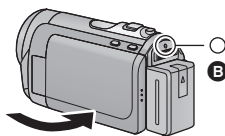
During normal use, opening and closing of the LCD monitor can be conveniently used to turn the power on/off.

■ To turn on the power



A The status indicator lights.

■ To turn off the power



B The status indicator goes off.




- The power will not turn off while recording motion pictures even if the LCD monitor is closed.

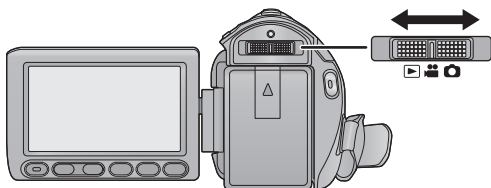
- In the following cases, opening the LCD monitor does not turn on the power. Press the power button to turn on the power.
 - When the unit is purchased
 - When you have turned off the power using the power button




4

Selecting a mode

Change the mode to recording or playback.

Operate the mode switch to change the mode to ,  or .



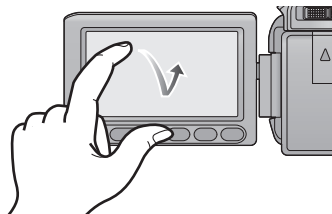
	Motion picture recording mode (→ 25)
	Still picture recording mode (→ 26)
	Playback mode (→ 28)

How to use the touch screen

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

■ Touch

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



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

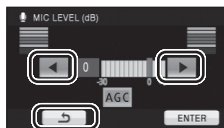
■ About the operation icons



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



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





- Do not touch the LCD monitor with hard pointed tips, such as ball point pens.
- Perform the touch screen calibration when the touch is not recognised or wrong location is recognised.


Setting date and time

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

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

◇ Change the mode to  or .

1 Select the menu.

 : [SETUP] → [CLOCK SET]

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



A Displaying the World time setting:

 [HOME]/  [DESTINATION]

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

3 Touch [ENTER].

- The clock function starts at [00] seconds.
- A message prompting for World time setting may be displayed. Perform the World time setting by touching the screen.
- Touch [EXIT] or press the MENU button to complete the setting.



- The date and time function is driven by a built-in lithium battery.
- When this unit is purchased, the clock is set. If the time display becomes [- -], the built-in lithium battery needs to be charged. To recharge the built-in lithium battery, connect the AC adaptor or attach the battery to this unit. Leave the unit as it is for approx. 24 hours and the battery will maintain the date and time for approx. 6 months. (The battery is still being recharged even if the power is off.)

1

Selecting a media to record

[HDC-TM60/HDC-HS60]

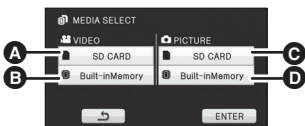
The card, built-in memory, and HDD media can be selected separately to record motion pictures or still pictures.

- 1 Change the mode to  or  .
- 2 Select the menu.

 : [MEDIA SELECT]

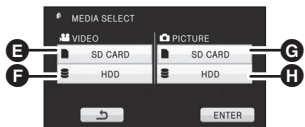
- 3 Touch the media to record motion pictures or still pictures.

HDC-TM60



- A [VIDEO/SD CARD]
- B [VIDEO/Built-inMemory]
- C [PICTURE/SD CARD]
- D [PICTURE/Built-inMemory]

HDC-HS60



- E [VIDEO/SD CARD]
- F [VIDEO/HDD]
- G [PICTURE/SD CARD]
- H [PICTURE/HDD]


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

- 4 Touch [ENTER].



2

Recording motion
pictures

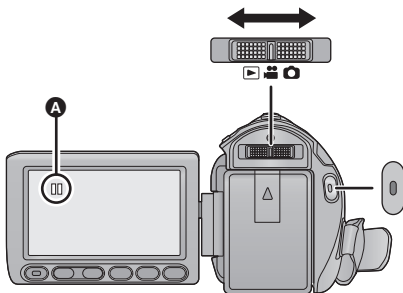
VIDEO

- 1 Change the mode to .
- 2 Open the LCD monitor.
- 3 Press the recording start/stop button to start recording.

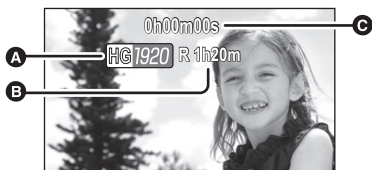


- A** When you begin recording,  changes to .

- 4 Press the recording start/stop button again to pause recording.





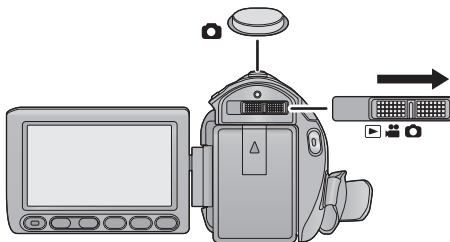
■ Screen indications in the motion picture recording mode



- A Recording mode**
- B Remaining time left for recording**
(When the remaining time is less than 1 minute, [R 0h00m] flashes red.)
- C Recording time elapsed**
Each time the unit is put into recording pause, the counter display will be reset to "0h00m00s".

PHOTO

- 1 Change the mode to .
- 2 Open the LCD monitor.
- 3 Press the  button halfway. (For auto focus only)













- 4 Press the  button fully.



■ About the screen indications in still picture recording



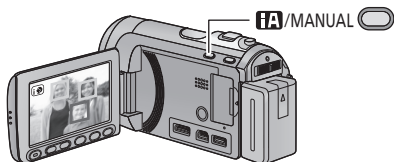
-  : Still picture operation indicator
-  : Flash
-  : Flash level
-  : Red eye reduction
-  : MEGA optical image stabilizer
-  1 : Optical image stabilizer (→ 33)
-  : Quality of still pictures
-  : Size of still pictures
-  : Remaining number of still pictures
(Flashes in red when [0] appears.)
-  : AF assist lamp

4

Intelligent auto mode

VIDEO PHOTO

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



Intelligent auto/Manual button
Press this button to switch Intelligent auto mode/Manual mode.

Mode	Scene	Effect
Portrait	When the object is a person	Faces are detected and focused automatically, and the brightness is adjusted so it is recorded clearly.
Scenery	Recording outdoors	The whole landscape will be recorded vividly without whitening out the background sky, which may be very bright.
Spotlight ^{*1}	Under a spotlight	Very bright object is recorded clearly.
Low light ^{*1}	Dark room or twilight	It can record very clearly even in a dark room or twilight.
Night portrait ^{*2}	Recording night portrait	A person and the background are recorded with near real-life brightness.
Night scenery ^{*2}	Recording night scenery	You can record night scenery vividly by slowing the shutter speed.
Macro ^{*2}	Recording zooming in on a flower etc.	This allows recording while going near to the object of recording.
Normal	Other situations	Contrast is adjusted automatically for clear image.

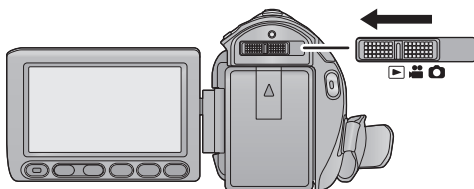
*1 In motion picture recording mode only


*2 In still picture recording mode only

- Depending on the recording conditions, the unit may not enter the desired mode.
- In the portrait mode, one that is bigger and close to centre of the screen will be surrounded by an orange frame.
- It is recommended using a tripod in night portrait and night scenery mode.
- Optical image stabilizer function (→ 33) is set to Active mode/ON in all modes.
- Faces cannot be detected depending on the recording conditions, such as when faces are of certain sizes or at certain tilts or when digital zoom is used.
- The zoom microphone is set to [OFF] in the Intelligent auto mode.

Motion picture/Still
picture playback

VIDEO PHOTO



- 1 Change the mode to .
- 2 Touch the play mode select icon **A**.
- 3 Touch the desired media to be played back motion pictures or still pictures.

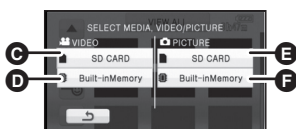


HDC-SD60



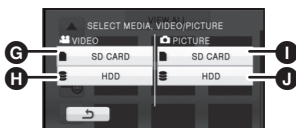
- A** [VIDEO/SD CARD]
- B** [PICTURE/SD CARD]

HDC-TM60





- C** [VIDEO/SD CARD]
- D** [VIDEO/Built-inMemory]
- E** [PICTURE/SD CARD]
- F** [PICTURE/Built-inMemory]

HDC-HS60



- G** [VIDEO/SD CARD]
- H** [VIDEO/HDD]
- I** [PICTURE/SD CARD]
- J** [PICTURE/HDD]

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



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












5 Select the playback operation by touching the operation icon.



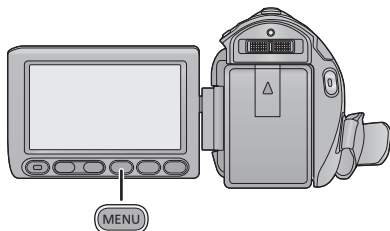
A Operation icon

- Touch  /  to display/not-display the operation icon.

Motion picture playback	Still picture playback
<ul style="list-style-type: none"> : Playback/Pause : Rewind playback : Fast forward playback : Stops the playback and shows the thumbnails. : Displays the direct playback bar. 	<ul style="list-style-type: none"> : Slide show (playback of the still pictures in numerical order) start/pause. : Plays back the previous picture. : Plays back the next picture. : Stops the playback and shows the thumbnails.

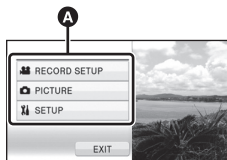
1

Using the menu screen

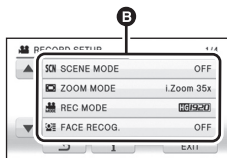




1 Press the MENU button. 

2 Touch the top menu **A**.

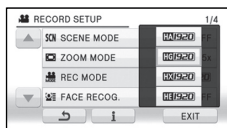


3 Touch the submenu **B**.




• Next (previous) page can be displayed by touching  / .

4 Touch the desired item to enter the setting.



5 Touch [EXIT] or press the MENU button to exit the menu setting.

■ About guide display

After touching , touching the submenus and items will cause function descriptions and settings confirmation messages to appear.

• After the messages have been displayed, the guide display is cancelled.

Language selection

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



1 Press the MENU button, then touch [SETUP] → [LANGUAGE].

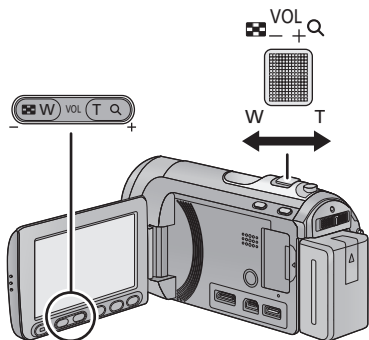
2 Touch [English].

Zoom in/out function

The maximum optical zoom ratio is 25×.

The default setting of the [ZOOM MODE] is [i.Zoom 35×]. It can be extended to a maximum of 35× during motion picture recording mode.

◇ Change the mode to  or .



Zoom lever/Adjust zoom buttons

T side:

Close-up recording (zoom in)

W side:


Wide-angle recording (zoom out)

- The zoom speed varies depending on the range over which the zoom lever is moved.
- The adjust zoom buttons are useful for making fine adjustments to the zoom magnification.

Zoom mode

VIDEO **PHOTO**

Set the maximum zoom ratio for the motion picture recording mode.

◇ Change the mode to .

(MENU) : [RECORD SETUP] → [ZOOM MODE] → desired setting

[Opt.Zoom 25×]: Optical zoom (Up to 25×)

[i.Zoom 35×]: This zoom function allows you to maintain high-definition picture quality. (Up to 35×)

[D.Zoom 60×]: Digital zoom (Up to 60×)

[D.Zoom 1500×]: Digital zoom (Up to 1500×)

- The larger the digital zoom magnification, the more the image quality is degraded.

If the number of the recording pixels is set to anything other than the maximum number of recording pixels in still picture recording mode, the still picture can be recorded with a zoom ratio of a maximum of 50× without degrading the picture quality.

- Extra optical zoom ratio varies depending on the setting of [PICTURE SIZE] and [ASPECT RATIO].

■ Extra optical zoom mechanism

When you set the picture size to 0.3m , the maximum 5m area is cropped to the centre 0.3m area, allowing a picture with a higher zoom effect.

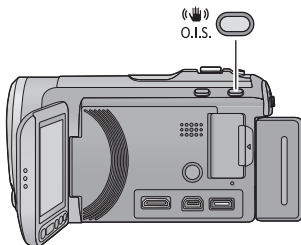
-
- If you take your finger off the zoom lever during zoom operation, the operation sound may be recorded. When returning the zoom lever to the original position, move it quietly.
 - When the zoom magnification is 25×, the subjects are focused at about 1.5 m or more.
 - When the zoom magnification is 1×, this unit can focus on a subject approx. 4 cm away from the lens.
 - The zoom speed does not vary when operating with the adjust zoom buttons.

Optical image stabilizer function

VIDEO PHOTO

Optical image stabilizer can stabilize the image without decreasing the image quality as much.

◇ Change the mode to  or .



Optical image stabilizer button

Pressing the button changes the optical image stabilizer setting.

(Motion picture recording mode)

 →  → OFF

(Still picture recording mode)

₁ / ₂ → ₁ / ₂ → OFF

- Switch to manual mode before setting the Optical Image Stabilizer function to off.

: **Active mode**

This setting gives more stabilization and is suitable for recording when walking.

: **ON**

This setting is suitable for recording in a stable state such as scenery. We recommend recording with a tripod in motion picture recording mode.


■ Changing the optical image stabilizer function when in still picture recording mode





[MENU] : [RECORD SETUP] → [O.I.S.] → [MODE1] or [MODE2]

[MODE1]:

The function works all the time.

[MODE2]:

The function works when the  button is pressed. We recommend you are recording yourself or recording with a tripod in still picture recording mode.

- When in [MODE1], ₁ / ₁ appears. When in [MODE2], ₂ / ₂ appears.

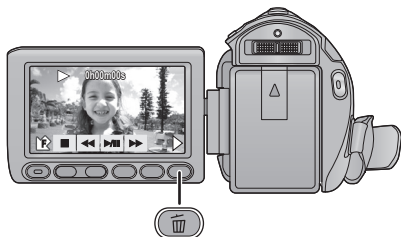
- Stabilization may not be possible under strong shaking conditions.

Deleting scenes/still pictures


VIDEO PHOTO

Deleted scenes/still pictures cannot be restored, so perform appropriate confirmation of the contents before proceeding with deletion.


◇ Change the mode to  .



To delete by confirming images being played back

Press the  button while scenes or still pictures to be deleted are being played back.

■ Deleting multiple scenes/still pictures from the thumbnail display

1 Press the  button while the thumbnail view screen is displayed.

2 Touch [ALL SCENES] or [SELECT].


• When [ALL SCENES] is selected, all the scenes or still pictures on the selected media will be deleted.

(In case of playing back scenes or still pictures by date, all the scenes or still pictures on the selected date will be deleted.)

• Protected scenes/still pictures cannot be deleted.

3 (Only when [SELECT] is selected in step 2)

Touch the scene/still picture to be deleted.

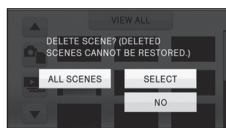
• When touched, the scene/still picture is selected and the  indication appears on the thumbnail. Touch the scene/still picture again to cancel the operation.

• Up to 99 scenes can be selected to be deleted.

4 (Only when [SELECT] is selected in step 2)

Touch [Delete] or press the button.

• To continuously delete other scenes/still pictures, repeat steps 3-4



When you stop deleting halfway

Touch [CANCEL] or press the MENU button while deleting.

• The scenes or still pictures that have already been deleted when the deletion is cancelled cannot be restored.


To complete editing

Press the MENU button.

Please be aware that if a medium is formatted, then all the data recorded on the medium will be erased and cannot be restored. Back up important data on a PC, DVD disc etc.

Select the menu. (→ 30)

HDC-SD60



 : [SETUP] → [FORMAT CARD]

HDC-TM60

 : [SETUP] → [FORMAT MEDIA] → [SD CARD] or [Built-inMemory]

HDC-HS60

 : [SETUP] → [FORMAT MEDIA] → [SD CARD] or [HDD]

- When formatting is complete, touch [EXIT] to exit the message screen.
 - Perform a physical formatting of the SD card when the SD card is to be disposed/ transferred. (Refer to the Operation Instructions (PDF format))
 -  /  Perform a physical formatting of the built-in memory/HDD when this unit is to be disposed/ transferred. (Refer to the Operation Instructions (PDF format))
-
- Do not turn this unit off or remove the SD card, while formatting. Do not expose the unit to vibrations or shock.

Use this unit to format media.

Formatting built-in memory or HDD is only available with this unit.

Do not format an SD card using any other equipment such as a PC. The card may not be used on this unit.

1

Watching Video/Pictures on your TV

VIDEO PHOTO

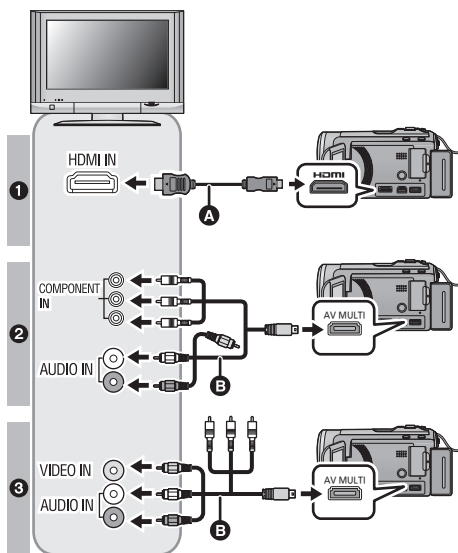
Confirm the terminals on your TV and use a cable compatible with the terminals. Image quality may vary with the connected terminals.

- ① High quality
- ② HDMI terminal
- ③ Component terminal
- ④ Video terminal



- Use the supplied AV multi cable. Check the output settings when connecting the component terminal or the video terminal with the AV multi cable.
- Use of the following Panasonic HDMI mini cables is recommended to connect the unit to the HDMI terminal.
- HDMI is the interface for digital devices. If you connect this unit to a HDMI compatible high definition TV and then play back the recorded high definition images, you can enjoy them in high resolution with high quality sound.

1 Connect this unit to a TV.



- A HDMI mini cable (optional)
- Be sure to connect to the HDMI terminal.
- B AV multi cable (supplied)

Picture quality

- ① High definition images when connecting to HDMI terminal
- ② High definition images when connecting to component terminal compatible with 1080i
Standard images when connecting to component terminal compatible with 576i
- ③ Standard images when connecting to video terminal

- Check that the plugs are inserted as far as they go.
- Do not use any other cables except a genuine Panasonic HDMI mini cable (RP-CDHM15, RP-CDHM30; optional).
- Do not use any other AV multi cables except the supplied one.
- When connecting to the component terminal of the TV, the yellow plug of the AV multi cable is not required.
- When connecting to the AV terminal of the TV, the component plug of the AV multi cable is not required.

2 Select the video input on the TV.

- Example:
Select the [HDMI] channel with a HDMI mini cable.
Select the [Component] or [Video 2] channel with an AV multi cable.
(The name of the channel may differ depending on the connected TV.)
- Check the input setting (input switch) and the audio input setting on the TV. (For more information, please read the operating instructions for the TV.)

3 Change the mode to to play back.

Cables	Reference items
A HDMI mini cable (optional)	<ul style="list-style-type: none"> • Connecting with a HDMI mini cable • Playback using VIERA Link (HDAVI Control™)
B AV multi cable (supplied)	<ul style="list-style-type: none"> • Connecting with the AV multi cable

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.
- “AVCHD” and the “AVCHD” Logo are trademarks of Panasonic Corporation and Sony Corporation.
- Manufactured under license from Dolby Laboratories.
Dolby and the double-D symbol are trademarks of Dolby Laboratories.
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- “x.v.Colour” is trademark.
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- Intel®, Core™, Pentium® and Celeron® are the registered trademarks or trademarks of the Intel Corporation in the United States and other countries.
- AMD Athlon™ is a trademark of the Advanced Micro Devices, Inc.
- iMovie and Mac are trademarks of Apple Inc., registered in the U.S. and other countries.

- PowerPC is a trademark of International Business Machines Corporation.
- 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>.

Specifications

High Definition Video Camera

Information for your safety

Power source:	DC 5.0 V (When using AC adaptor) DC 3.6 V (When using battery)	
Power consumption:	Recording:	Charging:
	HDC-SD60	HDC-SD60
	4.4 W	7.7 W
	HDC-TM60	HDC-TM60
	4.4 W	7.7 W
	HDC-HS60	HDC-HS60
4.7 W	7.7 W	

Signal system	1080/50i
Recording format	AVCHD format compliant
Image sensor	1/4.1" 1MOS image sensor Total: 3320 K Effective pixels: Motion picture: 2110 K (16:9) Still picture: 2320 K (4:3), 2280 K (3:2), 2110 K (16:9)
Lens	Auto Iris, F1.8 to F3.3 Focal length: 3.02 mm to 75.5 mm Macro (Full range AF) 35 mm equivalent: Motion picture: 35.7 mm to 893 mm (16:9) Still picture: 36 mm to 900 mm (4:3) 35.7 mm to 893 mm (3:2) 35.7 mm to 893 mm (16:9) Minimum focus distance: Normal: approx. 4 cm (Wide)/approx. 1.5 m (Tele) Tele macro: approx. 70 cm (Tele) Intelligent auto Macro: approx. 1 cm (Wide)/approx. 70 cm (Tele)
Zoom	25× optical zoom, 35× i.Zoom, 60×/1500× digital zoom
Monitor	2.7" wide LCD monitor (approx. 230 K dots)
Microphone	Stereo (with a zoom microphone)
Speaker	1 round speaker, dynamic type

White balance adjustment	Auto tracking white balance system	
Standard illumination	1,400 lx	
Minimum required illumination	Approx. 4 lx (1/25 in low light mode) Approx. 1 lx with the colour night view function	
AV multi connector video output level	AV video output level: 1.0 Vp-p, 75 Ω, PAL system Component video output level: Y: 1.0 Vp-p, 75 Ω Pb: 0.7 Vp-p, 75 Ω Pr: 0.7 Vp-p, 75 Ω	
HDMI mini connector video output level	HDMI™ (x.v.Colour™) 1080i/576p	
AV multi connector audio output level (Line)	316 mV, 600 Ω, 2 ch	
HDMI mini connector audio output level	Dolby Digital/Linear PCM	
USB	SD card	Read only (No copyright protection support)
	Built-in memory	HDC-TM60 Read only
	HDD	HDC-HS60 Read only
	Hi-Speed USB (USB 2.0), USB terminal Type Mini AB USB host function (for DVD burner)	
Flash	Available range: Approx. 1.0 m to 2.5 m	
Dimensions	HDC-SD60 HDC-TM60	51.5 mm (W)×65.5 mm (H)×112 mm (D) (excluding projecting parts)
	HDC-HS60	54.5 mm (W)×65.5 mm (H)×112 mm (D) (excluding projecting parts)
Mass	HDC-SD60	Approx. 255 g [without battery (supplied) and an SD card (optional)]
	HDC-TM60	Approx. 258 g [without battery (supplied)]
	HDC-HS60	Approx. 327 g [without battery (supplied)]

Mass in operation	HDC-SD60	Approx. 299 g [with battery (supplied) and an SD card (optional)]
	HDC-TM60	Approx. 300 g [with battery (supplied)]
	HDC-HS60	Approx. 369 g [with battery (supplied)]
Operating temperature	0 °C to 40 °C	
Operating humidity	10% to 80%	
Battery operation time	See page 16	

Motion pictures

Recording media	SD card	SD Memory Card (FAT12 and FAT16 system compliant) SDHC Memory Card (FAT32 system compliant) SDXC Memory Card (exFAT system compliant) Refer to page 18 for details on SD cards usable in this unit.	
	Built-in memory	HDC-TM60	16 GB
	HDD	HDC-HS60	120 GB
Compression	MPEG-4 AVC/H.264		
Recording mode and transfer rate	HA: Approx. 17 Mbps (VBR) HG: Approx. 13 Mbps (VBR) HX: Approx. 9 Mbps (VBR) HE: Approx. 5 Mbps (VBR)		
Picture size	HA/HG/HX/HE: 1920×1080/50i		
Audio compression	Dolby Digital		

Still pictures

Recording media	SD card	SD Memory Card (FAT12 and FAT16 system compliant) SDHC Memory Card (FAT32 system compliant) SDXC Memory Card (exFAT system compliant) Refer to page 18 for details on SD cards usable in this unit.	
	Built-in memory	HDC-TM60	16 GB
	HDD	HDC-HS60	120 GB
Compression	JPEG (Design rule for Camera File system, based on Exif 2.2 standard), DPOF corresponding		
Picture size	Picture aspect [4:3]: 2592×1944/1600×1200/640×480 Picture aspect [3:2]: 2688×1792/1680×1120 Picture aspect [16:9]: 2816×1584/1920×1080		

AC adaptor

Information for your safety

Power source:	AC 110 V to 240 V, 50/60 Hz
Power consumption:	12 W
DC output:	DC 5.0 V, 1.6 A

Dimensions	46 mm (W)×25 mm (H)×75.5 mm (D)
Mass	Approx. 115 g

Specifications may change without prior notice.

Reading the Operating Instructions (PDF format)

- You have practised the basic operations introduced in these operating instructions and want to progress to advanced operations.
- You want to check the Troubleshooting.

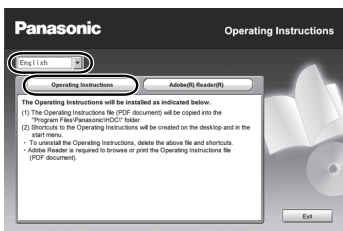
In these kinds of situations refer to Operating Instructions (PDF format) recorded on the CD-ROM containing the Operating Instructions (supplied).

■ 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 "SD60_SD66_TM60_HS60 Operating Instructions" shortcut icon on the desktop.

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

You will need Adobe Acrobat Reader 4.0 or later or Adobe Reader 6.0 or later to browse or print the Operating Instructions (PDF format).

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

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

If using the following OS

- Windows 2000 SP4
- Windows XP SP2/SP3
- Windows Vista SP1/SP2
- Windows 7

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

■ To uninstall the Operating Instructions (PDF format)

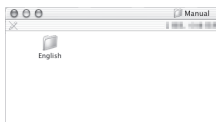
Delete the PDF file from the "Program Files\Panasonic\HDC\" folder.

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

■ For Mac

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

2 Open the "Manual" folder in "VFF0610" and then copy the PDF file with the desired language inside the folder.



3 Double click the PDF file to open it.

EU



Panasonic Corporation

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

Pursuant to at the directive 2004/108/EC, article 9(2)

Panasonic Testing Centre

Panasonic Marketing Europe GmbH

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