

Panasonic®

Basic Owner's Manual Digital Camera

Model No. **DMC-ZS50**

LUMIX



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

More detailed instructions on the operation of this camera are contained in "Owner's Manual for advanced features (PDF format)" in the supplied CD-ROM.



Register online at www.panasonic.com/register (U.S. customers only)

If you have any questions, visit:
USA: www.panasonic.com/support

P



SQT0612
M1214KZ0

Dear Customer,
Thank you for choosing Panasonic!

You have purchased one of the most sophisticated and reliable products on the market today. Used properly, we're sure it will bring you and your family years of enjoyment. Please take time to fill in the information below. The serial number is on the tag located on the underside of your camera. Be sure to **retain this manual** as your convenient camera information source.

Date of Purchase	Dealer Phone No.
Dealer Purchased From	Model No.
Dealer Address	Serial No.

Please note that the actual controls and components, menu items, etc. of your Digital Camera may look somewhat different from those shown in the illustrations in this Owner's Manual.

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.



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

Information for Your Safety

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

■ Product identification marking

Product	Location
Digital camera	Bottom

WARNING:

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

- Do not expose this unit to rain, moisture, dripping or splashing.
- Use only the recommended accessories.
- Do not remove covers.
- Do not repair this unit by yourself. Refer servicing to qualified service personnel.

■ About the AC adaptor (supplied)

CAUTION!

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

- Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure this unit is well ventilated.

AC adaptor

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

But

- In the U.S.A. and Canada, the AC adaptor must be connected to a 120V AC power supply only.
- When connecting to an AC supply outside of the U.S.A. or Canada, use a plug adaptor to suit the AC outlet configuration.

■ About the battery pack

CAUTION

Battery pack (Lithium ion battery pack)

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

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

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

CAUTION

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

- Do not heat or expose to flame.
- Do not leave the battery(ies) in a car exposed to direct sunlight for a long period of time with doors and windows closed.

Warning

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



FCC Note:

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

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

FCC Caution: To assure continued compliance, follow the attached installation instructions and use only shielded interface cables with ferrite core when connecting to computer or peripheral devices.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Declaration of Conformity

Trade Name: Panasonic

Model No.: DMC-ZS50

Responsible Party: Panasonic Corporation of North America

Two Riverfront Plaza, Newark, NJ 07102-5490

Support Contact: <http://www.panasonic.com/contactinfo>

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

■ Cautions for Use

- Do not use any other USB connection cables except the supplied one or a genuine Panasonic USB connection cable (DMW-USBC1: optional).
- Always use a genuine Panasonic AV cable (DMW-AVC1: optional).
- Use a "High Speed HDMI micro cable" with the HDMI logo. Cables that do not comply with the HDMI standards will not work.
"High Speed HDMI micro cable" (Type D-Type A plug, up to 2 m (6.6 feet) long)

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 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 (supplied). 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.

Certification and Compliance

See Camera for the certification and compliance mark specific to that device.

1 Select [Wi-Fi Setup] in the [Wi-Fi] menu

2 Press ▲ ▼ to select [Approved Regulations], and press [MENU/SET]

Contains FCC ID : VPYLBXN604

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment has very low levels of RF energy that are deemed to comply without testing of specific absorption ratio (SAR).

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Before use

■ Camera handling

- Keep the camera away from excessive vibration, force, or pressure.
- The camera is not dust resistant, splash resistant, or waterproof.
Avoid using the camera in places with excessive dust or sand, or where water can come into contact with the camera.
- Do not allow camera to come into contact with pesticides or volatile substances (can cause surface damage or coating to peel).

■ Condensation (When the lens, the LCD monitor or the viewfinder is fogged up)






- Condensation may occur when the camera is exposed to sudden changes of temperature or humidity. Avoid these conditions, which may make the lens, the LCD monitor or the viewfinder dirty, cause mold, or damage the camera.
- If condensation does occur, turn off the camera and wait about two hours before using it. Once the camera adjusts to the surrounding temperature, the fogging will clear naturally.

■ Caring for your camera

- Before cleaning the camera, remove the battery or disconnect the power plug from the outlet.
- Do not press the LCD monitor with excessive force.
- Do not press the lens with excessive force.
- Do not keep rubber or plastic products in contact with the camera for a long period of time.
- Do not use solvents such as benzene, thinner, alcohol, kitchen detergents, etc., to clean the camera, since it may deteriorate the external case or the coating may peel off.
- Do not leave the camera with the lens facing the sun, as rays of light from the sun may cause it to malfunction.
- Do not extend the supplied cord or cable.
- While the camera is accessing the card or built-in memory (for an operation such as picture writing, reading, deleting, or formatting), do not turn off the camera or remove the battery, card, AC adaptor (supplied).
- The data on the built-in memory or the card may be damaged or lost due to electromagnetic waves, static electricity or breakdown of the camera or the card. We recommend storing important data on a PC etc.
- Do not format the card on your PC or other equipment. Format it on the camera only to ensure proper operation.

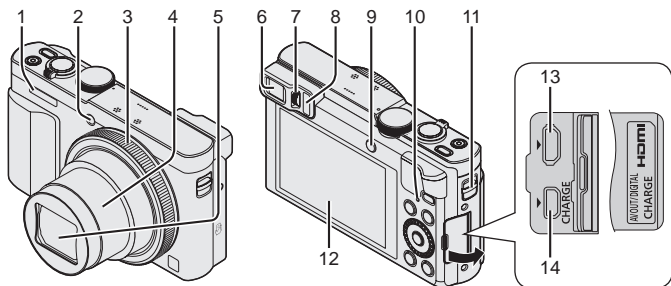
Standard accessories

Check that all the accessories are supplied before using the camera. Part numbers are as of January 2015. These may be subject to change.

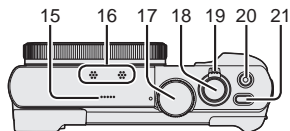
<input type="checkbox"/> Battery pack DMW-BCM13PP • Charge the battery before use. Battery pack is indicated as battery pack or battery in the text. 	<input type="checkbox"/> USB connection cable K1HY08YY0031 
<input type="checkbox"/> AC adaptor VSK0768 	<input type="checkbox"/> CD-ROM SFM0063 • Software: Use it to install the software on your PC. • Owner's Manual for advanced features 
<input type="checkbox"/> Hand strap VFC4297 	

- SD Memory Card, SDHC Memory Card and SDXC Memory Card are indicated as card in the text.
- **Cards are optional.** You can record or play back pictures on the built-in memory when you are not using a card.
- **Compatible memory cards (optional)**
The following SD standard-based cards (Panasonic brand recommended) can be used.
SD Memory Card (8 MB to 2 GB) / SDHC Memory Card (4 GB to 32 GB) / SDXC Memory Card (48 GB, 64 GB)
- For information about optional accessories, refer to the "Digital Camera Accessory System".
- If accessories are lost, customers can visit us at www.panasonic.com/support for further information about obtaining replacement parts.
- Please dispose of all packaging appropriately.
- Keep small parts in a safe place out of the reach of children.
- The illustrations and screens in this manual may differ from the actual product.
- SILKYPIX Developer Studio SE is not provided on the supplied CD-ROM. Download this software from the website and install it on your computer to use. (→36)

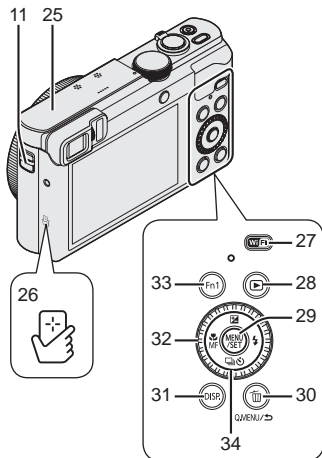
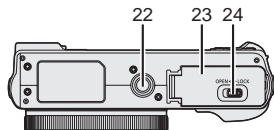
Names and Functions of Main Parts



(Top)



(Bottom)



Names and Functions of Main Parts

- 1 Flash
- 2 Self-timer indicator/
AF Assist Lamp
- 3 Control ring
- 4 Lens barrel
- 5 Lens
 - Do not touch the lens barrier.
- 6 Viewfinder (LVF)
- 7 Diopter adjustment dial
 - Adjusts the focus in the viewfinder.
- 8 Eye sensor
 - The display is automatically switched to viewfinder when your eye or an object moves close to the viewfinder.
- 9 [LVF] button/[Fn2] button
 - Use this to switch display between viewfinder and LCD monitor.
- 10 Charging lamp (Red)/
Wi-Fi® connection lamp (Blue)
 - The color of the lamp differs depending on the function.
- 11 Strap eyelet
 - We recommend using the supplied hand strap to avoid dropping the camera.
- 12 Monitor
- 13 [HDMI] socket
 - Do not connect any other cables except the HDMI micro cable. Doing so may cause malfunction.
- 14 [AV OUT/DIGITAL] socket
 - This socket is also used when charging the battery.
- 15 Speaker
- 16 Microphones
- 17 Mode dial
 - Use this to select the recording mode.
- 18 Shutter button
- 19 Zoom lever
- 20 Motion picture button
- 21 Camera [ON/OFF] button
- 22 Tripod mount
 - Do not attach this unit to tripods that have screws with a length of 5.5 mm (0.22 inch) or more. Doing so may damage this unit.
 - If you are not holding the camera while using zoom, such as during self-timer recording, [Time Lapse Shot] recording, or remote recording, the camera could tilt when the lens barrel extends, so be sure to secure the camera in place on a tripod or by other means.
 - It may not be possible to attach certain types of tripods properly.
- 23 Card/Battery door
- 24 Release lever
- 25 [Wi-Fi] antenna
- 26 NFC antenna
- 27 [Wi-Fi] button
- 28 Playback button
 - Use this to select the recording mode or playback mode.
- 29 [MENU/SET] button
- 30 [Q.MENU/👉] / [👈] button
 - You can display the Quick Menu and erase pictures.
- 31 [DISP.] button
 - Use this to change display.
- 32 Control dial
 - Turn the dial to select setting items and change setting values.
- 33 [Fn1] button
- 34 Cursor button

[MENU/SET] button / Cursor button



[MENU/SET] button

- Use this button to display the menus, enter the settings, etc.

Cursor button

- This button is used to move the cursor on the menu screens and for other functions.
- In this manual, the button that is to be used is indicated by ▲▼◀▶.

You can perform the following operations while recording.

[] button (▲)

- Exposure Compensation
 - Corrects the exposure when there is a backlight or when the subject is too dark or too bright.



[] button (▶)

- Flash


[] (Drive Mode*1) button (▼)

- Burst*2
 - A burst of still pictures can be recorded while the shutter button is pressed fully.
- Auto Bracket*2
 - Records 3 pictures in continuous succession while exposure is changed automatically. After exposure adjustment, the adjustment value is set as the standard.
- Self-timer*2
 - This is effective for preventing jitter when pressing the shutter button, by setting the self-timer to 2 seconds.

*1 You can switch the operation to be performed when you press the shutter button.

*2 To cancel the setting, select [] or [].

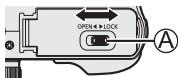
[] button (◀)

- Macro recording
 - When you want to enlarge the subject, setting to [AF Macro] ([AF ]) enables you to take pictures at an even closer distance than the normal focus range (up to 3 cm (0.098 feet) for max. Wide).
- Manual Focus
 - Manual Focus is convenient when you want to lock the focus to take pictures or when it is difficult to adjust focus using Auto Focus.

Inserting and removing the battery or SD memory card (optional)

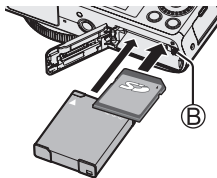
Make sure that the camera is turned off.

- 1 Slide the release lever (A) to the [OPEN] position and open the card/battery door**



- 2 Insert the battery and card, making sure that their orientation is correct**

- Battery: Insert the battery all the way firmly and check that it is locked by lever (B).
- Card: Insert the card all the way firmly until it clicks. Do not touch the terminals on the back of the card.



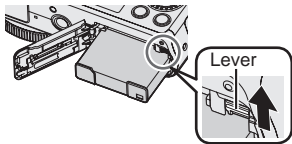
- 3 Close the door**

Slide the release lever to the [LOCK] position.

■ To remove

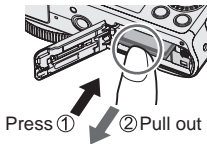
• To remove battery:

Move lever in direction of arrow.



• To remove card:

Push the card until it clicks, then pull the card out.



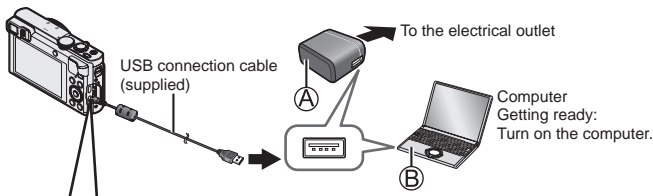
- Always use genuine Panasonic batteries (DMW-BCM13PP).
- If you use other batteries, we cannot guarantee the quality of this product.
- Keep the Memory Card out of reach of children to prevent swallowing.
- We recommend using a Panasonic card.

Charging the battery

- The battery that can be used with this unit is DMW-BCM13PP.
- The battery is not charged when the camera is shipped. Charge the battery before use.
- We recommend charging in a location where the ambient temperature is between 10 °C and 30 °C (50 °F to 86 °F).

Make sure that the camera is turned off.

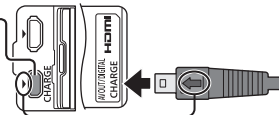
- 1** Insert the battery to this unit, and then connect this unit to the AC adaptor (supplied) (A) or a PC (B)



When charging the camera, connect the USB connection cable (supplied) to the [AV OUT/DIGITAL] socket.
Connecting the cable to a wrong terminal may cause malfunction.

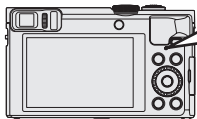
[AV OUT/DIGITAL] socket

- This terminal is located at the bottom when the camera is in an upright position.



- Insert the USB connection cable so that its [←] mark will face the [▶] mark side of the camera.
- Always check the direction of the pins and hold the plug straight to insert or remove it. (If the cable is inserted in the wrong direction, the pins could become deformed and cause faulty operation.) Also, do not insert into the wrong socket. Doing so may cause damage to this unit.

Charging the battery



■ Charging lamp (Red)

On: Charging in progress

Off: Charging stops

(After charging stops, disconnect the camera from the electrical outlet or your computer.)

Flashing: Charging error

(For instructions on correcting the problem, refer to “Troubleshooting” (→37).)

■ Notes on charging time

When using the AC adaptor (supplied)

Charging time	Approx. 170 min
---------------	-----------------

- The battery is a rechargeable lithium ion battery. If the temperature is too high or too low, the operating time of the battery will become shorter.
- The battery becomes warm after using and during and after charging. The camera also becomes warm during use. This is not a malfunction.
- Do not peel off or scratch the covering on the battery.
- **Do not leave any metal items (such as clips) near the contact areas of the power plug or near the batteries.**
- Store the battery in a cool and dry place with a relatively stable temperature. (Recommended temperature: 15 °C to 25 °C (59 °F to 77 °F), Recommended humidity: 40%RH to 60%RH)
- **Do not store the battery for a long time while fully charged.** When storing the battery for a long period of time, we recommend charging it once a year. Remove the battery from the camera and store it again after it has completely discharged.
- If you try to recharge the battery when it is already fully charged, the charging lamp will light for approximately 15 seconds.

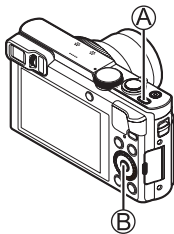
When using the AC adaptor (supplied), observe the following points as improper connections may cause malfunctions.

- Do not use any other USB connection cables except the supplied one or a genuine Panasonic USB connection cable (DMW-USBC1: optional).
- Do not use any other AC adaptors except the supplied one.
- Do not use the AC adaptor (supplied) or the USB connection cable (supplied) with other devices.

Setting the clock

The clock is not set when the camera is shipped.
Disconnect the unit from the AC adaptor (supplied).

- 1 Press the Camera [ON/OFF] button (A)**
- 2 Press [MENU/SET] (B)**
- 3 Press ◀▶ to select the items (year, month, day, hour, minute, display order or time display format), and press ▲▼ to set**
 - To cancel → Press [Q.MENU/↶] button.
- 4 Press [MENU/SET] to set**
- 5 Confirm the setting and press [MENU/SET]**
 - To cancel → Press [Q.MENU/↶] button.
- 6 When [Please set the home area] is displayed, press [MENU/SET]**
- 7 Press ◀▶ to set your home area and press [MENU/SET]**



■ Changing time settings

Select [Clock Set] from [Setup] menu, perform **3** and **4**.
Please see the next page on how to set the menu.

Setting the menu

Refer to the following procedures to operate the menus.

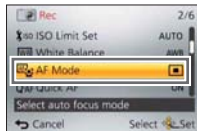
1 Press [MENU/SET] to display the menu

2 Press ▲▼◀▶ or turn the control dial to select the menu type, and press [MENU/SET]



3 Press ▲▼ or turn the control dial to select the menu item, and press [MENU/SET]

- Depending on the item, its setting may not appear or it may be displayed in a different way.



4 Press ▲▼ or turn the control dial to select the setting, and press [MENU/SET]

5 Press the [Q.MENU/↶] button repeatedly until the previous screen reappears

- In recording mode, the menu screen can also be exited by pressing the shutter button halfway.



■ Menu types

- [Rec]
- [Motion Picture]
- [Setup]
- [Wi-Fi]
- [Playback Mode]
- [Playback]

Holding the camera

Do not block the flash or the lamp. Do not look at it from close range.

- To avoid camera shake, hold it with both hands keeping your arms close to your body while standing with your feet slightly apart.
- Do not touch the lens.

Flash/AF Assist Lamp



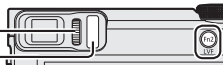
Recording pictures using the viewfinder

When you use the viewfinder, you can check the view of the subject even if you are in a bright area.

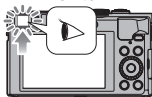
■ Switching between the monitor and viewfinder

- ① Press [LVF] ([Fn2]) button

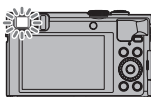
Diopter adjustment dial
Eye Sensor



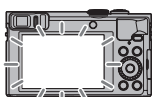
Automatic switching
between viewfinder and
monitor*



Viewfinder display



Monitor display



*For automatic switching between the viewfinder and monitor, the eye sensor automatically switches the display to viewfinder when your eye or an object moves close to the viewfinder.

■ About diopter adjustment

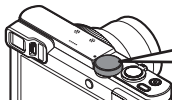
Turn the diopter adjustment dial to adjust until you are able to clearly see the characters displayed in the viewfinder.

Taking pictures with automatic settings

[Intelligent Auto] Mode

This mode is recommended for those who want to point and shoot or beginners as the camera optimizes settings to match the subject and recording environment.

1 Set mode dial to [iA] ([Intelligent Auto] Mode)



Align the mode dial correctly to the mode that you want to use.

2 Take a picture



Press halfway
(press lightly to focus)





Press fully
(press the button all the way to record)

■ Automatic Scene Detection

Camera reads scene when pointed at subject, and makes optimum settings automatically.

[i-Portrait]	[i-Night Portrait] (Only when [i&A] is selected)
[i-Baby]	
[i-Scenery]	[i-Night Scenery]
[i-Sunset]	[i-Handheld Night Shot]
[i-Macro]	[i-Food]
[iA]	When scene does not correspond to any of the above

■ Recording modes

iA	[Intelligent Auto] Mode Take pictures with automatic settings. iA+ You can switch to the [Intelligent Auto Plus] Mode on the menu to adjust the brightness and color settings to your liking.
P	[Program AE] Mode Take pictures with automatic shutter speed and aperture value settings.
A	[Aperture-Priority] Mode Determine aperture, then record pictures.
S	[Shutter-Priority] Mode Determine shutter speed, then record pictures.
M	[Manual Exposure] Mode Determine aperture and shutter speed, then record pictures.
C1 C2	[Custom] Mode Record pictures using pre-registered settings.
	[Panorama Shot] Mode Record panorama pictures.
SCN	[Scene Mode] This allows you to take pictures that match the scene being recorded.
	[Creative Control] Mode Take pictures by selecting your preferred picture effect.

■ Zoom types

You can adjust the area of a picture to be taken using zoom.

Capture a wider area (wide-angle)  Enlarge the subject (telephoto)

• Optical Zoom

Zooming in up to 30x is possible if pictures without **[EZ]** have been selected by [Picture Size] on the [Rec] menu.

• Extended optical zoom

Zooming in up to 58.6x is possible when pictures with **[EZ]** have been selected by [Picture Size] on the [Rec] menu.

(Continued on the next page)

- **[i.Zoom]**

Increase the zoom ratio up to 2x higher than the original zoom ratio with limited deterioration of picture quality.

Set the [i.Zoom] in the [Rec] menu to [ON].

- **[Digital Zoom]**

Zoom 4x further than Optical/Extended optical zoom. When [Digital Zoom] is used simultaneously with [i.Zoom], you can only increase the zoom ratio up to 2x.

Note that, with Digital Zoom, enlarging will decrease picture quality.

Set the [Digital Zoom] in the [Rec] menu to [ON].

- **[Step Zoom]**

Each time the control ring/control dial is operated, the zoom stops at the position for one of the preset focal lengths.

■ Menu convenient for taking pictures

- **[Picture Size]**

Estimated recording capacity (number of pictures)

[Picture Size]	12M	5M	0.3M
Built-in Memory	16	29	450
Card (8 GB)	1540	2620	40310
Card (32 GB)	6260	10620	162960
Card (64 GB)	12670	21490	247150

(When [Aspect Ratio] is set to [4:3] and [Quality] is set to [📷])

- **[Time Lapse Shot]**

You can preset data such as recording start time and time lapse to take still pictures automatically. This setting is convenient for taking pictures at constant intervals for landscape scenes, observation of the gradual changes in animals/plants, and other applications. When [Time Lapse Video] in the [Playback] menu is used, you can create a motion picture.

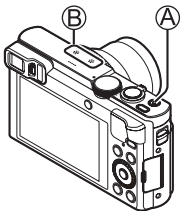
● Please refer to “Owner’s Manual for advanced features (PDF format)” for details.

Recording motion pictures

You can record motion pictures with audio (stereo).
You can record motion pictures fitting each recording mode.

1 Press the motion picture button (A) to start recording

- Do not block the microphones (B) when recording motion pictures.
- You can also use zoom while recording motion pictures.
 - The zoom speed will be slower than normal.
 - The operating sounds of the zoom lever or control ring/control dial may be recorded in some cases.
- Still pictures can be taken during motion picture recording.



2 Press the motion picture button (A) again to end recording

- About recording time
 - You can continuously record a motion picture in [MP4] for up to 29 minutes 59 seconds or approx. 4 GB. (Since recording in [MP4] with [FHD/30p] creates larger files, the recording time for such motion pictures will be shorter than 29 minutes 59 seconds.)
 - If [Rec Quality] of [AVCHD] motion pictures is set to [FHD], you can continuously record a motion picture for up to 29 minutes 59 seconds.
- Motion pictures cannot be recorded in the following cases.
 - [Panorama Shot] Mode
 - [3D Photo Mode] ([Scene Mode])
 - [Soft Focus]/[Star Filter] ([Creative Control] Mode)
 - When using [Time Lapse Shot]

Recording motion pictures

■ About the recording format for recording motion pictures

This unit can record motion pictures in either AVCHD or MP4 formats.

The recording format for motion pictures can be changed in [Rec Format] of the [Motion Picture] menu.

■ About the recording quality setting

The recording quality for motion pictures can be changed in [Rec Quality] of the [Motion Picture] menu.

[AVCHD] in [Rec Format]

* AVCHD Progressive

Item	Picture size	fps	Bit rate
[FHD/60p]*	1920×1080	60p	Approx. 28 Mbps
[FHD/60i]	1920×1080	60i	Approx. 17 Mbps
[HD/60p]	1280×720	60p	Approx. 17 Mbps

[MP4] in [Rec Format]

Item	Picture size	fps	Bit rate
[FHD/30p]	1920×1080	30p	Approx. 20 Mbps
[HD/30p]	1280×720	30p	Approx. 10 Mbps
[VGA/30p]	640×480	30p	Approx. 4 Mbps

- You can record a motion picture to the built-in memory only in [MP4] using the [VGA] setting.

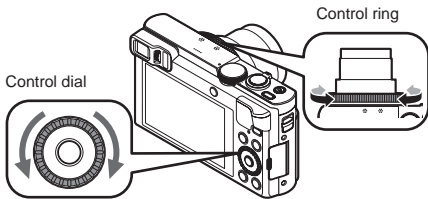
■ About motion picture icon

[Rec Format] ——— AVCHD
Picture size ——— FHD|60i ——— fps



- If the surrounding temperature is high, or a motion picture is recorded continuously, [Δ] is displayed and recording may be stopped halfway through to protect the camera.
- If Extended optical zoom is used before pressing the motion picture button, these settings will be cleared, and the recordable area will be changed significantly.

Using the control ring/control dial


You can use the control ring/control dial to perform frequently used operations and settings directly.



Items that can be set by the control ring/control dial vary depending on recording modes. Following are the pre-assigned settings.

Recording mode	Setting	
	Control ring*1	Control dial
iA	Step Zoom (→22)	
P	Program Shift	
A	Aperture adjustment	
S	Shutter speed adjustment	
M	Aperture adjustment	Shutter speed adjustment*2
	Picture effects change	
SCN	Scene change	
	Picture effects change	

*1 When Manual Focus is set, the control ring is assigned to focus adjustment.

*2 Press  to switch between aperture adjustment and shutter speed adjustment.

■ To change the settings assigned to the control ring/control dial

Changes the settings assigned to the control ring/control dial.

- ① Press [MENU/SET]
- ② Press ▲▼◀▶ to select [Setup] menu and press [MENU/SET]
- ③ Press ▲▼ to select [Ring/Dial Set] and press [MENU/SET]
- ④ Press ▲▼ to select [(0)] (control ring) or [(⦿)] (control dial), and then press [MENU/SET]
- ⑤ Press ▲▼ to select the setting and press [MENU/SET]
The following settings can be assigned.
 - [Default Control]
 - [Zoom]
 - [Step Zoom]
 - [Exposure Comp.]
 - [Aspect Ratio]
 - [Sensitivity]
 - [White Balance]
 - [Not Set] (control ring only)
- ⑥ Press [Q.MENU/↶] button several times
 - The assigned function setting applies to all the recording modes. However, the assigned function may not operate when combined with certain recording mode.

■ Using Quick menu

During recording, you can easily call some of the menu items and set them.

- ① Press [Q.MENU/↶] button
- ② Press ◀▶ to select menu items
 - The menu items and setting items that are displayed differ depending on the recording mode.
- ③ Turn the control ring or control dial to change the setting
- ④ Press [MENU/SET]

Registering preferred functions to the [Fn1] / [Fn2] button

Register frequently used functions from the [Rec] menu, [Setup] menu or other menus to the [Fn1] button or [Fn2] button for faster operation.

- The [Fn1] button (see below) is set to [Composition Guide] and [Fn2] button (→19) is set to [LVF/Monitor Switch] at the time of purchase.

- 1 Press [MENU/SET]
- 2 Press $\blacktriangle \blacktriangledown \blacktriangleleft \blacktriangleright$ to select [Setup] menu and press [MENU/SET]
- 3 Press $\blacktriangle \blacktriangledown$ to select [Fn Button Set] and press [MENU/SET]
- 4 Press $\blacktriangle \blacktriangledown$ to select the function button you want to assign a function to and press [MENU/SET]
- 5 Press $\blacktriangle \blacktriangledown$ to select the function to register and press [MENU/SET]

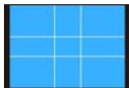
Taking pictures with the composition determined [Composition Guide]

Refer to the [Composition Guide] guidelines to easily take impressive and well-balanced still pictures.

- 1 Press [Fn1] button
 - If the setting of the [Fn1] button has been changed, select [Composition Guide] in the [Setup] menu and press [MENU/SET].
- 2 Press $\blacktriangle \blacktriangledown$ to select the guideline to display and press [MENU/SET]
 - Explanations and examples of the composition will be displayed in turn when you press the [DISP.] button.

■ Guidelines (Examples)

[Rule of Thirds Offset]



[Diagonal lines]



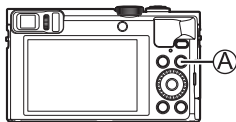
[Radiation]



Viewing your pictures

1 Press the Playback button (A)

- By holding down the Playback button while the camera is off, you can turn the camera on in playback mode.



2 Press ◀▶ or turn the control dial to select the picture to be displayed



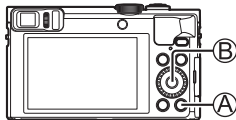
- To play back a motion picture, select a picture with the motion picture icon, and press ▲.

Deleting pictures

Deleted pictures cannot be recovered.

1 Press [] button (A) to delete the displayed picture

2 Press ◀ to select [Yes] and then press [MENU/SET] (B)



What you can do with the Wi-Fi® function/ NFC function

■ Using the camera by connecting it to a smartphone/tablet

By installing the “Panasonic Image App” on your smartphone/tablet, you can operate the camera remotely and use the smartphone/tablet to record and play back. In addition, you can copy pictures in the camera to the smartphone/tablet.

Hereafter, this manual uses the term “smartphone” for both smartphones and tablets unless it is necessary to distinguish between them.



- Taking pictures via a smartphone (remote recording) (→32)
- Playing back pictures in the camera on a smartphone (→32)
- Saving pictures in the camera to the smartphone (→32)
- Easily transferring pictures in the camera by establishing Wi-Fi connection using the NFC function
- Adding location information to pictures in the camera

■ Additional things you can do

- View pictures on a TV
- Print wirelessly
- Send pictures to Wi-Fi compatible equipment
- Send pictures to social networking services, etc. through “LUMIX CLUB”.
<http://lumixclub.panasonic.net/eng/c/>
- Transfer pictures automatically [Smart Transfer]

- Please refer to “Owner’s Manual for advanced features (PDF format)” for details.

Using the camera by connecting it to a smartphone/tablet

You can connect to and operate this unit using a smartphone by following three steps.

STEP 1 Preparing the smartphone: Installing the special app “Panasonic Image App”^{*1}

^{*1} Hereafter “Image App”

The “Image App” is an application provided by Panasonic.

• Supported OS

iOS: iOS 6.0 or later^{*2}

Android™: Android 2.3.3 or later^{*3}

^{*2} iPhone 3GS is not supported.

^{*3} To connect this unit with [Wi-Fi Direct], Android OS 4.0 or above is required and the device must be compatible with Wi-Fi Direct™.

1 Connect the smartphone to a network

2 <Using an iOS device (iPhone, iPod touch, iPad)> Select “App StoreSM”

<Using an Android device>
Select “Google Play™ Store”

3 Enter “Panasonic Image App” or “LUMIX” to search for the app

4 Select “Panasonic Image App” and install it

- Use the latest version.
- Supported OS versions as of January 2015. Supported OS versions may be changed without prior notice.
- Some of the screens and information provided in this document may be different depending on the supported operating system and “Image App” version.
- The service may not be able to be used properly depending on the type of smartphone being used.
- For details about the operating procedure, etc., refer to [Help] in the “Image App” menu.
- For the latest information on the “Image App”, refer to the support site below.
<http://panasonic.jp/support/global/cs/dsc/> (This site is available in English only.)

STEP 2

Connecting to a smartphone

You can easily establish a Wi-Fi connection on this unit without entering a password on your smartphone.

1 Press [Wi-Fi] button

The information (SSID) required for directly connecting your smartphone to this unit is displayed.



2 Perform the Wi-Fi setting on your smartphone

<Using an iOS device (iPhone, iPod touch, iPad)>

- ① Turn on the Wi-Fi function in the setting menu of the smartphone
- ② Select the SSID displayed on the screen of this unit
- ③ Return to the home screen and start "Image App"



<Using an Android device>

- ① Start "Image App"
- ② Select [Wi-Fi]
- ③ Select the SSID displayed on this unit

3 When a confirmation screen for connection is displayed on the camera, press ◀▶ to select [Yes] and press [MENU/SET]

- The confirmation screen does not appear when reconnecting.

[Wi-Fi Password] is set to [OFF] at the time of purchase. In [OFF] state, a third party can tap into the Wi-Fi transmission and steal transmitted data.

- You can set [Wi-Fi Password] to [ON] for stronger security. For details (→33).

Using the camera by connecting it to a smartphone/tablet

STEP 3

Operating the camera with a smartphone

Taking pictures via a smartphone (remote recording)

You can operate the zoom and press the shutter just like using a remote control.

1 Select [📷] on the “Image App” screen

2 Take pictures

- The recorded images are saved in the camera.
- When using zoom, the camera could tilt when the lens barrel extends.
Make sure to secure the camera in place with a tripod or by other means.

Playing back pictures in the camera on a smartphone

1 Select [▶] on the “Image App” screen

- The images captured by the camera are displayed on the smartphone.

Saving pictures in the camera to the smartphone

1 Select [▶] on the “Image App” screen

- The images captured by the camera are displayed on the smartphone.

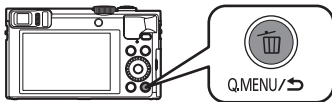
2 Press and hold the picture and drag it to save it on the smartphone

- The picture is saved on the smartphone.
- It is not possible to save pictures in RAW file format or AVCHD motion pictures.
- 3D still pictures (MPO format) are saved as 2D still pictures (JPEG).



Closing the connection

1 Press [Q.MENU/↶] button



- A confirmation screen is displayed. Select [Yes] and press [MENU/SET].

2 Close “Image App” on the smartphone

- For details on how to close the application, refer to the operating instructions of your device.

■ Reconnecting the unit to a smartphone

Once a smartphone has been connected to this unit, you can reconnect it by starting with **STEP 2** (→31).

■ Setting [Wi-Fi Password] to [ON]

You can enhance security when using a Wi-Fi connection.

- ① Press [MENU/SET]
- ② Press ▲▼◀▶ to select [Wi-Fi] menu and press [MENU/SET]
- ③ Press ▲▼◀▶ to select [Wi-Fi Setup] and press [MENU/SET]
- ④ Press ▲▼ to select [Wi-Fi Password] and press [MENU/SET]
- ⑤ Press ▲▼ to select [ON] and press [MENU/SET]
 - Password authentication by manual input or a QR code is enabled when you establish a Wi-Fi connection.

- For details on how to connect the unit to a smartphone when [Wi-Fi Password] is set to [ON], refer to the “Owner’s Manual for advanced features (PDF format)”.

Reading the Owner's Manual (PDF format)

More detailed instructions on the operation of this camera are contained in "Owner's Manual for advanced features (PDF format)" in the supplied CD-ROM.

■ For Windows

1 Turn the PC on and insert the CD-ROM containing the Owner's Manual (supplied)

- The menu screen appears. If the menu screen does not appear, you can display it by executing [Launcher.exe] in [SFMXXXX] in [Computer]. (The "XXXX" portion differs depending on the model.)

2 Click [Owner's Manual]

- The list of Owner's Manuals (PDF format) will be displayed.

3 Click the language of the Owner's Manual you want to open

- The "Owner's Manual for advanced features (PDF format)" will open. You can save the "Owner's Manual for advanced features" on the PC.
- You will need Adobe Reader to browse or print the Owner's Manual (PDF format). You can download and install a version of Adobe Reader that you can use with your OS from the following website. (As of January 2015)
<http://www.adobe.com/products/acrobat/readstep2.html>

■ For Mac

1 Turn the PC on and insert the CD-ROM containing the Owner's Manual (supplied)

2 Open the "Manual" folder in the CD-ROM

3 Double click the [INDEX.pdf]

- The list of Owner's Manuals (PDF format) will be displayed.

4 Click the language of the Owner's Manual you want to open

- The "Owner's Manual for advanced features (PDF format)" will open. You can save the "Owner's Manual for advanced features" on the PC.

Storing recorded still pictures and motion pictures on your PC

The supplied CD-ROM contains the following software.

Install the software on your computer to use.

For details about operating environment and usage, please read “Owner’s Manual for advanced features (PDF format)” or the manuals for each software.

- PHOTOfunSTUDIO / LoiLoScope are not compatible with Mac.

PHOTOfunSTUDIO 9.6 PE	Pictures can be captured to a PC, and can be viewed, organized, printed, etc. Also, still pictures can be corrected and motion pictures can be edited. <ul style="list-style-type: none">• Compatible OS: Windows 8.1 / 8 / 7 / Vista
LoiLoScope (30-day full-trial version)	You can edit motion pictures easily. This will only install a shortcut to the trial version download site. For details about using LoiLoScope, please download and see the manual from the following site. http://loilo.tv/product/20 <ul style="list-style-type: none">• Compatible OS: Windows 8.1 / 8 / 7 / Vista

Installing supplied software

Preparations:

- Check your PC’s specifications and operating environment for each software.
- Before inserting the CD-ROM (supplied), close all running applications.

■ For Windows

1 Insert the supplied CD-ROM with the supplied software

- The menu screen appears. If the menu screen does not appear, you can display it by executing [Launcher.exe] in [SFMXXXX] in [Computer]. (The “XXXX” portion differs depending on the model.)

2 Click [Applications]

3 Click [Recommended Installation]

- Continue the installation procedure following the instructions displayed on the screen.
- The software compatible with your PC will be installed.

Downloading SILKYPIX Developer Studio SE

This software develops and edits RAW file pictures. Edited pictures can be saved in a file format such as JPEG or TIFF that can be displayed on a PC, etc. Download SILKYPIX Developer Studio SE from the following site and install it on your computer to use. (This software is not provided on the supplied CD-ROM.) <http://www.isl.co.jp/SILKYPIX/english/p/>

- Compatible OS: Windows 8.1 / 8 / 7 / Vista
Mac OS X (10.5 - 10.10)
- For details on how to use the SILKYPIX Developer Studio SE, refer to the “Help” or the Ichikawa Soft Laboratory’s support website.
- To download the software, the PC must be connected to the Internet.
- It may take time to download the software in some communication environments.

Copying still pictures and motion pictures

1 Turn on the camera and the PC, and connect them using the USB connection cable (supplied)

- Do not use any other USB connection cables except the supplied one or a genuine Panasonic USB connection cable (DMW-USBC1: optional). Using cables other than the above may cause a malfunction.

2 Press ▲ ▼ on the camera to select [PC], and press [MENU/SET]

3 Copy pictures to your computer

- For Windows
Use “PHOTOfunSTUDIO”.
- For Mac
Copy the picture files contained in the “DCIM” folder (except for AVCHD motion pictures).

4 Cancel the connection and disconnect the USB connection cable

Troubleshooting

First, try out the following procedures.

- If the problem persists, performing [Reset] in the [Setup] menu may resolve the issue.
- Further information is provided in the “Owner’s Manual for advanced features (PDF format)”. Check it together with the information in this section.

The charging lamp blinks.

- Charging is being performed in a place with extremely high or low temperature.
→ **Reconnect the USB connection cable (supplied) and retry charging in a place where ambient temperature is 10 °C to 30 °C (50 °F to 86 °F) (temperature conditions also apply to the battery itself).**
- Charging is not possible if the power supply capacity of the computer is low.

The lower right portion of recorded pictures appears dark or the color is unnatural.

- Your finger is blocking the flash.
→ Make sure you are holding the camera correctly (→19).

Stripping or flicker may appear under lighting such as fluorescent lighting and LED lighting fixture.

- This is characteristic of MOS sensors which serve as the camera's pickup sensors. This is not a malfunction.

The camera cannot be connected to Mac computer/Windows PC via Wi-Fi connection.

- Please confirm login name and password are correctly typed.
- When the system time of Mac computer or Windows PC connected to a camera differs severely from that of the camera, the camera cannot be connected to the computer or PC in some OSs. Please confirm clock set and world time of the camera matches with time, date and time zone in Windows PC or Mac computer. When both settings do not match severely, please match them.

Troubleshooting

I am having a problem connecting to my Windows 8 PC. The user name and password are not recognized.

- Depending on the OS version, on Windows 8, for example, there are two types of user account (local account/Microsoft account).
- Be sure to set the local account and use the user name and password for the local account.

The Wi-Fi connection is not recognizing my PC.

- By default, the Wi-Fi connection uses the default workgroup name of "WORKGROUP". If the name of the workgroup has been changed, it will not be recognized.
- Select [PC Connection] then [Change Workgroup Name] in the [Wi-Fi Setup] menu to change the workgroup name to match that of your PC.

Please refer to “Owner’s Manual for advanced features (PDF format)” for details.

Specifications

Digital Camera: Information for your safety

Power Source	DC 5 V
Power Consumption	1.7 W (When recording with LCD Monitor) 1.1 W (When playing back with LCD Monitor)
Camera effective pixels	12,100,000 pixels
Image sensor	1/2.3" MOS sensor, total pixel number 12,800,000 pixels Primary color filter
Lens	Optical 30x zoom f=4.3 mm to 129.0 mm (35 mm film camera equivalent: 24 mm to 720 mm) / Max. Wide: F3.3 to F8.0 Max. Tele: F6.4 to F8.0
Image Stabilizer	Optical method
Focus range	
AF	50 cm (1.6 feet) (Max. Wide) / 200 cm (6.6 feet) (Max. Tele) to ∞
AF Macro / Intelligent Auto / Motion picture / MF	3 cm (0.098 feet) (Max. Wide) / 200 cm (6.6 feet) (Max. Tele) to ∞
Scene Mode	The focus ranges listed above may vary depending on the selected Scene Mode.
Shutter system	Electronic shutter + Mechanical shutter
Shutter speed	4 seconds to 1/2000th of a second [Starry Sky] Mode: 15 seconds, 30 seconds, 60 seconds
Minimum Illumination	Approx. 10 lx (when i-Low light is used, the shutter speed is 1/30th of a second)

Specifications

Exposure (AE)	Program AE (P) / Aperture-priority AE (A) / Shutter-priority AE (S) / Manual exposure (M)
Metering Mode	[Multi Metering] / [Center Weighted] / [Spot]
Monitor	3.0" TFT LCD (3:2) (Approx. 1,040,000 dots)
Viewfinder	0.2" Color LCD (4:3) (Approx. 1,160,000 dots equivalent) (with diopter adjustment -4 to +4 diopter)
Microphones	Stereo
Speaker	Monaural
Recording media	Built-in Memory (Approx. 86 MB) SD Memory Card / SDHC Memory Card / SDXC Memory Card
Recording file format	
Still picture	RAW / JPEG (based on Design rule for Camera File system, based on Exif 2.3 standard / DPOF corresponding) / MPO
Motion pictures	AVCHD / MP4
Audio compression format	AVCHD: Dolby® Digital (2 ch) MP4: AAC (2 ch)
Interface	
Digital	USB 2.0 (High Speed)
Analog video	NTSC Composite
Audio	Audio line output (Monaural)
Terminal	HDMI: MicroHDMI Type D AV OUT/DIGITAL: Dedicated jack (8 pin)
Dimensions	Approx. 110.7 mm (W) x 64.6 mm (H) x 34.4 mm (D) [4.36" (W) x 2.54" (H) x 1.35" (D)] (excluding the projection part)

Mass (Weight)	With card and battery: Approx. 243 g (0.536 lb) Excluding card and battery: Approx. 217 g (0.478 lb)
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Operating humidity	10%RH to 80%RH
Language select	[ENGLISH] / [ESPAÑOL]

Wi-Fi

Compliance standard	IEEE 802.11b/g/n (standard wireless LAN protocol)
Frequency range used (central frequency)	2412 MHz to 2462 MHz (1ch to 11ch)
Encryption method	Wi-Fi compliant WPA™ / WPA2™
Access method	Infrastructure mode

NFC

Compliance standard	ISO / IEC 18092 NFC-F (Passive Mode)
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AC adaptor

(Panasonic VSK0768): Information for your safety

Input	~ 110 V to 240 V, 50/60 Hz, 0.2 A
Output	=== 5 V, 800 mA

Battery pack (lithium-ion)

(Panasonic DMW-BCM13PP): Information for your safety

Voltage / capacity	3.6 V / 1250 mAh
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Specifications are subject to change without notice.

Digital Camera Accessory System

Description	Accessory#
Battery pack	DMW-BCM13
USB connection cable	DMW-USBC1
AV cable	DMW-AVC1

- Product numbers are correct as of January 2015. These may be subject to change.
- Accessories and/or model numbers may vary between countries. Consult your local dealer.

Digital Camera Accessory Order Form

Please photocopy this form when placing an order.

1. Digital Camera Model # _____

2. Items Ordered

Accessory #	Description	Price Each	Quantity	Total Price
Shipping & Handling				\$6.95
Subtotal				
Your State & Local Sales Tax				
Total				

3. Method of payment (check one)

- ☐ American Express
☐ VISA
☐ MasterCard
☐ Discover

Credit Card # _____
Expiration Date _____
Customer Signature _____

(Please do not send cash)

4. Shipping information (UPS delivery requires complete street address)

Ship To:

Mr.

Mrs.

Ms.

First _____ Last _____

Street Address _____

City _____ State _____ Zip _____

Phone#:

Day () _____

Night () _____

TO OBTAIN ANY OF OUR DIGITAL CAMERA ACCESSORIES YOU CAN DO ANY OF
THE FOLLOWING:

VISIT YOUR LOCAL PANASONIC DEALER

OR

YOU MAY CONTACT US DIRECTLY AT:

1-800-237-9080 (FAX ONLY)

OR

MAIL THIS ORDER TO: PANASONIC NATIONAL PARTS CENTER

20421 84th Avenue South, Kent, WA 98032

Limited Warranty (ONLY FOR U.S.A.)

Panasonic Products Limited Warranty

Limited Warranty Coverage (For USA Only)

If your product does not work properly because of a defect in materials or workmanship, Panasonic Corporation of North America (referred to as “the warrantor”) will, for the length of the period indicated on the chart below, which starts with the date of original purchase (“warranty period”), at its option either (a) repair your product with new or refurbished parts, (b) replace it with a new or a refurbished equivalent value product, or (c) refund your purchase price. The decision to repair, replace or refund will be made by the warrantor.

Product or Part Name	Parts	Labor
Digital Camera	1 Year	1 Year
All included Accessories (Except Non-Rechargeable Batteries)	90 Days	Not Applicable
Only Non-Rechargeable Batteries	10 Days	Not Applicable

During the “Labor” warranty period there will be no charge for labor. During the “Parts” warranty period, there will be no charge for parts. This Limited Warranty excludes both parts and labor for non-rechargeable batteries, antennas, and cosmetic parts (cabinet). This warranty only applies to products purchased and serviced in the United States. This warranty is extended only to the original purchaser of a new product which was not sold “as is”.

Mail-In Service--Online Repair Request

Online Repair Request

To submit a new repair request and for quick repair status visit our Web Site at www.panasonic.com/support.

When shipping the unit, carefully pack, include all supplied accessories listed in the Owner's Manual, and send it prepaid, adequately insured and packed well in a carton box. When shipping Lithium Ion batteries please visit our Web Site at www.panasonic.com/BatteryHandling as Panasonic is committed to providing the most up to date information. Include a letter detailing the complaint, a return address and provide a daytime phone number where you can be reached. A valid registered receipt is required under the Limited Warranty.

IF REPAIR IS NEEDED DURING THE WARRANTY PERIOD, THE PURCHASER WILL BE REQUIRED TO FURNISH A SALES RECEIPT/PROOF OF PURCHASE INDICATING DATE OF PURCHASE, AMOUNT PAID AND PLACE OF PURCHASE. CUSTOMER WILL BE CHARGED FOR THE REPAIR OF ANY UNIT RECEIVED WITHOUT SUCH PROOF OF PURCHASE.

Limited Warranty Limits and Exclusions

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