Panasonic®

Basic Operating Instructions

Digital Camera/
Lens Kit/Body

Model No. DMC-GH3A/DMC-GH3H
DMC-GH3

LUMIX

LUMIX

GH3

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

LUMIX™ **G** MICRO SYSTEM

MICRO FOURTHIRDS™

Wi Fi® CERTIFIED

WI-FI PROTECTED SETUP

SD XC™ I

dlna CERTIFIED™

More detailed instructions on the operation of this camera are contained in "Operating Instructions for advanced features (PDF format)" in the supplied CD-ROM. Install it on your PC to read it.

Web Site: http://www.panasonic-europe.com

Model number suffix "EB" denotes UK model.

EB

VQT4M51
F1012SM0

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

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.

Information for Your Safety

WARNING:

To reduce the risk of fire, electric shock or product damage,
• **Do not expose this unit to rain, moisture, dripping or splashing.**
• **Use only the recommended accessories.**
• **Do not remove covers.**
• **Do not repair this unit by yourself. Refer servicing to qualified service personnel.**

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

■ **Product identification marking**

Product	Location
Digital Camera	Bottom
Battery charger	Bottom

Pursuant to the applicable EU legislation
Panasonic Marketing Europe GmbH
Panasonic Testing Centre
Winsbergring 15, 22525 Hamburg, Germany

CE 1731

Declaration of Conformity (DoC)
Hereby, *"Panasonic Corporation"* declares that this product is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Customers can download a copy of the original DoC to our R&TTE products from our DoC server:
http://www.doc.panasonic.de
Contact to Authorized Representative:
Panasonic Marketing Europe GmbH, Panasonic Testing Centre, Winsbergring 15, 22525 Hamburg, Germany

This product is intended for general consumer. (Category 3)
This product on purpose to connect to access point of 2.4 GHz WLAN.

∎ **About the battery pack**

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

• 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 or incinerate.

Caution for AC mains lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug. Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362. Check for the ASTA mark ⓐ or the BSI mark ⓥ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local dealer.

■ **Before use**

Remove the connector cover.

■ **How to replace the fuse**

The location of the fuse differ according to the type of AC mains plug (figures A and B). Confirm the AC mains plug fitted and follow the instructions below.
Illustrations may differ from actual AC mains plug.
1. Open the fuse cover with a screwdriver.

Figure A	Figure B
Fuse cover |
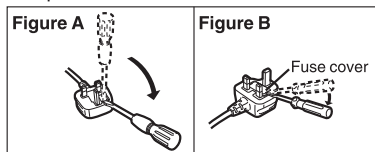
2. Replace the fuse and close or attach the fuse cover.

Figure A	Figure B
Fuse (5 ampere) |
Fuse (5 ampere) |
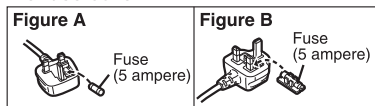
■ **About the battery charger**

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.**

• The battery charger is in the standby condition when the AC power supply cord is connected. The primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

■ **Cautions for Use**

• Always use a genuine Panasonic remote shutter (DMW-RSL1: optional).
• Do not use the synchro cables with the length of 3 m (9.8 feet) or more.

Information for Users on Collection and Disposal of Old Equipment and used Batteries

These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries should not be mixed with general household waste.
For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC and 2006/66/EC.
By disposing of these products and batteries correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.
For more information about collection and recycling of old products and batteries, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.
Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

For business users in the European Union
If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

[Information on Disposal in other Countries outside the European Union]
These symbols are only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

Note for the battery symbol (bottom two symbol examples):
This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

Contents

Wi-Fi

Connecting to other equipment

Others

Reading the Operating Instructions (PDF format)

More detailed instructions on the operation of this camera are contained in "Operating Instructions for advanced features (PDF format)" in the supplied CD-ROM. Install it on your PC to read it.

■ **For Windows**

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

2 Select the desired language and then click [Operating Instructions] to install.

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

Ⓐ

Panasonic   LUMIX
                   Operating Instructions

English ▼

Operating Instructions   Adobe(R) Reader(R)

The Operating Instructions will be installed as indicated below.
(1) The Operating Instructions file (PDF document) will be copied into the
    "Program Files\Panasonic\Lumix\" folder.
(2) Shortcuts to the Operating Instructions will be created on the desktop and in the
    start menu.
• To uninstall the Operating Instructions, delete the above file and shortcuts.
• Adobe Reader is required to browse or print the Operating Instructions file
  (PDF document).

Exit

■ **When the Operating Instructions (PDF format) will not open**
You will need Adobe Acrobat Reader 5.0 or later or Adobe Reader 7.0 or later to browse or print the Operating Instructions (PDF format).
Insert the CD-ROM containing the Operating Instructions (supplied), click Ⓐ and then follow the messages on the screen to install.
(Compatible OS: Windows XP SP3/Windows Vista SP2/Windows 7)

• You can download and install a version of Adobe Reader that you can use with your OS from the following Web Site.
  http://get.adobe.com/reader/otherversions

■ **To uninstall the Operating Instructions (PDF format)**
Delete the PDF file from the "Program Files\Panasonic\Lumix\" folder.

■ **For Mac**

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

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

3 Double click the PDF file to open it.

Care of the camera

Do not subject to strong vibration, shock, or pressure.
• The lens, monitor, or external case may be damaged if used in the following conditions.
  It may also malfunction or image may not be record if you:
  – Drop or hit the camera.
  – Press hard on the lens or the monitor.

The dust- and splash-proofing of this unit is not a guarantee of a full protection against the intrusion of dust and water. Please note the following to optimise the dust-proof and splash-proof performance:
  – Use a Panasonic interchangeable lens that supports the dust- and splash-proof design.
    When you are using an interchangeable lens that does not support the dust-splash proofing or are using the mount adaptor (DMW-MA1: optional), the dust-splash proofing of this unit is disabled.
  – **Use with the built-in flash closed.**
  – **Securely close each door part, socket cap and terminal cover of this unit.**
  – When you attach/detach the lens or cap, or open/close the door, make sure to prevent sand, dust, and water droplets from entering the interior of this unit.
  – If this unit is exposed to water or other liquids, wipe off the liquid with soft dry cloths after use.

Do not place your hands inside the mount of the digital camera body. Since the sensor unit is a precision apparatus, it may cause a malfunction or damage.

■ **About Condensation (When the lens, the viewfinder or monitor is fogged up)**
• Condensation occurs when the ambient temperature or humidity changes. Be careful of condensation since it causes lens, viewfinder and monitor stains, fungus and camera malfunction.
• If condensation occurs, turn the camera off and leave it for about 2 hours. The fog will disappear naturally when the temperature of the camera becomes close to the ambient temperature.

Accessories

Check that all the accessories are supplied before using the camera.
Product numbers correct as of October 2012. These may be subject to change.

Digital Camera Body
(This is referred to as **camera body** in these operating instructions.)
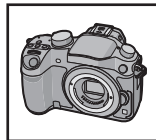
(○: Included, —: Not included)

		DMC-GH3A	DMC-GH3H	DMC-GH3
1	Interchangeable Lens*1	○ (H-HS12035)*4	○ (H-VS014140)*5	—
2	Lens Hood	○	○	—
3	Lens Cap	○*2	○*2	—
4	Lens Rear Cap	○*2	○*2	—
5	Body Cap	○*3	○*3	○*3

6   Battery Pack
(Indicated as **battery pack** or **battery** in the text)
Charge the battery before use.
7   Battery Charger
(Indicated as **battery charger** or **charger** in the text)
8   AC Mains Lead
9   USB Connection Cable
10 CD-ROM
  • Software:
    Use it to install the software to your PC.
11 CD-ROM
  • Operating Instructions for advanced features:
    Use it to install to your PC.
12 Shoulder Strap
13 Hot shoe cover*3

∗1 This is referred to as **lens** in these operating instructions.
∗2 This is attached to the interchangeable lens at the time of purchase.
∗3 This is attached to the camera body at the time of purchase.
∗4 The interchangeable lens (H-HS12035) included in DMC-GH3A is dust- and splash-proof.
∗5 The interchangeable lens (H-VS014140) included in DMC-GH3H is not dust- and splash-proof.
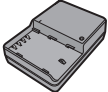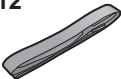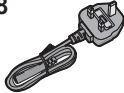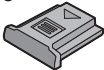
- SD Memory Card, SDHC Memory Card and SDXC Memory Card are indicated as **card** in the text.
- **The card is optional.**
- Description in these operating instructions is based on the interchangeable lens (H-HS12035). [The lens kit that includes the interchangeable lens (H-HS12035) is not commercially available in some regions.]
- Consult the dealer or Panasonic if you lose the supplied accessories. (You can purchase the accessories separately.)

	DMC-GH3A	DMC-GH3H	DMC-GH3
1	H-HS12035	H-VS014140	──
2	VYC1084	VYC0997	──
3	VYF3480	VYF3250	──
4	VFC4605	VFC4315	──
5	VKF4971	VKF4971	VKF4971

6	11
DMW-BLF19E	VFF1067
7	12
DMW-BTC10E	VFC4908
8	13
K2CT3YY00034	VYF3522
9	
K1HY08YY0025	
10	

Sales and Support Information

Customer Communications Centre
• For customers within the UK: 0844 844 3899
• For customers within Ireland: 01 289 8333
• For further support on your product, please visit our website:
  www.panasonic.co.uk

Direct Sales at Panasonic UK
• Order accessory and consumable items for your product with ease and confidence by phoning
  our Customer Communications Centre
  Monday–Thursday 9:00 a.m.–5:30 p.m.,
  Friday 9:30 a.m.–5:30 p.m. (Excluding public holidays)
• Or go on line through our Internet Accessory ordering application at www.pas-europe.com.
• Most major credit and debit cards accepted.
• All enquiries transactions and distribution facilities are provided directly by Panasonic UK.
• It couldn't be simpler!
• Also available through our Internet is direct shopping for a wide range of finished products.
  Take a browse on our website for further details.

∎ **Optional Accessories**

Lithum Ion Battery	DMW-BLF19
Battery Charger	DMW-BTC10
AC Adaptor[*1]	DMW-AC8
DC Coupler[*1]	DMW-DCC12
Battery Grip	DMW-BGGH3
Flash	DMW-FL360L, DMW-FL220, DMW-FL360, DMW-FL500
Stereo Shotgun Microphone	DMW-MS2
Remote Shutter	DMW-RSL1
MC Protector	DMW-LMCH58[*2], DMW-LMCH62[*3]
ND Filter	DMW-LND58[*2], DMW-LND62[*3]
PL Filter (Circular Type)	DMW-LPL58[*2], DMW-LPL62[*3]
Lens Cap	DMW-LFC58[*2], DMW-LFC62[*3]
Lens Rear Cap	DMW-LRC1
Body Cap	DMW-BDC1
Zoom Lever	DMW-ZL1
Tripod Adaptor[*4]	DMW-TA1
USB connection Cable	DMW-USBC1

AV Cable	DMW-AVC1
HDMI mini Cable	RP-CDHM15, RP-CDHM30
Interchangeable Lens	H-PS45175, H-PS14042, H-VS014140, H-HS35100, H-HS12035, H-FS45150, H-FS100300, H-FS045200, H-FS014042, H-FS014045, H-F007014, H-F008, H-ES045, H-X025, H-H020, H-H014
The 3D Interchangeable Lens	H-FT012
Mount Adaptor	DMW-MA1, DMW-MA2M, DMW-MA3R
Class 10 64 GB SDXC Memory Card Class 10 32 GB SDHC Memory Card Class 10 16 GB SDHC Memory Card Class 10 8 GB SDHC Memory Card Class 10 4 GB SDHC Memory Card Class 4 32 GB SDHC Memory Card Class 4 16 GB SDHC Memory Card Class 4 8 GB SDHC Memory Card Class 4 4 GB SDHC Memory Card Class 4 2 GB SD Memory Card This unit is compatible with UHS-I standard SDHC/SDXC memory cards.	RP-SDUB64GAK RP-SDA32GE1K/RP-SDUB32GAK/RP-SDRB32GAK RP-SDA16GE1K/RP-SDUB16GAK/RP-SDRB16GAK RP-SDA08GE1K/RP-SDUB08GAK/RP-SDRB08GAK RP-SDRB04GAK RP-SDLB32GAK RP-SDLB16GAK RP-SDLB08GAK RP-SDLB04GAK RP-SDLB02GAK

Some optional accessories may not be available in some countries.

∗1 The AC Adaptor (optional) can only be used with the designated Panasonic DC Coupler (optional). The AC adaptor (optional) cannot be used by itself.

∗2 When the interchangeble lens (H-HS12035) is used

∗3 When the interchangeble lens (H-VS014140) is used

∗4 Use if the attached lens is in contact with the tripod pedestal.

Names and Functions of Components

■ **Camera body**

1   Shutter button (P26)
2   Self-timer indicator (P55)/
    AF Assist Lamp
3   Sensor
4   Flash (P43)
5   Flash synchro socket∗
6   Lens fitting mark
7   Mount
8   Lens lock pin
9   Lens release button (P18)
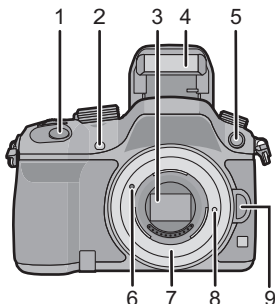
10 [▶] (Playback) button (P29)
11 [LVF] button (P22)/[Fn5] button (P25)
12 Viewfinder (P22)
13 Eye Cup∗ (P92)
14 Eye sensor (P22)
15 Diopter adjustment dial (P22)
16 [AF/AE LOCK] button (P52)
17 Focus mode lever (P48)
18 Rear dial
19 Motion picture button (P27)
20 Speaker
    • Be careful not to cover the speaker with your
      finger. Doing so may make sound difficult to
      hear.
21 Touch screen/monitor (P17)
22 [Q.MENU] button (P24)/[Fn2] button (P25)
23 [⊞] (Auto Focus Mode) button (P48)/
    [Fn3] button (P25)
24 [�🗑/↩] (Delete/Cancel) button (P33)/
    [Fn4] button (P25)
25 [MENU/SET] button (P17, 23)
26 Control dial (P17)/Cursor buttons (P17)
27 [DISP.] button (P28, 32)
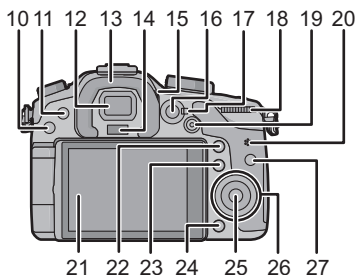
∗   If you lost the flash synchro socket cap (VKF5108) or eye cup (VYK6B43), please contact
    the dealer where you purchased the camera or Panasonic.

28 Drive mode dial
 Single (P26): ☐
 Burst (P53): ⊒
 Auto Bracket (P54): ⊒
 Self-timer (P55): ⟳
29 Hot shoe (Hot shoe cover)
 • Keep the Hot Shoe Cover out of reach of children
  to prevent swallowing.
30 Mode dial (P34)
31 [Wi-Fi] button (P60)/[Fn1] button (P25)
32 Front dial
33 [WB](White Balance) button (P46)
34 [ISO](ISO sensitivity) button (P45)
35 [⊠](Exposure Compensation) button (P44)
36 Flash open button (P43)
37 Stereo microphone
 • Be careful not to cover the microphone with your
  finger. Doing so may make sound difficult to
  record.
38 Status indicator (P21)
39 Camera ON/OFF switch (P21)
40 Wi-Fi connection lamp
41 Focus distance reference mark
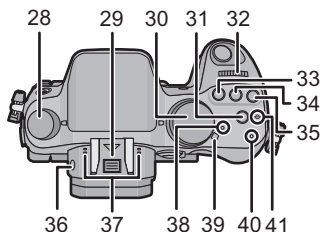
42 [MIC] socket
43 Headphone socket
44 [HDMI] socket (P76)
45 [AV OUT/DIGITAL] socket (P76, 79, 80)
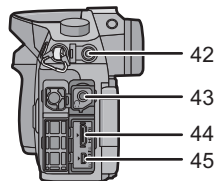
46 [REMOTE] socket
47 Shoulder strap eyelet (P18)
 • Be sure to attach the shoulder strap when using
  the camera to ensure that you will not drop it.
48 Card door (P20)
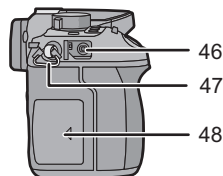
49 Tripod mount
   • A tripod with a screw length of 5.5 mm (0.22 inch) or more may damage this unit if attached.
50 Terminal cover✻
   • Keep the terminal cover out of reach of children to prevent swallowing.
51 Battery door (P20)
52 Release lever (P20)
53 DC coupler cover
   • When using an AC adaptor, ensure that the Panasonic DC coupler (DMW-DCC12: optional) and AC adaptor (DMW-AC8E: optional) are used.
   • Always use a genuine Panasonic AC adaptor (DMW-AC8E: optional).
   • When using an AC adaptor, use the AC mains lead supplied with the AC adaptor.
   • It is recommended to use a fully charged battery or AC adaptor when recording motion pictures.
   • If while recording motion pictures using the AC adaptor and the power supply is cut off due to a power outage or if the AC adaptor is disconnected etc., the motion picture will not be recorded.

49 50 53 51   52
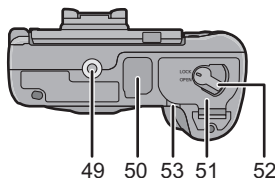
✻ If you lost the terminal cover (VKF5104), please contact the dealer where you purchased the camera or Panasonic.

■ **Lens**

H-HS12035
(LUMIX G X VARIO 12‒35 mm/
F2.8 ASPH./POWER O.I.S.)
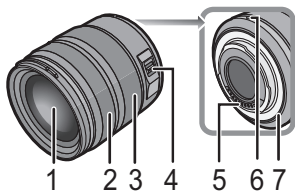
H-VS014140
(LUMIX G VARIO HD 14‒140 mm/
F4.0‒5.8 ASPH./MEGA O.I.S.)

1   2 3 4   5   6 7   1   2 3 4   5   6
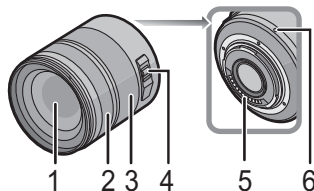
1 Lens surface
2 Focus ring (P51)
3 Zoom ring (P43)
4 [O.I.S.] switch
   • The interchangeable lens (H-HS12035, H-VS014140) have O.I.S switch. Stabiliser function is activated when the O.I.S switch of the lens is set to [ON]. ([(‖)] is set at the time of purchase)
5 Contact point
6 Lens fitting mark
7 Lens mount rubber

Touch screen

Touch panel of this unit is capacitive. Touch the panel directly with your bare finger.

∎ Touch
To touch and release the touch screen.
Use for selecting items or icons.
• When selecting features using the touch screen, be sure to touch the centre of the desired icon.
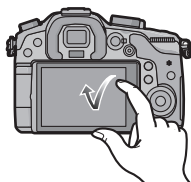
∎ Drag
A movement without releasing the touch screen.
This is used to move the AF area, operate the slide bar, etc.
This can also be used to move to the next image during playback, etc.
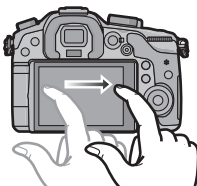
∎ Pinch (enlarge/reduce)
Pinch the touch panel apart (enlarge) or together (reduce) with two fingers.
Use to enlarge/reduce the played back images or AF area.
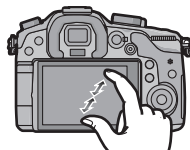
Cursor buttons/[MENU/SET] button

Pressing the cursor button:
Selection of items or setting of values etc., is performed.
Pressing [MENU/SET]:
Confirmation of setting contents, etc., is performed.
• This document expresses the up, down, left, and right of the cursor button as ▲/▼/◀/▶.
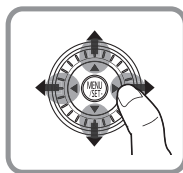
Control Dial

Rotating the control dial:
Selection of items or setting of values etc., is performed.
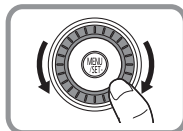
Preparation

• Check that the camera is turned off.

Changing the Lens

• Change lenses where there is not a lot of dirt or dust. Refer to P92, when dirt or dust gets on the lens.

Attaching the lens

• Do not press the lens release button Ⓐ when you attach a lens.

■ **Detaching the lens**
1 **Attach the lens cap.**
2 **While pressing on the lens release button Ⓑ, rotate the lens toward the arrow until it stops and then remove.**
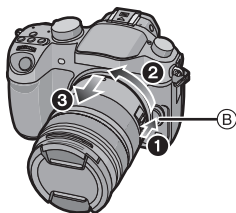
Attaching the Shoulder Strap

• **We recommend attaching the shoulder strap when using the camera to prevent it from dropping.**
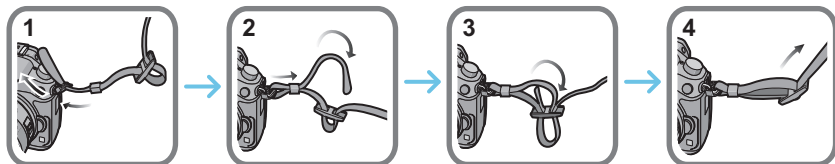
• Perform steps **1** to **4** and then attach the other side of the shoulder strap.

• Use the shoulder strap around your shoulder.
  – Do not wrap the strap around your neck.
  – It may result in injury or accident.
• Do not leave the shoulder strap where an infant can reach it.
  – It may result in an accident by mistakenly wrapping around the neck.

Charging the Battery

The battery that can be used with this unit is DMW-BLF19E.

1 **Connect the AC mains lead.**
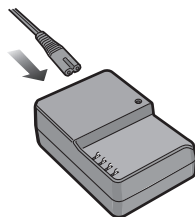
2 **Attach the battery paying attention to the direction of the battery until it clicks.**
   • The [CHARGE] indicator Ⓐ lights up and charging begins.
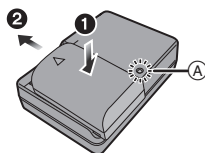
■ **About the [CHARGE] indicator**
The [CHARGE] indicator turns on:
The [CHARGE] indicator is turned on during charging.

The [CHARGE] indicator turns off:
The [CHARGE] indicator will turn off once the charging has completed without any problem. (Disconnect the charger from the electrical socket and detach the battery after charging is completed.)

■ **Charging time**

Charging time	Approx. 220 min

• **The indicated charging time is for when the battery has been discharged completely. The charging time may vary depending on how the battery has been used. The charging time for the battery in hot/cold environments or a battery that has not been used for a long time may be longer than normal.**

Inserting/Removing the Battery

• **Always use genuine Panasonic batteries (DMW-BLF19E).**
• **If you use other batteries, we cannot guarantee the quality of this product.**
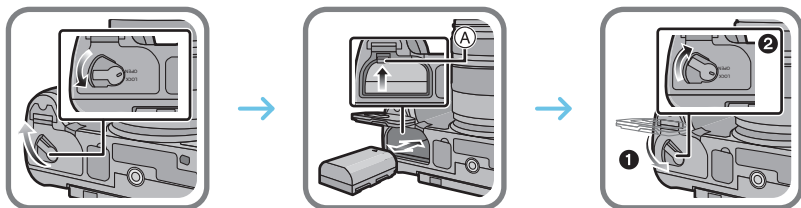
• Being careful about the battery orientation, insert all the way until you hear a locking sound and then check that it is locked by lever Ⓐ.
  Pull the lever Ⓐ in the direction of the arrow to remove the battery.

Inserting/Removing the Card (Optional)
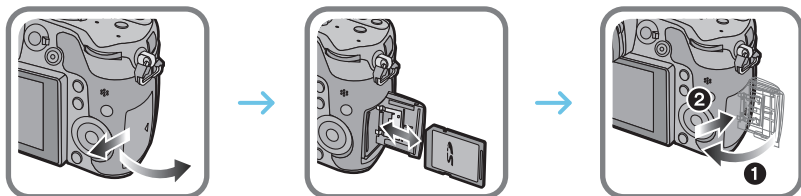
• Push it securely all the way until you hear a "click" while being careful about the direction in which you insert it.
  To remove the card, push the card until it clicks, then pull the card out upright.

■ **About cards that can be used with this unit**
SD Memory Card (8 MB to 2 GB)
SDHC Memory Card (4 GB to 32 GB)
SDXC Memory Card (48 GB, 64 GB)

■ **About the motion picture recording and SD speed class**
Confirm the SD Speed Class (the speed standard regarding continuous writing) on a card label etc. when you record a motion picture. Use a card with SD Speed Class with "Class 4" or more for [AVCHD]/[MP4] motion picture recording, and use "Class 10" for [MOV].

  e.g.:

  CLASS④   ④   CLASS⑩   ⑩

• Please confirm the latest information on the following website.
  http://panasonic.jp/support/global/cs/dsc/
  (This Site is English only.)

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

Formatting the card (initialisation)

Format the card before recording a picture with this unit.
Since data cannot be recovered after formatting, make sure to back up necessary data in advance.

Select [Format] in the [Setup] menu. (P23)
• Confirmation screen is displayed. It is executed when [Yes] is selected.

Setting Date/Time (Clock Set)

• **The clock is not set when the camera is shipped.**
1 **Turn the camera on.**
   • The status indicator ❶ lights when you turn this unit on.
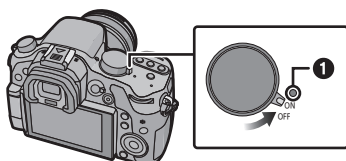
2 **Press [MENU/SET].**

3 **Press ◄/► to select the items (year, month, day, hour, minute), and press ▲/▼ to set.**
4 **Press [MENU/SET] to set.**
5 **Press [MENU/SET].**
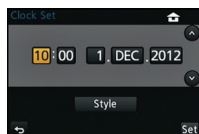
Using the Viewfinder

■ **About the eye sensor automatic switching**
When [LVF/Monitor Auto] of [Eye Sensor] in the
[Custom] menu is set to [ON] and your eye or an
object is brought close to the viewfinder, the display
automatically switches to the viewfinder display.

Ⓐ [LVF]/[Fn5] button
Ⓑ Eye sensor
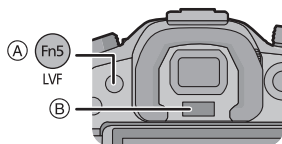
■ **Switching the Monitor/Viewfinder manually**

Press [LVF].

[LVF]/[Fn5] button can be used in two ways, as [LVF] or as [Fn5] (function 5). At the
time of purchase, it is initially set to [LVF/Monitor Switch].
• Refer to P25 for details about the function button.

■ **Diopter adjustment**
**Adjust the diopter to suit your vision so that you
can see the characters displayed in the
viewfinder clearly.**
Ⓒ Diopter adjustment dial
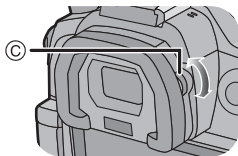
Setting the Menu

Setting menu items

1 Press [MENU/SET].

Menu	Description of settings
○ [Rec] (P83)	This menu lets you set the aspect ratio, number of pixels and other aspects of the pictures you are recording.
🎞 [Motion Picture] (P85)	This menu lets you set the [Rec Mode], [Rec Quality], and other aspects for motion picture recording.
⨍C [Custom] (P86)	Operation of the unit, such as displaying of the screen and button operations, can be set up according to your preferences.
⨍ [Setup] (P88)	This menu lets you perform the clock settings, select the operating beep tone settings and set other settings which make it easier for you to operate the camera. You can also configure the settings of Wi-Fi related functions.
▷ [Playback] (P90)	This menu lets you set the Protection, Cropping or Print Settings, etc. of recorded pictures.

2 Press ▲/▼ of the cursor button to select the menu item and press ▶.

3 Press ▲/▼ of the cursor button to select the setting and press [MENU/SET].

• Depending on the menu item, its setting may not appear or it may be displayed in a different ways.

∎ **Close the menu**
Press [🗑 / ↩] or press the shutter button halfway.

∎ **Switching to other menus**
e.g.: Switching to the [Setup] menu from [Rec] menu.

1 **Press ◄.**
2 **Press ▲/▼ to select [🔧] or another of the menu toggle icons Ⓐ.**
3 **Press ►.**
 • Select a menu item next and set it.

Calling frequently-used menus instantly (Quick Menu)

By using the Quick Menu, some of the menu settings can be easily found.
• The features that can be adjusted using Quick Menu are determined by the mode or a display style the camera is in.

[Q.MENU]/[Fn2] button can be used in two ways, as [Q.MENU] or as [Fn2] (function 2).
At the time of purchase, it is initially set to [Q.MENU].
• Refer to P25 for details about the function button.

1 **Press [Q.MENU] to display the Quick Menu.**
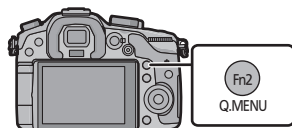
2 **Rotate the front dial to select the menu item.**

 Ⓐ Item

3 **Rotate the rear dial to select the setting.**

4 **Press [Q.MENU] to exit the menu once the setting is complete.**
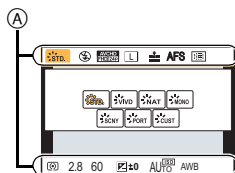
 • You can close the menu by pressing the shutter button halfway.

Assigning frequently used functions to the buttons (function buttons)

You can assign recording functions, etc. to specific buttons and icons.
To use those functions, press [Fn1], [Fn2], [Fn3], [Fn4] or [Fn5] or touch [Fn6] or [Fn7].
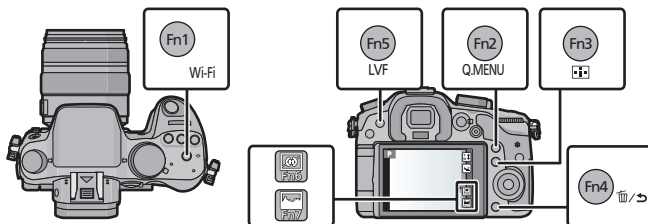
1 **Select the function buttons you want to assign the function from the [Fn Button Set] in the [Custom] menu. (P23)**

2 **Press ▲/▼ to select the function you want to assign and then press [MENU/SET].**

 • Assign your favourite functions to each of the function buttons.
 • Exit the menu after it is set.

Taking a Still picture

• Set the drive mode dial to [▢] (single).

1 Select the Recording Mode. (P34)

2 Press the shutter button halfway to focus.

Ⓐ Aperture value
Ⓑ Shutter speed

• Aperture value and shutter speed are displayed. (It will flash in red if the correct exposure is not achieved, except when set to flash.)
• **When the image is correctly focused, the picture will be taken, since the [Focus/Release Priority] is set initially to [FOCUS].**
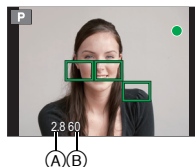
3 Press the shutter button fully (push it in further), and take the picture.

Recording Motion Picture

This can record full high definition motion pictures compatible with the AVCHD format or motion pictures recorded in MP4, MOV.
Audio will be recorded in stereo.

Item	Format
[AVCHD]	Select this format to record HD (high definition) video for playback on your HDTV using an HDMI connection.
[MP4]	Select this format to record standard definition video for playback on your PC.
[MOV]	Data format for image editing.

1 Start recording by pressing the motion picture button.

Ⓐ Elapsed recording time
Ⓑ Available recording time

- The recording state indicator (red) Ⓒ will flash while recording motion pictures.
- If approximately 10 seconds elapses without an operation being performed, part of the display will disappear. Press [DISP.] or touch the monitor to make the display reappear.
- Release the motion picture button right after you press it.
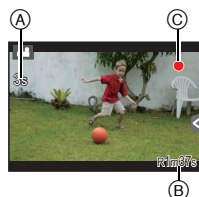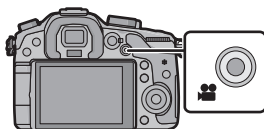
2 Stop the recording by pressing the motion picture button again.

- Maximum time to record motion pictures continuously with [AVCHD] is 29 minutes 59 seconds.
- Maximum time to record motion pictures continuously with [MP4] is 29 minutes 59 seconds or up to 4 GB.
- Maximum time to record motion pictures continuously with [MOV] is 29 minutes 59 seconds.
  Though a [MOV] motion picture can be recorded continuously without a pause even when its file size exceeds 4 GB, the recorded content is played back with multiple files.

Switching the Information Displayed on the recording screen

Press [DISP.] to change.

• Screen will switch as follows:
  (Example of monitor display)

Ⓐ   Ⓑ   Ⓒ   Ⓓ

Ⓕ   Ⓔ
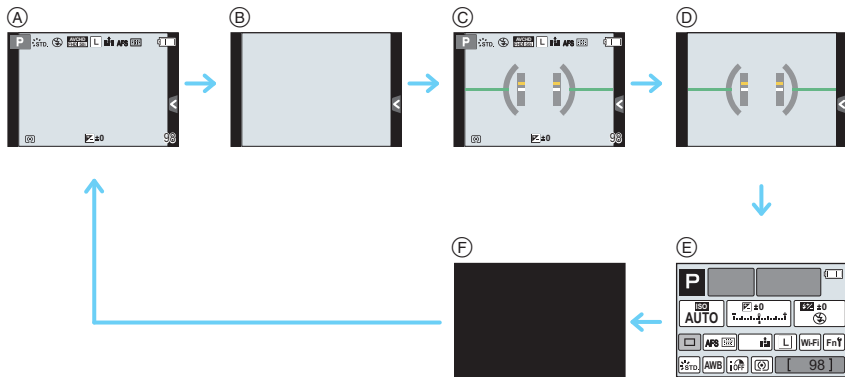
Ⓐ With information
Ⓑ Without information
Ⓒ With information (tilt sensor display)
Ⓓ Without information (tilt sensor display)
Ⓔ On-monitor recording information∗1
Ⓕ Turned off

∗1 It is displayed when the [Monitor Info. Disp.] of the [Custom] menu is set to [ON].
  Settings can be adjusted directly by touching each of the items displayed on the screen.

• If approximately 10 seconds elapses without an operation being performed, part of the display
  will disappear. Press [DISP.] or touch the monitor to make the display reappear.

Playing Back Pictures/Motion Pictures

Playing Back Pictures

1 **Press [▶].**
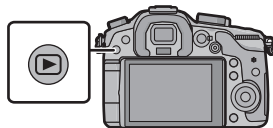
2 **Press ◀ or ▶.**

◀: Play back the previous picture

▶: Play back the next picture

Using the Playback Zoom

Rotate the rear dial right.

1✕ → 2✕ → 4✕ → 8✕ → 16✕

• You can move the enlarged part by pressing ▲/▼/◀/▶ of the cursor button or dragging the screen. (P17)

• You can also enlarge (2✕) the image by double-touching the part you want to enlarge. If you double-touch the enlarged image, the magnification is reset to 1✕.

• You can also enlarge/reduce the image by pinching out/pinching in (P17) on the part you want to enlarge/reduce.
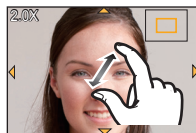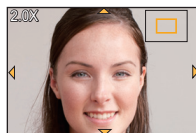
Displaying multiple screens (Multi Playback)

Rotate the rear dial left.

1 screen → 12 screens → 30 screens → Calendar screen display

• It is possible to switch the playback screen by touching the following icons.

– [▆]: 1 screen
– [▚]: 12 screens
– [▦]: 30 screens
– [CAL]: Calendar screen display

• Screen can be switched by dragging the slide bar up or down.

Ⓐ Slide bar
Ⓑ Number of the selected picture and the total number of recorded pictures

Displaying Pictures by Recording Date (Calendar Playback)

1 **Rotate the rear dial left to display the Calendar screen.**

2 **Press ▲/▼/◄/► to select the date to be played back.**
• If there were no pictures recorded during a month, that month is not displayed.

3 **Press [MENU/SET] to display the images that are recorded in selected date.**
• Rotate the rear dial left to return to the Calendar screen display.

4 **Press ▲/▼/◄/► to select a picture and then press [MENU/SET].**

Playing Back Motion Pictures

This unit was designed to play motion pictures using the AVCHD, MP4, MOV and QuickTime Motion JPEG formats.

In Playback Mode, select a picture with the motion picture icon ([🎥]), and then press ▲ to play back.

Ⓐ Motion picture icon
Ⓑ The motion picture recording time
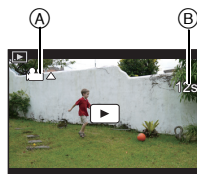
• After playback starts, the elapsed playback time is displayed on the screen.
• Touching [▶] in the middle of the screen allows you to play back motion pictures.

■ Operations performed during Motion Picture Playback

▲	▶/❙❙	Play/Pause	▼	■	Stop
◀	◀◀	Fast rewind	▶	▶▶	Fast forward
	◀❙❙	Frame-by-frame rewind (while pausing)		❙❙▶	Frame-by-frame forward (while pausing)
Control dial (left)	−	Reduce volume level	Control dial (right)	+	Increase volume level

Changing the information displayed on the playback screen

Press [DISP.] to switch the monitor screen.

• Screen will switch as follows:
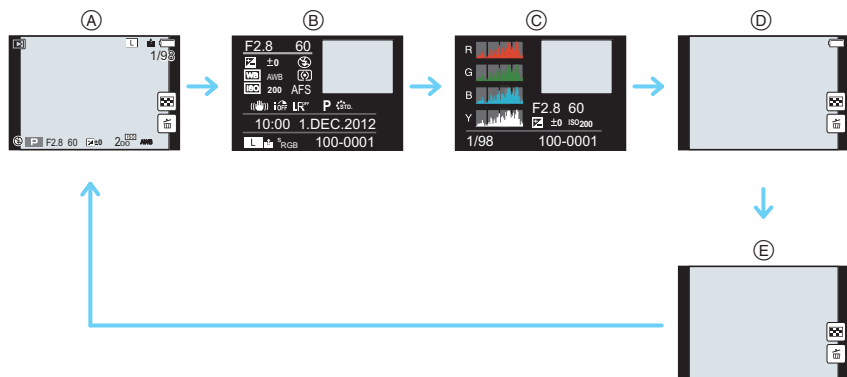
Ⓐ With information[*1]

Ⓑ Detailed information display

Ⓒ Histogram display

Ⓓ Without information (Highlight display)[*1, 2]

Ⓔ Without information

*1 If approximately 10 seconds elapses without an operation being performed, part of the display will disappear. Press [DISP.] or touch the monitor to make the display reappear.

*2 This is displayed if [Highlight] in the [Custom] menu is set to [ON].

Deleting Pictures

Once deleted, pictures cannot be recovered.

To delete a single picture

1 **In Playback Mode, select the picture to delete and then press [𝗆/↩].**

   • The same operation can be performed by touching [𝗆].
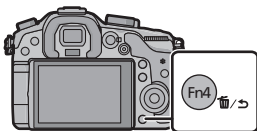
2 **Press ▲ to select [Delete Single] and then press [MENU/SET].**

   • Confirmation screen is displayed.
     Pictures are deleted by selecting [Yes].

Delete Single
Delete Multi
Delete All
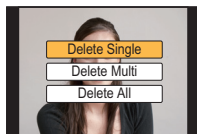
To delete multiple pictures (up to 100*) or all the pictures

* Picture groups are treated as a single picture. (All the pictures in the selected picture group will be deleted.)

1 **In Playback Mode, press [𝗆/↩].**

2 **Press ▲/▼ to select [Delete Multi] or [Delete All] and then press [MENU/SET].**

   • [Delete All] → Confirmation screen is displayed.
     Pictures are deleted by selecting [Yes].
   • It is possible to delete all pictures except the ones set as favourite when [All Delete Except Favorite] is selected with the [Delete All] set.

3 **(When [Delete Multi] is selected) Press ▲/▼/◄/► to select the picture, and then press [MENU/SET] to set.** (Repeat this step.)

   • [𝗆] appears on the selected pictures. If [MENU/SET] is pressed again, the setting is cancelled.

4 **(When [Delete Multi] is selected) Press ◄ to select [OK], and then press [MENU/SET] to execute.**

   • Confirmation screen is displayed.
     Pictures are deleted by selecting [Yes].

Selecting the Recording Mode

Select the mode by rotating the mode dial.

• Rotate the mode dial slowly to select the desired mode Ⓐ.
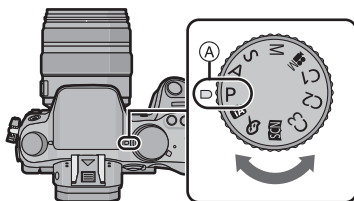
P	**Programme AE Mode (P35)**

Records at the aperture value and shutter speed set by the camera.

A	**Aperture-Priority AE Mode (P36)**

The shutter speed is automatically determined by the aperture value you set.

S	**Shutter-Priority AE Mode (P36)**

The aperture value is automatically determined by the shutter speed you set.

M	**Manual Exposure Mode (P37)**

The exposure is adjusted by the aperture value and the shutter speed which are manually adjusted.

🎦M	**Creative Video Mode (P56)**

Allows you to set the aperture value and shutter speed and record motion pictures with slow and quick effects.
✳ You cannot take still pictures.

C1C2C3	**Custom Mode (P42)**

Use this mode to take pictures with previously registered settings.

SCN	**Scene Guide Mode (P38)**

This allows you to take pictures that match the scene being recorded.

⟡	**Creative Control Mode (P39)**

Record while checking the image effect.

🅸🅰	**Intelligent Auto Mode (P40)**

The subjects are recorded using settings automatically selected by the camera.

🅸🅰⁺	**Intelligent Auto Plus Mode (P41)**

Allows you to adjust the brightness and colour hue when in Intelligent Auto Mode.

Taking Pictures with Your Favourite Settings

(Programme AE Mode)

Recording Mode: [P]

The camera automatically sets the shutter speed and the aperture value according to the brightness of the subject.
You can take pictures with greater freedom by changing various settings in the [Rec] menu.

1 **Set the mode dial to [P].**

2 **Press the shutter button halfway and display the aperture value and shutter speed value on the screen.**
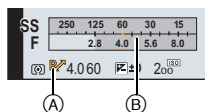
3 **While the values are displayed (about 10 seconds), perform Programme Shift by rotating the rear dial or front dial.**

• Rotate the front/rear dial to display [Expo.Meter] Ⓑ.
• The Programme Shift indication Ⓐ appears on the screen.
• To cancel Programme Shift, turn off this unit or rotate the front/rear dial until the Programme Shift indication disappears.

Programme Shift

In Programme AE Mode, you can change the preset aperture value and shutter speed without changing the exposure. This is called Programme Shift.
You can make the background more blurred by decreasing the aperture value or record a moving subject more dynamically by slowing the shutter speed when taking a picture in Programme AE Mode.

Taking Pictures by Specifying the Aperture/ Shutter Speed

Recording Mode: [A] [S] [M]

Aperture-Priority AE Mode

Set the aperture value to a higher number when you want a sharp focus background. Set the aperture value to a lower number when you want a soft focus background.

1 **Set the mode dial to [A].**

2 **Set the aperture value by rotating the rear dial or the front dial.**

Ⓐ Aperture value
Ⓑ Exposure meter

• The effects of the set aperture value will not be visible on the recording screen. To check on the recording screen, please use [Preview]. (P38)
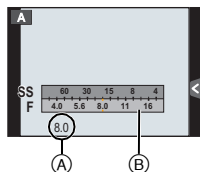
Shutter-Priority AE Mode

When you want to take a sharp picture of a fast moving subject, set with a faster shutter speed. When you want to create a trail effect, set to a slower shutter speed.

1 **Set the mode dial to [S].**

2 **Set the shutter speed by rotating the rear dial or the front dial.**

Ⓐ Shutter speed
Ⓑ Exposure meter

• The effects of the set shutter speed will not be visible on the recording screen. To check on the recording screen, please use [Preview]. (P38)
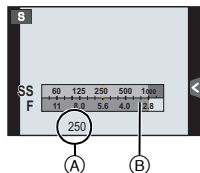
Manual Exposure Mode

Determine the exposure by manually setting the aperture value and the shutter speed.
The Manual Exposure Assistance appears on the lower portion of the screen to indicate
the exposure.

1 **Set the mode dial to [M].**

2 **Rotate the rear dial to set the shutter speed, and rotate the front dial to set the aperture value.**

Ⓐ Exposure meter
Ⓑ Aperture value
Ⓒ Shutter speed
Ⓓ Manual Exposure Assistance
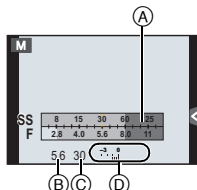
∎ Manual Exposure Assistance

±0	The exposure is adequate.
0 +3	Set to faster shutter speed or larger aperture value.
−3 0	Set to slower shutter speed or smaller aperture value.

∎ About [B] (Bulb)

If you set the shutter speed to [B], the shutter stays open while the shutter button is
pressed fully (up to approximately 60 minutes).
The shutter closes if you release the shutter button.
Use this when you want to keep the shutter open for a long time to take pictures of
fireworks, a night scene etc.
• When you take pictures with the shutter speed set to [B], noise may become visible. To avoid
  picture noise, we recommend setting [Long Shtr NR] in the [Rec] menu to [ON] before taking
  pictures.
• The Manual Exposure Assistance does not appear.
• This cannot be used when [Electronic Shutter] is set to [ON].
• It can only be used with Manual Exposure Mode.

∎ Constant preview

In Manual Exposure Mode, when [Constant Preview] in the [Custom] menu is [ON], you
will be able to confirm the effects of aperture and shutter speed on the screen. (P38)
• Close the flash.
• It can only be used with Manual Exposure Mode.

Confirm the Effects of Aperture and Shutter Speed (Preview Mode)

Applicable modes: 🅰🅰ᴾ Ⓟ Ⓐ Ⓢ Ⓜ ⧉ᴹ Ⓒ1 Ⓒ2 Ⓒ3 ⓈⒸⓃ ☞

1 **Set [Fn Button Set] in the [Custom] menu to [Preview]. (P25)**
   • The following step is an example in which [Preview] is assigned to [Fn4].
2 **Switch to confirmation screen by pressing [Fn4].**
   • Screen is switched every time [Fn4] is pressed.

Normal recording screen ⟶ **Effects of Aperture** ⟶ **Effects of Shutter Speed**

Taking Pictures that match the Scene being recorded (Scene Guide Mode)

Recording Mode: ⓈⒸⓃ

If you select a scene to suit the subject and recording conditions with reference to the example images, the camera will set optimal exposure, colour, and focus, allowing you to record in a manner appropriate to the scene.

1 **Set the mode dial to [ⓈⒸⓃ].**

2 **Press ◀/▶ to select the scene.**

   • You can also select the scene by dragging the example images.

3 **Press [MENU/SET] to set.**
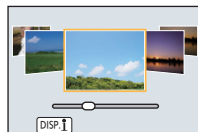
■ **To enjoy a variety of picture effects**
Press [DISP.] or touch [⸀ᴰᴵˢᴾ·Ⅰ⸀] on the scene selection screen to display explanations etc. for picture effects to suit the scene. To take full advantage of the picture effects, we recommend that you read the explanations and try recording pictures.

Taking Pictures with different image effects
(Creative Control Mode)

Recording Mode:

This mode records with additional image effects. You can set the effects to add by selecting example images and checking them on the screen.

1 **Set the mode dial to [ ].**

2 **Press ▲/▼ to select the image effects (filters).**

- You can also select the image effects (filters) by touching the example images.
- Press [DISP.] or touch [DISP. i] to display the explanation for the selected image effect.

3 **Press [MENU/SET] to set.**
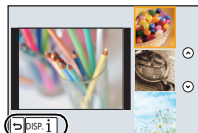
Adjust the effect to fit your preferences

The strength and colours of the effects can be easily adjusted to fit your preferences.

1 **Press [WB].**

2 **Rotate the rear dial to adjust.**
- The items that can be set differ depending on which Creative Control Mode is currently set.
- When making the effect setting, [ ] is displayed on the screen.
- If you cannot change the settings, select the centre (standard).
- Press [WB] again to return to the recording screen.
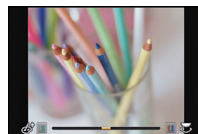
[One Point Color]

■ **Select the colour to leave in**
1 **Press ▲ to display the setting screen.**
2 **Select the colour you want to leave by moving the frame with ▲/▼/◄/►.**
3 **Press [MENU/SET] to set.**

Taking Pictures using the Automatic Function

(Intelligent Auto Mode)

Recording Mode: [iA] [iA⁺]

In this mode, the camera makes the optimal settings for the subject and scene, so we recommend it when you wish to leave the settings to the camera and record without thinking about them.

1 Set the mode dial to [iA].

• The camera will switch to either the most recently used of Intelligent Auto Mode or Intelligent Auto Plus Mode. (P41)
At the time of purchase, the mode is set to Intelligent Auto Plus Mode.

2 Align the screen with the subject.

• When the camera identifies the optimum scene, the icon of the scene concerned is displayed in blue for 2 seconds, after which its colour changes to the usual red.

• When the subject is touched, AF Tracking function works. It is also possible by pressing [⊞], and then pressing the shutter button halfway.
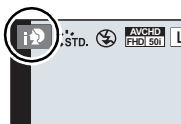
Taking a picture with a blurred background (Defocus Control)

You can easily set the blurriness of the background while checking the screen.

1 **Press [Fn4].**

2 **Set the blurriness by rotating the rear dial.**
• If you press [MENU/SET], you can return to the recording screen. (To end the Defocus Control function, press [Fn4].)
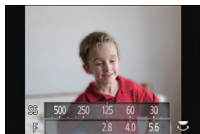
Recording images by changing the brightness or colour tone (Intelligent Auto Plus Mode)

Recording Mode:

This mode enables you to change the brightness and colour tone to your preferred settings from the ones set by the camera in Intelligent Auto Mode.

1 **Press [MENU/SET] when in Intelligent Auto Mode.**

2 **Press ▶ to select [ ] and then press [MENU/SET].**

- Press [DISP.] or touch [DISP.] to display the description of the selected mode.
- When the menu does not appear, select the [ ] tab on the menu screen.

Setting brightness

1 **Press [ ].**

2 **Rotate the rear dial to adjust brightness.**
- Press [ ] again to return to the recording screen.

Setting colour

1 **Press [WB].**

2 **Rotate the rear dial to adjust colour.**
- This will adjust the colour of the image from a reddish colour to a bluish colour.
- Press [WB] again to return to the recording screen.

Registering your preferred settings (Custom Mode)

Recording Mode: C1 C2 C3

You can register the current camera settings as custom settings. If you then record in Custom Mode, you can use the registered settings.
• Initial setting of the Programme AE Mode is registered as the custom settings initially.

Registering Personal Menu Settings (Registering custom settings)

To allow recording using the same settings, up to 5 sets of current camera settings can be registered using [Cust.Set Mem.]. (C1, C2, C3-1, C3-2, C3-3)

Preparations: Set in advance the Recording Mode you wish to save and select the desired menu settings on the camera.

1   **Select [Cust.Set Mem.] in the [Custom] menu. (P23)**

2   **Press ▲/▼ to select the custom set to register and then press [MENU/SET].**

   • Confirmation screen is displayed. It is executed when [Yes] is selected.
     Exit the menu after it is executed.

Recording using registered custom set

You can easily call up the settings you have registered using [Cust.Set Mem.].

1   **Set the mode dial to [C1], [C2] or [C3].**

   • If you set the mode dial to [C3], the camera calls a custom setting registered to [C3-1], [C3-2] or [C3-3]. The last custom setting you used is called.
     To change the custom setting
     → step **2**, **3**

2   **Press [MENU/SET] to display the menu.**

3   **Press ◄/► to select the custom setting you want to use, and then press [MENU/SET].**

■ **Changing the settings**
Registered contents do not change when the menu setting is changed temporarily with the mode dial set to C1, C2 or C3. To change the registered settings, overwrite the registered content using [Cust.Set Mem.] on the [Custom] menu.

Taking Pictures with the Zoom

Applicable modes: [IA] [IA+] [P] [A] [S] [M] [≡M] [C1] [C2] [C3] [SCN] [⟳]

■ Types of zooms and recording magnification

Feature	Optical Zoom	Extra Tele Conversion (EX) (P84, 85)	Digital Zoom (P84)
Recording magnification	Different depending on the lens used.	When taking still pictures: Max. 2×[*1] When recording motion pictures: 2.4×[*2]	When selecting [2×] When selecting [4×]
Picture quality	No deterioration	No deterioration	The higher the magnification level, the greater the deterioration.

∗1 When a picture size of [S] (4 M), aspect ratio of [4:3] is selected.
   The magnification level differs depending on [Picture Size] and [Aspect Ratio] setting.
∗2 When recording quality setting [FHD/25p], [FHD/24p], [FHD/25p/ ▮] or [FHD/24p/ ▮] is selected:

Taking pictures by using the flash

Applicable modes: [IA] [IA+] [P] [A] [S] [M] [≡M] [C1] [C2] [C3] [SCN] [⟳]

■ Open/Close the built-in flash

Taking a picture using the flash becomes possible by opening the built-in flash.

Ⓐ To open the built-in flash
Turn the camera on, and press the flash open button.

Ⓑ To close the built-in flash
Press the built-in flash until it clicks.
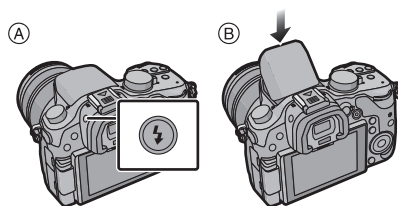
• Forcibly closing the flash can damage the camera.
• Be sure to close the built-in flash when not in use.

Changing Flash Mode

Applicable modes: iA iA⁺ [P][A][S][M] ≛M [C1][C2][C3][SCN] ⚙

Set the built-in flash to match the recording.
• Open the flash.

1 **Select [Flash] in the [Rec] menu. (P23)**
2 **Press ▲/▼ to select [Flash Mode] and then press [MENU/SET].**
3 **Press ▲/▼ to select the item and then press [MENU/SET].**

Compensating the Exposure

Applicable modes: iA iA⁺ [P][A][S] M ≛M [C1][C2][C3][SCN] ⚙

Use this function when you cannot achieve appropriate exposure due to the difference in brightness between the subject and the background.

1 Press [⤫].

2 Rotate the rear dial to compensate the exposure.

Ⓐ Exposure Compensation value
Ⓑ Flash Adjust
• You can switch the functions between the rear dial and the front dial by pressing [DISP.].
• Select [±0] to return to the original exposure.
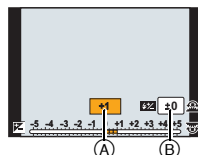
3 Rotate the front dial to adjust the flash output.

• Only available when [Auto Exposure Comp.] in [Flash] in the [Rec] menu is set to [ON], and [Firing Mode] in [Flash] is set to [TTL] or [WIRELESS].

4 Press [⤫] to set.

• You can also press the shutter button halfway to set.

Setting the Light Sensitivity

Applicable modes: [IA] [IA⁺] [P] [A] [S] [M] [⊞M] [C1] [C2] [C3] [SCN] [⌂]

This allows the sensitivity to light (ISO sensitivity) to be set. Setting to a higher figure enables pictures to be taken even in dark places without the resulting pictures coming out dark.

1 Press [ISO].

2 Rotate the rear dial to select the ISO sensitivity.

Ⓐ ISO sensitivity
Ⓑ ISO Limit Set
• You can switch the functions between the rear dial and the front dial by pressing [DISP.].
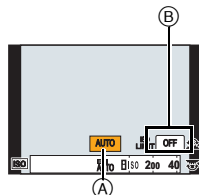
3 Rotate the front dial to set the upper limit of ISO sensitivity.

• It will work when the [Sensitivity] is set to [AUTO] or [ISO].

4 Press [ISO] to set.

• You can also set by pressing the shutter button halfway.

ISO sensitivity	Settings
AUTO	The ISO sensitivity is automatically adjusted according to the brightness. • Maximum [ISO3200] (With the flash on [ISO1600])∗1
ISO (Intelligent)	The ISO sensitivity is adjusted according to the movement of the subject and the brightness. • Maximum [ISO3200] (With the flash on [ISO1600])∗1 • The shutter speed is not fixed when the shutter button is pressed halfway. It is continuously changing to match the movement of the subject until the shutter button is pressed fully.
L.125∗²/200/400/800/1600/ 3200/6400/12800/H.25600∗²	The ISO sensitivity is fixed to various settings. • When the [ISO Increments] in [Rec] menu is set to [1/3 EV], items of ISO sensitivity that can be set will increase.

∗1 When [ISO Limit Set] is set to [OFF].
  When [ISO Limit Set] is set to [400], [800], [1600], [3200], [6400] or [12800], the camera optimises the ISO sensitivity according to the brightness of the subject within the range not exceeding the selected upper limit.
∗2 Only available when [Extended ISO] is set.

Adjusting the White Balance

Applicable modes: 🅰 🅰⁺ P A S M ⊞M C1 C2 C3 SCN ✎

In sunlight, under incandescent lights or in other such conditions where the colour of white takes on a reddish or bluish tinge, this item adjusts to the colour of white which is closest to what is seen by the eye in accordance with the light source.

1 Press [WB].

2 Rotate the rear dial or front dial to select the White Balance.

• Setting can also be performed by rotating the control dial.

3 Press ▼, and then press ◄/► or ▲/▼ to make fine adjustments to the White Balance.

◄ : A (AMBER: ORANGE)
► : B (BLUE: BLUISH)
▲ : G (GREEN: GREENISH)
▼ : M (MAGENTA: REDDISH)

• You can also make fine adjustments by touching the White Balance graph.
• To reset, press [DISP.].

4 Press [WB] to set.

• You can also press the shutter button halfway to set.

Item	Recording conditions
[AWB]	Automatic adjustment
[☼]	When taking pictures outdoors under a clear sky
[☁]	When taking pictures outdoors under a cloudy sky
[🏠]	When taking pictures outdoors in the shade
[⚲]	When taking pictures under incandescent lights
[⚡ᵂᴮ]＊	When taking pictures with the flash only
[🬐]/[🬑]/[🬒]/[🬓]	The manually set value is used
[𝕂]	When using the preset colour temperature setting

＊It will operate as [AWB] during motion picture recording.

White Balance Bracket

Bracket setting is performed based on the adjustment values for the White Balance fine adjustment, and 3 pictures with different colours are automatically recorded when the shutter button is pressed once.

1 **Press [WB].**

2 **Rotate the rear dial or front dial to select the White Balance, and then press ▼.**

3 **Rotate the control dial to set the bracket.**

Rotating the control dial to the right: Horizontal ([A] to [B])
Rotating the control dial to the left: Vertical ([G] to [M])

• You can also set the bracket by touching [◆]/[◆].
• To reset, press [DISP.].

4 **Press [MENU/SET].**

Setting the White Balance manually

Set the White Balance value. Use to match the condition when taking photographs.

1 **Press [WB].**

2 **Rotate the rear dial or front dial to select [▣], [▣], [▣], or [▣], and then press ▲.**

3 **Aim the camera at a sheet of white paper etc. so that the frame in the centre is filled by the white object only and then press [MENU/SET].**
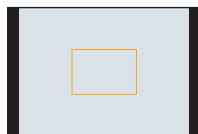
Setting the colour temperature

You can set the colour temperature manually for taking natural pictures in different lighting conditions. The colour of light is measured as a number in degrees Kelvin. As the colour temperature increases, the picture becomes more bluish. As the colour temperature decreases, the picture becomes more reddish.

1 **Press [WB].**

2 **Rotate the rear or front dial to select [▣], and then press ▲.**

3 **Press ▲/▼ to select the colour temperature and then press [MENU/SET].**

• You can set a colour temperature from [2500K] to [10000K].
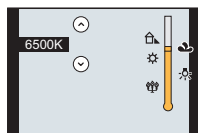
Taking Pictures with Auto Focus

Applicable modes: 🄰 🄰⁺ P A S M ≋M C1 C2 C3 SCN 🔗

This allows the focusing method that suits the positions and number of the subjects to be selected.
Also, it is possible to set the focus to the subject specified on the touch screen.
(Set the [Touch AF] of the [Touch Settings] in the [Custom] menu to [ON].)

[⊞]/[Fn3] button can be used in two ways, as [⊞] (AF Mode) or as [Fn3] (function 3).
At the time of purchase, it is initially set to [AF Mode].
• Refer to P25 for details about the function button.

1 Set the focus mode lever to [AFS/AFF] or [AFC] (P49).

2 Press [⊞].

3 Press ◄/► to select AF Mode and then press [MENU/SET].

• AF area selection screen is displayed when ▼ is pressed while
[👤], [▦], [▣], or [⊞] is selected.
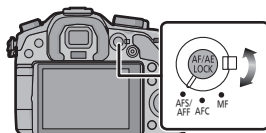
About the focus mode (AFS/AFF/AFC)

Item	The movement of the subject and the scene (recommended)	Description of settings
AFS✳	Subject is still (Scenery, anniversary photograph, etc.)	"AFS" is an abbreviation of "Auto Focus Single". Focus is set automatically when the shutter button is pressed halfway. Focus will be fixed while it is pressed halfway.
AFF✳	Movement cannot be predicted (Children, pets, etc.)	"AFF" is an abbreviation of "Auto Focus Flexible". In this mode, focusing is performed automatically when the shutter button is pressed halfway. If the subject moves while the shutter button is pressed halfway, the focus is corrected to match the movement automatically.
AFC	Subject is moving (Sport, trains, etc.)	"AFC" is an abbreviation of "Auto Focus Continuous". In this mode, while the shutter button is pressed halfway, focusing is constantly performed to match the movement of the subject. When the subject is moving, the focusing is performed by predicting the subject position at the time of recording. (Movement prediction)
MF	Set the focus manually. (P51)	

✳ In [AFS/AFF] of the [Custom] menu, you can assign [AFS] or [AFF] to the [AFS/AFF] of the focus mode lever.

Type of the Auto Focus Mode

About [😐] ([Face Detection])

The camera automatically detects the person's face. The focus and exposure can then be adjusted to fit that face no matter what portion of the picture it is in. (max. 15 areas)
When the camera detects a person's face, the AF area is displayed.
Yellow:
When the shutter button is pressed halfway, the frame turns green when the camera is focused.
White:
Displayed when more than one face is detected. Other faces that are the same distance away as faces within the yellow AF areas are also focused.

Setting up [⌖] ([AF Tracking])

Focus and exposure can be adjusted to a specified subject. Focus and exposure will keep on following the subject even if it moves. (Dynamic tracking)

∎ **When operating buttons**
Place the subject in the AF tracking frame, and press the shutter button halfway to lock the subject.

Ⓐ AF tracking frame

• AF area will turn green when the camera detects the subject.
• The AF area turns yellow when the shutter button is released.
• Lock is cancelled when [MENU/SET] is pressed.
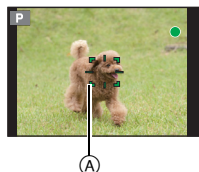
About [▩] ([23-Area])

Up to 23 points for each AF area can be focused. This is effective when the subject is not in the centre of the screen.
(AF area frame will be same as image aspect ratio setting)

About [▣] ([1-Area])

The camera focuses on the subject in the AF area on the centre of the screen.

About [⊞] ([Pinpoint])

You can achieve a more precise focus on a point that is smaller than [▣].

∎ **Setting up position of the AF area**
• Perform the operation after cancelling the touch shutter function.

1 **Select [⊞] and press ▼.**
2 **Press ▲/▼/◀/▶ to set the focus position and then press [MENU/SET].**
   • The assist screen is enlarged to approximately 5 times original size.
   • The assist screen can also be displayed by touching the subject.
3 **Press ▲/▼/◀/▶ to align the subject on the cross point of the crosshair in the centre of the screen.**
   • The focus position can also be set by dragging the screen.
   • Press [DISP.] to return the focus position to the centre of the screen.
   • On the assist screen, it is also possible to record a picture by touching [↧].

Taking Pictures with Manual Focus

Applicable modes: [iA] [iA+] [P] [A] [S] [M] [≌M] [C1] [C2] [C3] [SCN] [⟲]

Use this function when you want to fix the focus or when the distance between the lens and the subject is determined and you do not want to activate Auto Focus.

1 Set the focus mode lever to [MF].

2 Rotate the focus ring on the lens to focus on the subject.

Ⓐ Approximate indicator of ∞ (infinity)

• When the focus ring is rotated, display is switched to the assist screen and the image is enlarged (MF Assist Ⓑ). You can change the display method of the MF Assist at [MF Assist] in the [Custom] menu.

• MF guide Ⓒ is displayed on the screen when the focus ring is rotated if the [MF Guide] in the [Custom] menu is set to [ON]. You can check the direction of rotation of the focus ring is toward the near side or the far side.
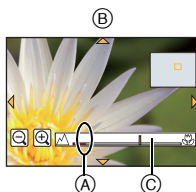
MF ASSIST

■ **Displaying the MF Assist**

• It is displayed by rotating the focus ring or touching the screen. (In the Creative Control Mode [Miniature Effect], MF Assistance cannot be displayed by touching the screen)
• It can also be displayed by pressing [⊞] to display the setup screen for the enlarged area, deciding the area to enlarge using the cursor button, and then pressing [MENU/SET].
• It will switch to the setting screen for the enlarged area by pressing the cursor button when the [Direct Focus Area] in the [Custom] menu is set to [ON].

■ **Changing the display of the MF Assist**

You can switch the magnification factor between approx. 4 times, 5 times and 10 times. In the case of 4 times magnification, the central region is magnified. In the case of 5 and 10 times magnification, the whole screen is magnified.

• To change the magnification, rotate the rear dial or touch [⊕]/[⊖].

■ **Moving the enlarged area**

• The enlarged area can be moved by dragging the screen (P17), or pressing the cursor button.
• The following will return the MF assistance to the original position.
  – When the [Focus Mode] is set to other than [MF]
  – Changing [Aspect Ratio] or [Picture Size]
  – Turning the camera off
  – Pressing [DISP.] when the setting screen for determining the area to be enlarged is displayed.

■ **Closing the MF Assist**

• It will close when the shutter button is pressed halfway.
• You can also close MF Assist by pressing [MENU/SET] or touching [Exit].
• When displayed by rotating the focus ring, it is closed approximately 10 seconds after the operation is stopped.

Fixing the Focus and the Exposure (AF/AE Lock)

Applicable modes: 🅸🅰 🅸🅰⁺ P A S M ⏻M C1 C2 C3 SCN 🍴

This is useful when you want to take a picture of a subject outside the AF area or the contrast is too strong and you cannot achieve appropriate exposure.

1 Align the screen with the subject.

2 Press and hold [AF/AE LOCK] to fix the focus or exposure.

• If you release [AF/AE LOCK], AF/AE Lock is cancelled.
• Only the exposure is locked in the default setting.

3 While pressing [AF/AE LOCK], move the camera as you compose the picture and then press shutter button fully.
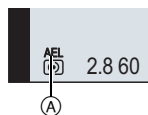
Ⓐ AE Lock indication

• When [AE LOCK] is set, after pressing the shutter button halfway to focus, press the shutter button fully.

■ AF/AE Lock
Locking of the focus and exposure can be set in [AF/AE Lock] in the [Custom] menu.

Item	Settings
[AE LOCK]	Only the exposure is locked. • [AEL], aperture value, the shutter speed light when the exposure is set.
[AF LOCK]	Only the focus is locked. • [AFL], the focus indication, aperture value, the shutter speed light when the subject is focused.
[AF/AE LOCK]	Both focus and exposure are locked. • [AFL], [AEL], the focus indication, aperture value and the shutter speed light when the subject is focused and the exposure is set.
[AF-ON]	Auto Focus Mode is activated.

Taking Pictures using Burst Mode

Applicable modes: ⒤Ⓐ ⒤Ⓐ⁺ Ⓟ Ⓐ Ⓢ Ⓜ ☰M C1 C2 C3 SCN ⟲

Pictures are taken continuously while the shutter button is pressed.
Pictures taken with a burst speed of [SH] will be recorded as a single burst group.

1 Set the drive mode dial to [▱ᵢ].

2 Focus on the subject and take a picture.

Ⓐ When Burst Mode is set to high speed [H].

• Hold down the shutter button fully to activate the Burst Mode.
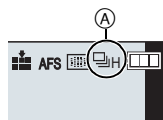
■ **Changing the burst speed**

1 Select [Burst Rate] in the [Rec] menu. (P23)
2 Press ▲/▼ to select the burst speed and then press [MENU/SET].

		[SH] (Super high speed)	[H] (High speed)	[M] (Middle speed)	[L] (Low speed)
Burst speed (pictures/second)		20	6	4	2
Live View during Burst Mode		None	None	Available	Available
∗1	**With RAW files**	—	18∗2, 3		
	Without RAW files	Max. 80	Depends on the capacity of the card∗3		

∗1 Number of recordable pictures

∗2 Depending on the recording conditions, the number of frames in a burst may be reduced. (For example, when [i.Resolution] of the recording menu is set to [EXTENDED], the number of frames in a burst may be reduced)

∗3 Pictures can be taken until the capacity of the card becomes full. However the burst speed will become slower halfway. The exact timing of this depends on the aspect ratio, the picture size, the setting for the quality and the type of card used.

■ **Focusing in Burst Mode**

Focus Mode	Focus/Release Priority	Focus
AFS	[FOCUS]	At the first picture
	[RELEASE]	
AFF/AFC∗1	[FOCUS]	Normal focusing∗2
	[RELEASE]	Predicted focusing∗3
MF	—	Focus set with Manual Focus

∗1 When the subject is dark or the burst speed is set to [SH], the focus is fixed on the first picture.
∗2 The burst speed may become slower because the camera is continuously focusing on the subject.
∗3 Burst speed takes priority, and focus is estimated within possible range.

Taking Pictures using Auto Bracket

Applicable modes: 🅰🅰P A S M ✂M C1 C2 C3 SCN ✄

Maximum of 7 pictures will be recorded with different exposure settings following the Exposure Compensation range every time the shutter button is pressed.

1 Set the drive mode dial to [▤].

2 Focus on the subject and take a picture.

Ⓐ Auto Bracket indication

- If you press and hold the shutter button, the number of pictures that you set is taken.
- The Auto Bracket indication blinks until the number of pictures that you set is taken.
- The picture count is reset to [0] if you change the Auto Bracket setting or turn the camera off before all the pictures that you set are taken.

■ **Changing the settings for [Single/Burst Settings], [Step] and [Sequence] in Auto Bracket**

1 Select [Auto Bracket] in the [Rec] menu. (P23)
2 Press ▲/▼ to select [Single/Burst Settings], [Step] or [Sequence] and then press ▶.
3 Press ▲/▼ to select the setting and then press [MENU/SET].
   • Exit the menu after it is set.

Taking Pictures with the Self-timer

Applicable modes: ⒤Ａ ⒤Ａ̃ P A S M ⸬M C1 C2 C3 SCN 🎨

1 **Set the drive mode dial to [⟳].**

2 **Press the shutter button halfway to focus and then press it fully to take the picture.**

Ⓐ When self-timer is set to [⟳₁₀].
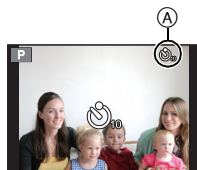
■ **Changing the time setting for the self-timer**

1 Select [Self Timer] in the [Rec] menu. (P23)
2 Press ▲/▼ to select the mode and then press [MENU/SET].

Item	Settings
⟳₁₀	Picture is taken 10 seconds after shutter is pressed.
⟳₁₀▦	After 10 seconds the camera takes 3 pictures at about 2 seconds intervals.
⟳₂	Picture is taken 2 seconds after shutter is pressed.

• Exit the menu after it is set.

Recording Motion Picture

Recording while monitoring camera images

During HDMI output, you can record while monitoring motion pictures on the TV, etc.
Refer to P76 on how to connect with TV by using HDMI mini cable (optional).

Checking the sound while recording motion pictures

You can record motion pictures while hearing the sounds that are being recorded by connecting a commercially available headphones to this unit.

• Do not use the headphone cables with the length of 3 m (9.8 feet) or more.
• Excessive sound pressure from earphones and headphones can cause hearing loss.

• 🎧 To prevent possible hearing damage, do not listen at high volume levels for long periods.

Recording still pictures while recording motion pictures

Applicable modes: 🅸🄰 🄰⁺ P A S M ⇅M C1 C2 C3 SCN ♪

Still pictures can be recorded even while recording a motion picture. (Simultaneous recording)

During motion picture recording, press the shutter button fully to record a still picture.

• Simultaneous recording indicator Ⓐ is displayed while recording still pictures.
• Recording with the Touch Shutter function is also available.
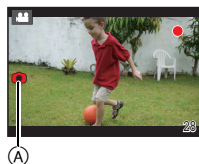
Recording motion pictures with manually set aperture value/shutter speed (Creative Video Mode)

Recording Mode: ⇅M

It is possible to manually change the aperture and shutter speed and record motion pictures.

1 **Set the mode dial to [⇅M].**

2 **Select [Exposure Mode] in the [Motion Picture] menu. (P23)**

3 **Press ▲/▼ to select [P], [A], [S] or [M], and then press [MENU/SET].**

• The operation for changing the aperture value or shutter speed is the same as the operation for setting the mode dial to P , A , S or M .

4 **Start recording.**

• Press the motion picture button or the shutter button to start recording a motion picture. (Still pictures cannot be taken.)

5 **Stop recording.**

• Press the motion picture button or the shutter button to stop recording a motion picture.

Motion pictures in slow and fast motion

Change the number of frames recorded and record motion pictures in slow and fast motion.

1 **Select [Frame Rate] in the [Motion Picture] menu. (P23)**

2 **Press ▲/▼/◄/► to select the item and then press [MENU/SET].**

Item	Settings
[OFF]	—
40% / 48% / 80%	Records 0.4 times, 0.48 times, and 0.8 times slower
160%/200%/300%	Records 1.6 times, 2.0 times, and 3.0 times faster

- For example, when a motion picture is recorded for 10 seconds with [200%], the length of the recorded motion picture will be 5 seconds.
- Exit the menu after it is set.

Minimizing operational sounds during motion picture recording

The operational sound of the zoom or button operation may be recorded when it is operated during the recording of a motion picture.
Using touch icons allows silent operation while recording motion pictures.
• Set [Silent Operation] in the [Motion Picture] menu to [ON].

1 Start recording.

2 Touch [🎬].

3 Touch icon to display the setting screen.

🔍	Zoom (When an interchangeable lens compatible with power zoom is used)
F	Aperture value
SS	Shutter speed
🔲	Exposure Compensation
ISO	ISO sensitivity
🎤	Mic level adjustment

4 Drag the slide bar to set.

- The speed of the zoom operation varies depending on the position you touch.

[▲]/[▼]	changes the setting slowly
[⬆]/[⬇]	changes the setting quickly

5 Stop recording.

Setting the recording method of time code

Applicable modes: ⒤Ⓐ P A S M ⒨⒨ C1 C2 C3 ⓢⒸⓃ⒢

Time code represents the recording time by the units of hour, minute, second and frame, and can be used as a time scale for editing motion pictures. This unit automatically records time code during motion picture recording.

• Time codes are not recorded on motion pictures recorded when the [Rec Mode] is set to [MP4].
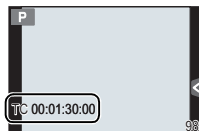
1 **Select [Time Code] in the [Motion Picture] menu. (P23)**

2 **Press ▲/▼ to select the item and then press [MENU/SET].**

Settings	Description of settings
[Time Code Display]	[ON]/[OFF]
[Count Up]	**[REC RUN]:** Counts the time code only when recording motion pictures. **[FREE RUN]:** Counts the time code even when not recording (including when this unit is turned off).
[Time Code Value]	**[Reset]:** Sets to 00:00:00:00 (hour: minute: second: frame) **[Manual Input]:** Manually input hour, minute, second and frame. **[Current Time]:** Sets hour, minute and second to current time and sets frame to 00.

What you can do with the Wi-Fi® function

Linking with the Wi-Fi compatible equipment allows you to remotely operate the camera, or share pictures with people in distant places even during recording or playing back.

[Remote Shooting] (P60)	[Playback on TV] (P66)
Linking with a smartphone/tablet enables the following: • Remote recording (P61) • Playing back the pictures in the camera (P62) • Saving the pictures in the camera to the smartphone/tablet, or sending them to WEB services. (P62) • Sending the acquired location information to the camera. (P62)	**By linking with the DLNA compatible TV, you can display pictures on TV right after taking them or display them on TV later by playing them back on the camera.**
[Send Images While Recording] (P67)	[Send Images Stored in the Camera] (P71)
Every time you take a picture, the picture can be automatically sent to a specified location. You can play back the picture on the smartphone/tablet, or save and edit it on PC. **• Send to:** – [Smartphone]/[PC]/[Cloud Sync. Service]/ [Web service]/[AV device]	**You can select and send recorded images.** **• Send to:** – [Smartphone]/[PC]/[Cloud Sync. Service]/ [Web service]/[AV device]/[Printer]
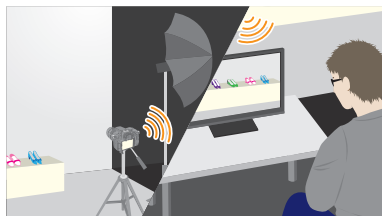
[Remote Shooting]

You can remotely operate the camera using a smartphone/tablet.
You need to install "LUMIX LINK" on your smartphone/tablet.

Installing the smartphone/tablet app "LUMIX LINK"

The "LUMIX LINK" is an application provided by Panasonic that allows your smartphone/tablet to perform the following operations of a Wi-Fi-compatible LUMIX.

	For Android™ apps	For iOS apps
Version	2.1 (As of October 2012)	
OS	Android 2.2~Android 4.0*	iOS 4.3~iOS 6.0
Installation procedure	**1** **Connect your Android device to a network.** **2** **Select "Google Play™ Store".** **3** **Enter "LUMIX LINK" into the search box.** **4** **Select "LUMIX LINK" and install it.** • The icon will be added to the menu.	**1** **Connect the iOS device to the network.** **2** **Select "App Store℠".** **3** **Enter "LUMIX LINK" into the search box.** **4** **Select "LUMIX LINK" and install it.** • The icon will be added to the menu.

• The service may not be able to be used properly depending on the type of smartphone/tablet being used. For compatible devices, see the following support site.
  http://panasonic.jp/support/global/cs/dsc/ (This Site is English only.)
• When downloading the app on a mobile network, high packet communication fees may be incurred depending on the details of your contract.
∗ To connect to this unit with [Wi-Fi Direct], Android OS 4.0 or above is required.

Connecting to a smartphone/tablet

Preparations:

• Install the "LUMIX LINK" in advance. (P60)

1 **Press [Wi-Fi].**

[Wi-Fi]/[Fn1] button can be used in two ways, as [Wi-Fi] or as [Fn1] (function 1). At the time of purchase, it is initially set to [Wi-Fi].
• Refer to P25 for details about the function button.
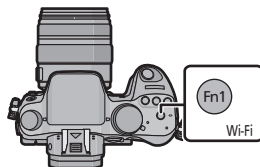
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
  • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite] (P62).

3 **Press ▲/▼ to select [Remote Shooting], and then press [MENU/SET].**

  • The information (SSID and password) required for directly connecting your smartphone/tablet to this unit is displayed.

On your smartphone/tablet
(The default connection method is set to [Manual Connection].)
4 **On the setting menu of your smartphone/tablet, turn on the Wi-Fi function.**
5 **Select the SSID that matches the one displayed on the screen of this unit, and then enter the password.**
6 **Start "LUMIX LINK" on your smartphone/tablet. (P60)**
  • When the connection is complete, live images being captured by the camera are displayed on the smartphone/tablet.

Taking pictures via a smartphone/tablet (remote recording)

Select [ ] on the smartphone/tablet.
• Motion pictures are recorded by timer recording. Set the recording time in advance.
• You cannot stop motion picture recording halfway from a smartphone/tablet. To stop the recording, operate the camera.
• A motion picture is not displayed on the screen of the smartphone/tablet during while its recording is taking place.
• The recorded images are saved in the camera.
• Some settings are not available.
• The screen differs depending on the operating system.
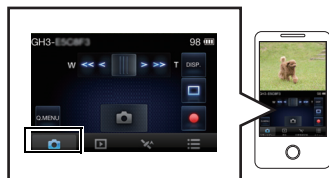
Playing back pictures in the camera

Select [▶] on a smartphone/tablet.
• You can save pictures on the smartphone/tablet.
• You can send pictures to a WEB service, etc.
• The screen differs depending on the operating system.
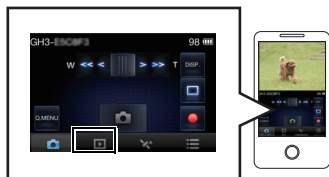
Sending location information to the camera from a smartphone/tablet

Select [⚲] on a smartphone/tablet.
• The screen differs depending on the operating system.
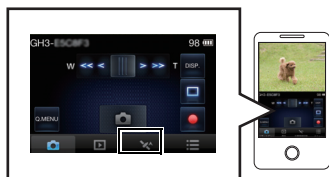
[Select a destination from History]

If you want to make a Wi-Fi connection with the setting you used before, you can select it from the history, and connect.
• The number of settings that can be saved in the history is limited. It is recommended that you save frequently used Wi-Fi connection settings in [Select a destination from Favorite].
• Performing [Reset Wi-Fi Settings] clears the history and the contents saved in [Select a destination from Favorite].
1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [Select a destination from History], and then press [MENU/ SET].**
3 **Select the desired connection setting with ▲/▼, and then press [MENU/SET].**
   • To display the connection detail, press [DISP.].

[Select a destination from Favorite]

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [Select a destination from Favorite], and then press [MENU/SET].**
3 **Select the desired connection setting with ▲/▼, and then press [MENU/SET].**
   • To display the connection detail, press [DISP.].

Selecting the connection method

• You can select whether to connect via a wireless access point or connect directly.

Connecting via a wireless access point

Press ▲/▼ to select connection method, and then press [MENU/SET].

Connection method	Description of settings	
[WPS (Push-Button)]*	Save push button type wireless access point that is compatible with Wi-Fi Protected Setup™ with a WPS mark.	P63
[WPS (PIN code)]	Save PIN code type wireless access point that is compatible with Wi-Fi Protected Setup with a WPS mark.	P63
[Manual Connection]	Select this option when you are not sure about the WPS compatibility, or when you want to search for and connect to a wireless access point.	P64

∗ WPS refers to a function that allows you to easily configure the settings related to the connection and security of wireless LAN devices. To check if the wireless access point you are using is compatible with WPS, refer to the manual of the wireless access point.

When connecting with [WPS (Push-Button)]

Press the wireless access point WPS button until it switches to WPS Mode.
• Refer to the wireless access point instruction manual for details.

e.g.:
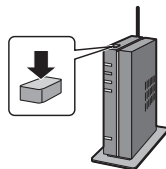
When connecting with [WPS (PIN code)]

1   **Press ▲/▼ to select the wireless access point you are connecting to, and press [MENU/SET].**
2   **Enter the PIN code displayed on the camera screen into the wireless access point.**
3   **Press [MENU/SET].**
    • Refer to the wireless access point instruction manual for details.

If you are not sure about the WPS compatibility (connecting by [Manual Connection])

Search for available wireless access points.
• Confirm encryption key of the selected wireless access point if the network authentication is encrypted.
• When connecting by [Manual Input], confirm SSID, encryption type, encryption key of the wireless access point you are using.

1 **Press ▲/▼ to select the wireless access point you are connecting to, and press [MENU/SET].**
   • Touching [DISP.] will search for a wireless access point again.
   • If no wireless access point is found, refer to "When connecting with [Manual Input]" on P64.
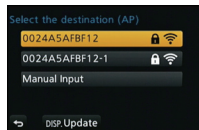
2 **(If network authentication is encrypted)**
   Enter the encryption key.
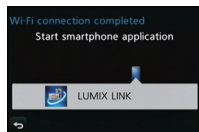
■ **When connecting with [Manual Input]**
1 **On the screen displayed in step 1 of "If you are not sure about the WPS compatibility (connecting by [Manual Connection])", select [Manual Input] by pressing ▲/▼, then press [MENU/SET].**
2 **Enter the SSID of the wireless access point you are connecting to, then select [Set].**
3 **Press ▲/▼ to select the network authentication type, and press [MENU/SET].**
   • For information on network authentication, see the manual of the wireless access point.
4 **Press ▲/▼ to select the encryption type, and press [MENU/SET].**
   • The type of settings that can be changed may vary depending on the details of network authentication settings.

Network authentication type	Encryption types that can be set
[WPA2-PSK]/[WPA-PSK]	[TKIP]/[AES]
[Common Key]	[WEP]
[Open]	[No Encryption]/[WEP]

5 **(When an option other than [No Encryption] is selected)**
   Enter the encryption key and select [Set].

Connecting directly

• Directly connect this unit to the device you are using as a wireless access point. You can connect this unit and your device in a method supported by your device.

Press ▲/▼ to select connection method, and then press [MENU/SET].

Connection method	Description of settings
[Wi-Fi Direct]™	*1* Set the device to Wi-Fi Direct mode. *2* Press ▲/▼ to select [Wi-Fi Direct] and then press [MENU/SET]. *3* Press ▲/▼ to select the device to connect to, and then press [MENU/SET]. • Read the operating instructions of your device for details.
[WPS Connection]	**[WPS (Push-Button)]** *1* Press ▲/▼ to select [WPS (Push-Button)] and then press [MENU/SET]. *2* Set the device to WPS mode. • You can wait longer for a connection by pressing the [DISP.] button on this unit. **[WPS (PIN code)]** *1* Press ▲/▼ to select [WPS (PIN code)] and then press [MENU/SET]. *2* Enter the PIN code of the device into this unit.
[Manual Connection]	Enter the SSID and password into the device. The SSID and password are displayed on the connection waiting screen of this unit.

[Playback on TV]

Displaying the picture on TV right after taking it/Displaying the picture on TV by playing it back on the camera

Preparations:

Set the TV to DLNA waiting Mode.
• Read the operating instructions for your TV.

1 **Press [Wi-Fi].**

2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite] (P62).

3 **Press ▲/▼ to select [Playback on TV], and then press [MENU/SET].**

4 **Press ▲/▼ to select connection method, and then press [MENU/SET].**
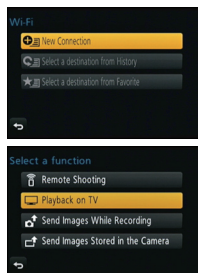
[Via Network]	When you want to connect to your TV via an wireless access point. (P63)
[Direct]	When you want to directly connect your TV to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P65)

5 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**
   • When the connection is established, the screen is displayed.
6 **Take or play back pictures on this unit.**
   • To change the setting or disconnect, press [Wi-Fi].

[Send Images While Recording]

A picture can be automatically sent to a specified device every time you take it.
Since the camera gives priority to recording, sending may take longer during the recording of Burst pictures or motion pictures.
• Motion pictures cannot be sent.
• If you turn off this unit or the Wi-Fi connection before sending is complete, unsent pictures will not be resent.
• You may not be able to delete files or use the playback menu while sending.
• When sending images on a mobile network, high packet communication fees may be incurred depending on the details of your contract.

When sending images to smartphone/tablet

Preparations:

• Install the "LUMIX LINK" in advance. (P60)

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite] (P62).
3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/ SET].**
4 **Press ▲/▼ to select [Smartphone], and then press [MENU/SET].**
5 **Select the connection method.**
6 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**
   • When the connection is complete, the screen is displayed. To change the send setting, press [DISP.].
7 **Take pictures.**
   • The pictures are sent automatically after taking them.
   • To change the setting or disconnect, press [Wi-Fi].
     You cannot change the settings while sending pictures. Wait until sending is complete.

When sending images to PC

Preparations:

• Turn the computer on.
• Prepare folders for receiving images on the PC before sending a picture to the PC.

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite] (P62).
3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/SET].**
4 **Press ▲/▼ to select [PC], and then press [MENU/SET].**
5 **Press ▲/▼ to select connection method, and then press [MENU/SET].**

[Via Network]	When you want to connect to your PC via a wireless access point. (P63)
[Direct]	When you want to directly connect your PC to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P65)

6 **Press ▲/▼ to select the PC you want to connect to, and then press [MENU/SET].**
7 **Press ▲/▼ to select the folder you want to send, and then press [MENU/SET].**
   • When the connection is complete, the screen is displayed. To change the send setting, press [DISP.].
8 **Take pictures.**
   • To change the setting or disconnect, press [Wi-Fi].
   You cannot change the settings while sending pictures. Wait until sending is complete.

When sending images to [Cloud Sync. Service]

Preparations:

You need to register to "LUMIX CLUB" and configure the Cloud Sync. setting to send a picture to a Cloud Folder.

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite] (P62).
3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/SET].**
4 **Press ▲/▼ to select [Cloud Sync. Service], and then press [MENU/SET].**
5 **Press ▲/▼ to select connection method, and then press [MENU/SET]. (P63)**
6 **Check the send setting.**
   • When the connection is complete, the screen is displayed. To change the send setting, press [DISP.].
7 **Take pictures.**
   • To change the setting or disconnect, press [Wi-Fi].
     You cannot change the settings while sending pictures. Wait until sending is complete.

When sending images to WEB Service

Preparations:

You need to register to "LUMIX CLUB" to send a picture to a WEB service.
When sending images to WEB services, such as Facebook or YouTube, the WEB service being used must be registered with the "LUMIX CLUB". Registering multiple WEB services will send images to all services simultaneously.

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite] (P62).
3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/SET].**
4 **Press ▲/▼ to select [Web service], and then press [MENU/SET].**
5 **Press ▲/▼ to select connection method, and then press [MENU/SET]. (P63)**
6 **Press ▲/▼/◄/► to select a WEB service you want to connect, and then press [MENU/SET].**
   • When the connection is complete, the screen is displayed. To change the send setting, press [DISP.].
7 **Take pictures.**
   • To change the setting or disconnect, press [Wi-Fi].
     You cannot change the settings while sending pictures. Wait until sending is complete.

When sending images to AV device

Preparations:

When sending a picture to [Home], set your device to DLNA waiting mode.
• Read the operating instructions of your device for details.
When sending images to [External], the following are required:
• Registration to "LUMIX CLUB".
• Address number and access number acquired by the destination External AV device.

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite] (P62).
3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/SET].**
4 **Press ▲/▼ to select [AV device], and then press [MENU/SET].**
5 **Press ▲/▼ to select [Home] or [External], and then press [MENU/SET].**
6 **Press ▲/▼ to select connection method, and then press [MENU/SET].**
   • When [External] is selected, the screen for setting a wireless access point is displayed. (P63)

[Via Network]	When you want to connect to an AV device via a wireless access point. (P63)
[Direct]	When you want to directly connect an AV device to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P65)

7 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**
   • When the connection is complete, the screen is displayed. To change the send setting, press [DISP.].
8 **Take pictures.**
   • To change the setting or disconnect, press [Wi-Fi].
     You cannot change the settings while sending pictures. Wait until sending is complete.

[Send Images Stored in the Camera]

• When sending images on a mobile network, high packet communication fees may be incurred depending on the details of your contract.
• Details of the playback menu [Favorite] or [Print Set] settings will not be sent.
• Some images taken with a different camera may not be able to be sent.
• Images that have been modified or edited with a computer may not be able to be sent.

When sending images to smartphone/tablet

Preparations:

• Install the "LUMIX LINK" in advance. (P60)

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite] (P62).
3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**
4 **Press ▲/▼ to select [Smartphone], and then press [MENU/SET].**
5 **Select the connection method.**
6 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**
   • When the connection is complete, the screen is displayed. To change the send setting, press [DISP.].
7 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/SET].**
   • To change the setting or disconnect, press [Wi-Fi].
8 **Select and send the images.**

When sending images to PC

Preparations:

• Turn the computer on.
• Prepare folders for receiving images on the PC before sending a picture to the PC.

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite]. (P62)
3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**
4 **Press ▲/▼ to select [PC], and then press [MENU/SET].**
5 **Press ▲/▼ to select connection method, and then press [MENU/SET].**

[Via Network]	When you want to connect to your PC via a wireless access point. (P63)
[Direct]	When you want to directly connect your PC to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P65)

6 **Press ▲/▼ to select a PC you want to connect, and then press [MENU/SET].**
7 **Press ▲/▼ to select the folder you want to send, and then press [MENU/SET].**
   • When the connection is complete, the screen is displayed. To change the send setting, press [DISP.].
8 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/SET].**
   • To change the setting or disconnect, press [Wi-Fi].
9 **Select and send the images.**

When sending images to [Cloud Sync. Service]

Preparations:

You need to register to "LUMIX CLUB" and configure the Cloud Sync. setting to send a picture to a Cloud Folder.

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite]. (P62)
3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**
4 **Press ▲/▼ to select [Cloud Sync. Service], and then press [MENU/SET].**
5 **Press ▲/▼ to select connection method, and then press [MENU/SET]. (P63)**
6 **Check the send setting.**
   • When the connection is complete, the screen is displayed. To change the send setting, press [DISP.].
7 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/SET].**
   • To change the setting or disconnect, press [Wi-Fi].
8 **Select and send the images.**

When sending images to WEB Service

Preparations:

You need to register to "LUMIX CLUB" to send a picture to a WEB service.
When sending images to WEB services, such as Facebook or YouTube, the WEB service being used must be registered with the "LUMIX CLUB". Registering multiple WEB services will send images to all services simultaneously.

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite]. (P62)
3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**
4 **Press ▲/▼ to select [Web service], and then press [MENU/SET].**
5 **Press ▲/▼ to select connection method, and then press [MENU/SET]. (P63)**
6 **Press ▲/▼/◄/► to select a WEB service you want to connect, and then press [MENU/SET].**
   • When the connection is complete, the screen is displayed. To change the send setting, press [DISP.].
7 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/SET].**
   • To change the setting or disconnect, press [Wi-Fi].
8 **Select and send the images.**

When sending images to AV device

Preparations:

When sending a picture to [Home], set your device to DLNA waiting mode.
• Read the operating instructions of your device for details.
When sending images to [External], the following are required:
• Registration to "LUMIX CLUB".
• Address number and access number acquired by the destination External AV device.

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
  • When connecting with the setting you used before, you can select the connection
    destination from [Select a destination from History] (P62) or [Select a destination from
    Favorite]. (P62)
3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press
  [MENU/SET].**
4 **Press ▲/▼ to select [AV device], and then press [MENU/SET].**
5 **Press ▲/▼ to select [Home] or [External], and then press [MENU/SET].**
6 **Press ▲/▼ to select connection method, and then press [MENU/SET].**
  • When [External] is selected, the screen for setting a wireless access point is displayed.
    (P63)

[Via Network]	When you want to connect to an AV device via a wireless access point. (P63)
[Direct]	When you want to directly connect an AV device to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P65)

7 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**
  • When the connection is complete, the screen is displayed. To change the send setting,
    press [DISP.].
8 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/
  SET].**
  • To change the setting or disconnect, press [Wi-Fi].
9 **Select and send the images.**

When sending images to Printer

Preparations:

• You can print out recorded pictures wirelessly from a PictBridge (wireless LAN-compatible)∗ printer.
∗ Compliant with the DPS over IP standards.
 See the following website for information on the PictBridge (wireless LAN-compatible) printer.
 http://panasonic.jp/support/global/cs/dsc/ (This Site is English only.)

1 **Press [Wi-Fi].**
2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
   • When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P62) or [Select a destination from Favorite] (P62).
3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**
4 **Press ▲/▼ to select [Printer], and then press [MENU/SET].**
5 **Press ▲/▼ to select connection method, and then press [MENU/SET].**

[Via Network]	When you want to connect to your Printer via a wireless access point. (P63)
[Direct]	When you want to directly connect your printer to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P65)

6 **Press ▲/▼ to select a printer you want to connect, and then press [MENU/SET].**
7 **Select pictures, and then print. (P80)**
   • To change the setting or disconnect, press [Wi-Fi].

Playing Back Pictures on a TV Screen

Preparations: Turn this unit and the TV off.

1 Connect the camera and a TV.

• Check the direction of the terminals and plug in/out straight holding onto the plug. (It may result in malfunction by the deforming of the terminal if it is plugged in obliquely or in wrong direction.)

To connect with an HDMI mini cable (optional)
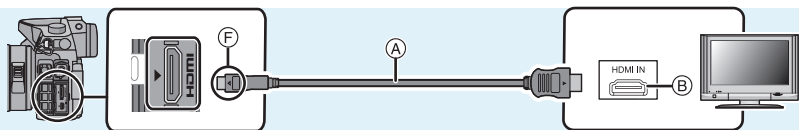
• Always use a genuine Panasonic HDMI mini cable (RP-CDHM15, RP-CDHM30: optional). Part numbers: RP-CDHM15 (1.5 m) (5 feet), RP-CDHM30 (3.0 m) (10 feet)

To connect with an AV cable (optional)
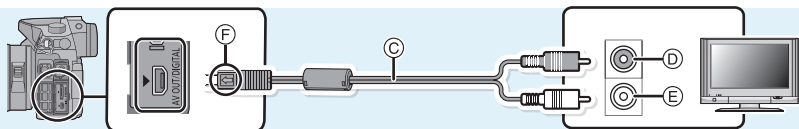
• Always use a genuine Panasonic AV cable (DMW-AVC1: optional).

Ⓐ HDMI mini cable (optional)
Ⓑ HDMI socket
Ⓒ AV cable (optional)
Ⓓ Yellow: to the video input socket
Ⓔ White: to the audio input socket
Ⓕ Align the marks, and insert.

2 Turn on the TV and select the input to match the connector in use.

3 Turn the camera on and then press [▶].

• Input of the TV will switch automatically and playback screen is displayed when connected to a VIERA Link compatible TV using an HDMI mini cable with the [VIERA Link] set to [ON].

Saving still pictures and motion pictures on your PC

■ **PC that can be used**

The unit can be connected to any PC capable of recognising a mass storage device.

• Windows support: Windows 7/Windows Vista/Windows XP

• Mac support: OS X v10.1 ~ v10.8

AVCHD motion pictures may not be imported correctly when copied as files or folder.
• With Windows, always import AVCHD motion pictures using "PHOTOfunSTUDIO", one of the programmes on the CD-ROM (supplied).
• With a Mac, AVCHD motion pictures can be imported using "iMovie'11".
Note that motion pictures (AVCHD Progressive) recorded in [FHD/50p] of [AVCHD] cannot be imported.
(For details about iMovie'11, please contact Apple Inc.)

About the supplied software

• **PHOTOfunSTUDIO 8.5 PE (Windows XP/Vista/7)**
This software allows you to acquire pictures to the PC, and also categorise these acquired pictures by their recording date or the model name of the camera used.

• **SILKYPIX Developer Studio**
(Windows XP/Vista/7, Mac OS X v10.4/v10.5/v10.6/v10.7/v10.8)
This is software to edit RAW format images.

For details on how to use the SILKYPIX Developer Studio, refer to the "Help" or the Ichikawa Soft Laboratory's support website:
http://www.isl.co.jp/SILKYPIX/english/p/support/

• **LoiLoScope 30 day full trial version (Windows XP/Vista/7)**
LoiLoScope is a video editing software where that draws out the full power of your PC.
– This will only install a shortcut to the trial version download site.

For more information on how to use LoiLoScope, read the LoiLoScope manual available for download at the link below.
Manual URL: http://loilo.tv/product/20

■ **Installing supplied software**

• Before inserting the CD-ROM, close all running applications.

1 Check the environment of your PC.

• **Operating environment of "PHOTOfunSTUDIO 8.5 PE"**
  – OS:
    Windows® XP (32bit) SP3,
    Windows Vista® (32bit) SP2,
    Windows® 7 (32bit/64bit) or SP1
  – CPU:
    Pentium® III 500 MHz or higher (Windows® XP),
    Pentium® III 800 MHz or higher (Windows Vista®),
    Pentium® III 1 GHz or higher (Windows® 7)
  – Display:
    1024×768 pixels or more (1920×1080 pixels or more recommended)
  – RAM:
    512 MB or more (Windows® XP/Windows Vista®),
    1 GB or more (Windows® 7 32bit),
    2 GB or more (Windows® 7 64bit)
  – Free hard disk space:
    450 MB or more for installing software
• Refer to the operating instructions of "PHOTOfunSTUDIO" (PDF) for further operating environment.
• For details on SILKYPIX Developer Studio 3.1 SE, please read the support site given on P77.

2 Insert the CD-ROM with the supplied software.

• When you insert the supplied CD-ROM, the install menu will start.

3 Click on the [Recommended Installation].

• Proceed with installation according to messages appearing on the screen.

• The software compatible with your PC will be installed.
• "PHOTOfunSTUDIO" is not compatible with Mac.
• On the Mac, SILKYPIX can be installed manually.

❶ Insert the CD-ROM with the supplied software.

❷ Double-click on the automatically displayed folder.

❸ Double-click the icon in the application folder.

■ **Transferring pictures to a PC**

Preparations: Install "PHOTOfunSTUDIO" to the PC.

1   Connect the computer and camera with the USB connection cable (supplied).

- Please turn this unit on and your PC before connecting.
- Turn the monitor toward you.
- Check the directions of the connectors, and plug them straight in or unplug them straight out. (Otherwise, the connectors may bend out of shape, which will cause a malfunction.)
- Do not use any other USB connection cables except the supplied one or a genuine Panasonic USB connection cable (DMW-USBC1: optional).
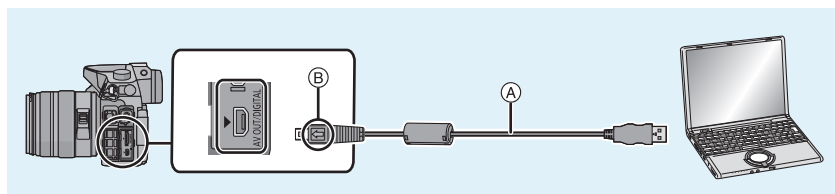
Ⓐ USB connection cable (supplied)
Ⓑ Align the marks, and insert.

2   Press ▲/▼ to select [PC], and then press [MENU/SET].

- If [USB Mode] is set to [PC] in the [Setup] menu in advance, the camera will be automatically connected to the PC without displaying the [USB Mode] selection screen.
- When the camera is connected to a PC while [USB Mode] is set to [PictBridge(PTP)], a message may appear on the PC screen. In that case, close the message, and remove the USB connection cable safely, and then set the [USB Mode] to [PC].

3   Copy the images to a PC using "PHOTOfunSTUDIO".

- Do not delete or move copied files or folders in Windows Explorer. When viewing in "PHOTOfunSTUDIO", you will not be able to play back or edit.

Printing the Pictures

If you connect the camera to a printer supporting PictBridge, you can select the pictures to be printed out and instruct that printing be started on the camera's monitor.
• Grouped pictures are displayed individually.
• Some printers can print directly from the card removed from the camera. For details, refer to the operating instructions of your printer.

Preparations:　Turn on the camera and the printer.
　　　　　　　　　Perform the print quality and other settings at the printer before printing the pictures.

1 Connect the printer and camera with the USB connection cable (supplied).

   • Turn the monitor toward you.
   • Check the directions of the connectors, and plug them straight in or unplug them straight out. (Otherwise, the connectors may bend out of shape, which will cause a malfunction.)
   • Do not use any other USB connection cables except the supplied one or a genuine Panasonic USB connection cable (DMW-USBC1: optional).
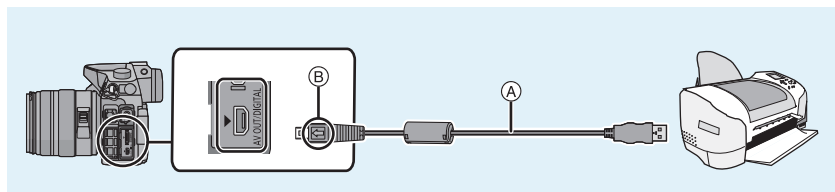
   Ⓐ USB connection cable (supplied)
   Ⓑ Align the marks, and insert.

2 Press ▲/▼ to select [PictBridge(PTP)], and then press [MENU/SET].

Selecting a single picture and printing it

1 Press ◄/► to select the picture and then press [MENU/SET].
2 Press ▲ to select [Print start] and then press [MENU/SET].
   • Disconnect the USB connection cable after printing.

Selecting multiple pictures and printing them

1 Press ▲.
2 Press ▲/▼ to select an item and then press [MENU/SET].

3 Press ▲ to select [Print start] and then press [MENU/SET].
   • If the print check screen has appeared, select [Yes], and print the pictures.
   • Disconnect the USB connection cable after printing.

Monitor Display/Viewfinder Display

• **The following images are examples of when the display screen is set to [⌷⌷⌷] (monitor style) in the monitor.**

∎ **In recording**

Recording in Programme AE Mode [P]
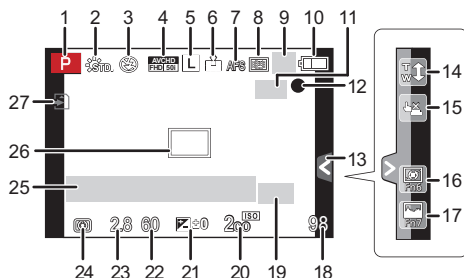
1   Recording Mode
2   Photo Style
3   Flash Mode
4   REC MODE (when recording motion pictures)/Recording quality
5   Picture size
6   Quality
7   Focus Mode
8   AF Mode
9   ☐ : Single*1
    ☐H : Burst
    ☐B : Auto Bracket
    ☉10 : Self-timer
10 Battery indication
11 (((∰))) : Optical Image Stabiliser*2/
    (((⌷))) : Jitter alert
12 Recording state (Flashes red.)/
    Focus (Lights green.)
13 Touch tab*3
14 Touch zoom*3
15 Touch Shutter*3
16 Fn6 (Function button)*3
17 Fn7 (Function button)*3
18 Number of recordable pictures*4
19 Extra Tele Conversion (when taking still pictures)

20 ISO sensitivity
21 Exposure compensation value/
    Brightness/Manual Exposure Assistance
22 Shutter speed
23 Aperture value
24 Metering Mode
25 Exposure meter
    Focal distance display
    Step zoom
26 AF area
27 Card (displayed only during recording)/
    Elapsed recording time: 8m30s *5

*1 Displayed only on the on-monitor recording information screen.
*2 Only available when a lens that supports the Stabiliser function is attached.
*3 Only displayed in the monitor.
*4 It is possible to switch the display between the number of recordable pictures and available recording time with the [Remaining Disp.] setting in the [Custom] menu.
*5 "m" is an abbreviation for minute and "s" for second.

■ **In playback**
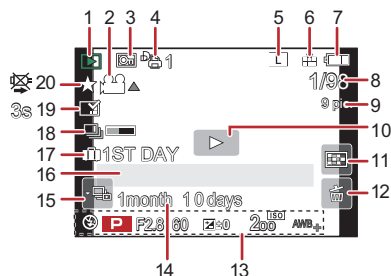
Detailed information display
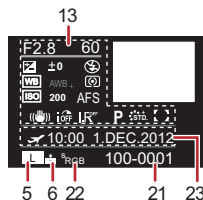
Histogram display
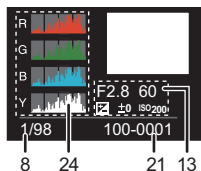
1 Playback Mode
2 ▣▲: Motion picture playback/
　▣▲: Continuously Burst Picture Group Playback
　▣▲: Continuously [Time Lapse Shot] Picture Group Playback
3 Protected picture
4 Number of prints
5 Picture size
　Recording mode (when recording motion pictures)
　▣: Recording quality
6 Quality
7 Battery indication
8 Picture number/Total pictures
9 Number of pictures in burst/
　Motion picture recording time: 8m30s ＊1
10 Playback (Motion Picture, Group pictures)
11 Multi Playback
12 Delete
13 Recording information ＊2
　▣: Intelligent Dynamic Range Control
　HDR: HDR
　I.R: Intelligent Resolution
　[ ]: [Shading Comp.]

14 Age
15 Burst Picture Group Display
　▣: [Time Lapse Shot] Picture Group Display
16 Name ＊3/Location ＊3/Title ＊3
17 Number of days that have passed since the departure date
18 Currently retrieving information icon
19 Stamped with text indication
　Elapsed playback time: 8m30s ＊1
20 Favourites
　Cable disconnection prohibit icon
21 Folder/File number ＊2
22 Colour space ＊4
23 Recorded date and time/World Time
24 Histogram

＊1 "m" is an abbreviation for minute and "s" for second.
＊2 This is not displayed for motion pictures recorded in [AVCHD].
＊3 It is displayed in order of [Title], [Location], [Name] ([Baby1]/[Baby2], [Pet]), [Name] ([Face Recog.]).
＊4 This is not displayed for motion pictures recorded in [AVCHD]/[MP4]/[MOV].

Menu list

[Rec]

This menu lets you set the aspect ratio, number of pixels and other aspects of the pictures you are recording.

[Photo Style]	You can select effects to match the type of image you wish to record. You can adjust the colour and image quality of the effects.
[Aspect Ratio]	Sets the aspect ratio of the image.
[Picture Size]	Set the number of pixels.
[Quality]	Set the compression rate at which the pictures are to be stored.
[Metering Mode]	Sets the light metering method for measuring brightness.
[Burst Rate]	Sets the burst speed for burst recording. (P53)
[Auto Bracket]	Sets single/burst recording, compensation range and recording sequence for Auto Bracket recording. (P54)
[Self Timer]	Set the time delay for the self-timer recording. (P55)
[i.Dynamic] (Intelligent dynamic range control)	Automatically corrects contrast and exposure.
[i.Resolution]	Records pictures with more defined outlines and sense of clarity.
[HDR]	You can combine 3 pictures with different levels of exposure into a single picture with rich gradation.
[Multi Exp.]	Gives an effect like multi exposure. (up to 4 times equivalent per a single image)
[Time Lapse Shot]	You can set the recording start time, the recording interval and the number of pictures, and automatically record subjects such as animals and plants as time elapses.
[Electronic Shutter]	The electronic shutter can reduce the picture blur.
[Shutter Delay]	To reduce the influence of hand shake, shutter is released after the specified time has passed.
[Flash]	Sets the manner in which the flash works. (P44)
[Red-Eye Removal]	Automatically detects red-eye caused by the flash and corrects the image data accordingly.

[ISO Increments]	The ISO sensitivity settings values changes in steps of 1/3 EV or 1 EV.
[Extended ISO]	Allows you to adjust the ISO from the minimum [ISO125] to the maximum [ISO25600].
[Long Shtr NR]	You can eliminate the noise caused by recording with a slower shutter speed.
[Shading Comp.]	If the screen periphery darkens as a result of lens characteristics, the brightness in this region will be corrected.
[Ex. Tele Conv.]	When the number of pixels is set to anything other than [L], the Tele effect is increased without degradation in image quality. (P43)
[Digital Zoom]	Increases the Tele effect. The higher the level of magnification, the greater the degradation in image quality. (P43)
[Color Space]	Set this when you want to correct the colour reproduction of the recorded pictures on a PC, printer etc.
[Stabilizer]	When camera shake is sensed during recording, the camera corrects it automatically.
[Face Recog.]	Sets the focus and exposure automatically prioritising registered faces.
[Profile Setup]	If you set the name and birthday of your baby or pet in advance, you can record their name and age in months and years in the images.

[Motion Picture]

This menu lets you set the [Rec Mode], [Rec Quality], and other aspects for motion picture recording.
• [Photo Style], [Metering Mode], [i.Dynamic], [i.Resolution] and [Digital Zoom] are common to both the [Rec] menu and [Motion Picture] menu. Changing these settings in one of these menus is reflected in other menu.
  – For details, refer to the explanation for the corresponding setting in the [Rec] menu.

[Rec Mode]	Sets the file format for the motion pictures you record.
[Rec Quality]	This sets up the picture quality of motion pictures.
[Exposure Mode]	Select the method for setting the aperture value and shutter speed in Creative Video Mode. (P56)
[Frame Rate]	Adds the slow/quick effect to motion pictures in Creative Video Mode. (P57)
[Picture Mode]	Sets the recording method for still pictures during motion picture recording.
[Continuous AF]	Continues to focus on the subject for which focus has been achieved.
[Time Code]	Sets the time code. (P58)
[Rec Highlight]	White saturated areas appear blinking in black and white.
[Ex. Tele Conv.]	Increases the Tele effect. (P43)
[Flkr Decrease]	The shutter speed can be fixed to reduce the flicker or striping in the motion picture.
[Silent Operation]	Enables touch operations to allow silent use while recording motion pictures.
[Mic Level Disp.]	Set whether or not the mic levels are displayed on the screen.
[Mic Level Adj.]	Adjust the sound input level to 19 different levels.
[Special Mic.]	Sets the sound recording method when a stereo shotgun microphone (optional) is connected.
[Headphone Sound]	Sets the sound output method when headphones (optional) are connected.
[Wind Cut]	Reduces the wind noise effectively if there is wind noise when recording sound.

[Custom]

Operation of the unit, such as displaying of the screen and button operations, can be set up according to your preferences. Also, it is possible to register the modified settings.

[Cust.Set Mem.]	Registers the current camera settings as custom set. (P42)
[AF/AE Lock]	Sets the fixed content for focusing and exposure when the AF/AE lock is on. (P52)
[AF/AE Lock Hold]	This will set the operation of [AF/AE LOCK] button when taking a picture with fixed focus or exposure.
[Shutter AF]	Set whether or not the focus is adjusted automatically when the shutter button is pressed halfway.
[Half Press Release]	The shutter will immediately fire when the shutter button is pressed halfway.
[AFS/AFF]	Assigns [AFS] or [AFF] to [AFS/AFF] of the focus mode lever.
[Quick AF]	Speeds up the focusing that takes place when you press the shutter button.
[Eye Sensor AF]	The camera automatically adjusts the focus when the eye sensor is active.
[Pinpoint AF Time]	Sets the time for which the screen is enlarged when the shutter button is pressed halfway with Auto Focus Mode set to [⊞].
[AF Assist Lamp]	AF assist lamp will illuminate the subject when the shutter button is pressed half-way making it easier for the camera to focus when recording in low light conditions.
[Direct Focus Area]	Moves the AF area or MF assist using the cursor button when recording.
[Focus/Release Priority]	It will set so no picture can be taken when it is out of focus.
[AF+MF]	You can set the focus manually after the automatic focus has finished.
[MF Assist]	Sets the display method of MF Assist (enlarged screen).
[MF Guide]	When you set the focus manually, an MF guide that allows you to check the direction to achieve focus is displayed. (P51)
[Histogram]	This allows you to set either to display or not display the histogram.
[Guide Line]	This will set the pattern of guide lines displayed when taking a picture.

[Highlight]	When the Auto Review function is activated or when playing back, white saturated areas appear blinking in black and white.
[Constant Preview]	You can check the effects of the chosen aperture and shutter speed on the recording screen in Manual Exposure Mode.
[Expo.Meter]	Set whether or not to display the exposure meter.
[LVF Disp.Style]	This will set the display style of the Live Viewfinder.
[Monitor Disp. Style]	This will set the display style of the monitor.
[Monitor Info. Disp.]	Display the recording information screen. (P28)
[Rec Area]	This changes the angle of view during motion picture recording and still picture recording.
[Remaining Disp.]	This will switch display between the number of recordable pictures and available recording time.
[Auto Review]	Set the length of time that the picture is displayed after taking the still picture.
[Fn Button Set]	You can assign various recording and other functions to the function button. (P25)
[Q.MENU]	Switch the setting method of Quick Menu.
[Dial Set.]	Changes the operation methods of the front dial and rear dial.
[Video Button]	Enables/disables the motion picture button.
[Power Zoom Lens]	Sets the screen display and lens operations when using an interchangeable lens that is compatible with power zoom (electrically operated zoom).
[Eye Sensor]	Enable or disable the eye sensor. You can also set the sensitivity of the eye sensor. (P22)
[Touch Settings]	Enables/disables the Touch operation.
[Touch Scroll]	This allows you to set the speed of continuously forwarding or rewinding pictures using touch operation.
[Menu Guide]	Set the screen that is displayed when the mode dial is set to ⌧ and .
[Shoot w/o Lens]	Sets whether or not the shutter can be released when no lens is attached to the main body.

[Setup]

This menu lets you perform the clock settings, select the operating beep tone settings and set other settings which make it easier for you to operate the camera.
You can also configure the settings of Wi-Fi related functions.

[Clock Set]	Setting Date/Time. (P21)
[World Time]	Sets the times for the region where you live and your holiday destination.
[Travel Date]	Departure date and return date of the trip as well as the name of the travel destination can be set.
[Wi-Fi]	Configure the each setting for Wi-Fi functions.
[Beep]	Set the volume for electronic noises and the electronic shutter noise.
[Speaker Volume]	Adjust the volume of the speaker to any of 7 levels.
[Headphone Volume]	Adjust the volume of when connected headphone (optional) from 16 levels.
[Monitor Display]/[Viewfinder]	Brightness, colour, or red or blue tint of the Monitor/Live Viewfinder is adjusted.
[Monitor Luminance]	Set the monitor brightness to suit the amount of surrounding light.
[Economy]	Suppresses the unit's power consumption to prevent the battery from being run down.
[Battery Use Priority]	When batteries are inserted to both this unit and the battery grip, you can set that which battery should be used first.
[USB Mode]	Sets the communication method when connecting using the USB connection cable (supplied).
[Output]	This sets how the unit connects to a television etc.
[VIERA Link]	Equipment that supports the VIERA Link will connect automatically.
[3D Playback]	Set the output method for 3D pictures.
[Menu Resume]	Stores the location of the last-used menu item for each menu.
[Menu Background]	Set the background colour for the menu screen.
[Menu Information]	Descriptions of menu items or their settings are displayed on the menu screen.
[Language]	Set the language displayed on the screen.

[Version Disp.]	This enables the firmware versions of the camera and lens to be checked.
[No.Reset]	Returns the image file number to 0001.
[Reset]	The [Rec] or [Setup]/[Custom] menu settings are reset to the initial settings.
[Reset Wi-Fi Settings]	Reset all settings in the [Wi-Fi] menu to factory default settings. (excluding [LUMIX CLUB])
[Pixel Refresh]	It will perform optimisation of imaging device and image processing.
[Sensor Cleaning]	Dust reduction to blow off the debris and dust that have affixed to the front of the imaging device is performed.
[Format]	The card is formatted.

[Playback]

This menu lets you set the Protection, Cropping or Print Settings, etc. of recorded pictures.

[2D/3D Settings]	Switches the playback method for 3D images.
[Slide Show]	Selects the type etc. of the images and plays back in order.
[Playback Mode]	Selects the type etc. of the images and plays back only particular images.
[Location Logging]	The location information (longitude/latitude) acquired by the smartphone/tablet can be sent to the camera and written in images.
[Title Edit]	Input texts (comments) on the recorded pictures.
[Text Stamp]	Stamps the recorded pictures with recording date and time, names, travel destination, travel date, etc.
[Video Divide]	Splits the recorded motion picture in two.
[Resize]	Reduces the image size (number of pixels).
[Cropping]	Crops the recorded image.
[Rotate]	Rotate pictures manually in 90° steps.
[Rotate Disp.]	This mode allows you to display pictures vertically if they were recorded holding the camera vertically.
[Favorite]	Marks can be added to images, and images can be set as favourites.
[Print Set]	Sets the images for printing and the number of prints.
[Protect]	Protects images to prevent deletion by mistake.
[Face Rec Edit]	Removes or changes information relating to personal identity.

Cautions for Use

Optimal use of the camera

Keep this unit as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).
• If you use this unit on top of or near a TV, the pictures and/or sound on this unit may be disrupted by electromagnetic wave radiation.
• Do not use this unit near cell phones because doing so may result in noise adversely affecting the pictures and/or sound.
• Recorded data may be damaged, or pictures may be distorted, by strong magnetic fields created by speakers or large motors.
• Electromagnetic wave radiation generated by microprocessors may adversely affect this unit, disturbing the pictures and/or sound.
• If this unit is adversely affected by electromagnetic equipment and stops functioning properly, turn this unit off and remove the battery or disconnect AC adaptor (DMW-AC8E: optional). 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.

Always use the supplied cords and cables. If you use optional accessories, use the cords and the cables supplied with them.
Do not extend the cords or the cables.

Do not spray the camera with insecticides or volatile chemicals.
• If the camera is sprayed with such chemicals, the body of the camera may be damaged and the surface finish may peel off.
• Do not keep rubber or plastic products in contact with the camera for a long period of time.

Cleaning

Before cleaning the camera, remove the battery or the DC coupler (DMW-DCC12: optional), or disconnect the power plug from the outlet. Then wipe the camera with a dry, soft cloth.
• When the camera is soiled badly, it can be cleaned by wiping the dirt off with a wrung wet cloth, and then with a dry cloth.
• Wipe off any dirt or dust on the zoom ring and the focus ring with a dry, dustless cloth.
• Do not use solvents such as benzine, thinner, alcohol, kitchen detergents, etc., to clean the camera, since it may deteriorate the external case or the coating may peel off.
• When using a chemical cloth, be sure to follow the accompanying instructions.

■ **About dirt on the image sensor**

This camera features an interchangeable lens system so dirt may get inside the camera body when changing lenses. Depending on the recording conditions, dirt on the image sensor may appear on the recorded picture.

To prevent debris or dust adhering to internal parts of the body, avoid changing the lens in a dusty environment and always fit the body cap or a lens when storing the camera. Remove any dirt on the body cap before attaching it.

Dust reduction function

This unit has a dust reduction function that will blow off the debris and dust that have affixed to the front of the imaging device. This function will function automatically when the camera is turned on, but if you see dust, perform the [Sensor Cleaning] in the [Setup] menu.


Removing dirt on the image sensor

The image sensor is very precise and delicate, so be sure to observe the following when you do have to clean it yourself.

• Blow off the dust on the surface of the image sensor with a commercially available blower brush. Be careful not to blow too strongly.

• Do not put the blower brush further inside than the lens mount.

• Do not let the blower brush touch the image sensor as the image sensor may get scratched.

• Do not use any objects except a blower brush to clean the image sensor.

• If you cannot remove the dirt or dust with the blower, consult the dealer or Panasonic.

■ **For care of the eye cup on the viewfinder**

• If the eye cup becomes dirty, detach it from the camera body, gently wipe off the dirt with a soft, dry cloth, and then reattach it to the camera body.

• Be careful not to lose the eye cup.

• Keep the eye cup out of reach of children to prevent swallowing.
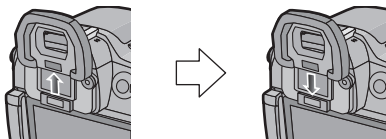
Battery

Always remove the battery after use.

• Place the removed battery in a plastic bag, and store or keep away from metallic objects (clips, etc.).

Bring charged spare batteries when going out.

Specifications

Specifications are subject to change without notice.

Digital Camera Body (DMC-GH3):
Information for your safety

Power Source:	DC 8.4 V
Power Consumption:	2.9 W (When recording with Monitor) [When the Interchangeable lens (H-HS12035) is used] 3.1 W (When recording with Monitor) [When the Interchangeable lens (H-VS014140) is used] 2.0 W (When playing back with Monitor) [When the Interchangeable lens (H-HS12035) is used] 2.3 W (When playing back with Monitor) [When the Interchangeable lens (H-VS014140) is used]

Camera effective pixels	16,050,000 pixels
Image sensor	4/3″ Live MOS sensor, total pixel number 17,200,000 pixels, Primary colour filter
Digital Zoom	Max. 4×
Extra Tele Conversion	When taking still pictures: Max. 2× (When a picture size of [S] (4 M), aspect ratio of [4:3] is selected.) When recording motion pictures: 2.4×/3.6×/4.8×
Focus	Auto Focus/Manual Focus, Face Detection/AF Tracking/23-area-focusing/ 1-area-focusing/Pinpoint (Touch focus area selection possible)
Shutter system	Focal-plane shutter
Burst recording	
Burst speed	20 pictures/second (Super high speed), 6 pictures/second (High speed), 4 pictures/second (Middle speed), 2 pictures/second (Low speed)
Number of recordable pictures	Max. 18 pictures (when there are RAW files) Depends on the capacity of the card (when there are no RAW files)
ISO sensitivity (Standard Output Sensitivity)	AUTO/ⒷISO/125✱/200/400/800/1600/3200/6400/12800/25600✱ (1/3 EV step change possible) ✱ Only available when [Extended ISO] is set.

Minimum Illumination	Approx. 6 lx (when i-Low light is used, the shutter speed is 1/25th of a second) [When the Interchangeable lens (H-HS12035) is used] Approx. 12 lx (when i-Low light is used, the shutter speed is 1/25th of a second) [When the Interchangeable lens (H-VS014140) is used]
Shutter speed	B (Bulb) (Max. approx. 60 minutes), 60 seconds to 1/4000th of a second Taking still pictures during motion picture recording Motion picture priorities: 1/25th of a second to 1/16000th of a second Still picture priorities: B (Bulb) (Max. approx. 60 minutes), 60 seconds to 1/4000th of a second
Metering range	EV 0 to EV 18
White Balance	Auto White Balance/Daylight/Cloudy/Shade/Incandescent lights/Flash/White set/White set2/White set3/White set4/ White Balance K set
Exposure (AE)	Programme AE (P)/Aperture-priority AE (A)/Shutter-priority AE (S)/Manual exposure (M)/AUTO Exposure Compensation (1/3 EV Step, -5 EV to $+5$ EV)
Metering Mode	Multiple/Centre weighted/Spot
Monitor	3.0″ OLED Monitor (3:2) (Approx. 610,000 dots) (field of view ratio about 100%) Touch screen
Viewfinder	OLED Live Viewfinder (16:9) (Approx. 1,740,000 dots) (field of view ratio about 100%) (with diopter adjustment -4 to $+4$ diopter)
Flash	Built-in pop up flash GN 17.0 equivalent (ISO200·m) [GN 12.0 equivalent (ISO100·m)] Flash range: Approx. 30 cm (0.98 feet) to 17.1 m (56.0 feet) [When the Interchangeable lens (H-HS12035) is mounted, WIDE, [ISO AUTO] is set] Flash range: Approx. 50 cm (1.6 feet) to 12.0 m (39.0 feet) [When the Interchangeable lens (H-VS014140) is mounted, WIDE, [ISO AUTO] is set] AUTO, AUTO/Red-Eye Reduction, Forced ON, Forced ON/ Red-Eye Reduction, Slow Sync., Slow Sync./Red-Eye Reduction, Forced OFF

Flash synchronisation speed	Equal to or smaller than 1/160th of a second
Microphone	Stereo
Speaker	Monaural
Recording media	SD Memory Card/SDHC Memory Card∗/SDXC Memory Card∗ (∗ UHS-I-compatible)

Picture size	
Still picture	When the aspect ratio setting is [4:3] 4608×3456 pixels, 3264×2448 pixels, 2336×1752 pixels When the aspect ratio setting is [3:2] 4608×3072 pixels, 3264×2176 pixels, 2336×1560 pixels When the aspect ratio setting is [16:9] 4608×2592 pixels, 3264×1840 pixels, 1920×1080 pixels When the aspect ratio setting is [1:1] 3456×3456 pixels, 2448×2448 pixels, 1744×1744 pixels

Recording quality	
Motion pictures	[AVCHD] 1920×1080/50p (28 Mbps)/1920×1080/50i (17 Mbps)/ 1920×1080/50i∗ (24 Mbps)/1920×1080/24p (24 Mbps) (∗Sensor output is 25 frames/sec.) [MP4] 1920×1080/25p (20 Mbps)/1280×720/25p (10 Mbps)/ 640×480/25p (4 Mbps) [MOV] 1920×1080/50p [50 Mbps (IPB)]/ 1920×1080/25p [72 Mbps (ALL-Intra)]/ 1920×1080/25p [50 Mbps (IPB)]/ 1920×1080/24p [72 Mbps (ALL-Intra)]/ 1920×1080/24p [50 Mbps (IPB)]/ 1280×720/50p [72 Mbps (ALL-Intra)] When recording motion pictures in slow and fast motion: 1920×1080/24p [24 Mbps (IPB)]

Quality	RAW/RAW+Fine/RAW+Standard/Fine/Standard/MPO+Fine/ MPO+Standard

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 Progressive/AVCHD/MP4/MOV	
Audio compression	AVCHD	Dolby® Digital (2 ch)
	MP4	AAC (2 ch)
	MOV	LPCM (non-compression)

Interface	
Digital	"USB 2.0" (High Speed) ∗ Data from the PC can not be written to the camera using the USB connection cable.
Analogue video/ audio	NTSC/PAL Composite (Switched by menu) Audio line output (monaural)
Terminal	
[REMOTE]	φ 2.5 mm jack
[AV OUT/DIGITAL]	Dedicated jack (8 pin)
[HDMI]	MiniHDMI TypeC
[MIC]	φ 3.5 mm jack
Headphone	φ 3.5 mm jack
Flash synchro	Available
Dimensions	Approx. 132.9 mm (W)×93.4 mm (H)×82.0 mm (D) [5.23″ (W)×3.68″(H)×3.23″ (D)] (excluding the projecting parts)
Mass	Approx. 550 g/1.21 lb [with the card and battery] Approx. 470 g/1.04 lb (camera body) Approx. 855 g/1.88 lb [with the Interchangeable lens (H-HS12035), card and battery] Approx. 1010 g/2.23 lb [with the Interchangeable lens (H-VS014140), card and battery]
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Operating humidity	10%RH to 80%RH
Dust-proof and splash-proof	Yes

Wireless transmitter

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

Battery Charger (Panasonic DMW-BTC10E):
Information for your safety

Input:	AC∼110 V to 240 V, 50/60 Hz, 0.2 A
Output:	DC⎓8.4 V, 0.65 A

Battery Pack (lithium-ion) (Panasonic DMW-BLF19E):
Information for your safety

Voltage/capacity:	7.2 V/1860 mAh

Interchangeable Lens	H-HS12035 "LUMIX G X VARIO 12–35 mm/F2.8 ASPH./ POWER O.I.S."	H-VS014140 "LUMIX G VARIO HD 14–140 mm/F4.0–5.8 ASPH./MEGA O.I.S."
Focal length	f=12 mm to 35 mm (35 mm film camera equivalent: 24 mm to 70 mm)	f=14 mm to 140 mm (35 mm film camera equivalent: 28 mm to 280 mm)
Aperture type	7 diaphragm blades/circular aperture diaphragm	7 diaphragm blades/circular aperture diaphragm
Aperture range	F2.8	F4.0 (Wide) to F5.8 (Tele)
Minimum aperture value	F22	F22
Lens construction	14 elements in 9 groups (4 aspherical lenses/1 UED Lens/1 UHR Lens)	17 elements in 13 groups (4 aspherical lenses/2 ED lenses)
Nano surface coating	Yes	None
In focus distance	0.25 m (0.82 feet) to ∞ (from the focus distance reference line)	0.5 m (1.6 feet) to ∞ (from the focus distance reference line)
Maximum image magnification	0.17× (35 mm film camera equivalent: 0.34×)	0.2× (35 mm film camera equivalent: 0.4×)
Optical Image Stabiliser	Available	Available
[O.I.S.] switch	Available (Switching ON/ OFF)	Available (Switching ON/ OFF)
Mount	"Micro Four Thirds Mount"	"Micro Four Thirds Mount"
Angle of view	84° (Wide) to 34° (Tele)	75° (Wide) to 8.8° (Tele)
Filter diameter	58 mm (2.3 inch)	62 mm (2.4 inch)
Max. diameter	Approx. 67.6 mm (2.7 inch)	Approx. 70 mm (2.8 inch)
Overall length	Approx. 73.8 mm (2.9 inch) (from the tip of the lens to the base side of the lens mount)	Approx. 84 mm (3.3 inch) (from the tip of the lens to the base side of the lens mount)
Mass	Approx. 305 g/0.67 lb	Approx. 460 g/1.01 lb
Dust-proof and splash-proof	Yes	None

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(2) the software owned by third party and licensed to Panasonic Corporation and/or,
(3) open sourced software including the software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/), and the software written by Eric Young (eay@cryptsoft.com).

For the software categorised as (1) and (2), please view the information by pressing [MENU/SET], displaying [Setup] → [Version Disp.], and then pressing [MENU/SET].
For the software categorised as (3), please refer to the applicable license terms in the following "Operating Instructions for advanced features (PDF format)".

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