



Panasonic®

Operating Instructions Manuel d'utilisation 取扱説明書

FLASH
フラッシュライト

Model No.

Modèle

品番

DMW-FL580L

LUMIX



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

Il est recommandé de lire attentivement ce manuel avant d'utiliser l'appareil et de le conserver pour consultation ultérieure.

このたびは、パナソニック製品をお買い上げいただき、まことにありがとうございます。

- 取扱説明書をよくお読みのうえ、正しく安全にお使いください。
- ご使用前に「安全上のご注意」（3～5 ページ）を必ずお読みください。
- 保証書（裏表紙）は「お買い上げ日・販売店名」などの記入を確かめ、取扱説明書とともに大切に保管してください。

If you have any questions, visit:

USA : www.panasonic.com/support

Canada : www.panasonic.ca/english/support

Pour toute assistance supplémentaire, visiter :

www.panasonic.ca/french/support

保証書付き

VQT5F44-1
F0214KD1044

Operating Instructions

FLASH

Thank you for purchasing Panasonic product.

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

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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.
- Do not place objects filled with liquids, such as vases, on this unit.
- Use only the recommended accessories.
- Do not remove covers.
- Do not repair this unit by yourself. Refer servicing to qualified service personnel.

CAUTION!

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

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

IMPORTANT SAFETY INSTRUCTIONS

When using your photographic equipment, basic safety precautions should always be followed, including the following:

- Read and understand all instructions before using.
- Close supervision is necessary when any appliance is used by or near children. Do not leave appliance unattended while in use.
- Care must be taken as burns can occur from touching hot parts.
- Do not operate if the appliance has been dropped or damaged - until it has been examined by qualified service personnel.
- Let appliance cool completely before putting away.
- To reduce the risk of electric shock, do not immerse this appliance in water or other liquids.
- To reduce the risk of electric shock, do not disassemble this appliance, but take it to qualified service personnel when service or repair work is required. Incorrect reassembly can cause electric shock when the appliance is used subsequently.
- The use of an accessory attachment not recommended by the manufacturer may cause a risk of fire, electric shock, or injury to persons.

SAVE THESE INSTRUCTIONS

■ About the batteries

CAUTION

- Danger of explosion if battery is incorrectly replaced. Replace only with the type recommended by the manufacturer.
 - When disposing of the batteries, please contact your local authorities or dealer and ask for the correct method of disposal.
-
- Do not heat or expose to flame.
 - Do not leave the battery(ies) in a car exposed to direct sunlight for a long period of time with doors and windows closed.
 - If rechargeable batteries are to be used, then rechargeable batteries manufactured by Panasonic are recommended.

THE FOLLOWING APPLIES ONLY IN THE U.S.A.

FCC Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

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

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

Any unauthorized changes or modifications to this equipment would void the user's authority to operate this device.

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

Responsible Party:

Panasonic Corporation of North America
Two Riverfront Plaza, Newark, NJ 07102-5490

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

THE FOLLOWING APPLIES ONLY IN CANADA.

CAN ICES-3(B)/NMB-3(B)

English

-If you see this symbol-

Disposal of Old Equipment

Only for European Union and countries with recycling systems



This symbol on the products, packaging, and/or accompanying documents means that used electrical and electronic products must not be mixed with general household waste.

For proper treatment, recovery and recycling of old products, please take them to applicable collection points in accordance with your national legislation.

By disposing of them correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment. For more information about collection and recycling, please contact your local municipality.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

Precautions

- This is the external flash for the Panasonic digital cameras (mentioned as flash in the following). When this flash is used together with a digital camera that supports wireless mode, shooting with a wireless flash becomes possible. Available functions vary depending on the digital camera used. As for the corresponding digital cameras, please visit our web site.
<http://panasonic.jp/support/global/cs/dsc/> (This Site is English only.)

■ Handling the unit

- **Do not subject the unit to strong vibration or impact.** Doing so may not only cause the unit to malfunction but also cause the flash head to break.
- **Sand and dirt may cause the unit to malfunction. When using the unit in an environment such as a beach, take steps to protect it from sand and dirt.**
- **This unit is neither dust-proof nor splash-proof. If by any chance water droplets, etc. are splashed on the unit, wipe them off with a dry cloth. If the unit fails to function correctly, consult your dealer or Panasonic.**
- Use a soft, dry, and dust free cloth to wipe the dust and dirt on the filters.
- Be careful not to catch your finger, etc. in the unit when adjusting the angle of the flash head.
- Read the operating instructions for your digital camera.



Supplied Accessories

[Inspection to be performed when you unpack the unit]

When removing the unit from its packing box, check that the main unit and the supplied accessories are there and also check their external appearance and functions to verify that they have not sustained any damage during distribution and transportation.

If you discover any trouble, contact your vendor before using the product.

Product numbers correct as of February 2014. These may be subject to change.

1  VFC5100	2  VFB0243	3  (A): VFB0244/ (B): VFB0245/ (C): VFB0246
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1 Flash case

2 Flash stand

3 Filter

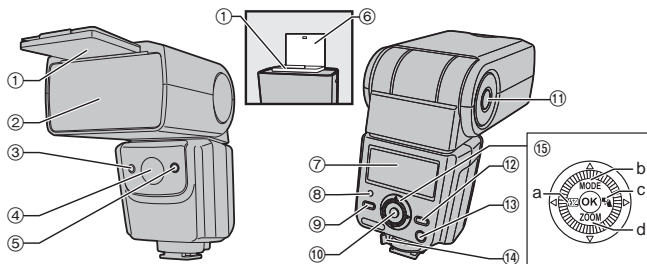
(A): Diffuser (Whiter)

(C): IR filter (Black)

• The batteries are optional.

(B): Warming filter (Orange)

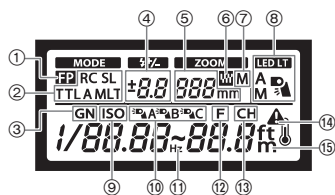
Names of Parts



- ① Wide panel
- ② Flash head
- ③ Wireless sensor
- ④ AF assist lamp/LED light
- ⑤ Flash sensor
- ⑥ Catch light plate
- ⑦ Control panel
- ⑧ [AUTO CHECK] lamp
- ⑨ [TEST/CHARGE] button/lamp

- ⑩ [OK] button
- ⑪ Bounce unlock button
- ⑫ [BACK LIGHT] button
- ⑬ [ON/OFF] button
- ⑭ Lock lever
- ⑮ Dial
- a (◀): Flash intensity adjustment button
- b (▲): [MODE] button
- c (▶): LED light button
- d (▼): [ZOOM] button

Control Panel



- ① FP firing
- ② Flash mode
- ③ Guide number (GN)
- ④ Flash intensity adjustment
- ⑤ ZOOM value
- ⑥ FOUR THIRDS
- ⑦ Zoom mode
- ⑧ LED light
- ⑨ ISO sensitivity
- ⑩ RC mode group
- ⑪ Unit of frequency (in Multi Flash Mode)
- ⑫ Aperture (F)
- ⑬ RC mode channel
- ⑭ Temperature warning
- ⑮ Distance units

Continuous Firing

The flash may become hot when fired many times in succession, resulting in damage or malfunction. The flash should be fired no more than 30 times in succession at intervals of 2 seconds, after which it should be left unused for at least 10 minutes.

- When a filter is being used, we do not recommend firing with full flash intensity or firing many times in succession. The heat caused by these firing methods may deform the filter.

Preparing a Battery (optional)

Choose from the below batteries:

- LR6/AA Alkaline dry batteries (x 4)
- HR6/AA Rechargeable nickel metal hydride batteries (Ni-MH) (x 4)

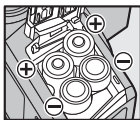
R6/AA Manganese dry batteries cannot be used.

The use of batteries made by Panasonic is recommended.

Loading Batteries

- Use alkaline dry batteries or rechargeable nickel metal hydride batteries.

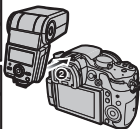
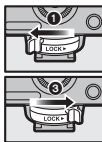
- 1 Slide the battery cover to open it.
- 2 Insert the batteries with correct [+] / [-] polarity.
- 3 Close the battery cover by sliding it back firmly as far as it will go.



Attaching to the Camera

Confirm that both the camera and flash are off. Attaching or removing the flash while either the flash or the camera is on may result in malfunction.

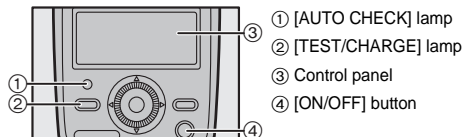
- 1 Slide the lock lever in the direction opposite to that indicated by the [LOCK ►] icon (❶).
- 2 Slide the flash into the hot shoe until it clicks securely into place (❷).
- 3 Slide the lock lever to the [LOCK ►] position (❸).



- To remove the flash, slide the lock lever in the direction opposite to the [LOCK ►] arrow and slide it from the shoe.

Turning on the Flash

Attach a flash to the camera, and then turn the camera on.



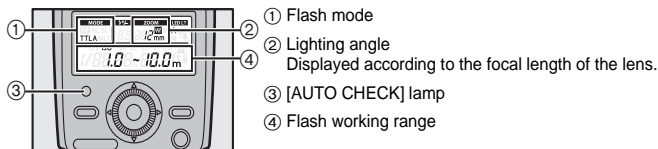
Press the [ON/OFF] button.

- The control panel display will turn on.
- To turn the flash off, press the [ON/OFF] button again.
- Replace the batteries if the [TEST/CHARGE] lamp does not light after:

30 seconds (Alkaline dry batteries)
10 seconds (Rechargeable nickel metal hydride batteries)

- If the [TEST/CHARGE] lamp and [AUTO CHECK] lamp blink simultaneously, batteries are running low. Replace the batteries. **Using a considerably exhausted battery may result in malfunction.**
- The flash will enter sleep mode whenever the camera enters sleep mode.
- If no operations are performed for approximately 60 minutes, the flash will turn off automatically. Press the [ON/OFF] button to turn it on.
- Oscillating sound may be output while charging the flash, but this is not malfunction.

Shooting



1 Use camera controls to choose the flash mode.

See the camera operating instructions for details.

2 Choose a flash mode.

"Flash Mode" (P10)

- The camera and flash will exchange shooting information and the flash working range will be displayed in the control panel.

3 Press the shutter button halfway.

- Flash working range varies with camera settings (ISO sensitivity, aperture, and lens focal length).

4 Press the shutter button the rest of the way down to take the picture.

The unit emits light in proper exposure if [AUTO CHECK] lamp flashes for approximately 5 seconds.

- When using a flash, flash light may be blocked by the lens body, lens hood, etc.
- Use the wide panel to prevent overexposure at ranges of less than 1 m (3.3 feet) (P14).

Flash Mode

Choose a flash mode according to your subject and shooting conditions.






1 Press the [MODE] (▲) button.

2 Rotate the dial to select a flash mode.







- While [MANUAL] or [FP MANUAL] is selected, pressing [MODE] (▲) button allows you to set the guide number. Press the [MODE] (▲) again to turn back.

3 Press [OK] to set.

Control panel display	Control operation
	The flash light intensity is controlled automatically according to the camera's setup. The flash will be adjusted based on the brightness taken through the camera's lens. Usually use this mode with a camera with communication capability.
<p>Blinks: Out of flash working range</p>	The flash will be adjusted based on the brightness captured by flash sensor on the flash. If the camera has communication capability, this mode can be used only when the camera is an AUTO-compatible model.
	In this mode, the flash is emitted according to the guide number setting. The flash displays the optimal range, which is calculated based on the guide number and camera settings.
	Wireless control is available with Panasonic digital cameras that support wireless mode. (P13)
	FP firing. This mode allows you to use flash photography even at shutter speeds faster than the flash synchronization speed of the camera. <ul style="list-style-type: none"> • Maximum output is reduced, resulting in a smaller flash working range. Flash working range also diminishes with shutter speed.
	[FP TTL AUTO]: Flash level is set automatically. [FP MANUAL]: The flash fires at the selected guide number. The flash displays the optimal range, which is calculated based on the guide number and camera settings.

Control panel display	Control operation
 SL AUTO	The flash can be fired remotely in sync with any flash fired by other units. [SL AUTO]: Flash level is set automatically. [SL MANUAL]: The flash fires at the selected guide number.
 SL MANUAL	
 MULTI	The flash can be fired many times in succession while the shutter is open. ("Multi Flash Mode" (P12))

Button Functions

Button	Function	Use
	Adjust flash level by up to ± 5 EV. This value is combined with adjustments to flash compensation made using the camera.	<ol style="list-style-type: none"> 1 Press  (\blacktriangleleft) or [ZOOM] (\blacktriangledown). 2 Rotate the dial to select the value, and then press the [OK] button.
[ZOOM]	Adjust the lighting angle manually. [M] appears in the display.	
	Manually turn the LED light on or off.	<ol style="list-style-type: none"> 1 Before shooting, set the LED light to [M]. "Other Settings" (P15) 2 Press  (\blacktriangleright) to turn the LED light on. Press  (\blacktriangleright) again to turn the LED light off. To view the LED brightness setting, press and hold  (\blacktriangleright) for 2 seconds while the LED light is on. <ul style="list-style-type: none"> • The flash and batteries may become warm if you keep the LED light on, but this is not a malfunction.
[TEST/CHARGE]	To fire a test flash, press the [TEST/CHARGE] button while the [TEST/CHARGE] lamp is lit.	
[BACK LIGHT]	The control panel backlight lights for about 15 seconds. <ul style="list-style-type: none"> • If the flash is fired when the backlight is lit, it turns off. To turn the backlight on again, press the [BACK LIGHT] button.	

Multi Flash Mode

The flash can be fired many times in succession while the shutter is open. ("Multi Flash Mode") The Multi Flash Mode allows you to capture continuous movement of the subject in a single picture, like a series of pictures taken in quick succession.

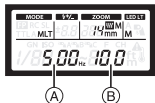
1 Set the flash mode of the flash to the [MLT] mode.

"Flash Mode" (P10)

2 Press $\blacktriangle/\blacktriangledown/\blacktriangleleft/\blacktriangleright$ to select an item (flash frequency(A)/flash count(B)/flash intensity), and rotate the dial to set a value.

3 Press [OK] to set.

- We recommend using a tripod in Multi Flash Mode.



■ Calculating the shutter speed

Shutter speed = Flash count ÷ Flash frequency

Example: When taking a picture with a flash count of 10 and a flash frequency of 5 Hz, set a shutter speed of 2 seconds or longer.

When the flash fires many times in succession in Multi Flash Mode, the shutter has to be open.

Take a picture with a shutter speed slower than the shutter speed you have calculated by the formula above.

■ Maximum continuous flash counts

Flash intensity	Flash frequency (Hz)				
	1-2	3-4	5-10	11-50	51-500
1/4	4	4	4	4	4
1/8	8	8	8	8	8
1/16	16	16	16	16	16
1/32	30	30	30	32	32
1/64	60	60	60	64	64
1/128	60	70	80	90	100

Wireless Flash Settings

Wireless control is available with Panasonic digital cameras that support wireless mode. See the operating instructions of the digital camera for operation of the digital camera during wireless flash shooting.

1 Set the camera to wireless mode.

2 Set the flash to [RC] mode.



"Flash Mode" (P10)

- When [RC] is selected, pressing [MODE] (▲) button allows you to set a channel. Press the [MODE] (▲) button again to turn back.

3 Use the flash to select the channel and group.

"Other Settings" (P15)

CH Channel	Set the camera and flash to the same channel.
A B C Group	The camera can adjust flash settings separately for up to 3 groups; choose the group to which the flash belongs.

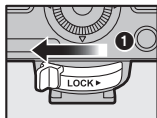
The Firing mode, the flash adjustment, and the manual flash adjustment can be set for each group by operating the camera.

Placing Wireless Flash Units

Since the communication is performed with the flash emission of the camera, the flash positioning range varies with the camera. Refer to the camera operating instructions for details about the flash positioning range.

1 Attach the supplied stand.

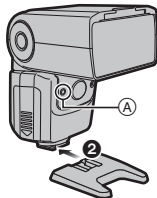
- Slide the lock lever in the direction opposite to that indicated by the [LOCK ►] icon (1) and slide the flash onto the stand until it clicks securely into place (2).
- Slide the lock lever to the [LOCK ►] position to latch the flash in place.
- To remove the flash, slide the latch in the direction opposite to the [LOCK ►] arrow and slide it from the stand.



2 Position the flash with the wireless sensor (A) facing the camera.

Take a test shot after positioning.

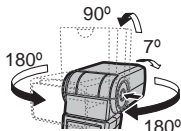
- We recommend using a single group of up to three remote flash units.
- Flash may not fire due to the angle or distance between the camera and the object.



Fixing the Irradiation Angle

Point the flash head at a wall or ceiling for bounce flash photography. The area illuminated at ranges of 0.5 m (1.6 feet) to 1.0 m (3.3 feet) will not be correct; point the flash down.

Pressing the bounce unlock button, turn the light-emitting section up/down and left/right.

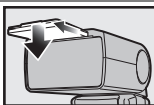


Using the Wide Panel

Use the built-in wide panel for flash photography when the focal length of the lens is wider than 12 mm.

Slide out the wide panel and place it on the flash head.

- The estimated range display changes when the wide panel is used.
- The lighting angle can be set to 14 mm, 12 mm, 10 mm and 7 mm only.
- Do not tilt the wide panel up.
- The ZOOM display will blink if the lens has a focal length of 16 mm or more.

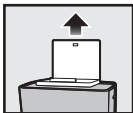


Using the Catch Light Plate

Reflecting the flash light allows you to shoot with the catch light effect, which reflects light in the models eyes.

Slide out the catch light plate.

Point the flash directly upward with the plate toward the subject.



Custom Settings

Customize settings for improved ease of use.

1 Press and hold the [OK] button for more than 2 seconds.


The flash will enter custom settings mode.

2 Press ▲/▼ to highlight items.

3 Rotate the dial to change the highlighted item.

4 Press the [OK] button.

Control panel	Option	Description
	AF assist lamp	[A]: Controlled by camera. [OFF]: Does not light.
	LED brightness	[1/1] to [1/16]: Adjust LED brightness.
	Slave flash	[ON]: Flash control display shows slave mode. [OFF]: Flash control display does not show slave mode.
	Flash cable	[ON]: Flash cable not used. [OFF]: Flash cable used.
	Zoom display	[W]: Display values for FOUR THIRDS lenses. None: Display 35 mm film camera equivalent values.
	Distance units	[m]: Distances displayed in meters. [ft]: Distances displayed in feet.
	Wide panel detection	[ON]: Flash detects position of wide panel. Lighting angle adjusted automatically. [OFF]: Flash does not detect wide panel position.
	Guide number display	[ON]: Flash output is shown as a guide number. [OFF]: Flash output is shown as a relative value.
	Auto light sensing	[ON]: The ISO sensitivity and the aperture are adjusted to match the camera. [OFF]: The ISO sensitivity and the aperture of the flash can be adjusted with the dial. ● This can only be used for digital cameras with communication functions. (Only when the flash mode is set to [AUTO] or [SL AUTO] mode.)
	Auto ISO display	[25] to [3200]: Display the ISO sensitivity when [AUTO] is selected as the flash mode for cameras that can not communicate with the flash unit.

Control panel	Option	Description
	Modeling flash	This allows you to check the lighting and shadow effects in advance. [ON]: Fires a test flash many times in succession for approximately 1 second. [OFF]: Fires a flash once with the flash intensity you specify.

■ Returning the custom settings to the default setting

Press and hold the [OK] button and [BACK LIGHT] button together for more than 2 seconds.

The control panel will blink once when settings are reset.

Display of the distance unit does not return to the default setting.

Camera without Communication Functions

■ AUTO

Set aperture and ISO sensitivity to the values selected with the camera.

1 Set the flash mode to [AUTO].

"Flash Mode" (P10)

- When [AUTO] is selected, pressing [MODE] (▲) button allows you to set the aperture. Press the [MODE] (▲) button again to turn back.



2 Match the zoom position to the focal length of the lens.

"[ZOOM]" (P11)

3 Adjust aperture and ISO sensitivity.

"Other Settings" (P15)

If the selected values are out of the flash working range, [ISO] and [F] will blink in the display. The [AUTO CHECK] lamp blinks for about 5 seconds after the shutter is released to show that the flash has fired successfully.

■ MANUAL

Choose the guide number.

1 Set the flash mode to [MANUAL].

"Flash Mode" (P10)

2 Match the zoom position to the focal length of the lens.

"[ZOOM]" (P11)

3 Set the guide number.

"Other Settings" (P15)



Slave Mode

The flash can be fired remotely in sync with any flash fired by other units.

1 Set the flash mode to [SL AUTO] or [SL MANUAL].

"Flash Mode" (P10)

Adjust other flash settings as for [AUTO] or [MANUAL] mode.

"Camera without Communication Functions" (P17)

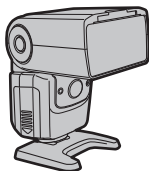
2 Position the flash.

Flash positioning method is same as the wireless mode.

"Placing Wireless Flash Units" (P13)

Refer to the camera operating instructions for details about the flash positioning range.

- Set the flash mode of the camera to the manual which does not fire the pre-flash. If the camera fires the pre-flash, the external flash synchronizes with the pre-flash of the camera, and cannot fire the flash light properly.
- The flash may fire in response to flash units used by other photographers.



Cautions for Use

■ About the unit

Do not carry the unit when it is still attached to the camera body.

■ About the batteries

Be sure to remove the batteries when you will not be using the unit for a long period of time.

Table of Guide Numbers (GN)

■ [MANUAL]

Flash intensity	Lighting angle (mm)						
	7*1, 2	10*1, 2	12*1, 2	14*1, 2	12*2	14*2	17*2
1/1	20	22	25	26	30	33	38
1/2	14	16	18	18	21	23	27
1/4	10	11	13	13	15	17	19
1/8	7.1	7.8	8.8	9.2	11	12	13
1/16	5.0	5.5	6.3	6.5	7.5	8.3	9.5
1/32	3.5	3.9	4.4	4.6	5.3	5.8	6.7
1/64	2.5	2.8	3.1	3.3	3.8	4.1	4.8
1/128	1.8	1.9	2.2	2.3	2.7	2.9	3.4

Flash intensity	Lighting angle (mm)					
	25*2	35*2	42*2	52*2	67*2	100*2
1/1	45	50	53	55	56	58
1/2	32	35	38	39	40	41
1/4	23	25	27	28	28	29
1/8	16	18	19	19	20	21
1/16	11	13	13	14	14	15
1/32	8.0	8.8	9.4	9.7	9.9	10
1/64	5.6	6.3	6.6	6.9	7.0	7.3
1/128	4.0	4.4	4.7	4.9	4.9	5.1

*1 These are the values with the wide panel.

*2 Multiplying these lighting angles (mm) by two yields equivalent values for 35 mm films.

■ [FP MANUAL]

• Listed below are the guide numbers (GN) for 1/1 (FULL) flashes.

Shutter speed	Lighting angle (mm)						
	7*1, 2	10*1, 2	12*1, 2	14*1, 2	12*2	14*2	17*2
1/125	14	16	18	18	21	23	27
1/160	13	14	16	16	19	21	24
1/200	11	12	14	15	17	18	21
1/250	10	11	13	13	15	17	19
1/320	8.9	9.8	11	12	13	15	17
1/400	7.9	8.8	9.9	10	12	13	15
1/500	7.1	7.8	8.9	9.2	11	12	13
1/640	6.3	6.9	7.9	8.2	9.4	10	12
1/800	5.6	6.2	7.0	7.3	8.4	9.2	11
1/1000	5.0	5.5	6.3	6.5	7.5	8.2	9.5
1/1300	4.4	4.9	5.6	5.8	6.7	7.3	8.5
1/1600	4.0	4.4	5.0	5.2	5.9	6.5	7.5
1/2000	3.5	3.9	4.4	4.6	5.3	5.8	6.7
1/2500	3.1	3.5	3.9	4.1	4.7	5.2	6.0
1/3200	2.8	3.1	3.5	3.7	4.2	4.6	5.4
1/4000	2.5	2.8	3.1	3.3	3.7	4.1	4.8
1/5000	2.2	2.5	2.8	2.9	3.4	3.7	4.3
1/6400	2.0	2.2	2.5	2.6	3.0	3.3	3.8
1/8000	1.8	2.0	2.2	2.3	2.7	2.9	3.4

*1 These are the values with the wide panel.

*2 Multiplying these lighting angles (mm) by two yields equivalent values for 35 mm films.

Shutter speed	Lighting angle (mm)					
	25*2	35*2	42*2	52*2	67*2	100*2
1/125	32	35	38	39	40	41
1/160	28	31	33	35	35	36
1/200	25	28	30	31	31	32
1/250	23	25	27	28	28	29
1/320	20	22	24	25	25	26
1/400	18	20	21	22	22	23
1/500	16	18	19	19	20	21
1/640	14	16	17	17	18	18
1/800	13	14	15	15	16	16
1/1000	11	13	13	14	14	14
1/1300	10	11	12	12	12	13
1/1600	8.9	9.9	11	11	11	11
1/2000	8.0	8.9	9.4	9.7	9.9	10
1/2500	7.1	7.9	8.3	8.6	8.8	9.1
1/3200	6.3	7.0	7.5	7.7	7.9	8.2
1/4000	5.6	6.3	6.6	6.9	7.0	7.2
1/5000	5.0	5.6	5.9	6.2	6.3	6.5
1/6400	4.4	4.9	5.2	5.4	5.5	5.7
1/8000	4.0	4.4	4.7	4.9	5.0	5.1

*2 Multiplying these lighting angles (mm) by two yields equivalent values for 35 mm films.

- In the [FP MANUAL] mode, the following formula can be used to obtain the guide numbers (GN) when any setting except 1/1 is used for the light quantity.

Guide number (GN) = Guide number for 1/1 × light quantity ratio coefficient*3

*3 Light quantity ratio coefficient

Light quantity ratio	1/1	1/2	1/4	1/8	1/16
Light quantity ratio coefficient	1.0	0.71	0.5	0.35	0.25

- The values in the table assume that the ISO sensitivity is set to [100].

Specifications

Specifications are subject to change without notice.

Power requirements: DC 6.0 V

Batteries recommended for use	LR6/AA Alkaline dry batteries × 4/ HR6/AA Rechargeable nickel metal hydride batteries (Ni-MH) × 4
Charging time (from full flash until the [TEST/CHARGE] lamp lights)	Approx. 2.7 sec.: LR6/AA Alkaline dry batteries Approx. 1.7 sec.: HR6/AA Rechargeable nickel metal hydride batteries
Firing period	Approx. 1/20000 sec. to 1/250 sec. (Varies depending on the flash intensity; FP firing excluded.)
No. of flashes (with full flash)	Approx. 125 flashes: LR6/AA Alkaline dry batteries Approx. 175 flashes: HR6/AA Rechargeable nickel metal hydride batteries (min. 1900 mAh type) (Differs depending on the photo taking conditions.)
AF assist lamp	Effective distance: approximately 1 m (3.3 feet) to 5 m (16 feet) (Differs depending on the digital camera and type of lens used)
Flash modes	TTL AUTO/AUTO/MANUAL/FP TTL AUTO/ FP MANUAL/SL AUTO/SL MANUAL/RC/MULTI
Guide number	58 (ISO100), 26 (ISO100: When the wide panel is used)
Lighting angle	Covers the angle of view of 12 mm to 100 mm lenses (35 mm film camera equivalent: 24 mm to 200 mm) (With wide panel: 7 mm lens, 35 mm film camera equivalent: 14 mm)
Dimensions	Approx. 72.0 mm (W) × 112.5 mm (H) × 112.5 mm (D) [2.835" (W) × 4.429" (H) × 4.429" (D)] (excluding the projecting parts)
Mass (weight)	Approx. 435 g/0.959 lb (including batteries) Approx. 340 g/0.750 lb (main unit)
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Operating humidity	10%RH to 80%RH (no condensation)

For the U.S.A.

Panasonic Corporation of North America
Two Riverfront Plaza, Newark, NJ 07102-5490

For CANADA

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Printed in China

VQT5F44 **21**

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

Panasonic Products Limited Warranty

Limited Warranty Coverage (For USA Only)

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

Product or Part Name	Parts	Labor
Digital Camera Accessories	90 Days	90 Days
Batteries (Non-rechargeable batteries are not warranted.)	10 Days	Not Applicable

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

Mail-In Service--Online Repair Request

Online Repair Request

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

When shipping the unit, carefully pack, include all supplied accessories listed in the Owner's Manual, and send it prepaid, adequately insured and packed well in a carton box. When shipping Lithium Ion batteries please visit our Web Site at

www.panasonic.com/BatteryHandling as Panasonic is committed to providing the most up to date information. Include a letter detailing the complaint, a return address and provide a daytime phone number where you can be reached. A valid registered receipt is required under the Limited Warranty.

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

Limited Warranty Limits And Exclusions

This warranty ONLY COVERS failures due to defects in materials or workmanship, and DOES NOT COVER normal wear and tear or cosmetic damage. The warranty ALSO DOES NOT COVER damages which occurred in shipment, or failures which are caused by products not supplied by the warrantor, or failures which result from accidents, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, set-up adjustments, misadjustment of consumer controls, improper maintenance, power line surge, lightning damage, modification, introduction of sand,

humidity or liquids, commercial use such as hotel, office, restaurant, or other business or rental use of the product, or service by anyone other than a Factory Service Center or other Authorized Servicer, or damage that is attributable to acts of God.

THERE ARE NO EXPRESS WARRANTIES EXCEPT AS LISTED UNDER "LIMITED WARRANTY COVERAGE".

THE WARRANTOR IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY.

(As examples, this excludes damages for lost time, travel to and from the servicer, loss of or damage to media or images, data or other memory or recorded content. The items listed are not exclusive, but for illustration only.)

ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY, ARE LIMITED TO THE PERIOD OF THE LIMITED WARRANTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. If a problem with this product develops during or after the warranty period, you may contact your dealer or Service Center. If the problem is not handled to your satisfaction, then write to the warrantor's Consumer Affairs Department at the addresses listed for the warrantor.

PARTS AND SERVICE, WHICH ARE NOT COVERED BY THIS LIMITED WARRANTY, ARE YOUR RESPONSIBILITY.

Customer Services Directory (United States)

Obtain Product Information and Operating Assistance; locate your nearest Dealer or Service Center; purchase Parts and Accessories; or make Customer Service and Literature requests by visiting our Web Site at:

<http://www.panasonic.com/support>

or, contact us via the web at:

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

For hearing or speech impaired TTY users, TTY: 1-877-833-8855

Accessory Purchases (United States)

Purchase Parts, Accessories and Owner's Manual online for all Panasonic Products by visiting our Web Site at:

<http://www.pstc.panasonic.com>

Or, send your request by E-mail to:

npcparts@us.panasonic.com

You may also contact us directly at:

1-800-237-9080 (Fax Only)

(Monday-Friday 9am-9pm EST)

Panasonic National Parts Center

20421 84th Avenue South, Kent, WA 98032

(We accept Visa, MasterCard, Discover Card, American Express)

For hearing or speech impaired TTY users, TTY: 1-866-605-1277

As of April 2014

Limited Warranty (ONLY FOR CANADA)

Panasonic Canada Inc.

5770 Ambler Drive, Mississauga, Ontario L4W 2T3

PANASONIC PRODUCT – LIMITED WARRANTY

Panasonic Canada Inc. warrants this product to be free from defects in material and workmanship under normal use and for a period as stated below from the date of original purchase agrees to, at its option either (a) repair your product with new or refurbished parts, (b) replace it with a new or a refurbished equivalent value product, or (c) refund your purchase price. The decision to repair, replace or refund will be made by Panasonic Canada Inc.

Digital Camera	One (1) year, parts and labour
Digital Camera Peripherals	One (1) year, parts and labour
Digital Camera Accessories	Ninety (90) days, parts and labour

This warranty is given only to the original purchaser, or the person for whom it was purchased as a gift, of a Panasonic brand product mentioned above sold by an authorized Panasonic dealer in Canada and purchased and used in Canada, which product was not sold “as is”, and which product was delivered to you in new condition in the original packaging.

**IN ORDER TO BE ELIGIBLE TO RECEIVE WARRANTY SERVICE
HEREUNDER, A PURCHASE RECEIPT OR OTHER PROOF OF DATE OF
ORIGINAL PURCHASE, SHOWING AMOUNT PAID AND PLACE OF
PURCHASE IS REQUIRED**

LIMITATIONS AND EXCLUSIONS

This warranty **ONLY COVERS** failures due to defects in materials or workmanship, and **DOES NOT COVER** normal wear and tear or cosmetic damage. The warranty **ALSO DOES NOT COVER** damages which occurred in shipment, or failures which are caused by products not supplied by Panasonic Canada Inc., or failures which result from accidents, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, set-up adjustments, misadjustment of consumer controls, improper maintenance, improper batteries, power line surge, lightning damage, modification, introduction of sand, humidity or liquids, commercial use such as hotel, office, restaurant, or other business or rental use of the product, or service by anyone other than a Authorized Servicer, or damage that is attributable to acts of God.

Dry cell batteries, printer ink cartridge and paper are also excluded from coverage under this warranty.

Rechargeable batteries are warranted for ninety (90) days from date of original purchase.

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WARRANTY SERVICE

For product operation, repairs and information assistance, please visit our Support page:

www.panasonic.ca/english/support