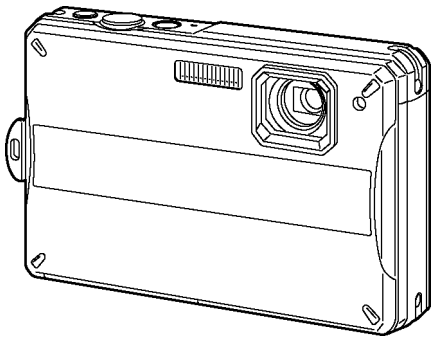
ORDER NO.DSC1009053CE
B26

Service Manual

Digital Camera

LUMIX SDXC



Model No. DMC-FT10EB
DMC-FT10EE
DMC-FT10EF
DMC-FT10EG
DMC-FT10EP
DMC-FT10GC
DMC-FT10GF
DMC-FT10GN
DMC-TS10P
DMC-TS10PC
DMC-TS10PU
DMC-TS10GH

VOL.1

Colours
(A).....Blue Type (Except DMC-FT10EB/EE/EF/EP, DMC-TS10PC/GH)
(K).....Black Type (Except DMC-TS10PU/GH)
(S).....Silver Type (Except DMC-FT10EB/EE/EF/EP/GN, DMC-TS10PC/PU)
(R).....Red Type

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

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1 Safety Precautions

1.1. General Guidelines

1. IMPORTANT SAFETY NOTICE
   There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-RADIATION, shock fire, or other hazards. Do not modify the original design without permission of manufacturer.
2. An Isolation Transformer should always be used during the servicing of AC Adaptor whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect AC Adaptor from being damaged by accidental shorting that may occur during servicing.
3. When servicing, observe the original lead dress. It a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.2. Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1MΩ and 5.2MΩ. When the exposed metal does not have a return path to the chassis, the reading must be infinity.

1.3. Leakage Current Hot Check (See Figure 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5kΩ, 10 W resistor, in parallel with a 0.15μF capacitor, between each exposed metallic part on the set and a good earth ground, as shown in Figure 1.
3. Use an AC voltmeter, with 1 kΩ/V or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 V RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 mA. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

Hot-Check Circuit

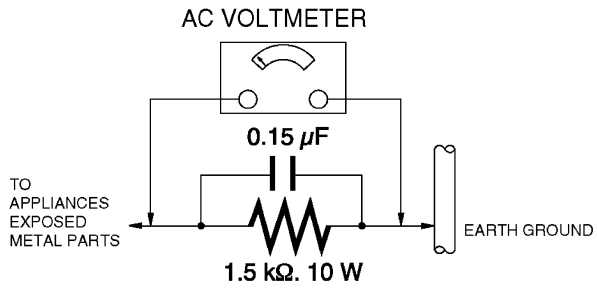


Figure 1

1.4. How to Discharge the Capacitor on Flash Top P.C.B.

• This unit equipped with two pieces of capacitors as flash charging capacitors.
"Either one of the capacitor discharging operation" makes discharging for others as well.

CAUTION:

1. **Be sure to discharge the capacitor on Flash Top P.C.B.**
2. **Be careful of the high voltage circuit on Flash Top P.C.B. when servicing.**

[Discharging Procedure]

1. Refer to the disassemble procedure and remove the necessary parts/unit.
2. Put the insulation tube onto the lead part of Resistor (ERG5SJ102:1kΩ /5W).
   (An equivalent type of resistor may be used.)
3. Put the resistor between both terminals of capacitor on Flash Top P.C.B. for approx. 5 seconds.
4. After discharging confirm that the capacitor voltage is lower than 10V using a voltmeter.

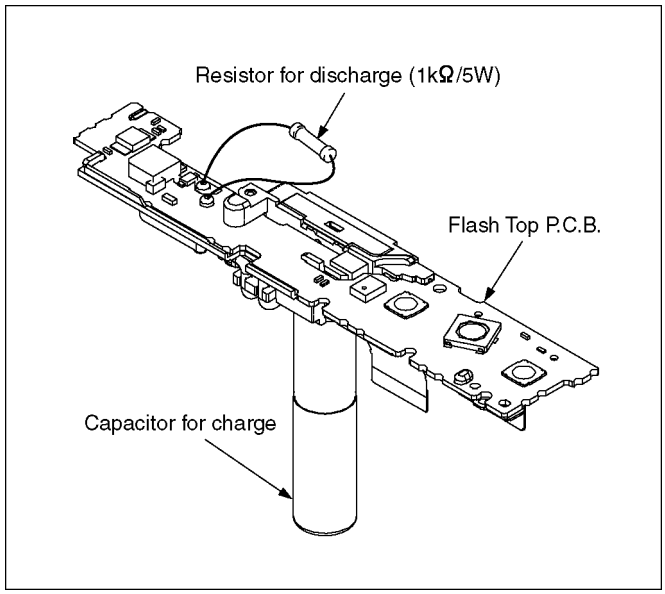


Fig. F1

2 Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatic Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices.

> Examples of typical ES devices are CCD image sensor, IC (integrated circuits) and some field-effect transistors and semiconductor “chip” components.

The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an antistatic solder removal device. Some solder removal devices not classified as antistatic (ESD protected) can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION:
   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

2.2. How to Recycle the Lithium Ion Battery (U.S. Only)

ENGLISH

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

FRANÇAIS

L'appareil que vous vous êtes procuré est alimenté par une batterie au lithium-ion/polymère recyclable. Pour des renseignements sur le recyclage de la batterie, veuillez composer le 1-800-8-BATTERY.

2.3. Caution for AC Cord (For EB/ GC/GH/SG)

2.3.1. Information for Your Safety

IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

FOR YOUR SAFETY

DO NOT REMOVE THE OUTER COVER

To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

2.3.2. 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 amperes and it is approved by ASTA or BSI to BS1362
Check for the ASRA mark or the BSI mark on the body of the fuse.

ASTA mark	BSI mark

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 Panasonic Dealer.

If the fitted moulded plug is unsuitable for the socket outlet in your home then the fuse should be removed and the plug cut off and disposed of safety.
There is a danger of severe electrical shock if the cut off plug is inserted into any 13-ampere socket.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt, please consult a qualified electrician.

2.3.2.1. Important

The wires in this mains lead are coloured in accordance with the following code:

Blue	Neutral
Brown	Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

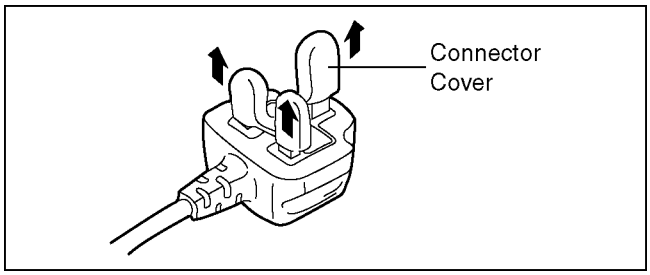
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol.

Earth Symbol	⏚

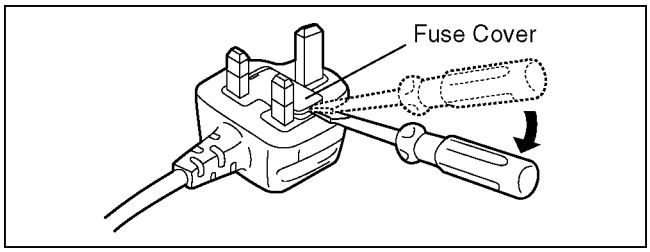
2.3.2.2. Before Use

remove the Connector Cover as follows.

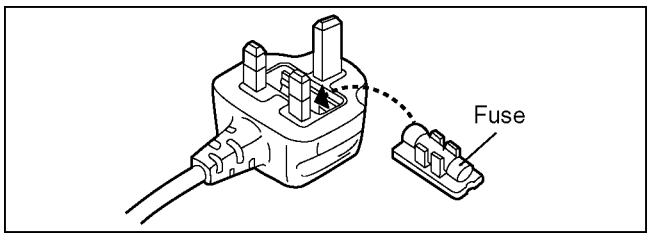


2.3.2.3. How to Replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



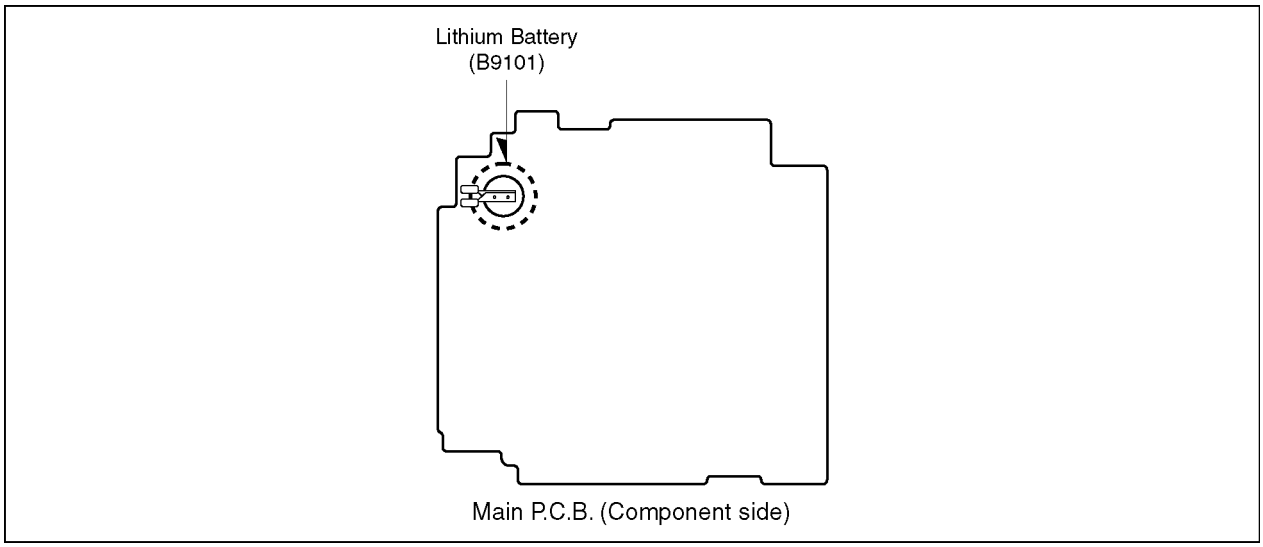
2. Replace the fuse and attach the Fuse cover.



2.4. How to Replace the Lithium Battery

2.4.1. Replacement Procedure

1. Remove the Main P.C.B. (Refer to Disassembly Procedures.)
2. Unsolder the Lithium battery (Ref. No. B9101 at foil side of Main P.C.B.) and then replace it into new one.



Note:

The lithium battery is a critical component.
(Type No.: ML-421S/DN **Manufactured by Energy Company, Panasonic Corporation**)
It must never be subjected to excessive heat or discharge.
It must therefore only be fitted in equipment designed specifically for its use.
Replacement batteries must be of the same type and manufacture.
They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.
Do not attempt to re-charge the old battery or re-use it for any other purpose.
It should be disposed of in waste products destined for burial rather than incineration.

(For English)

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

(For German)

ACHTUNG

Explosionsgefahr bei falschem Anbringen der Batterie. Ersetzen Sie nur mit einem äquivalentem vom Hersteller empfohlenem Typ.
Behandeln Sie gebrauchte Batterien nach den Anweisungen des Herstellers.

(For French)

MISE EN GARDE

Une batterie de remplacement inappropriée peut exploser. Ne remplacez qu'avec une batterie identique ou d'un type recommandé par le fabricant. L'élimination des batteries usées doit être faite conformément aux instructions du manufacturier.

Note:
Above caution is applicable for a battery pack which is for DMC-FT10 and DMC-TS10 series, as well.

3 Service Navigation

3.1. Introduction

This service manual contains technical information, which will allow service personnel's to understand and service this model.
Please place orders using the parts list and not the drawing reference numbers.
If the circuit is changed or modified, the information will be followed by service manual to be controlled with original service manual.

3.2. Air-leak test (inspection)

[About Waterproof/Dustproof]

- This camera's waterproof/dustproof rating complies with the "IPX8" and "IP6X" ratings.
- This camera can operate underwater, to a depth not exceeding 10 m (33 feet) for a time not exceeding 60 minutes.*1

  *1 This means that the camera can be used underwater for a specified time in specified pressure in accordance with the handling method established by Panasonic.
  This does not guarantee no destruction, no malfunction, or waterproofing in all conditions.

[About Shockproof]

- This camera also complies with "MIL-STD 810F (Method 516.5-Shock)".
  The camera has cleared a drop test from a height of 2 m (6.6 feet) onto 3 cm (0.10 feet) thick plywood.
  In most cases this camera should not sustain any damage if dropped from a height not exceeding 2 m (6.6 feet).*2

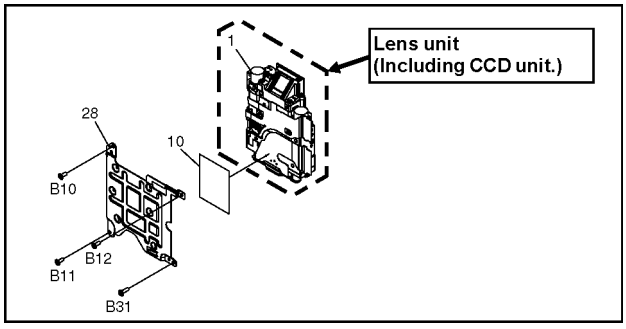
  *2 This does not guarantee no destruction, no malfunction, or waterproofing in all conditions.
- Due to the above characteristics of the products, perform the air-leak test (inspection) using Air -leak tester (Part No.:RFKZ0528) before/after servicing including assembly and/or assembly process.
  Note:
  The purpose of the air-leak test before servicing is that whether the malfunction occurred due to air-leak or not.
- When servicing, refer to the "7.Troubleshooting" section for details.

3.3. Replacing the waterproof packing (waterproof seal)

- The integrity of the waterproof packing may decrease about 1 year, with use and age.
  (We recommend end users to replace the waterproof packing (waterproof seal) at least once each year described in the operating instructions.)
- As for replacement procedure, refer to the 7.1.2. Periodical maintenance (Packing replacement) flow for details.

3.4. Lens Unit

- Since the lens unit for this model is assembled with high accuracy manufacturing technologies, it is not allowed to disassemble/assemble the lens unit, in terms of performance retention.
  When servicing, it has to be handled the "Lens with CCD unit" as the smallest part size.
  Confirm the replacement part list and exploded views for details.



3.5. General Description About Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.
The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30 °C (86 °F) more than that of the normal solder.

Definition of P.C.B. Lead Free Solder being used

The letter of PbF is printed either foil side or components side on the P.C.B. using the lead free solder. (See right figure)	PbF

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used.
- (Definition: The letter of PbF is printed on the P.C.B. using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the P.C.B. cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30 degrees C (662±86 °F).

Recommended Lead Free Solder (Service Parts Route.)

- The following 3 types of lead free solder are available through the service parts route.
  RFKZ03D01KS----------(0.3mm 100g Reel)
  RFKZ06D01KS----------(0.6mm 100g Reel)
  RFKZ10D01KS----------(1.0mm 100g Reel)

Note

* Ingredient: tin (Sn) 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

3.6. Important Notice 1:(Other than U.S.A. and Canadian Market)

1. The service manual does not contain the following information, because of the impossibility of servicing at component level without concerned equipment/facilities.
   a. Schematic diagram, Block Diagram and P.C.B. layout of MAIN P.C.B. and SUB OPE P.C.B.
   b. Parts list for individual parts for MAIN P.C.B. and SUB OPE P.C.B.
   When a part replacement is required for repairing MAIN P.C.B. and SUB OPE P.C.B., replace as an assembled parts. (MAIN P.C.B. and SUB OPE P.C.B.)
2. The following category is/are recycle module part. please send it/them to Central Repair Center.
   - MAIN P.C.B. (VEP56111A)
   - SUB OPE P.C.B. (VEP59087A)

3.7. How to Define the Model Suffix (NTSC or PAL model)

There are five kinds of DMC-FT10/TS10, regardless of the colours.

- a) DMC-TS10P/PC
- b) DMC-FT10EB/EF/EG/EP
- c) DMC-FT10EE
- d) DMC-FT10GN
- e) DMC-FT10GC/GF, DMC-TS10GH/PU

What is the difference is that the “INITIAL SETTINGS” data which is stored in Flash ROM mounted on Main P.C.B.

3.7.1. Defining methods

To define the model suffix to be serviced, refer to the nameplate which is putted on the bottom side of the Unit.

a) DMC-TS10P/PC

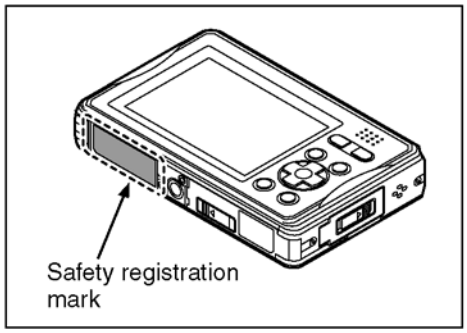
The nameplate for these models show the following Safety registration mark.

b) DMC-FT10EB/EF/EG/EP

The nameplate for these models show the following Safety registration mark.

c) DMC-FT10EE

The nameplate for this model show the following Safety registration mark.



d) DMC-FT10GN

The nameplate for this model show the following Safety registration mark.

e) DMC-FT10GC/GF, DMC-TS10GH/PU

The nameplate for these models do not show any above safety registration mark.

Note:

After replacing the MAIN P.C.B., be sure to achieve adjustment.

The Maintenance software (DIAS) is available at “software download” on the “Support Information from NWBG/VDBG-AVC” web-site in “TSN system”.

3.7.2. INITIAL SETTINGS:

After replacing the MAIN P.C.B., be sure to perform the initial settings after achieving the adjustment by ordering the following procedure in accordance with model suffix of the unit.

1. IMPORTANT NOTICE:

Before proceeding Initial settings, be sure to read the following CAUTIONS.

CAUTION 1:(INITIAL SETTINGS)

---AFTER REPLACING THE MAIN P.C.B. ---

*.The model suffix can be chosen **JUST ONE TIME.**
(Model suffix : DMC-FT10; "EB/EE/EF/EG/EP/GC/GF/GN", DMC-TS10 "P/PC/PU/GH")

*.Once one of the model suffix has been chosen, the model suffix lists will not be displayed, thus, it can not be changed.

[Note:Only for "EG, EF, EB and EP" models]

*.When one of the "EG, EF, EB and EP" has been chosen, only "EG, EF, EB and EP" are displayed from second times.

CAUTION 2:(Stored picture image data in the unit)

This unit employs "Built-in Memory" for picture image data recording.(Approx.40MB)
After proceeding "INITIAL SETTINGS", the picture image data stored in the unit is erased.

2. PROCEDURES:

- Precautions: Read the above "CAUTION 1" and "CAUTION 2", carefully
- Preparation:
  1. Attach the Battery or AC Adaptor with a DC coupler to the unit.
  2. Press the "MODE" button and set the mode to the NORMAL PICTURE mode.

Note:

If the mode select is other than NORMAL PICTURE mode, it does not display the initial settings menu.

- **Step 1. The temporary cancellation of "INITIAL SETTINGS":**
  While keep pressing "UP of Cursor button" and iA button simultaneously, turn the Power on.
- **Step 2. The cancellation of "INITIAL SETTINGS":**
  Press the PLAYBACK button.
  Press "UP of Cursor button" and iA button simultaneously, then turn the Power off.
- **Step 3. Turn the Power on:**
  Turn the Power on.
- **Step 4. Display the "INITIAL SETTINGS" menu:**

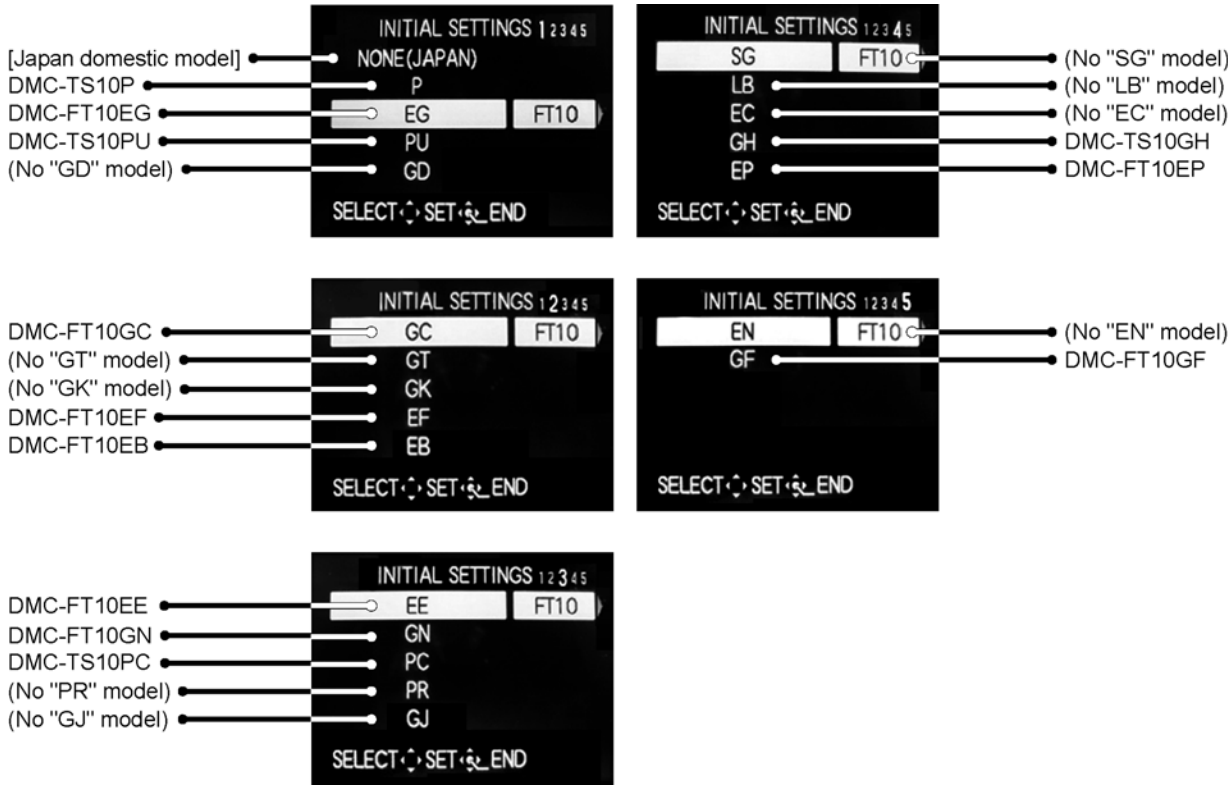
Note:

If the unit is other than NORMAL PICTURE mode, it does not display the initial settings menu.

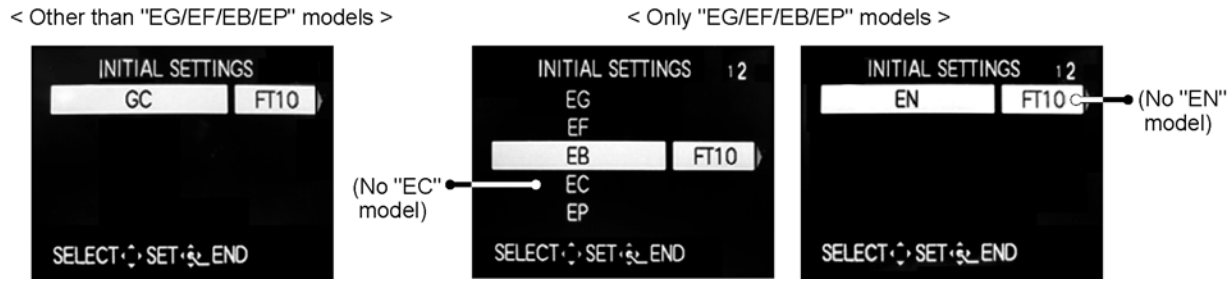
While keep pressing MENU/SET and "RIGHT of Cursor button" simultaneously, turn the Power off.
The "INITIAL SETTINGS" menu is displayed.
There are two kinds of "NITIAL SETTINGS" menu form as follows:

[CASE 1. After replacing MAIN P.C.B.]

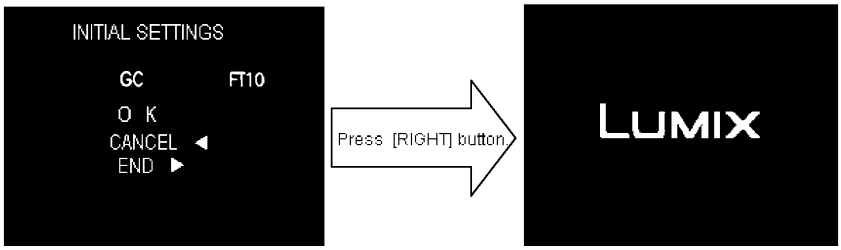
When MAIN P.C.B. has just been replaced, the following model suffix list is displayed as follows. (Five pages in total)



[CASE 2. Other than "After replacing MAIN P.C.B."]



- **Step 5. Chose the model suffix in "INITIAL SETTINGS": (Refer to "CAUTION 1")**
  [Caution: After replacing MAIN P.C.B.]
  (Especially, other than "EG, EF, EB and EP" models)
  The model suffix can be chosen, JUST ONE TIME.
  Once one of the model suffix have been chosen, the model suffix lists will not be displayed, thus, it can be changed.
  Therefore, select the area carefully.
  Select the area with pressing "UP / DOWN of Cursor buttons".
- **Step 6. Set the model suffix at "INITIAL SETTINGS":**
  Press the "RIGHT of Cursor buttons".
  The only set area is displayed. Press the "RIGHT of Cursor buttons" after confirmation.
  (The unit is powered off automatically.)



• **Step 7. CONFIRMATION:**

Confirm the display of "PLEASE SET THE CLOCK" in concerned language when the unit is turned on again.

When the unit is connected to PC with USB cable, it is detected as removable media.

1) As for your reference, major default setting condition is as shown in the following table.

Default setting (After "INITIAL SETTINGS")

	MODEL	VIDEO OUTPUT	LANGUAGE	DATE	REMARKS
a)	DMC-FT10EB	PAL	English	Date/Month/Year	
b)	DMC-FT10EE	PAL	Russian	Date/Month/Year	
c)	DMC-FT10EF	PAL	French	Date/Month/Year	
d)	DMC-FT10EG	PAL	English	Date/Month/Year	
e)	DMC-FT10EP	PAL	English	Date/Month/Year	
f)	DMC-FT10GC	PAL	English	Date/Month/Year	
g)	DMC-FT10GF	PAL	English	Date/Month/Year	
h)	DMC-FT10GN	PAL	English	Date/Month/Year	
i)	DMC-TS10GH	PAL	English	Date/Month/Year	
j)	DMC-TS10P	NTSC	English	Date/Month/Year	
k)	DMC-TS10PC	NTSC	English	Date/Month/Year	
l)	DMC-TS10PU	NTSC	Spanish	Date/Month/Year	

4 Specifications

Digital Camera: Information for your safety

Power Source	DC 5.1 V
Power Consumption	When recording: 1.0 W When playing back: 0.6 W
Camera effective pixels	14,100,000 pixels
Image sensor	1/2.33" CCD, total pixel number 14,500,000 pixels Primary color filter
Lens	Optical 4 x zoom f=6.3 mm to 25.2 mm (35 mm film camera equivalent: 35 mm to 140 mm)/ F3.5 (Max. W) to F5.9 (Max. T)
Digital Zoom	Max. 4 x
Extended Optical Zoom	Max. 8.4 x
Focus range	
Normal	50 cm (1.64 feet) to ∞
Macro/ Intelligent Auto	10 cm (0.33 feet) (Wide)/ 50 cm (1.64 feet) (Tele) to ∞
Scene Mode	There may be difference in above settings.
Shutter system	Electronic shutter + Mechanical shutter
Burst recording	
Burst speed	1.5 pictures/second
Number of recordable pictures	Until card/built-in memory is full
Hi-speed burst	
Burst speed	Approx. 4.6 pictures/second
Number of recordable pictures	Approx. 15 pictures (When using the built-in memory, immediately after formatting) Max. 100 pictures (When using a card, it may differ depending on the type of card and the recording conditions)
Shutter speed	8 to 1/1600 th [STARRY SKY] Mode: 15 seconds, 30 seconds, 60 seconds
Exposure (AE)	AUTO (Program AE) Exposure Compensation (1/3 EV Step, -2 EV to +2 EV)
Metering Mode	Multiple
LCD monitor	2.7" TFT LCD (4:3) (Approx. 230,400 dots) (field of view ratio about 100 %)
Flash	Flash range: (ISO ISO) Approx. 30 cm (0.99 feet) to 4.9 m (16.08 feet) (Wide)
Microphone	Monaural
Speaker	Monaural
Recording media	Built-in Memory (Approx. 40 MB)/SD Memory Card/ SDHC Memory Card/SDXC Memory Card
Recording file format	
Still picture	JPEG (based on Design rule for Camera File system, based on Exif 2.3 standard)/ DPOF corresponding
Motion pictures	QuickTime Motion JPEG (motion pictures with audio)
Interface	
Digital	USB 2.0 (Full Speed)
Analog video/ audio	NTSC Composite, Audio line output (Monaural)
Terminal	AV OUT/DIGITAL: Dedicated jack (8 pin) DC IN: Dedicated jack (2 pin)

Dimensions	Approx. 100.3 mm (W) x 63.5 mm (H) x 21.6 mm (D) [3.95" (W) x 2.50" (H) x 0.85" (D)] (excluding the projection part)
Mass	With card and battery: Approx. 172 g (0.38 lb) Excluding card and battery: Approx. 152 g (0.34 lb)
Operating temperature	-10 °C*1 to 40 °C (14 °F to 104 °F) *1 The performance of the battery (number of recordable pictures/operating time) and the LCD monitor (ghost images appearance, etc.) may drop temporarily when using the camera between -10 °C (14 °F) and 0 °C (32 °F) (in cold environments such as a ski resort).
Operating humidity	10 %RH to 80 %RH
Waterproof performance	Equivalent to IEC 60529 'IPX8' (Usable for 60 minutes in water depth of 3 m (10 feet))
Anti-shock performance	The camera's test method complies with MIL-STD 810F (Method 516.5-Shock)*2. *2 'MIL-STD 810F (Method 516.5-Shock)' is the test method standard of the U.S. Defense Department, which specifies performing drop tests from a height of 122 cm (4.00 feet), at 26 orientations (8 corners, 12 ridges, 6 faces) using 5 sets of devices, and passing the 26 orientation drops within 5 devices. (If failure occurs during the test, a new set is used to pass the drop orientation test within a total of 5 devices) • Panasonic's test method is based on MIL-STD 810F (Method 516.5-Shock) that is described above, with the drop height changed from 122 cm (4.00 feet) to 150 cm (5 feet). The camera cleared a test of being dropped onto 3 cm (0.10 feet) thick plywood. (Disregarding exterior changes such as paint peeling or deformation in the dropping impact areas.) **This is not a guarantee of no breakdowns or malfunctions under all conditions.**
Dustproof performance	Equivalent to IEC 60529 'IP6X'
Language select	[ENGLISH]/[ESPAÑOL]

Battery charger
(Panasonic DE-A75B): Information for your safety

Input	110 V to 240 V ~ 50/60Hz, 0.2 A
Output	4.2 V ⎓ 0.65 A (Battery charging)
Recommended recharging temperature	10 °C* to 30 °C (50 °F to 86 °F) * The battery cannot be recharged when the temperature is below 0 °C (32 °F). (The charging light blinks when the battery cannot be recharged.)

Equipment mobility: Movable
Battery pack (lithium-ion)
(Panasonic DMW-BCH7PP): Information for your safety

Voltage/capacity	3.7 V / 695 mAh
Operating temperature	-10 °C to 40 °C (14 °F to 104 °F) (When using the camera) 10 °C to 30 °C (50 °F to 86 °F) (Recommended recharging temperature)

Note:

*Above specification is for DMC-TS10P. Some of the specification may differ depends on model suffix.

[1] Only for "EB/EF/EG/EP" models:

1). [Interface Digital:]

- Data form the PC can not be written to the camera using the USB connection cable.
- Motion pictures can be recorded continuously for up to15 minutes.

[2] Others:

1). [Analog video/audio:]

NTSC ----------(Only "P/PC/PU" models)

NTSC/PAL Composite (Switched by menu) ----------(Except "P/PC/PU" models)

(Important) About the waterproof/dustproof and anti-shock performance of the camera

- Observe the following precautions, and avoid using the camera in locations subject to high water pressure. The camera's waterproof and dustproof performance complies with IPX8 and IP6X.
  Provided the usage and storage precautions in this document are strictly observed, the camera can record underwater in a depth up to 3 m (10 feet), for a time up to 60 minutes.*1
- The camera complies with MIL-STD 810F (Method 516.5-Shock). The camera has cleared a drop test from a height of 1.5 m (5 feet) onto 3 cm (0.10 feet) thick plywood. In most cases, the camera should not sustain any damage if dropped from a height of 1.5 m (5 feet) or less.*2
- The supplied accessories are not waterproof (excluding the hand strap and silicone jacket).

*1 This means that the camera can be used underwater for the specified time and specified pressure, in accordance with the handling method described by Panasonic. This is not a guarantee of no breakdowns, no malfunctions, or complete waterproofing under all conditions.

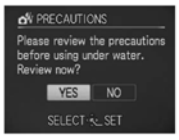
*2 This is not a guarantee of no breakdowns, no malfunctions, or complete waterproofing under all conditions.

Observe the precautions described in the following section 'Handling the camera'. Avoid using the camera in water pressure that exceeds the guaranteed performance, or in environments with excessive dust or sand. The waterproof performance is not guaranteed if the camera is subjected to an impact, such as being hit or dropped.
If the camera is subjected to an impact, it is recommended that you contact a Panasonic Service Center to have the camera inspected (subject to a fee) for its waterproof performance. Any malfunction caused by the customer's mishandling, such as water entering the camera, is not covered by the warranty.

■Handling the camera

- Do not leave the camera for a long time in a cold environment where the temperature is very low (such as a ski resort) or very high at 40 °C (104 °F) or higher (in particular locations such as under strong sunlight, inside a hot vehicle, near a heater, on a ship, or on a beach). (The waterproof performance will deteriorate.)
- The inside of the camera is not waterproof. Do not open or close the card/battery door or terminal cover close to water by the sea, a lake or river, or with wet hands.
- The waterproof function of the camera is for sea water and fresh water only.
- Operation may not be possible or the sound may be low if snow or water freezes on the zoom button, Power button, speaker or microphone in a cold environment such as a ski resort.
- The lens and LCD monitor may cloud up due to changes in temperature and humidity. For details, read of the Operating Instructions (PDF format) contained on the CD-ROM.

■About the [PRECAUTIONS] display



Check this information in advance to maintain the waterproof performance.
When the card/battery door is fully closed and the power is turned on for the first time after purchase, [PRECAUTIONS] is displayed.

❶ Select [YES] with ◄, and then press [MENU/SET]
- When [NO] is selected, the clock setting screen is displayed.

❷ Check the [PRECAUTIONS] on the screen
► : View the next screen
◄ : Return to the previous screen
[MENU/SET] : Cancel

❸ After the final screen (11/11), press [MENU/SET] to finish
- When [NO] is selected on the first screen or [MENU/SET] is pressed to cancel partway through the screens, [PRECAUTIONS] is displayed every time the power is turned on.
- The information can also be checked from [PRECAUTIONS] in the [SETUP] menu.

Camera care and the waterproof performance

To prevent water from entering the camera, be sure to observe the following before use.

■Do not open or close the card/battery door or terminal cover in sandy or dusty locations, while close to water, or with wet hands.

When the camera is used in the locations described above, sand or dust may enter through the gaps of the card/battery door or terminal cover and adhere to the camera without you knowing. Make sure in advance that the levels of the battery and card memory are sufficient.

■The use of the supplied silicone jacket is recommended to prevent the card/battery door or terminal cover from opening unexpectedly.

■The performance of the camera's rubber seal starts to deteriorate after 1 year.

It is recommended that you contact a Panasonic Service Center at least once a year to have the rubber seal replaced (subject to a fee).

Using the camera underwater

- Use this camera in a water depth of 3 m (10 feet) or less, in a water temperature range of 0 °C to 40 °C (32 °F to 104 °F), and do not use continuously underwater for longer than 60 minutes.
- Do not use in hot water exceeding 40 °C (104 °F) (such as a bath or hot springs).
- Do not open or close the card/battery door or terminal cover.
- Do not subject the camera to an impact underwater. (It may impair the waterproof performance and allow water to enter.)
- Do not dive into the water holding the camera. Do not use in locations subject to strong water flows, such as in rapids or under waterfalls. (The strong water pressure may cause a malfunction.)
- The camera sinks in water. Attach the camera securely to yourself, such as by wearing the hand strap around your wrist, to prevent you from dropping and losing the camera.
- If the camera is splashed by substances such as detergent, soap, hot spring water, bath powder, sun oil, sunscreen or chemicals, wipe off immediately.
- The card and battery are not waterproof. Do not handle them with wet hands. Further, do not insert a wet card or battery into the camera.

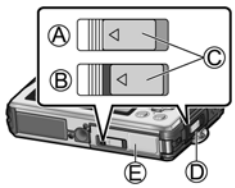
Opening and closing the card/battery door and terminal cover

At the time of purchase, the [LOCK] switches of the card/battery door and terminal cover are in the locked position.

■[LOCK] switch position

Ⓐ: Locked position
Ⓑ: Unlocked position

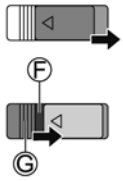
Ⓒ: [LOCK] switch
Ⓓ: Terminal cover
Ⓔ: Card/Battery door



■To open

❶ Slide the [LOCK] switch in the direction of the arrow until the red area (Ⓕ) is visible
The lock is unlocked.

❷ Slide the release lever (Ⓖ) to the [LOCK] switch side
The card/battery door and terminal cover open.



■To close

❶ While the [LOCK] switch is unlocked, push the card/battery door and terminal cover closed until they click

- To prevent water from entering the camera, make sure that no foreign objects are trapped in the card/battery door and terminal cover, such as liquid, sand, hair or dust.
- If the door or cover is closed while the [LOCK] switch is locked, it may cause damage or let water enter the camera.

❷ Lock the [LOCK] switch by sliding it in the direction of the arrow until the red area is no longer visible

- If the camera is used while a door or cover is not closed properly, it may open.

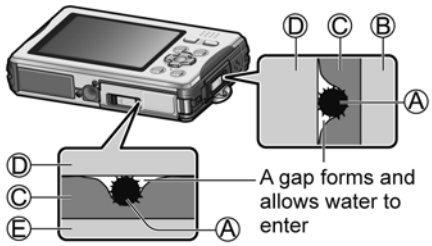
Causes of water entering the camera

When the camera is used in the following conditions, a gap may be formed between the camera and the card/battery door or terminal cover, allowing water to enter and causing a malfunction.

- When the rubber seal has deteriorated
- When the [LOCK] switch of the card/battery door or terminal cover is not locked
- When foreign objects such as lint, hair or sand are adhered to the inner side of the card/battery door or terminal cover (rubber seal or rubber seal contact area) and are trapped

Ⓐ: Foreign object

Ⓑ: Terminal cover
Ⓒ: Rubber seal
Ⓓ: Rubber seal contact area
Ⓔ: Card/Battery door



Cleaning the rubber seals

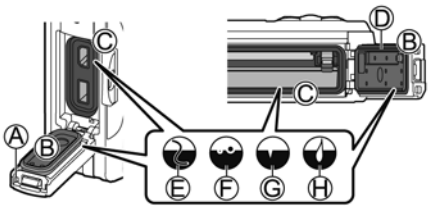
When a foreign object (such as hair, sand, dust or liquid) adheres to the rubber seal or rubber seal contact area, water may enter within a few seconds and cause a malfunction.

- When cleaning, make sure that no foreign objects get inside the camera.
- Be especially careful when removing very small or wet sand particles.

❶ **Make sure that there are no foreign objects adhered to the inner side of the card/battery door or terminal cover (Ⓑ rubber seal or Ⓒ rubber seal contact area)**

Ⓐ: Terminal cover
Ⓑ: Rubber seal
Ⓒ: Rubber seal contact area
Ⓓ: Card/ Battery door

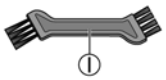
Ⓔ: Hair or lint
Ⓕ: Sand or dust
Ⓖ: Crack or deformation
Ⓗ: Liquid

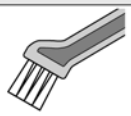


- **When the rubber seal attached to the inner side of the card/ battery door or terminal cover is cracked or deformed, contact a Panasonic Service Center.**

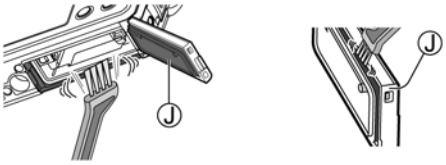
❷ **Remove adhered foreign objects with the supplied brush**

Ⓘ: Brush (supplied)

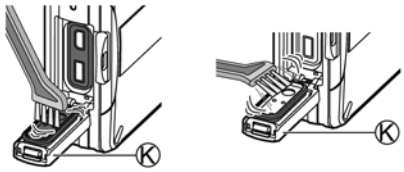


Long brush	Short brush
Use to remove substances such as fine or dry sand. 	Use to remove large foreign objects, and substances such as wet sand. 

Ⓙ: Card/ Battery door



Ⓚ: Terminal cover

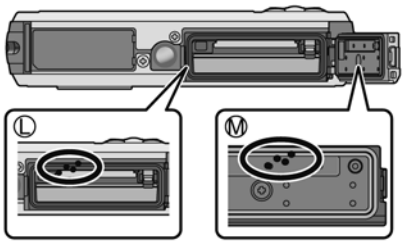


- Handling the brush
  - Before using the brush, make sure that no foreign objects are adhered to it.
  - After using the brush, clean it by removing any adhered foreign objects.

■Example of foreign objects on the inner side of the card/ battery door

Ⓛ: Rubber seal contact area (around the card/ battery compartment)

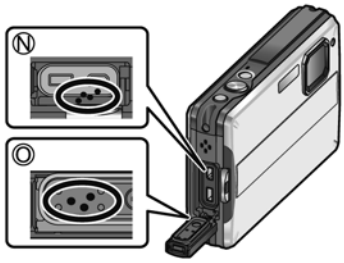
Ⓜ: Rubber seal area (around the card/ battery door)



■Example of foreign objects on the inner side of the terminal cover

Ⓝ: Rubber seal contact area (around the connection socket)

Ⓞ: Rubber seal area (around the terminal cover)



- If liquid is adhered, wipe it off with a soft and dry cloth.
- Foreign objects may also adhere to the grooves on the side of a rubber seal or at its corners. Clean with a brush.

Care after using the camera at a beach or in the sea or a river

Perform the following care procedure within 60 minutes of using the camera at a beach or in the sea or a river, etc.

❶ **Rinse with water while the card/battery door and terminal cover are closed, or if the camera was used in the sea, soak in a shallow container filled with fresh water for approx. 10 minutes**

Ⓐ: Locked position

- If the silicone jacket is attached, be sure to remove it before rinsing the camera.
- Leaving foreign objects or saline substances adhered to the camera may cause damage, discoloration, corrosion, abnormal odors, or deterioration.

❷ **Hold the camera with the speaker (terminal cover side) facing down, and gently shake it several times to drain the water**

- If water accumulates in the speaker, the sound volume may drop or distort.
- To prevent the camera from being dropped, wear the hand strap securely.

❸ **Wipe off the water droplets, and let the camera dry by standing it for a while on a dry cloth in a well ventilated and shaded area**

- Do not use a device such as a hair dryer to dry the camera.

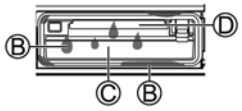
❹ **Make sure that there are no water droplets on the camera, and then open the door and cover**

❺ **If water droplets or sand remain adhered to the inner side of the card/battery door or terminal cover, remove them with a brush (supplied) or a soft and dry cloth**

■About the water drainage structure

The camera has a water drainage structure. Water that enters gaps such as those around the Power button or zoom button flows to the outside. For this reason, bubbles may appear when the camera is soaked in water, but this is not a malfunction.

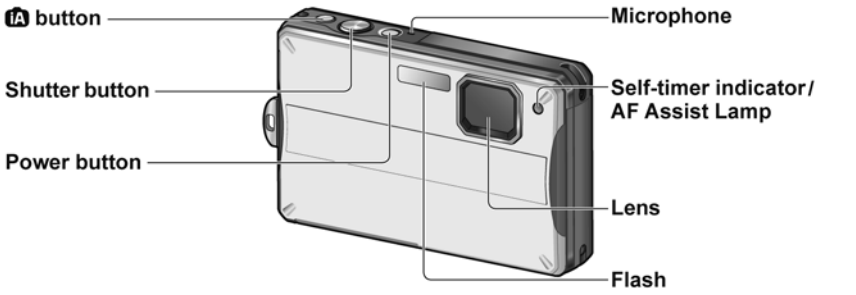
- Water may accumulate around the card/battery compartment or the connection sockets after using the camera underwater or soaking it in fresh water. If the card/battery door is opened while the camera is not completely dry, water droplets may adhere to the card or battery. If this happens, be sure to wipe with a soft and dry cloth.
- Do not open or close the card/battery door or terminal cover while there are water droplets on the camera. The water droplets may get inside the camera and cause condensation or a malfunction.
- Example of water droplets around the card/battery compartment
  Ⓑ: Water droplets
  Ⓒ: Battery
  Ⓓ: Card

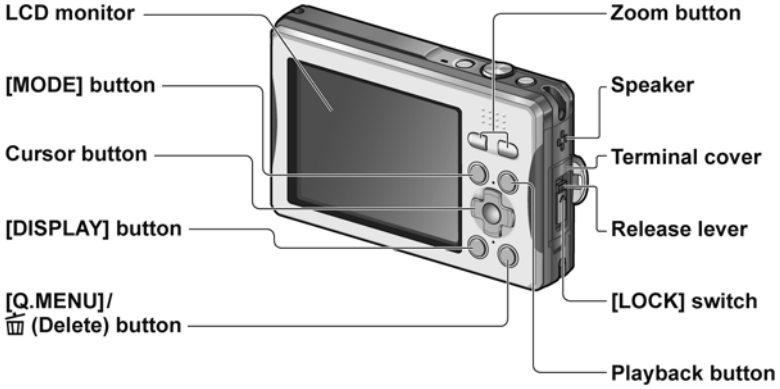


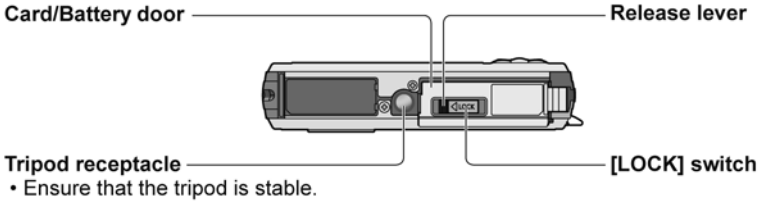
- If water droplets or dirt are adhered to the camera, wipe them off with a soft and dry cloth.
- After using the camera underwater, do not leave it for more than 60 minutes without performing the care procedure. The waterproof performance may deteriorate.
- If the buttons such as iA button or Power button do not move smoothly, it may be because there are adhered foreign objects. Continuing to use the camera in such a state may result in a malfunction where the camera becomes inoperable. Shake the camera well in fresh water to wash off any foreign objects. Then, confirm that buttons move smoothly.
- Water, sand and other foreign objects easily enter the speaker, so after using the camera, be sure to rinse with water and then shake it gently several times to remove any water droplets.
- Do not dry the camera with hot air, such as from a hair dryer. Deformation may deteriorate the waterproof performance.
- Do not use soap, neutral detergents, or chemicals such as benzine, thinner, alcohol or cleansers.

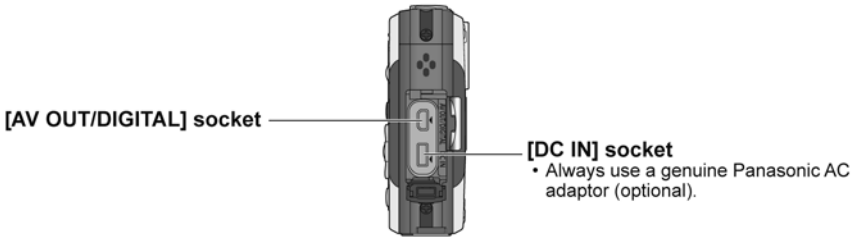
5 Location of Controls and Components

Names of parts

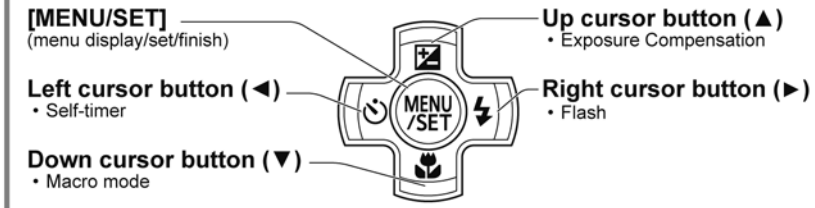








Cursor button



● In this manual, the button that is used is shaded or indicated by ▲▼◄►.

● The illustrations and screens in this manual may differ from the actual product.

About the Battery

- This unit has a function that can distinguish useable batteries. Exclusive batteries are supported by this function. (Conventional batteries not supported by this function cannot be used.)

It has been found that counterfeit battery packs which look very similar to the genuine product are made available to purchase in some markets. Some of these battery packs are not adequately protected with internal protection to meet the requirements of appropriate safety standards. There is a possibility that these battery packs may lead to fire or explosion. Please be advised that we are not liable for any accident or failure occurring as a result of use of a counterfeit battery pack. To ensure that safe products are used we would recommend that a genuine Panasonic battery pack is used.

6 Service Mode

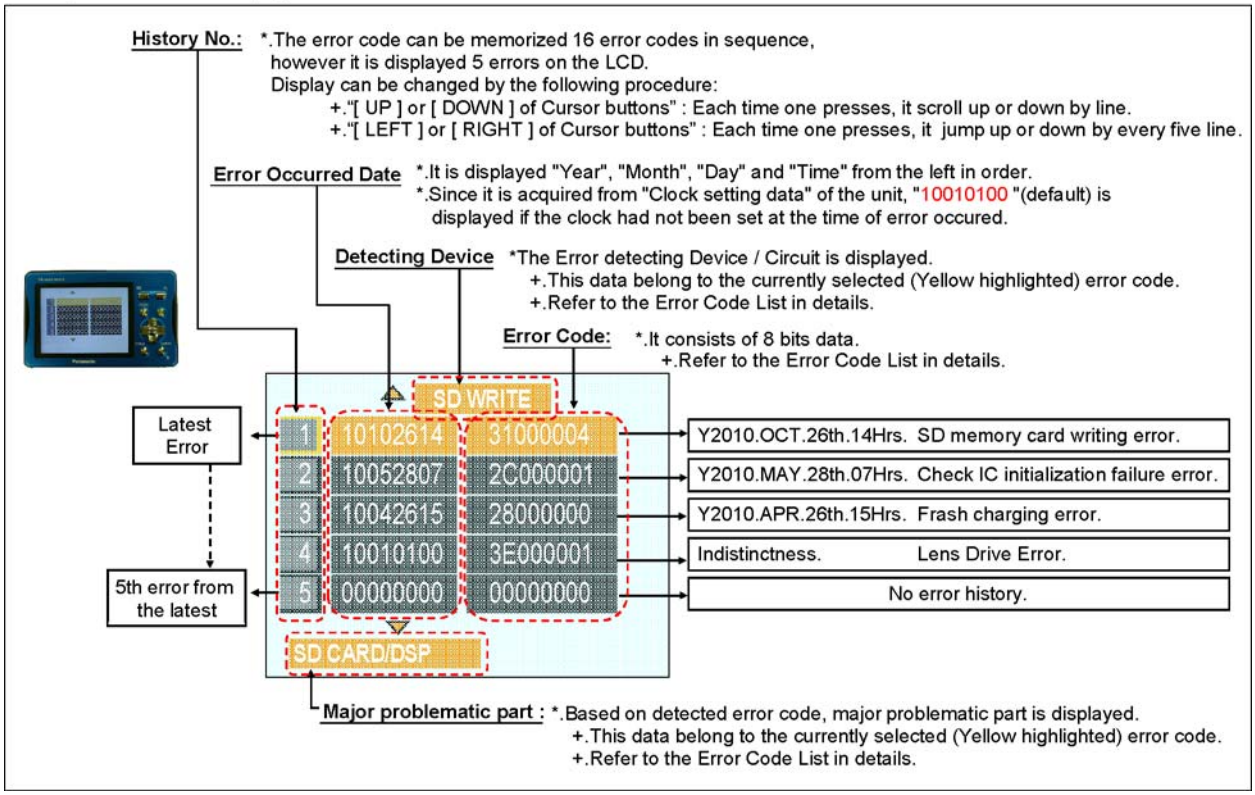
6.1. Error Code Memory Function

1. **General description**
   This unit is equipped with history of error code memory function, and can be memorized 16 error codes in sequence from the latest. When the error is occurred more than 16, the oldest error is overwritten in sequence.
   The error code is not memorized when the power supply is shut down forcibly (i.e.,when the unit is powered on by the battery, the battery is pulled out) The error code is memorized to FLASH ROM when the unit has just before powered off.
2. **How to display**
   The error code can be displayed by ordering the following procedure:

- **Preparation:**
  1. Attach the Battery or AC Adaptor with a DC coupler to the unit.

  Note:
  *Since this unit has built-in memory, it can be performed without inserting SD memory card.
  *Set the mode select other than "MOTION PICTURE" mode (such as normal picture / MS / SCN) to display the error code.
- **Step 1. The temporary cancellation of "INITIAL SETTINGS":**
  While keep pressing "UP of Cursor button" and iA button simultaneously, turn the Power on.
- **Step 2. Execute the error code display mode:**
  Press the "LEFT of Cursor button", MENU/SET button and iA button simultaneously.
  The display is changed as shown below when the above buttons are pressed simultaneously.
  Normal display → Error code display → Operation history display → Normal display → .....

Example of Error Code Display



3. **Error Code List**

The error code consists of 8 bits data and it shows the following information.

Attribute	Main item	Sub item	Error code		Contents (Upper)	Error Indication	
			High 4bits	Low 4 bits	Check point (Lower)	Detecting device	Part/Circuit
LENS	Lens drive	OIS	18*0	1000	PSD (X) error. Hall element (X axis) position detect error in OIS unit.	OIS X	LENSu NG
					OIS Unit		
				2000	PSD (Y) error. Hall element (Y axis) position detect error in OIS unit.	OIS Y	
					OIS Unit		
				3000	GYRO (X) error. Gyro (IC7101) detect error on SUB OPE P.C.B.	GYRO X	GYRO NG
					IC7101 (Gyro element) or IC6001 (VENUS 4)		
				4000	GYRO (Y) error. Gyro (IC7101) detect error on Top P.C.B.	GYRO Y	
					IC7101 (Gyro element) or IC6001 (VENUS 4)		
				5000	MREF error (Reference voltage error).	OIS REF	LENSSd/DSP NG
					IC9101 (LENS DRIVE) or IC6001 (VENUS 4)		
				6000	Drive voltage (X) error.	OISX REF	LENSu/LENS FPC
					LENS Unit, LENS flex breaks, IC6001(VENUS 4) AD value error, etc.		
				7000	Drive voltage (Y) error.	OISY REF	
					LENS Unit, LENS flex breaks, IC6001(VENUS 4) AD value error, etc.		
		Zoom		0?10	Collapsible barrel Low detect error (Collapsible barrel encoder always detects Low.)	ZOOM L	ZOOMm/ LENSu
					Mechanical lock, FP9002-(21) signal line or IC6001 (VENUS 4)		
				0?20	Collapsible barrel High detect error (Collapsible barrel encoder always detects High.)	ZOOM H	
					Mechanical lock, FP9002-(21) signal line or IC6001 (VENUS 4)		
				0?60	The zoom position jump is detected due to the impact (i.e. drop.) to the camera occurs.	(No indication)	(No indication)
					Lens unit		
		Focus		0?01	HP High detect error (Focus encoder always detects High, and not becomes Low)	FOCUS L	LENS FPC/ DSP
					Mechanical lock, FP9002-(21) signal line or IC6001 (VENUS 4)		
				0?02	HP Low detect error (Focus encoder always detects Low, and not becomes High)	FOCUS H	
					Mechanical lock, FP9002-(21) signal line or IC6001 (VENUS 4)		
		Lens	18*1	0000	Power ON time out error.	LENS DRV	LENSu
					Lens drive system		
			18*2	0000	Power OFF time out error.		
					Lens drive system		
	Adj.History	OIS	19*0	2000	OIS adj. Yaw direction amplitude error (small)	OIS ADJ	OIS ADJ
				3000	OIS adj. Pitch direction amplitude error (small)		
				4000	OIS adj. Yaw direction amplitude error (large)		
				5000	OIS adj. Pitch direction amplitude error (large)		
				6000	OIS adj. MREF error		
				7000	OIS adj. time out error		
				8000	OIS adj. Yaw direction off set error		
				9000	OIS adj. Pitch direction off set error		
				A000	OIS adj. Yaw direction gain error		
				B000	OIS adj. Pitch direction gain error		
				C000	OIS adj. Yaw direction position sensor error		
				D000	OIS adj. Pitch direction position sensor error		
				E000	OIS adj. other error		

Attribute	Main item	Sub item	Error code		Contents (Upper)	Error Indication	
			High 4bits	Low 4 bits	Check point (Lower)	Detecting device	Part/Circuit
HARD	VENUS A/D	Flash	28*0	0000	Flash charging error.	STRB CHG	FLASH TOP P.C.B./FPC
					IC6001-(AC17) signal line or Flash charging circuit		
	FLASH ROM (EEPROM Area)	FLASH ROM (EEPROM Area)	2B*0	0001 0003 0004	EEPROM read error	FROM RE	FROM
					IC6002 (FLASH ROM)		
				0002	EEPROM write error	FROM WR	FROM
					IC6002 (FLASH ROM)		
				0005	Firmware version up error	(No indication)	(No indication)
					Replace the firmware file in the SD memory card.		
				0008	SDRAM error		
				0009	SDRAM Mounting defective		
	SYSTEM	RTC	2C*0	0001	SYSTEM IC initialize failure error	SYS INIT	MAIN P.C.B.
					Communication between IC6001 (VENUS 4) and IC9101 (SYSTEM)		
SOFT	CPU	Reset	30*0	0001 | 0007	NMI reset Non Mask-able Interrupt (30000001-30000007 are caused by factors)	NMI RST	MAIN P.C.B.
	Card	Card	31*0	0001	Card logic error	SD CARD	SD CARD/ DSP
					SD memory card data line or IC6001 (VENUS 4)		
				0002	Card physical error		
					SD memory card data line or IC6001 (VENUS 4)		
				0004	Write error	SD WRITE	
					SD memory card data line or IC6001 (VENUS 4)		
			39*0	0005	Format error	INMEMORY	FROM
	CPU, ASIC hard	Stop	38*0	0001	Camera task finish process time out.	LENS COM	LENSu/DSP
					Communication between Lens system and IC6001 (VENUS 4)		
				0002	Camera task invalid code error.	DSP	DSP
					IC6001 (VENUS 4)		
				0100	File time out error in recording motion image		
					IC6001 (VENUS 4)		
				0200	File data cue send error in recording motion image		
					IC6001 (VENUS 4)		
				0300	Single or burst recording brake time out.		
		Memory area	3A*0	0008	USB work area partitioning failure	(No indication)	(No indication)
					USB dynamic memory securing failure when connect-ing		
	Operation	Power on	3B*0	0000	FLASHROM processing early period of camera during movement.	INIT	(No indication)
	Zoom	Zoom	3C*0	0000	Imperfect zoom lens processing	ZOOM	ZOOMm/ LENSu
					Zoom lens		
			35*0	0000 | FFFF	Software error (0-7bit : command, 8-15bit : status)	DSP	DSP
			35*1	0000	Though record preprocessing is necessary, it is not called.		
			35*2	0000	Though record preprocessing is necessary, it is not completed.	(No indication)	(No indication)

1) About "*" indication:

The third digit from the left is different as follows.

In case of 0 (example: 18 **0** 01000)

When the third digit from the left shows "0", this error occurred under the condition of INITIAL SETTINGS has been completed.

It means that this error is occurred basically at user side.

In case of 8 (example: 18 **8** 01000)

When the third digit from the left shows "8", this error occurred under the condition of INITIAL SETTINGS has been released.

(Example; Factory assembling-line before unit shipment, Service mode etc.)

It means that this error is occurred at service side.

2) About "?" indication: ("18*0 0?01" to "18*0 0?50"):

The third digit from the right shows one of the hexadecimal ("0" to "F") character.

4. **How to returned to Normal Display:**

Turn the power off and on, to exit from Error code display mode.

Note:

The error code can not be initialized.

6.2. ICS (Indication of additional Camera Settings when picture was taken) function

1. General description

This unit is equipped with ICS (ICS : **I**ndication of additional **C**amera **S**ettings when picture was taken) function by playing back the concerned picture on the LCD display.
(This function is achieved by utilizing "maker note" data stored in Exif data area of recorded picture file.)
To proceed failure diagnosis, use this ICS function together with "displaying the recorded picture with picture information" function.

Note:

*.The ICS function operates with a picture which is only taken with the same model. (It may not be displayed when the picture was taken with other model.)

*.Since Exif data is not available after the picture is edited by PC, the ICS function may not be activated.

2. How to display

The ICS data is displayed by ordering the following procedure:

- **Preparation:**

  1.Attach the Battery or AC Adaptor with a DC coupler to the unit.

  Note:

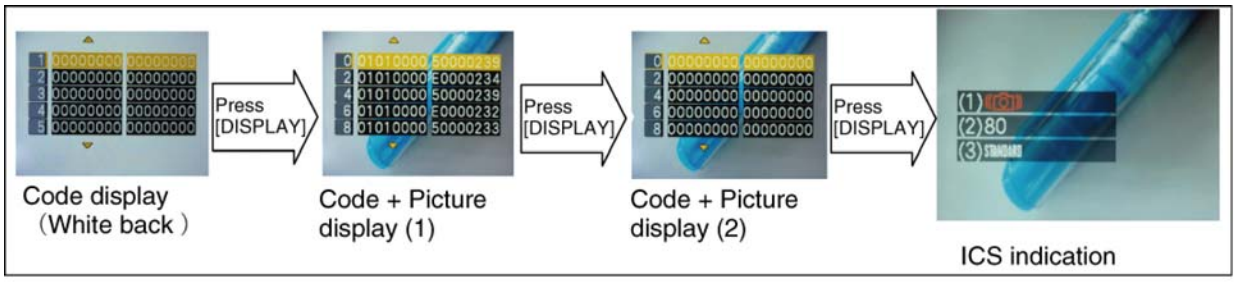
  *Set the mode select other than "MOTION PICTURE" mode (such as normal picture / MS / SCN) to display the ICS data.

- **Step 1. The temporary cancellation of "INITIAL SETTINGS":**

  While keep pressing "UP of Cursor button" and iA button simultaneously, turn the Power on.

- **Step 2. Execute the ICS display mode:**

  Press the PLAYBACK button.
  Select the concerned picture by pressing the "LEFT and RIGHT of Cursor button".
  Press the "LEFT of Cursor button", MENU/SET button and iA button simultaneously.
  Press the iA button, 3 times.
  The display condition is changed as shown below when the iA button is pressed.
  Code display → Code + Picture display (1) → Code + Picture display (2) → ICS display → .....



3. How to read

(1). Jitter alert was displayed or not:

This part shows that the "Jitter alert" mark was displayed or not when the picture has just before been taken.

+.With "Jitter alert" mark : The "Jitter alert" mark was displayed.
+.Without "Jitter alert" mark : The "Jitter alert "mark was not displayed.

[About "Jitter alert" mark]

Due to lacking the enough light amount etc, shooting condition prone to make a "hand jitter", the "Jitter alert" mark is displayed.

[Reference Guide]

(Applicable settings: Normal picture mode, ISO100, WIDE edge, Flash OFF)
+.The "Jitter alert" mark is displayed when the shutter speed is 1/15th and below.

Normal playback screen
(Recorded picture with information)

*In playback mode, the picture information is displayed when pressing the [DISPLAY] button. (It can be confirmed at user as well.)
*Use this indication together with ICS function.

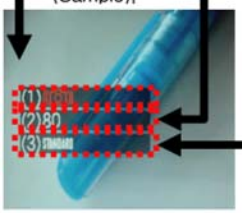
(2). ISO Sensitivity Setting condition:

This part shows that the "ISO Sensitivity" setting condition when the picture had been taken.
(Note: The [i ISO] is displayed when the "Intelligent ISO " was selected.)
For instance, when the recorded picture information shows [ISO80], it can be confirmed the ISO setting condition ; [AUTO], [INTELLIGENT ISO] or [ISO 80](Fixed: set by user).

[Point for Confirmation]

*The symptom is "Picture with "hand jitter". Subject is not clearly stopped." in darker scene, does the picture was taken with lower ISO setting mode?
*The symptom is "Noisy picture. Rough picture image" in brighter scene, does the picture was taken with higher ISO setting mode?

[ICS display (Sample)]



(1). Jitter alert mark: [Indicated]
(2). ISO sens. setting : ISO80 (Fixed)
(3). Color mode setting: Standard

(3). Color mode Setting condition:

This part shows that the "Color mode" setting condition when the picture had been taken.

[Point for Confirmation]

*The symptom is "Color is strange. The picture is bluish (Yellowish) ", does the picture was taken with [SEPIA] /[COOL] / [WARM] settings?

NOTE: As for the symptom related with the color, confirm the picture information which is displayed in normal playback screen as well.
(In normal playback screen, the setting condition of "White balance" and "WB Adjustment" can be confirmed.)

[Refer ence Guide : Settings "When taking

<ISO SENSITIVITY>

*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.
*In this unit, it can be set one of the [AUTO], [80], [100], [200], [400], [800] and [1600] in "Normal shooting" mode.
(The ISO sensitivity setting is not available when the [INTELLIGENT ISO] is being used.)
*When setting to [AUTO], the ISO sensitivity is automatically adjusted to a maximum of [ISO400] according to the brightness.
(It can be adjusted to a maximum of [ISO1000] when using the flash.)
*To avoid picture noise, we recommend that you either reduce the ISO sensitivity level or set [COLOR MODE] to [NATURAL], and then take pictures.

ISO sensitivity	80 ⟷ 1600	
Recording location (recommended)	When it is light (outdoors)	When it is dark
Shutter speed	Slow	Fast
Noise	Less	Increased

<COLOR MODE>

*Using these modes, the pictures can be made sharper or softer, the colors of the pictures can be turned into sepia colors or other color effects can be achieved.
*In this unit, it can be set one of the following effects in "Normal shooting" mode.

[STANDARD]	: This is the standard setting.	[B/W]	: The picture becomes black and white.
[NATURAL]	: The picture becomes softer.	[SEPIA]	: The picture becomes sepia.
[VIVID]	: The picture becomes sharper.	[COOL]	: The picture becomes bluish.
		[WARM]	: The picture becomes reddish.

NOTE: You cannot set [NATURAL], [VIVID], [COOL] or [WARM] in Intelligent auto mode.

4. How to exit

Simply, turn the power off. (Since ICS function is executed under the condition of temporary cancellation of "INITIAL SETTINGS",it wake up with normal condition when turn off the power.)

7 Troubleshooting Guide

7.1. Service and Check Procedures

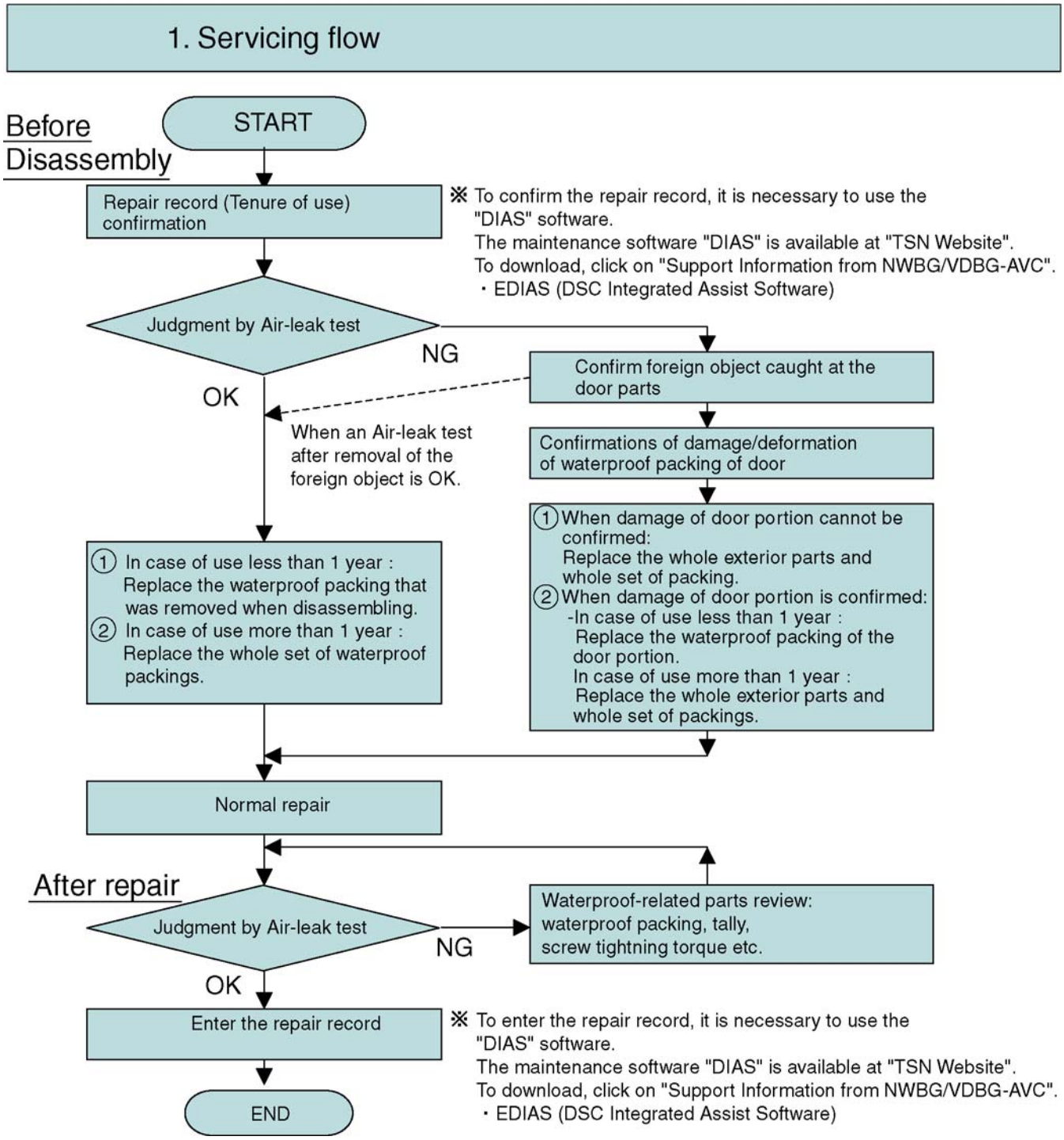
7.1.1. Servicing flow

- The following is the servicing procedure including assembly/disassembly process.
- As for the air-leak test, refer to "7.2. Air-leak Test".

<Note>

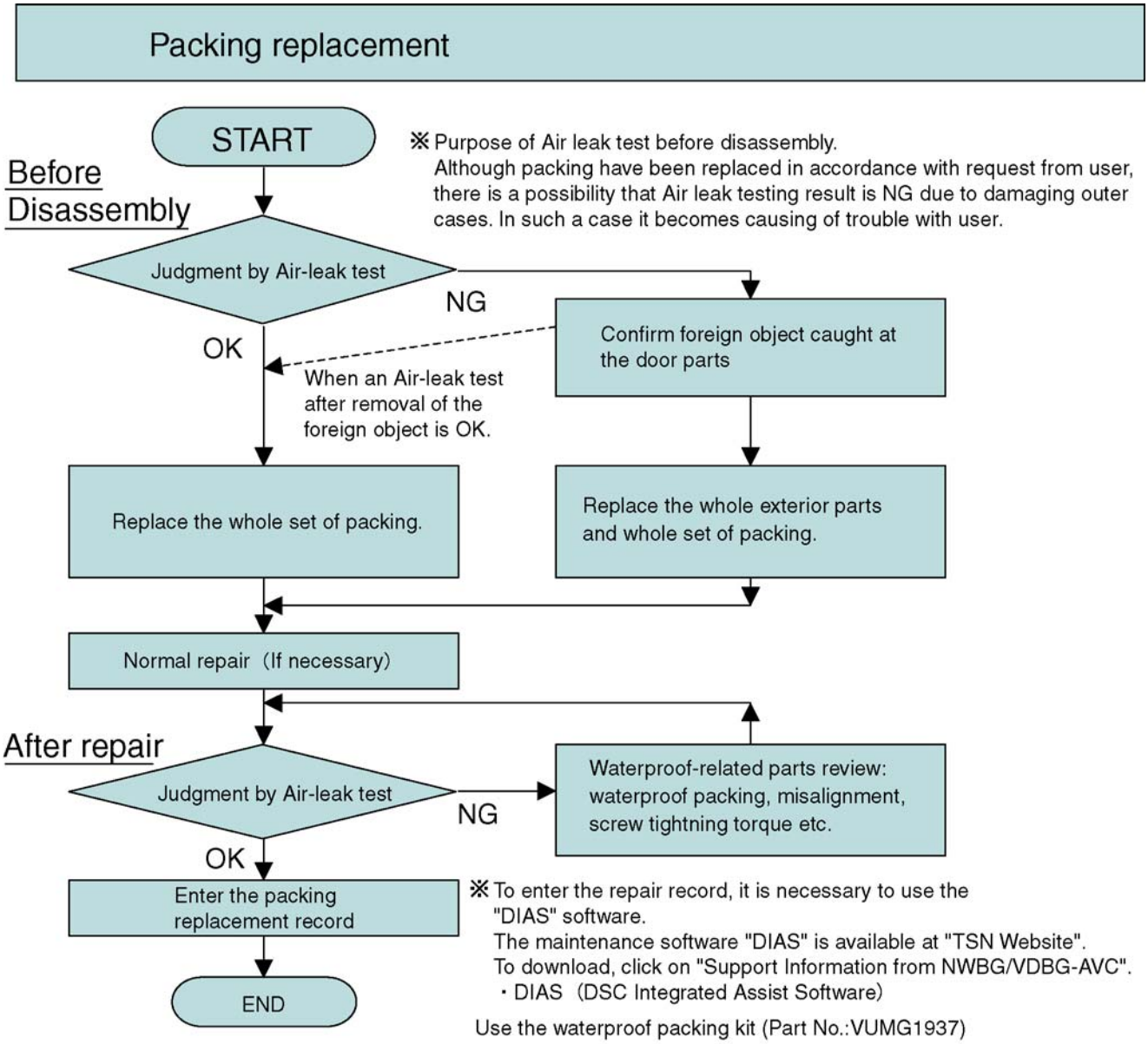
Air-leak test (inspection) before taking service measure:

- When the first inspection, do not perform cleaning (removal of foreign objects caught etc.) of the waterproof packing parts (battery door and Jack door) from the viewpoint of the cause investigation at NG of test (inspection) result.
- When the test (inspection) result was NG, perform test again after cleaning of waterproof packing parts.



7.1.2. Periodical maintenance (Packing replacement) flow

- The integrity of the waterproof packings may decrease about 1 year, with use and age.
  (We recommend end-users to replace the waterproof packing at least once each year described in the operating instructions.)
- Please use waterproof packing kit (Part No.: VUMG1937). (5 types, 5 packings in total are included)
- Do not touch the waterproof packings directly by the hand.
- Do not perform cleaning of waterproof packings by the solvent of alcohol etc. or by blowing air.
- Take care not to put any foreign objects (garbage and dust).
- As for the air-leak test, refer to "7.2. Air-leak Test".

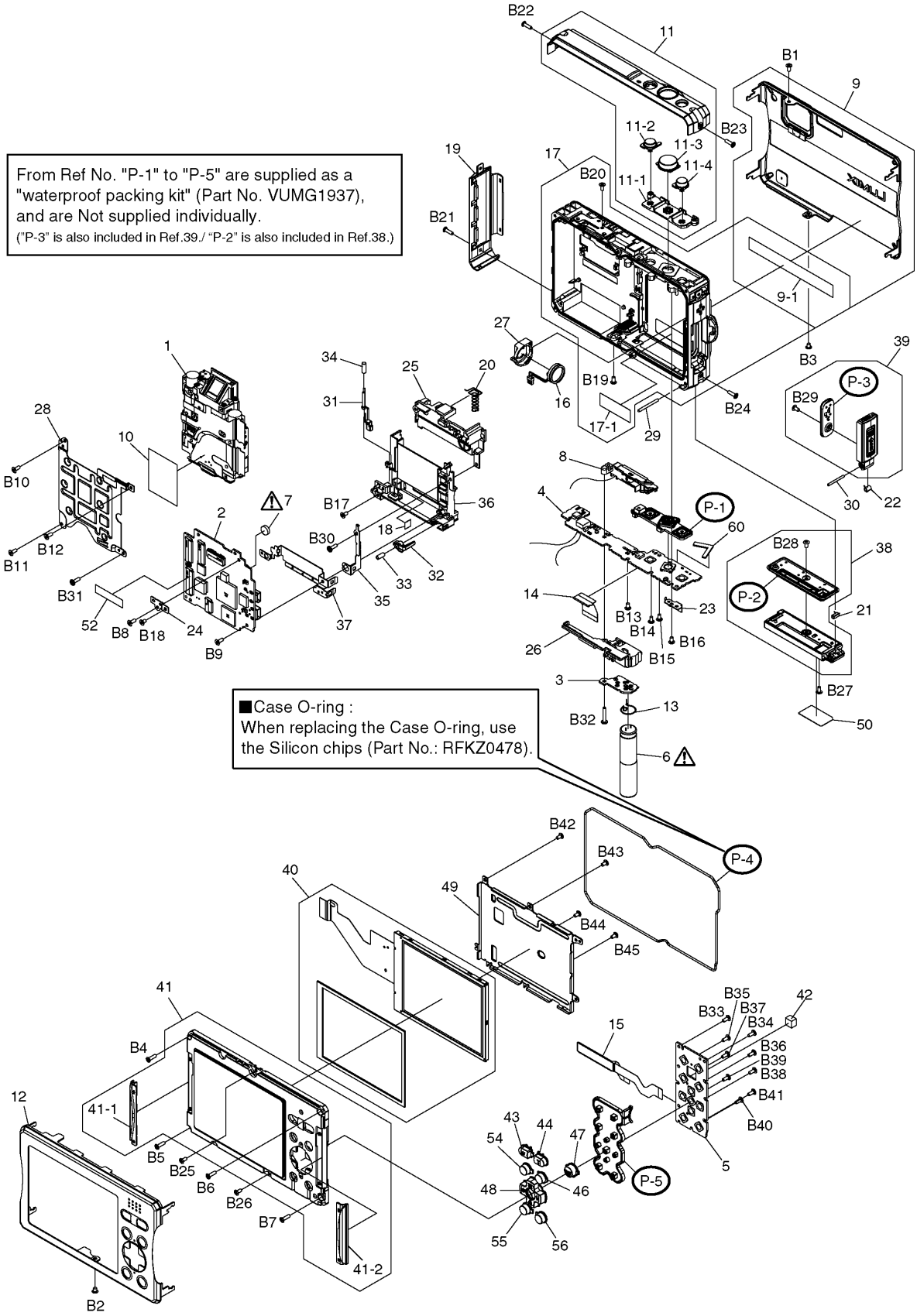


Replacing the waterproof packing

- The location of waterproof packing are shown at right. (5 types, 5 packings in total)
- Waterproof packings are supplied as Waterproof packing kit (Part No.: VUMG1937).

<Note for replacement>

- Do not touch the waterproof packings directly by the hand.
- Do not perform cleaning of waterproof packings by the solvent of alcohol etc. or by blowing air.
- Take care not to put any foreign objects (garbage and dust).
- Use the silicon chips (Prt No.: RFKZ0478) when replacing the Case O-ring.



7.2. Air-leak Test

Due to the waterproof performance retention, perform the air-leak test using Air-leak tester (Part No.:RFKZ0528) before/after servicing when disassembling and assembling the unit.
*The Air-leak test before servicing is necessary to be performed to check whether the malfunction occurred due to air-leak or not.

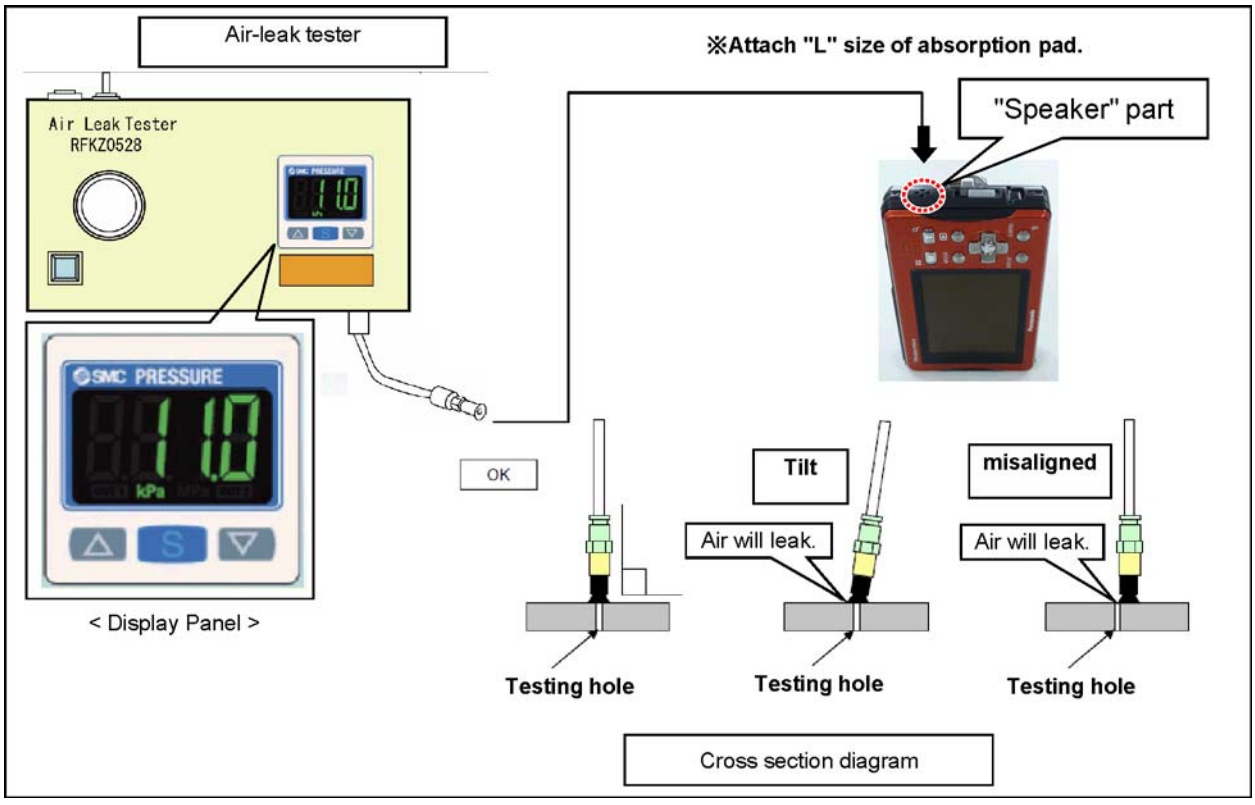
1. Preparation:
   1) Confirm that no foreign objects at the jack door and battery door, and they are firmly closed.

2. Air-leak Test (Inspection):
   *Perform the air-leak test by referring the following procedure.
   Note:
   As for the detail instruction of air-leak tester, refer to the operating guide (attached to the product).

   [Preparation]
   1. Put the camera with the top case facing upward condition.
   2. Set the following measurement pressure value on the air-leak tester. (Part No.:RFKZ0528).

   [Measurement pressure value] :-33kPa

   *About the Setting methods, refer to the operating guide for air-leak tester.
   3. Attach "L" size of absorption pad to the tip of the hose of the air-leak tester.
   4. Put the absorption pad of air-leak tester vertically on the Microphone part.
   Note:
   • **Keep firmly hold above condition until the measurement is completed.**
   Once pad is tilted/misaligned from the test hole during testing process, start it from this step.



nMeasuring condition (For DMC-FT10, DMC-TS10)

Item	Specifications	Remarks
Setting pressure	-33kPa	
Setting stand value	-30kPa	
Exhusted period	1)10sec.:Exhaust air 2) 5sec.:Pause 3)10sec.:Exhaust air 4) 5sec.:Pause 5)10sec.:Exhaust air	
Stand-by period	10sec.	
Measuring time (Period)	30sec.	
Testing Specification	±0.2kPa	(Pressure variation during the measuring period.)

*Attach "L" size of absorption pad.

[Exhaust Air]

5. Operate the measurement switch of the air-leak tester to exhaust air inside the product with the specified exhaust time.(① to ⑤).

[Specification] :①10sec.(Exhaust air)→②5sec.(Pause)→③10sec.(Exhaust air)→④5sec.(Pause)→⑤10sec.(Exhaust air)

① Press the measurement switch to exhaust air for 10 seconds.(The vacuum pump activates.)
② Press the measurement switch to pause for 5 seconds.
③ Press the measurement switch to exhaust air for 10 seconds.(The vacuum pump activates.)
④ Press the measurement switch to pause for 5 seconds.
⑤ Press the measurement switch to exhaust air for 10 seconds.(The vacuum pump activates.)

[Stand-by]

6. After a laps of 10 seconds, take a note (Record) that the pressure value indicated on the indication panel.

[Measurement]

7. Confirm that the pressure value fluctuations during measurement process are within the test specifications

[Measuring time] :30 seconds
[Testing Specification] :-30kPa ±0.2kPa

The air-leak test is now completed.

3. Packing replacement record input:

- To enter the repair record, it is necessary to use the "DIAS" software. The maintenance software "DIAS" is available at "TSN Website".
  To download, click on "Support Information from NWBG/VDBG-AVC".
  *DIAS (DSC Integrated Assist Software)

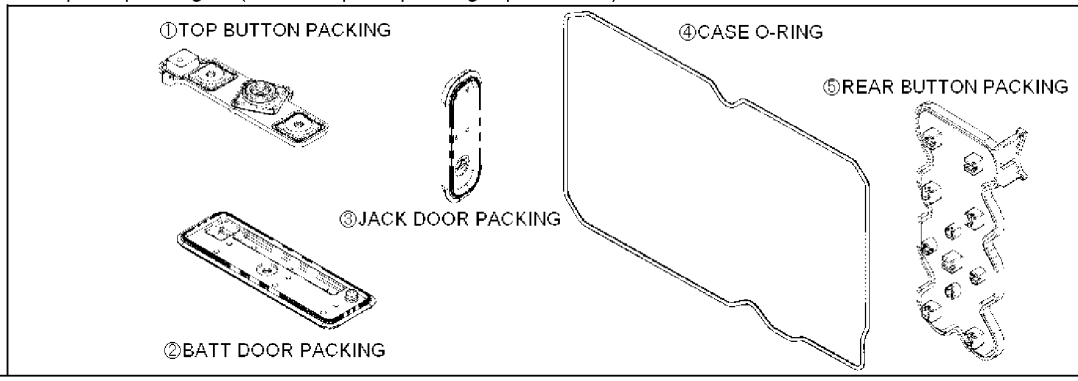
8 Service Fixture & Tools

8.1. Service Fixture and Tools

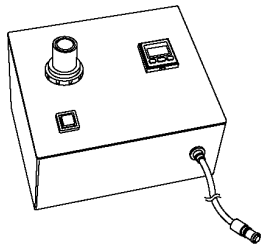
The following Service Fixture and tools are used for checking and servicing this unit.

Related to waterproof

Waterproof packing kit (For waterproof packing replacement) **VUMG1937**

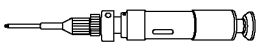


Air-leak test jig (For Waterproof property test) **RFKZ0528**



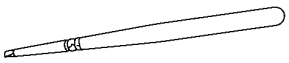
Part No.	Usage	Spec.	Remarks
RFKZ0536	DC/banana conversion cable	For power supply	Optional goods (1 piece supplied with RFKZ0528)
RFKZ0533	Vacuum pad (2 included)	For power supply	Optional goods (1 piece supplied with RFKZ0528)
RFKZ0537	Air-leak test tube (without pad)	For air-leak test	Optional goods (1 piece supplied with RFKZ0528)

Torque driver **RFKZ0542**



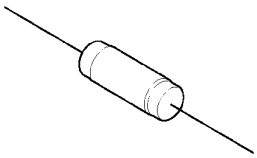
(For tightening screws with the torque)
* Torque driver (Part No.: RFKZ0456 has short shank and cannot be used for attaching of this unit's Top P.C.B.

Silicon chips **RFKZ0478**



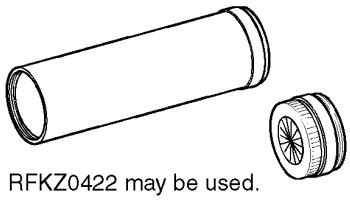
(For replacing the packings/ For prevention sticking of dust when replacing the packings)

Resistor for Discharging (1kΩ/5W) **ERG5SJ102**



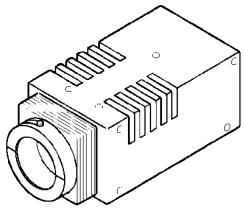
An equivalent type of Resistor may be used.

Infinity Lens (Built-in Focus Chart) **VFK1164TCM02**



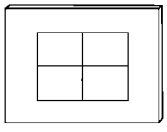
※ RFKZ0422 may be used.
※ VFK1164TCM03 may be used.

LIGHT BOX (with DC Cable) **RFKZ0523**



※ VFK1164TDVLB may be used.

TR Chart **RFKZ0443**



Lens Cleaning Kit **VFK1900BK**

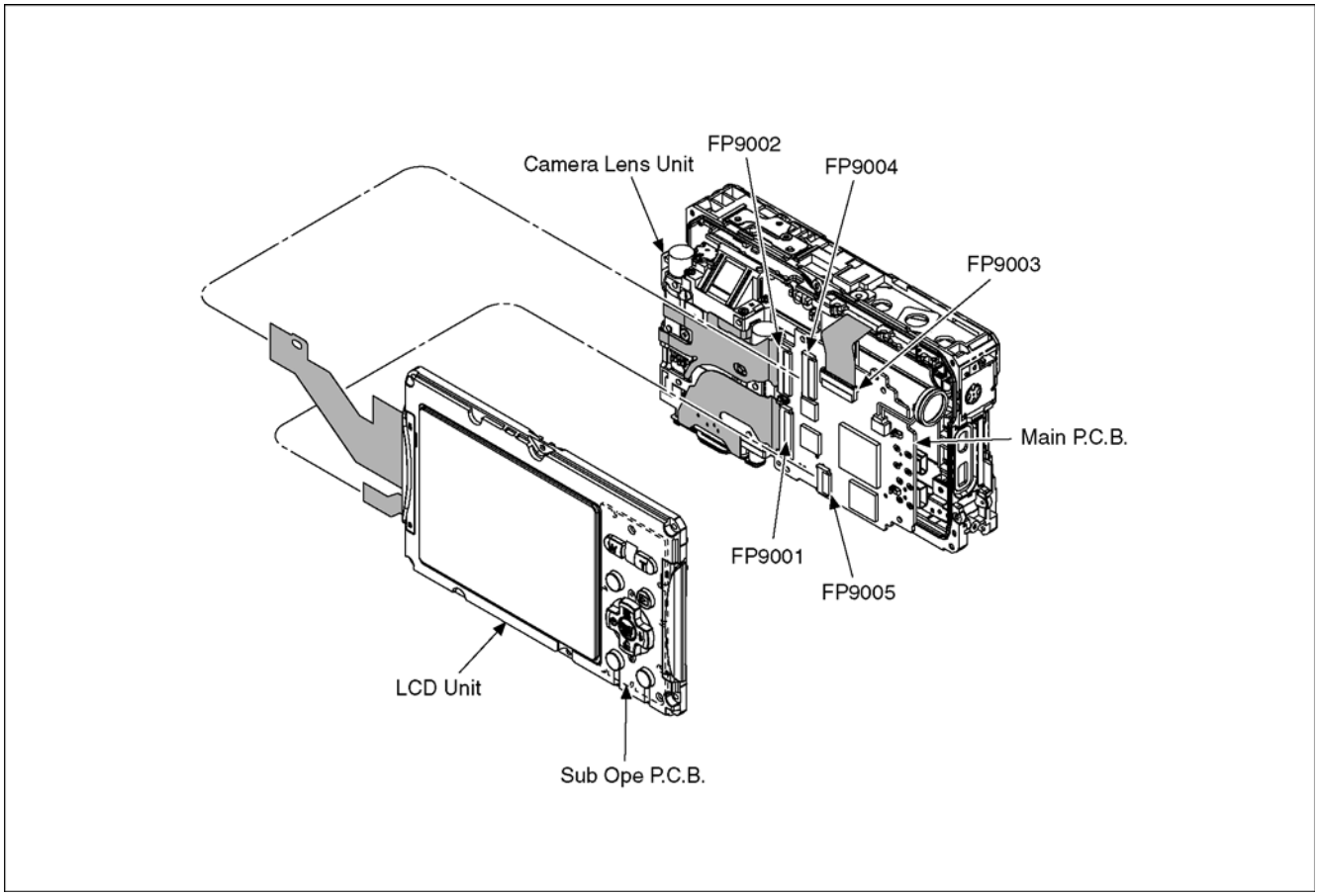
8.2. When Replacing the Main P.C.B.

After replacing the MAIN P.C.B., be sure to achieve adjustment.
The Maintenance software (DIAS) is available at “software download” on the “Support Information from NWBG/VDBG-AVC” web-site in “TSN system”.

8.3. Service Position

This Service Position is used for checking and replacing parts. Use the following Original cables for servicing.

8.3.1. Original Cable Connections

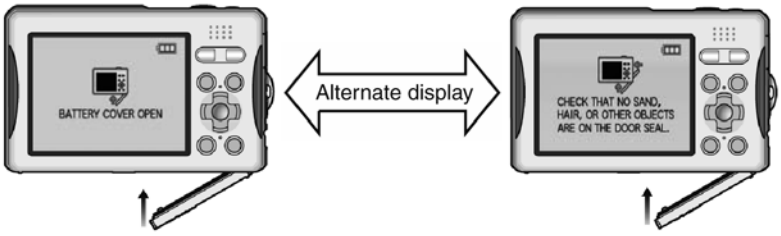


Note when repairing P.C.B.

In this unit, battery door lock detection switch is mounted on Main P.C.B. so as to secure the waterproof performance.
Be careful of following points.

(1)Before removing Main P.C.B., be sure to cancel Initial setting.

If the unit is turned on while Battery Door is not locked correctly, the following warning display as right figure appears on LCD, and
this unit cannot be operated.



When Main P.C.B. was removed, this battery door lock detection switch becomes to status of "Battery Door: OPEN".
Thus battery door lock detection switch does not operate correctly.
And even if the unit is turned on, this unit cannot be operated.
When initial setting was cancelled, battery door lock detection switch is ignored and the unit always be in status of "Battery Door: CLOSE" and the unit can be operated even if battery is removed.

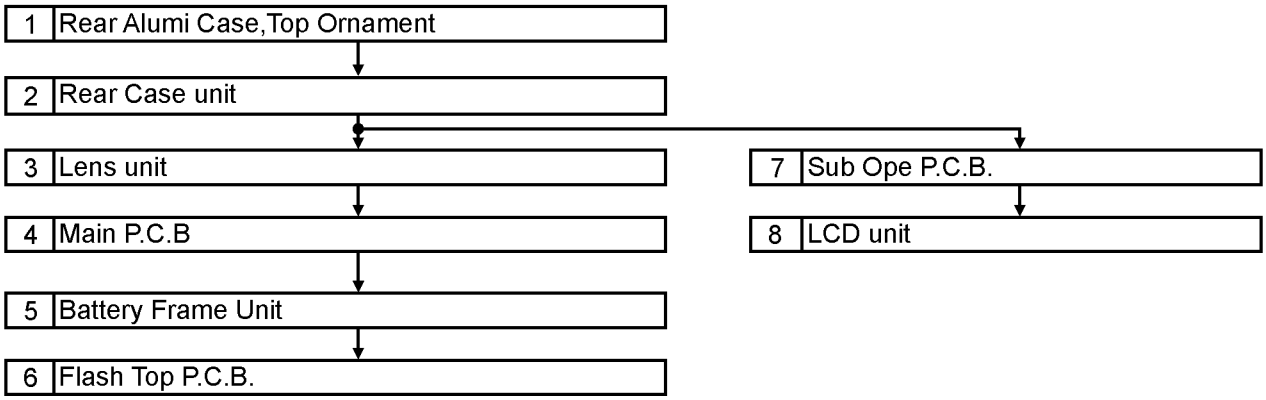
CAUTION-1. (When servicing FLASH TOP P.C.B.)

1. Be sure to discharge the capacitor on FLASH TOP P.C.B.
   Refer to “HOW TO DISCHARGE THE CAPACITOR ON FLASH TOP P.C.B.”.
   The capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on FLASH TOP P.C.B.
3. DO NOT allow other parts to touch the high voltage circuit on FLASH TOP P.C.B.

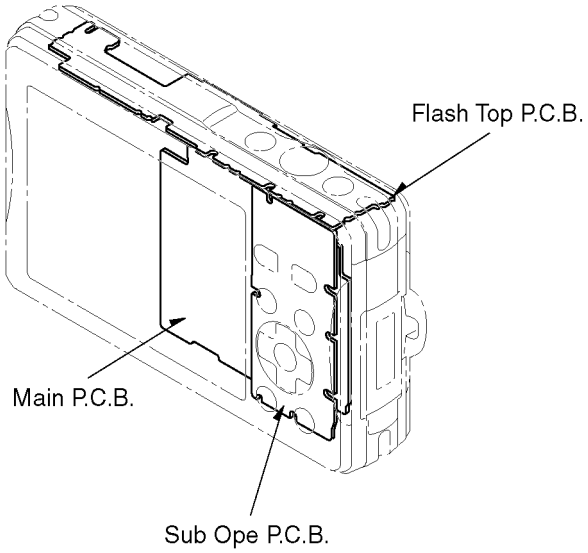
9 Disassembly and Assembly Instructions

9.1. Disassembly Flow Chart

- Make sure to perform air-leak test (refer to "7.1. Service and Check Procedures" before disassembly and after assembly for check of waterproof property.
- Do not touch the waterproof packings directly by the hand.
- Do not perform cleaning of waterproof packings by the solvent of alcohol etc. or by blowing air .
- Take care not to put any foreign object (garbage and dust).
- When replacing the case O-ring, use Silicon chips (RFKZ0478).
- When tightening screws, follow the specifications when the torque is specified .



9.2. P.C.B. Location



9.3. Disassembly Procedures

No.	Item	Fig.	Removal
1	Rear Alumi Case, Top Case Unit	Fig. D1	Card
			Battery
			4 Screws (A)
			1 Screw (B)
			Rear Alumi Case
		Fig. D2	Top Case Unit
2	Rear Case Unit	Fig. D3	Rear Ornament (R)
			Rear Ornament (L)
		Fig. D4	4 Screws (C) (Tightening torque is regretted)
			2 Screws (D) (Tightening torque is regretted)
			FP9004 (Flex)
			FP9005 (Flex)
			Rear Case Unit
		Fig. D5	Note when attaching Rear Case Unit
3	Camera Lens Unit	Fig. D6	3 Screws (E)
			1 Screw (F)
			FP9001 (Flex)
			FP9002 (Flex)
			Lens Plate
			Camera Lens Unit
4	Main P.C.B.	Fig. D7	Note before removal of Main P.C.B.
		Fig. D8	1 Screw (G)
			2 Screws (H)
			P9001 (Connector)
			FP9003 (Flex)
			PCB Earth Plate
			Speaker
			Main P.C.B.
5	Battery Frame Unit	Fig.D9	1 Screw (I)
			1 Screw (J)
			Batt Frame B
		Fig.D10	Batt Frame A
6	Flash Top P.C.B.	Fig. D11	4 Screws (K)
			Flash Top P.C.B.
		Fig. D12	Caution of discharge the capacitor on Flash Top P.C.B.
7	Sub Ope P.C.B.	Fig. D13	9 Screws (L)
			Sub Ope P.C.B.
8	LCD Unit	Fig. D14	4 Screws (M)
			LCD Unit

9.3.1. Removal of Rear Alumi Case, Top Case Unit

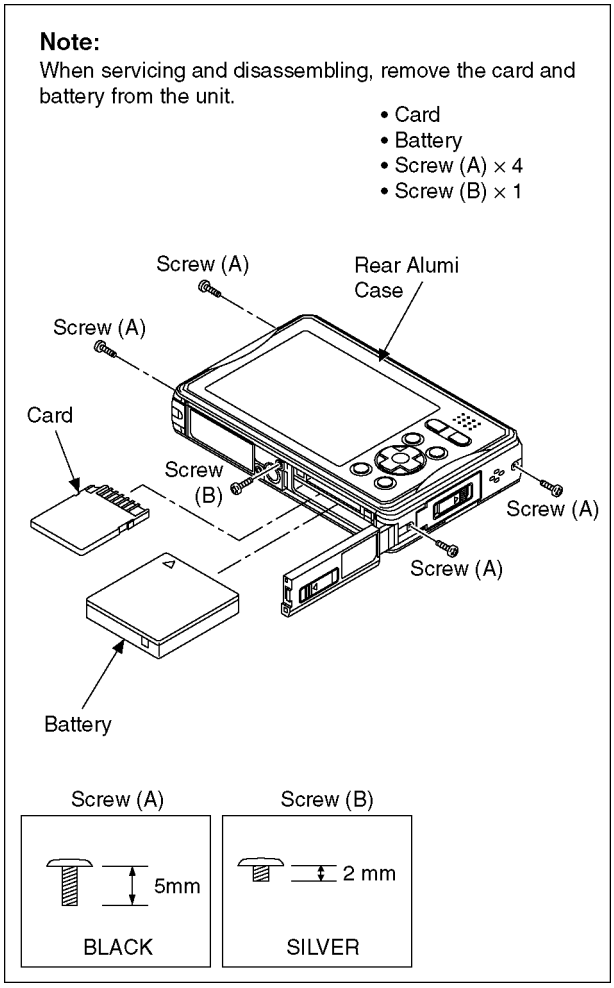


Fig. D1

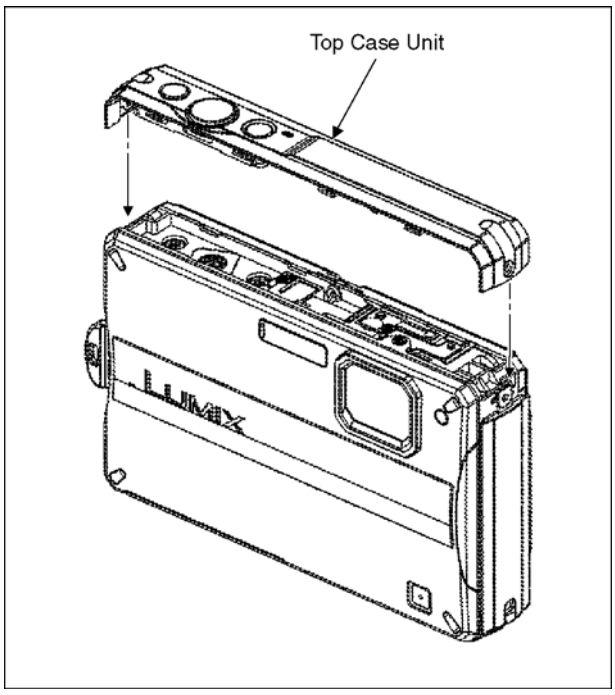


Fig. D2

9.3.2. Removal of Rear Case Unit

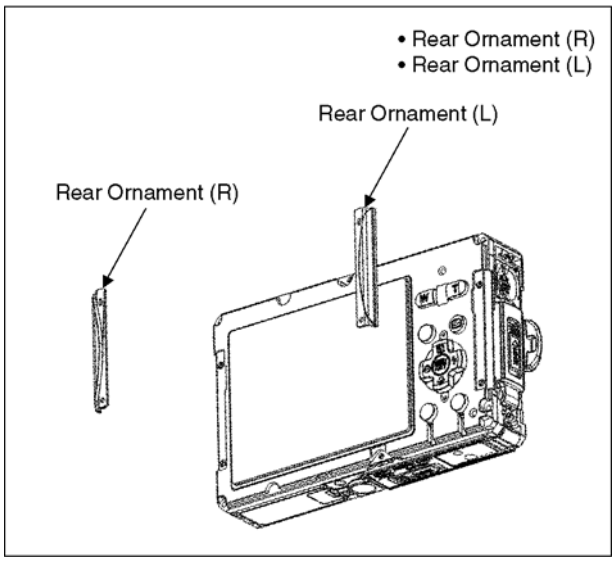
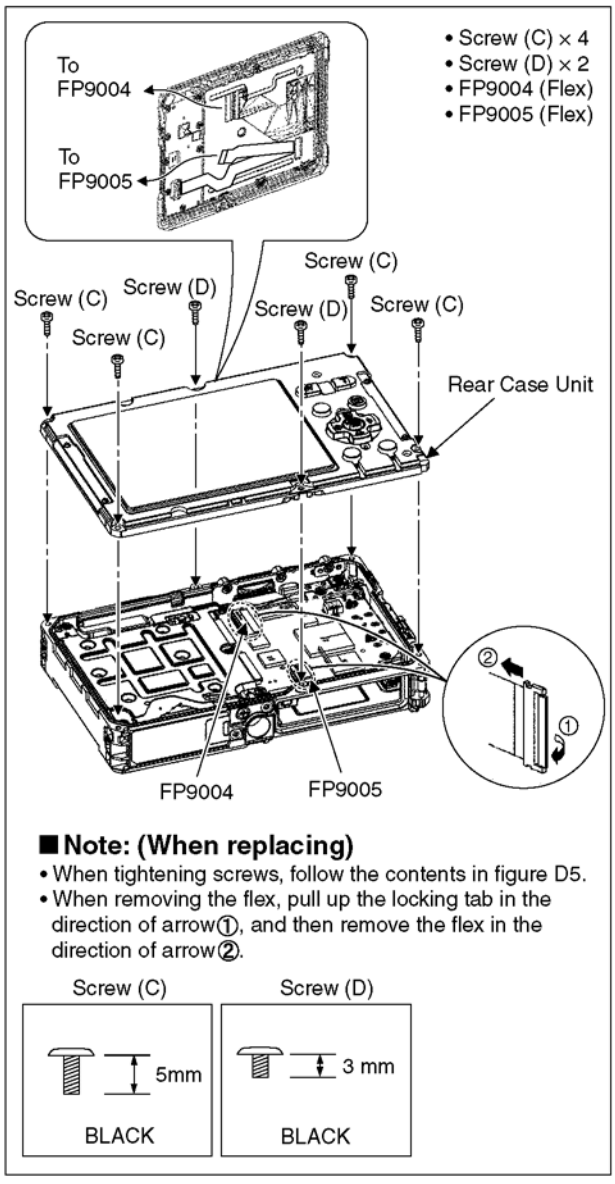


Fig. D3



■ Note: (When replacing)

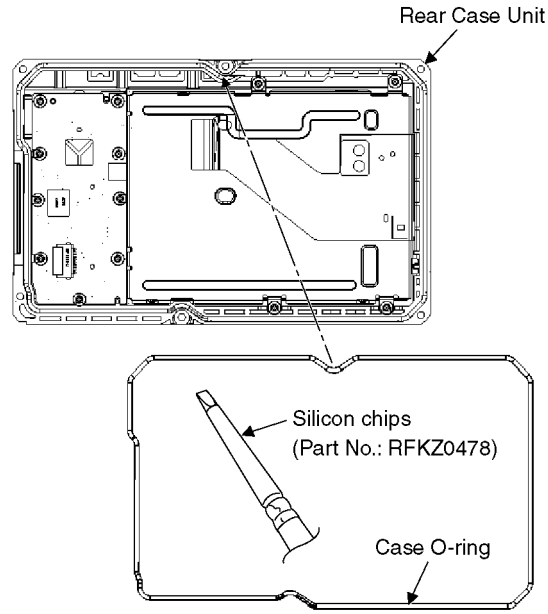
- When tightening screws, follow the contents in figure D5.
- When removing the flex, pull up the locking tab in the direction of arrow①, and then remove the flex in the direction of arrow②.

Fig. D4

SCREWTIGHTENING NOTE: TYPE/ORDER/TORQUE

■ Note: (When attaching the rear case unit)

- Do not insert the Flex from any slanted angle. Insert the Flex fully.
- Make sure the connector is firmly locked.
- When attaching Case O-ring, use Silicon chips (Part No.: RFKZ0478).
- Make sure the O-ring of rear case does not come off.
- Make sure foreign objects are not attached to the O-ring and the waterproof lib of the front case.
- When tighten the screws, use Torque screwdriver (Part No.: RFKZ0542) and tighten by the specified torque.
- Tighten the screws in the order of (1) to (6) as shown below.
- To keep waterproof property, be careful type of screw, screwing order and tightening torque.



■ Order of tightening screws/tightening torque

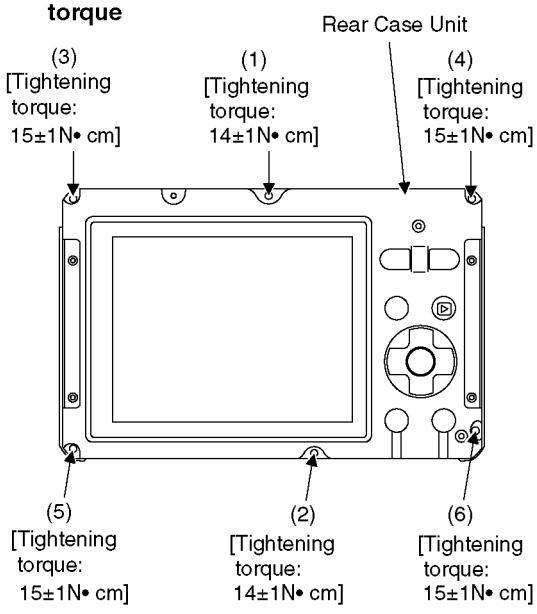


Fig. D5

9.3.3. Removal of Camera Lens Unit

Note: (When Disassembling/Assembling)

1. When dust stuck, use air-Blower to blow off the dust.
2. Do not touch the surface of lens by your hand.
3. Use Lens Cleaning KIT; VFK1900BK (Only supplied as 10 set/Box) is available as Service Aid.

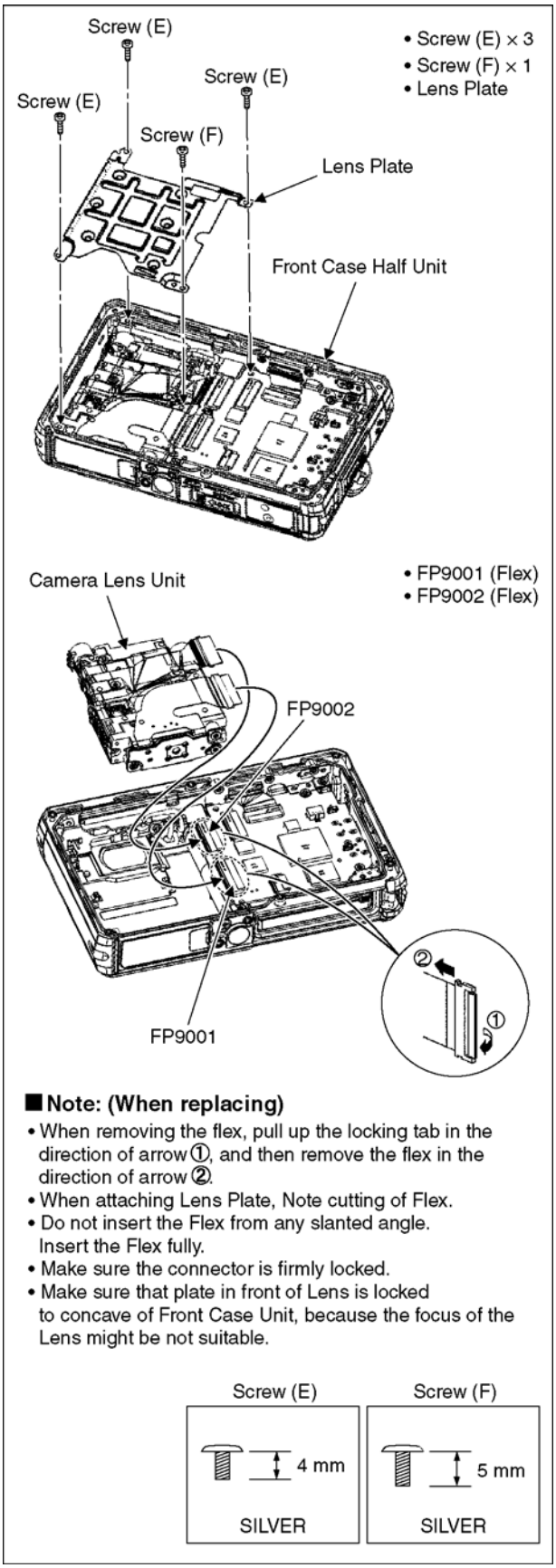


Fig. D6

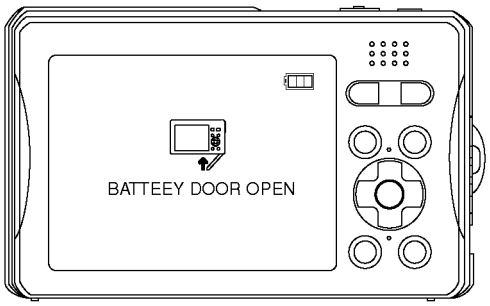
9.3.4. Removal of Main P.C.B.

■ **Note: (Before removing Main P.C.B.)**

When Main P.C.B. is removed while Initial setting is not cancelled, Battery door lock detection switch does not operate correctly, and the unit cannot be operated (refer to following figure).

To operate removed Main P.C.B., cancel the Initial setting before removing Main P.C.B. (refer to "3.7.2. INITIAL SETTINGS").

(While Initial setting is cancelled, Battery door lock detection switch is ignored.)



<LCD display when battery door is opened>

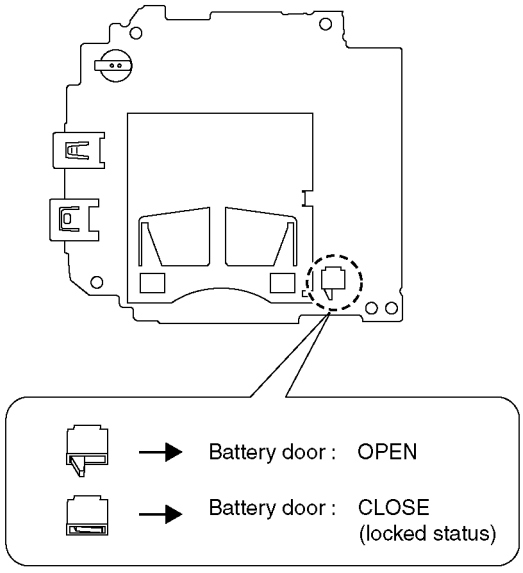
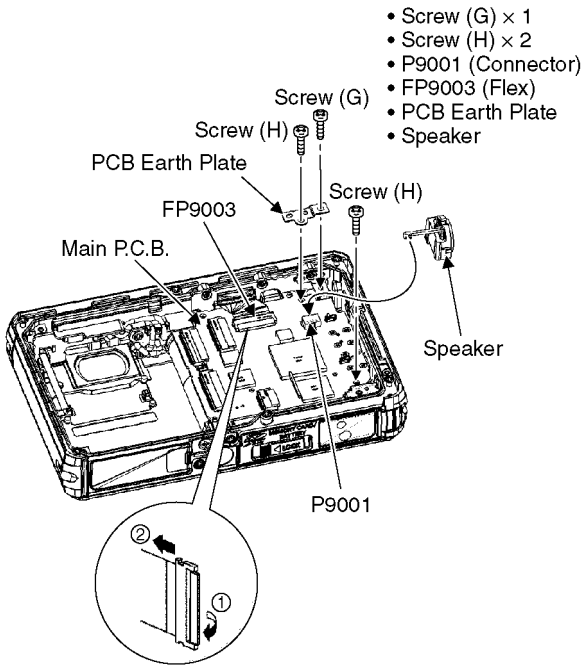
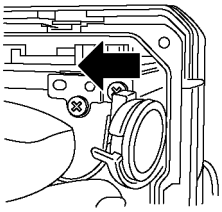


Fig. D7



■ Note: (When installing the speaker)

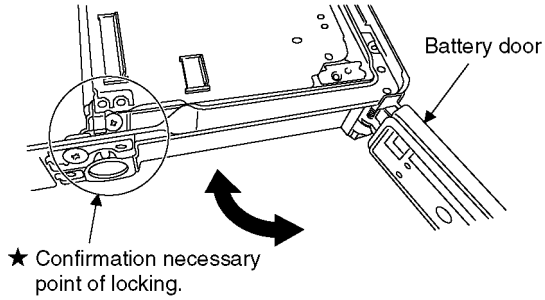
- When inserting the speaker, press the speaker unit in the direction of the arrow to prevent damage to the speaker grill.



■ Note: (When replacing Main P.C.B.)

Note the following because Battery door lock detection switch is mounted on Main P.C.B.

- Perform removing Main P.C.B. while Battery door is closed.
- Perform attaching Main P.C.B. while Battery door is opened. (When Battery door is closed, ★ part is not locked with the unit.)



■ Note: (When replacing)

- When removing the flex, pull up the locking tab in the direction of arrow①, and then remove the flex in the direction of arrow②.

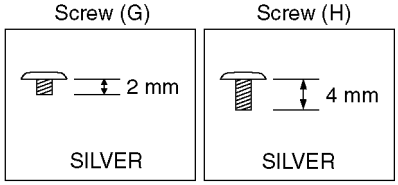
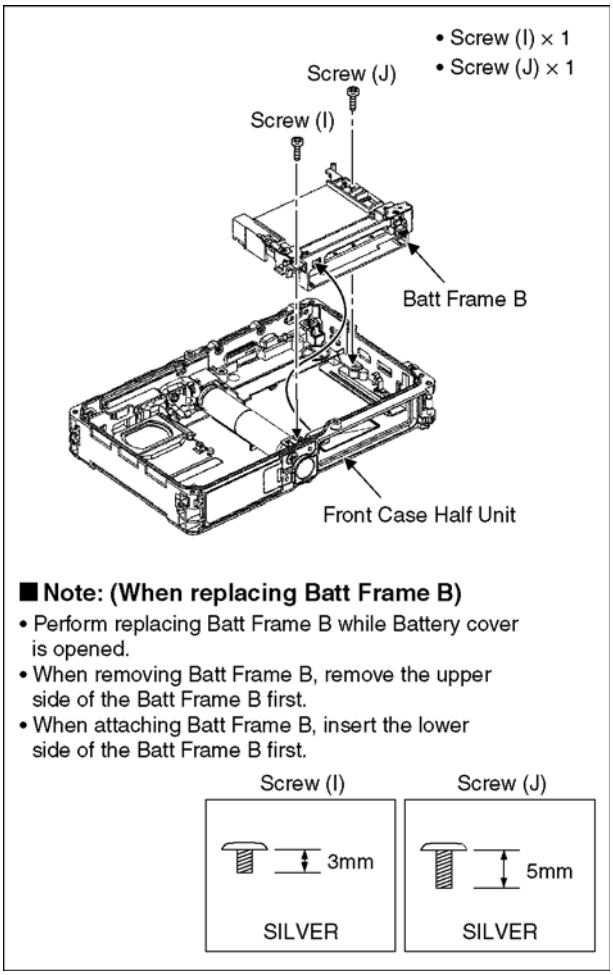


Fig. D8

9.3.5. Removal of Battery Frame Unit



■ Note: (When replacing Batt Frame B)

- Perform replacing Batt Frame B while Battery cover is opened.
- When removing Batt Frame B, remove the upper side of the Batt Frame B first.
- When attaching Batt Frame B, insert the lower side of the Batt Frame B first.

Fig. D9

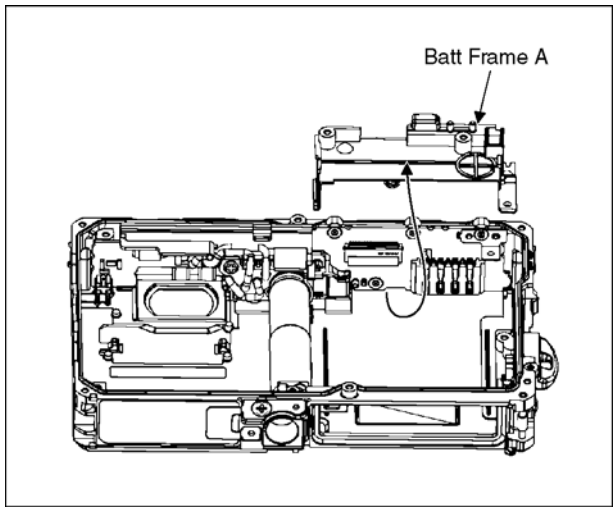
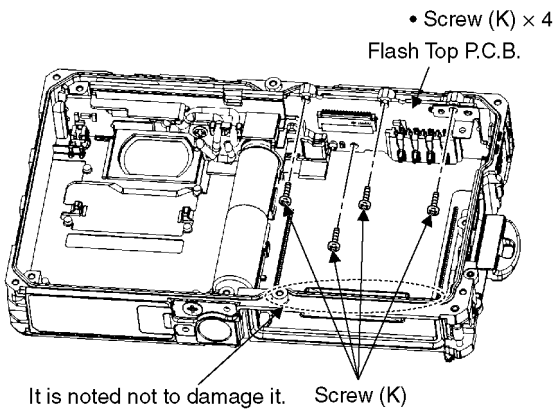


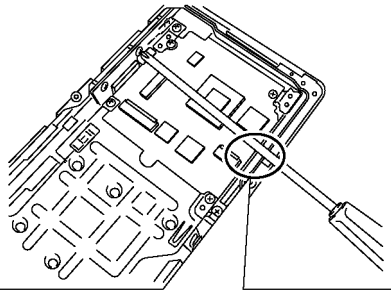
Fig. D10

9.3.6. Removal of Flash Top P.C.B.

SCREWTIGHTENING NOTE: TORQUE

< CAUTION >
To avoid electric shock, do not touch the electrode part of the flash condenser when removing the Flash Top P.C.B.





When screwing the TOP P.C.B.,
make sure not to touch the outer case
with the shaft of the screw driver.
(Otherwise, it may affect the waterproofing.)

■ Oder of tightening screws/tightening torque

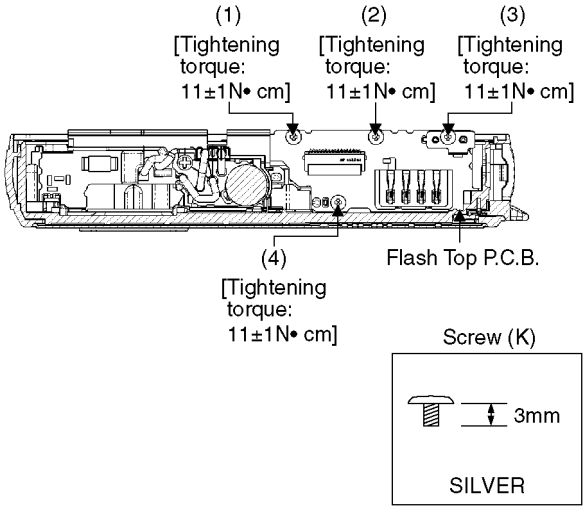


Fig. D11

< ⚠ Caution of Discharge the Capacitor no Flash Top P.C.B.>

To avoid electric shock, follow the procedure below to be sure to discharge the capacitor on Flash Top P.C.B.

[Discharging Procedure]

1. Put the insulation tube onto the lead part of Resistor (ERG5SJ102:1kΩ/5W).
2. Put the resistor between both terminals of capacitor on Flash Top P.C.B. for approx. 5 seconds.
3. Discharge completion.

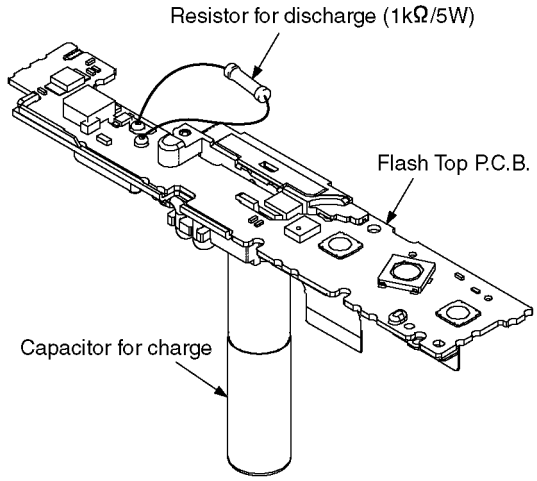


Fig. D12

9.3.7. Removal of Sub Ope P.C.B.

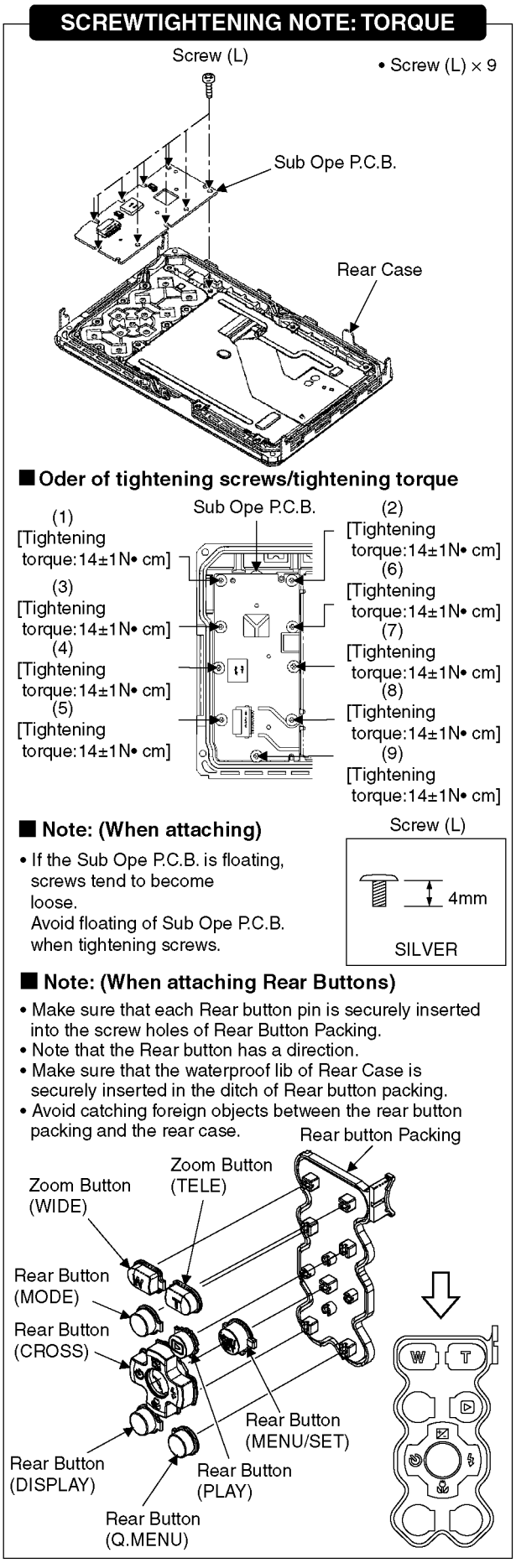


Fig. D13

9.3.8. Removal of LCD Unit

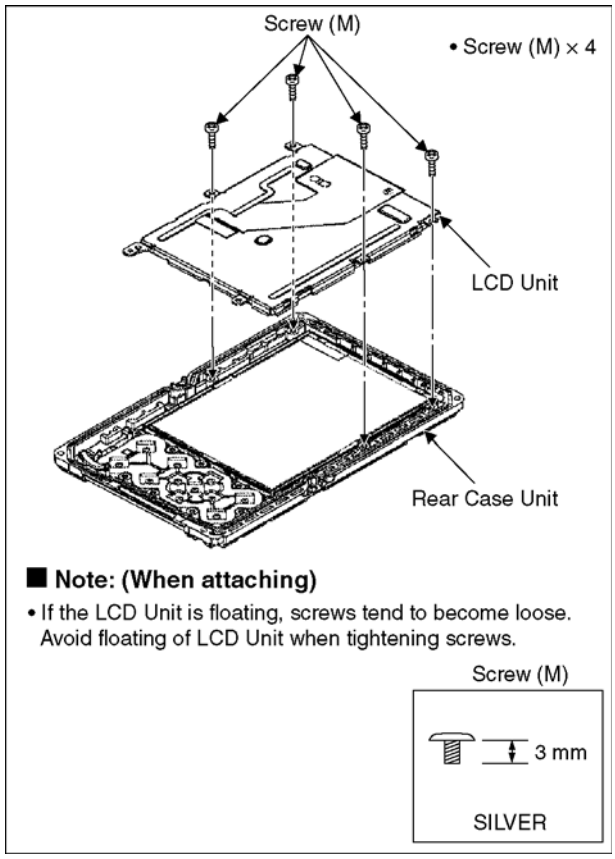


Fig. D14

10 Measurements and Adjustments

10.1. Introduction

When servicing this unit, make sure to perform the adjustments necessary based on the part(s) replaced.
Before disassembling the unit, it is recommended to back up the camera data stored in flash-rom as a data file.

IMPORTANT NOTICE (After replacing the MAIN P.C.B.)

After replacing the MAIN P.C.B., it is necessary to use the "DIAS" software to allow the release of adjustment flag(s).
The Adjustment software "DIAS" is available at "TSN Website". To download, click on "Support Information from NWBG/VDBG-AVC".
*DIAS (DSC Integrated Assist Software)

10.2. Before Disassembling the unit

10.2.1. Initial Setting Release

The cameras specification are initially set in accordance with model suffix (such as EB, EG, GK, GC, and so on.).
Unless the initial setting is not released, an automatic alignment software in the camera is not able to be executed when the alignment is carried out.

Note:

The initial setting should be again done after completing the alignment. Otherwise, the camera may not work properly.
Therefore as a warning, the camera display a warning symbol " ! " on the LCD monitor every time the camera is turned off.
Refer to the procedure described in "3.7.2. INITIAL SETTINGS" for details.

[How to Release the camera initial setting]
Preparation:

Attach the Battery or AC Adaptor with a DC coupler to the unit.
Set the recording mode dial to Normal picture mode.

Step 1. Temporary cancellation of "INITIAL SETTINGS":

While pressing the UP of Cursor button and iA button simultaneously, turn the power switch to the ON position.

Step 2. Cancellation of "INITIAL SETTINGS":

Press the PLAYBACK switch.
While pressing UP of Cursor button and iA button simultaneously. (The camera will beep after this.)
Turn the Power off. (The warning symbol " ! " is displayed on the LCD monitor.)

10.2.2. Flash-Rom Data Backup

When trouble occurs, it is recommended to backup the Flash-rom data before disassembling the unit.
There are two kinds of Flash-rom data backup methods:

[ROM_BACKUP (Method of Non-PC backup)]

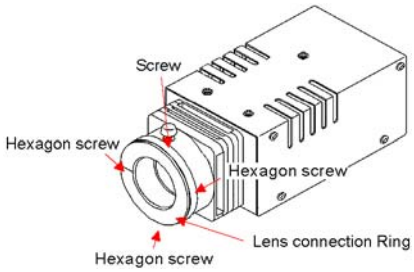
1. Insert the SD-card into the camera.
2. Set the camera to "Temporary cancellation of the initial settings".
3. Select the "SETUP" menu.
   From the "SETUP" menu, select "ROM BACKUP".
   Note:
   This item is not listed on the customer's "SET UP" menu.
4. When this "ROM_BACKUP" item is selected, the following submenus are displayed.

Item	Function	Details
DSC → SD	Save all the DSC's Flash-rom data to SD-CARD	・DSC's Flash-rom data is saved to the SD-CARD as a data file by the same format as the TATSUJIN software for the previous models. (DATA BACKUP) -File location: ROOT DIRECTORY in SD-CARD. -File Name: 1) User Setup Information data: <Model Number>U.txt [Example: DMC-FX66 : "FX66U.txt"] 2) Optical Adjustment data: <Model Number>F.txt [Example: DMC-FX66 : "FX66F.txt"] ・If the concerned file already exists, "OVERWRITE?" message is displayed.
SDALL→ DSC (ID CHECK)	Write the all data to DSC's Flash-rom from SD-CARD	・The backup data being stored in the SD card is transferred to DSC unit. ・ID CHECK: When the model ID is different, data is not transferred. ・FORCE: Even if the model ID is different, data is transferred. * If the main PCB is replaced, select "SDALL→DSC(FORCE)".
SDALL → DSC (FORCE)	Write the all data to DSC's Flash-rom from SD-CARD	
SDUSER → DSC (FORCE)	Only "User setup information" is written from the saved file in the SD-CARD to DSC's Flash-rom.	・Only the user's "setup" setting condition is transferred to DSC unit. ・FORCE: Even if the model ID is different, the data is transferred.
! → LUMIX	Shipping set without initializing "User setup information"	・Initial setting is executed without initializing the user's set up setting condition. * The initial setting must be perform while the Self-timer LED is blinking, * The picture data stored in the built-in memory of the DSC is not erased, with this operation.

[DSC Integrated Assist Software (Method of Using PC)]
Same as TATSUJIN software for previous models.

10.2.3. Light Box

If using VFK1164TDVLB Light Box, remove the lens connection ring by loosing three hexagon screws.



10.3. Details of Electrical Adjustment

10.3.1. How to execute the Electrical Adjustment

It is not necessary to connect the camera to a PC to perform adjustments.
"Flag reset operation" and "Initial setting operation" are required when carrying out the alignment, follow the procedure below.

10.3.1.1. Startup Electrical Adjustment mode

1. Release the initial settings.
2. Insert a recordable SD card.
   (Without a SD card, the automatic adjustment can not executed.)
3. Procedure to set the camera into adjustment mode:
   a. Set the mode dial to Normal picture mode.
   b. Turn the Power SW off.
   c. Turn the Power SW on pressing DISPLAY and Menu simultaneously.
   LCD monitor displays "SERVICE MODE". (Refer to Fig.F3-1)

Fig. 3-1

10.3.1.2. Status Adjustment Flag Setting

Reset (Not yet adjusted) the status flag condition.

1. After pressing the Display button, the LCD monitor displays the Flag status screen (Refer to Fig.3-2.)
2. Select item by pressing the cross keys. (Gray cursor is moved accordingly.)
3. Press the Delete button.
   Note:
   The selected item's flag has been changed from "F (green)" to "0 (yellow)".
   *(Refer to Fig. 3-3)

*Flag conditions:
F (green)
means that the alignment has been completed and the status flag condition is set. In this case, the flag condition should be reset, if you try to carry out the automatic alignment.
0 (yellow)
means that the alignment has been not "completed"and the status flag condition is "reset". In this case, automatic alignment is available.

Fig. 3-2

Fig. 3-3
<Example: OIS flag is reset.>

- In case of setting the status flag into set condition again without completion of the alignment, the status flag should be SET by using PC, or UNDO by using ROM BACKUP function.

10.3.1.3. Execute Adjustment

1. Perform step "10.3.1.1." to "10.3.1.2.", to reset the OIS flag status "F" (Set) to "0" (Reset).
2. Press Display button after Flag reset.
   OIS Adjustment screen is displayed on the LCD panel. (Refer to Fig.3-4)
3. Press the shutter button. The adjustment will start automatically.
4. When the adjustment is completed successfully, adjustment report menu appears with Green OK on the LCD monitor. (Refer to Fig.3-5)

Fig. 3-4

Fig. 3-5

10.3.1.4. Attention point during Adjustment

1. Step "10.3.1.3." procedure shows OIS adjustment as an example. To perform the adjustment, refer to the "10.3.2. Adjustment Specifications" table which shows key point for each adjustment.
2. Do not move the light box, the camera or the chart while adjusting. If one of these is moved accidentally, start the adjustment again.
3. Do not press any buttons/keys until the default menu (Fig.3-6) is displayed on the LCD monitor. Otherwise, adjustment data may not be stored properly.
4. If the adjustment is interrupted accidentally, the alignment data may not be properly saved in the Flash-rom.

Fig. 3-6

10.3.1.5. Finalizing the Adjustment

1. Several adjustment flags can be reset ("F" into "0") at the same time. In this case, when the adjustment has been completed, the screen will change showing the adjustment for the next item until all reset items are completed.
   Also, when the shutter button is pressed, the screen jump to the next adjustment item.
2. To cancel the adjustment mode while in the process of performing the adjustment, follow this procedures.
   (1) Press DELETE button.
   (2) Press "Right of cross key" button.

   Note:
   *.If adjustment is cancelled with above procedure, adjustment is not completed. Make sure to adjust it later.
   *.Adjustment software "DIAS" is able to control the status of the adjustment flags.

10.3.2. Adjustment Specifications

The following matrix table shows the relation between the replaced part and the Necessary Adjustment.
When a part is replaced, make sure to perform the necessary adjustment(s) in the order indicated.
The table below shows all the information necessary to perform each adjustment.

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts			JIG/TOOLS	SET UP	How to Operate
				MAIN PCB	Lens Parts (Inc. CCD U)	Front case unit			
1	Venus Zoom	PZM	Venus Zoom Inspection	○	—	—	NONE	NONE	1)Press Shutter Button 2)After displaying "PZM", press Shutter Button again. 3)After completed, the"OK" menu appears.
2	OIS sensor	OIS	OIS sensor output level adjustment	○	○	—	NONE	NONE	1)Press Shutter Button (Do not apply any shock and vibration for the camera while adjusting) 2)After completed, the "OK" menu appears.
3	Backfocus / GYRO	BF	To have the focus tracking curve be appropriate shape and GYRO sensor adjustment	○	○	○	・COLLIMATOR (VFK1164TCM02 or VFK1164TCM03 or RFKZ0422)	1)Set the camera in front of collimator so that the distance from collimator to camera becomes about 1 cm as shown in Fig.A. 【IMPORTANT】 The adjustment "NG" might be happened with the following conditions: – Do not put the black colored stuff at the back side of collimator near hunching chart. It needs to get some certain brightness. – Make sure the hunching chart has no dust and dirty condition. – Do not connect a USB cable during adjustment.	1)Press Shutter Button (Do not apply any shock and vibration for the camera while adjusting) 2)After completed, the "OK" menu appears.
4	Monitor Linearity	MLN	Monitor Linearity adjustment	○	○	—	・LIGHT BOX (VFK1164TDVLB or RFKZ0523)	1)Set the camera in front of LIGHT BOX so that the distance from collimator to camera becomes about 6 cm as shown in Fig.B.	1)Press Shutter Button 2)After completed, the "OK" menu appears.
5	Shutter	SHT	Shutter speed adjustment	○	○	—	・LIGHT BOX (VFK1164TDVLB or RFKZ0523) ・TR CHART (RFKZ0443)	1) Insert the TR chart into the slot of LIGHT BOX. 2) Set the camera in front of LIGHT BOX so that the distance from LIGHT BOX to camera becomes about 16 cm as shown in Fig.B. 3) Set the camera angle so that the color chart is displayed on the LCD monitor fully. 【IMPORTANT】 The adjustment "NG" might be happened with the following conditions: – Since the lens position is automatically set into certain position after executing auto adjustment, confirm the angle after stopping the lens zoom position. – It is no problem even though the chart on to the LCD monitor slightly cut at the corner. – It is no problem even though the focusing slightly becomes out of focusing condition. – Not connect the USB cable at this stage.	1)Press Shutter Button 2)After completed, the "OK" menu appears.
6	ISO	ISO	ISO sensitivity adjustment	○	○	—			1)Press Shutter Button 2)After completed, the "OK" menu appears.
7	White Balance	WBL	White balance adjustment under various color temperature	○	○	—			1)Press Shutter Button 2)After completed, the "OK" menu appears.
8	High brightness coloration	LIN	High brightness coloration adjustment	○	○	—			1)Press Shutter Button 2)After completed, the "OK" menu appears.
9	*1 CCD Missing Pixels (White)	WKI	Compensation of CCD Missing Pixels (White)	○	—	—	NONE	NONE	1)Press Shutter Button 2)After completed, the "OK" menu appears.
10	Color reproduction inspection and Microphone check	COL	Color reproduction inspection and Microphone check	○	○	—	NONE	Right after pressing the shutter button, enter the continuous sounds (voice) to the microphone until lens unit starting the zoom operation.	1)Press Shutter Button. Right after pressing the shutter button, make a continuous sound (voice) to the microphone until lens unit starting the zooming. 2)After completed, the "OK" menu appears.
11	*2 CCD Missing Pixels (Black)	BKI	Compensation of CCD Missing Pixels (Black)	○	—	—	・LIGHT BOX (VFK1164TDVLB or RFKZ0523)	1)Set the camera in front of LIGHT BOX so that the distance from collimator to camera becomes about 6 cm as shown in Fig.B.	1)Press Shutter Button 2)After completed, the "OK" menu appears.

*1 :White missing pixels means that the pixel which is always active (lit) although shading (Dark) condition.
*2 :Black missing pixels means that the pixel which is always non-active (off) although high-intensity light is coming.

Fig.A

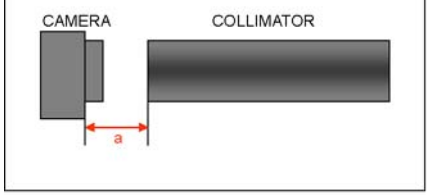


Fig.B

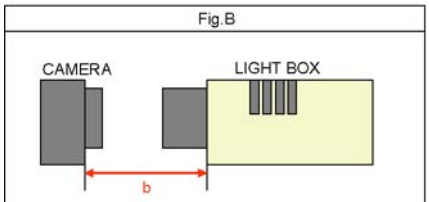
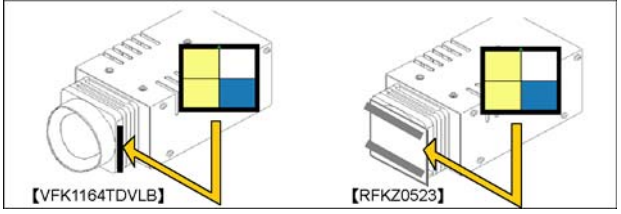


Fig.C How to Insert the TR chart into LIGHT BOX



n IMPORTANT NOTICE (After replacing the MAIN P.C.B.)

After replacing the MAIN P.C.B., make sure to perform the "INITIAL SETTINGS" first, then release the "INITIAL SETTINGS" in order to proceed the electrical adjustment.

Note:

1. If electrical adjustment or data re-writing is executed before "INITIAL SETTINGS", suffix code list is never displayed, and it cannot be chosen suitable suffix code.
2. Never remove the battery during initial setting in process.

10.4. After Adjustment

10.4.1. Initial Setting

Since the initial setting has been released to execute the built-in adjustment software, it should be set up again before shipping the camera to the customer.

Refer to the procedure described in "3.7.2. INITIAL SETTINGS" for details.

[IMPORTANT]

1. The initial setting should be done again after completing the alignment. Otherwise, the camera will not work properly.
   Therefore as a warning, the camera display a warning symbol " ! " on the LCD monitor every time the camera is turned off.
2. Confirm that status of all adjustment flag show "F". Even if one of the adjustment flag shows "0", initial setting programmed is never executed.
3. Adjustment software "DIAS" is able to control the status of the adjustment flags.
   The Adjustment software "DIAS" is available at "TSN Website", therefore, access to "TSN Website" at "Support Information from NWBG/VDBG-AVC".

11 Maintenance

11.1. Cleaning Lens and LCD Panel

Do not touch the surface of lens and LCD Panel with your hand.
When cleaning the lens, use air-Blower to blow off the dust.
When cleaning the LCD Panel, dampen the lens cleaning paper with lens cleaner, and the gently wipe the their surface.
Note:

The Lens Cleaning KIT; VFK1900BK (Only supplied as 10 set/Box) is available as Service Aid.

DSC1009053CE

Service Manual

Diagrams and Replacement Parts List

Digital Camera

Model No.

DMC-FT10EB	DMC-FT10GF
DMC-FT10EE	DMC-FT10GN
DMC-FT10EF	DMC-TS10P
DMC-FT10EG	DMC-TS10PC
DMC-FT10EP	DMC-TS10PU
DMC-FT10GC	DMC-TS10GH

Vol. 1
Colour
(A).....Blue Type (Except DMC-FT10EB/EE/EF/EP, DMC-TS10PC/GH)
(K).....Black Type (Except DMC-TS10PU/GH)
(S).....Silver Type (Except DMC-FT10EB/EE/EF/EP/GN, DMC-TS10PC/PU)
(R).....Red Type

Table of contents

S1. About Indication of The Schematic Diagram

S1.1. Important Safety Notice

COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS USE ONLY THE SAME TYPE.

1.Although reference number of the parts is indicated on the P.C.B. drawing and/or schematic diagrams, it is NOT mounted on the P.C.B. when it is displayed with "$" mark.

2.It is only the "Test Round" and no terminal (Pin) is available on the P.C.B. when the TP (Test Point) indicated as "●" mark.

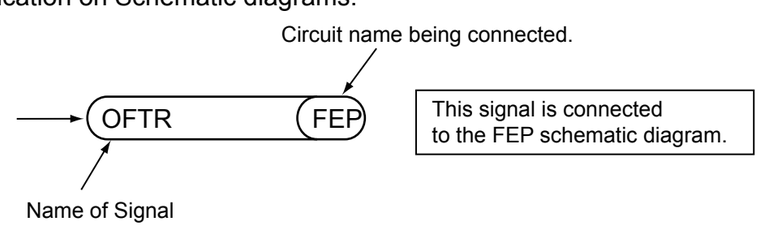
3.The voltage being indicated on the schematic diagram is measured in "Standard-Playback" mode when there is no specify mode is mentioned.

4.Although the voltage and waveform available on here is measured with standard frame, it may be differ from actual measurement due to modification of circuit and so on.

5.The voltage being indicated here may be include observational-error (deviation) due to internal-resistance and/or reactance of equipment. Therefore, handle the value indicated on here as reference.

6.Use the parts number indicated on the Replacement Parts List .

7.Indication on Schematic diagrams:



S2. Voltage Chart

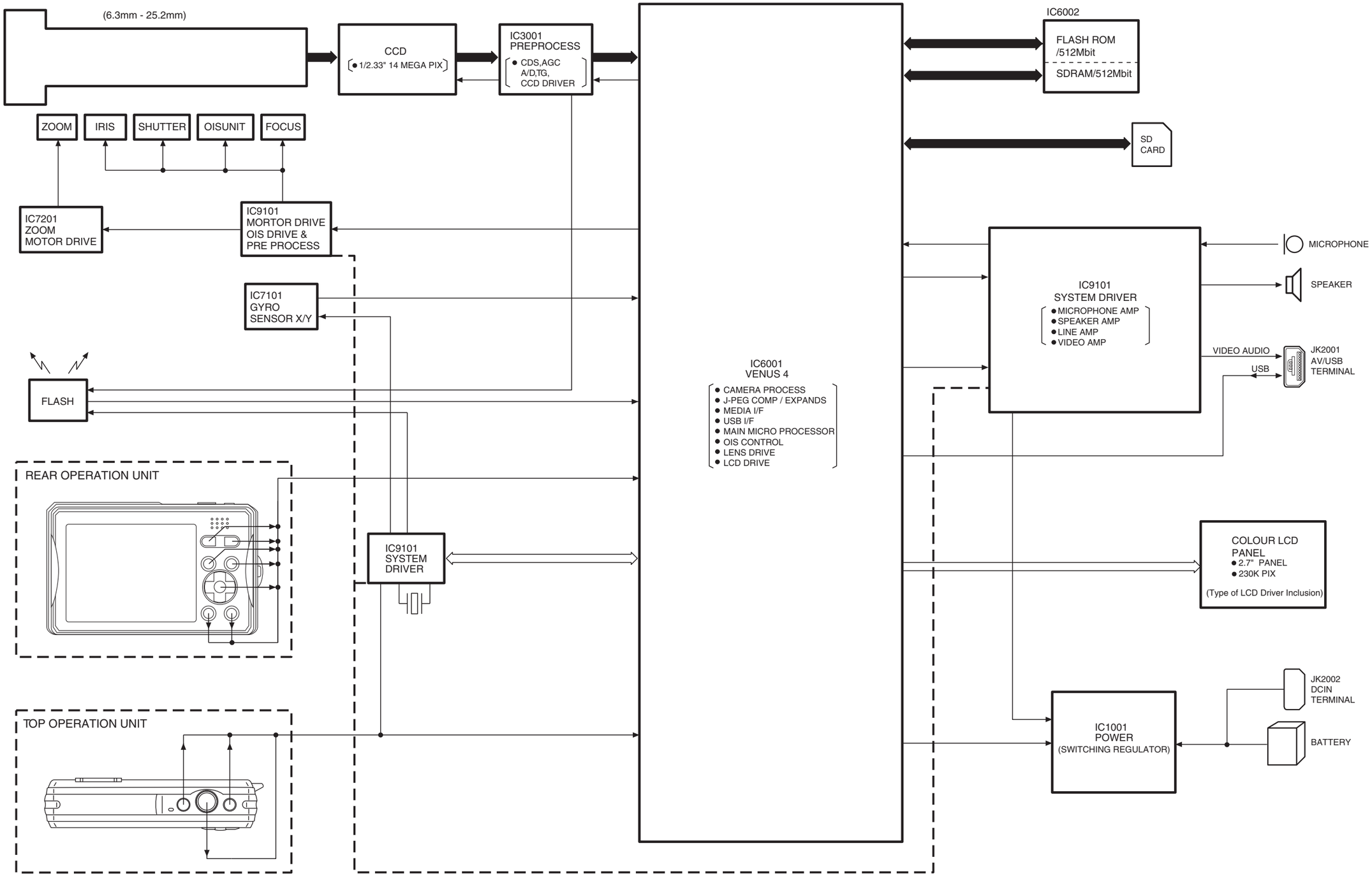
Note) Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.
Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

S2.1. Flash Top P.C.B.

REF No.	PIN No.	POWER ON
IC8100	1	0
IC8100	2	0
IC8100	3	0
IC8100	4	0
IC8100	5	3.4
IC8100	6	0
IC8100	7	0
IC8100	8	0
IC8100	9	3.1
IC8100	10	3.8

S3. Block Diagram

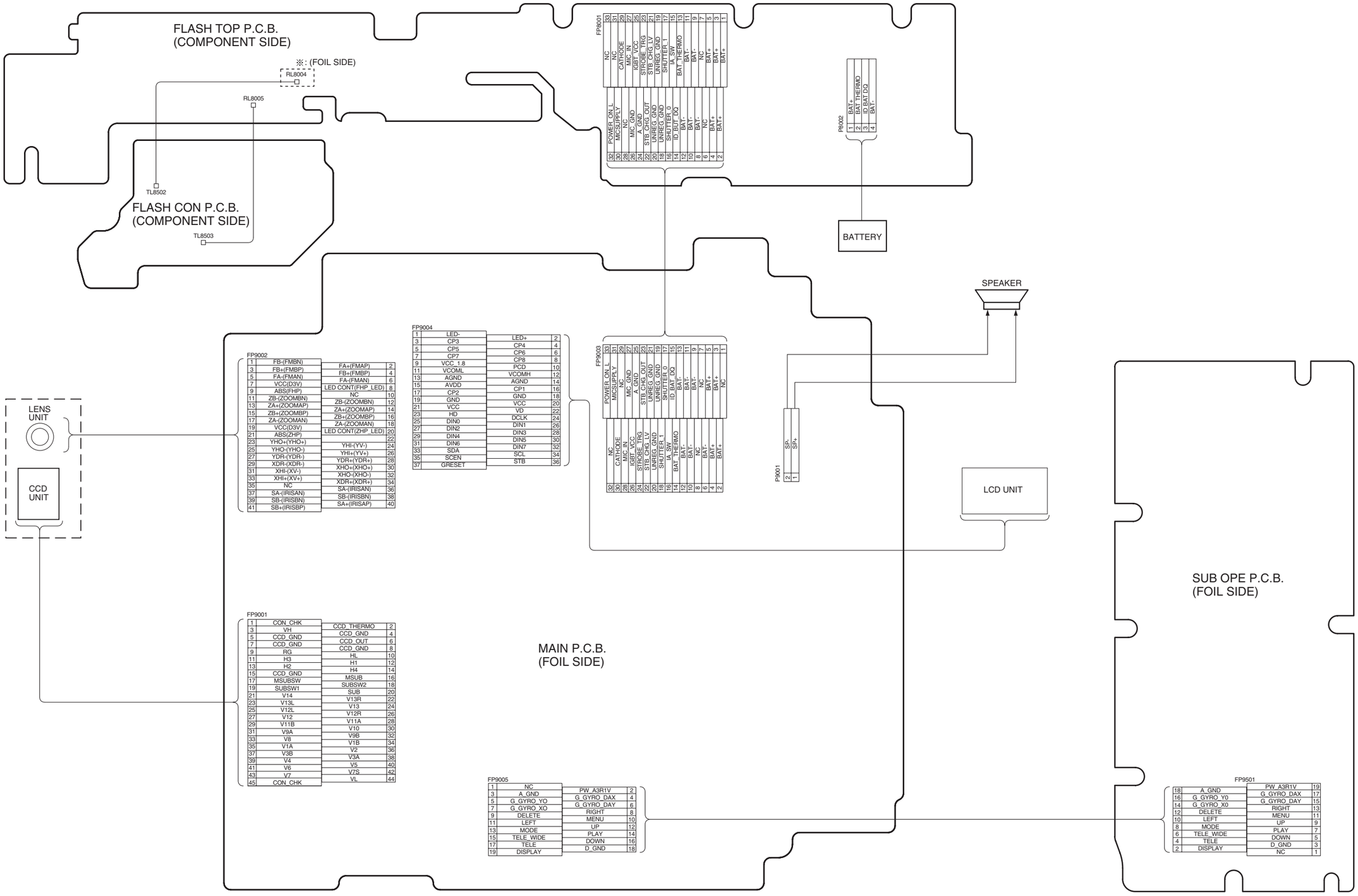
S3.1. Overall Block Diagram



DMC-FT10/TS10 OVERALL BLOCK DIAGRAM

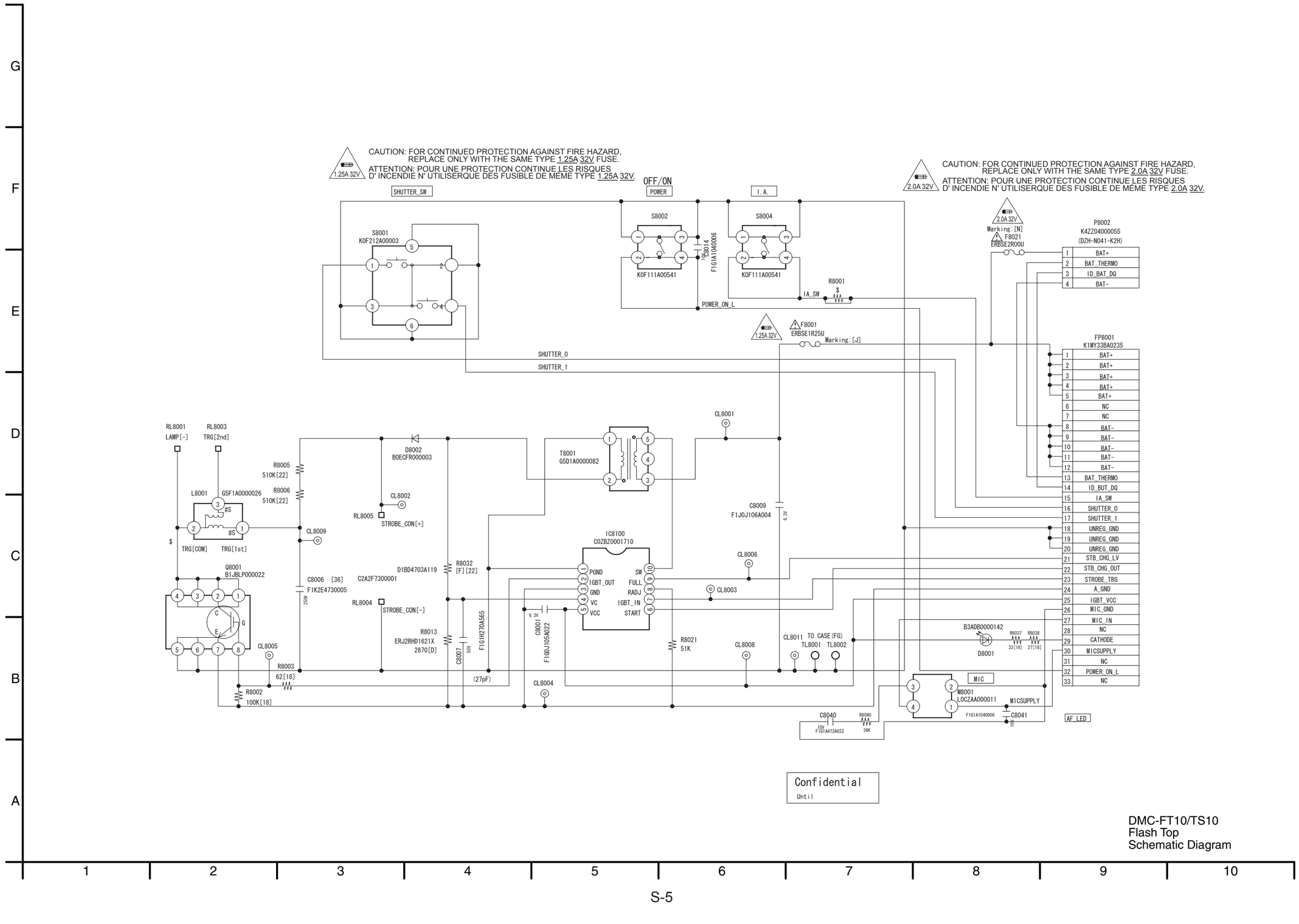
S4. Schematic Diagram

S4.1. Interconnection Diagram



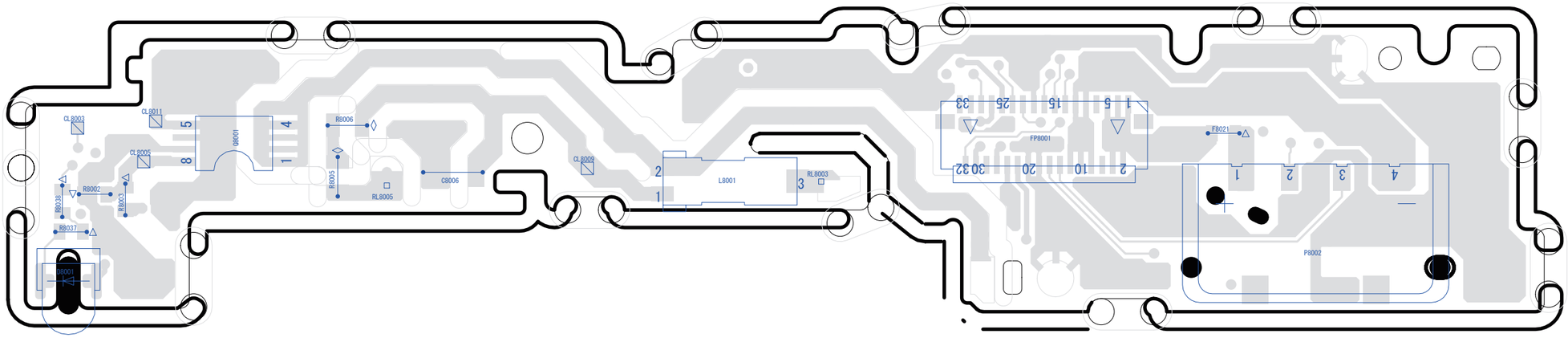
DMC-FT10/TS10
INTERCONNECTION
SCHEMATIC DIAGRAM

S4.2. Flash Top Schematic Diagram

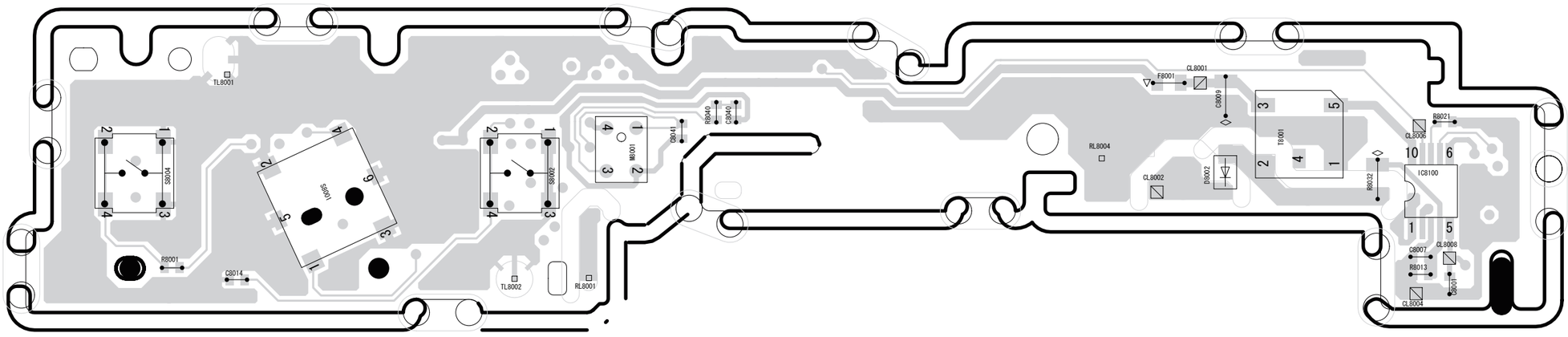


S5. Print Circuit Board

S5.1. Flash Top P.C.B.



(Component Side)



(Foil Side)

DMC-FT10/TS10
Flash Top P.C.B.

S6. Replacement Parts List

Note:
1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
   Components identified with the mark ⚠ have the special characteristics for safety.
   When replacing any of these components, use only the same type.
3. Unless otherwise specified,
   All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICRO-FARADS (uf), P=uuF.
4. The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.
5. Supply of CD-ROM, in accordance with license protection, is allowable as replacement parts only for customers who accidentally damaged or lost their own.

E.S.D. standards for Electrostatically Sensitive Devices, refer to PREVENTION OF ELECTROSTATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES section.

Definition of Parts supplier:

1. **Parts marked with [ENERGY] in the remarks column are supplied from Panasonic Corporation Energy Company.**
2. **Parts marked with [SPC] in the remarks column are supplied from AVC-CSC-SPC. Others are supplied from PAVCSG.**

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
##	VEK0R09	FLASH TOP P.C.B.	1	E.S.D.
##	VEK0R09	FLASH TOP P.C.B.		E.S.D.
C8001	F1G0J105A022	C.CAPACITOR CH 6.3V 1U	1	
C8006	F1K2E4730005	C.CAPACITOR 250V 0.047U	1	
C8007	F1G1H270A565	C.CAPACITOR CH 50V 27	1	
C8009	F1J0J106A004	C.CAPACITOR CH 6.3V 10U	1	
C8014	F1G1A1040006	C.CAPACITOR CH 10V 0.1U	1	
C8040	F1G1C153A122	C.CAPACITOR CH 16V 0.15U	1	
C8041	F1G1A1040006	C.CAPACITOR CH 10V 0.1U	1	
D8001	B3ADB0000142	DIODE	1	E.S.D.
D8002	B0ECFR000003	DIODE	1	E.S.D.
⚠ F8001	ERBSE1R25U	FUSE 32V 1.25A	1	
⚠ F8021	ERBSE2R00U	FUSE 32V 2.0A	1	
FP8001	K1MY33BA0235	CONNECTOR 33P	1	
IC8100	C0ZBZ0001710	IC	1	E.S.D.
L8001	G5F1A0000026	INDUCTOR	1	
M8001	L0CZAA000011	MICROPHONE UNITS	1	
P8002	K4ZZ04000055	SHIELD FINGER	1	
Q8001	B1JBLP000022	TRANSISTOR	1	E.S.D.
R8002	ERJ3GEYJ104V	M.RESISTOR CH 1/10W 100K	1	
R8003	ERJ3GEYJ620V	M.RESISTOR CH 1/10W 62	1	
R8005	ERJ6GEYJ514V	M.RESISTOR CH 1/10W 514K	1	
R8006	ERJ6GEYJ514V	M.RESISTOR CH 1/10W 514K	1	
R8013	ERJ2RHD1621X	M.RESISTOR CH 1/16W 1.62K	1	
R8021	ERJ2GEJ513X	M.RESISTOR CH 1/16W 51K	1	
R8032	D1BD4703A119	RESISTOR	1	
R8037	ERJ3GEYJ330V	M.RESISTOR CH 1/10W 33	1	
R8038	ERJ3GEYJ270V	M.RESISTOR CH 1/10W 27	1	
R8040	ERJ2GEJ683X	M.RESISTOR CH 1/16W 68K	1	
S8001	K0F212A00003	SWITCH	1	
S8002	K0F111A00541	SWITCH	1	
S8004	K0F111A00541	SWITCH	1	
T8001	G5D1A0000082	TRANSFORMER	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	VXW1177	CAMERA LENS UNIT	1	
2	VEP56111A	MAIN P.C.B.	1	(RTL) E.S.D.
3	VEP58126A	FLASH CON P.C.B.	1	(RTL) E.S.D.
4	VEK0R09	FLASH TOP P.C.B. UNIT	1	
5	VEP59087A	SUB OPE P.C.B.	1	(RTL) E.S.D.
⚠ 6	F2A2F7300001	FLASH CHRG CAPA. U	1	(C8503)
⚠ 7	ML-421S/DN	BUTTON BATTERY	1	(B9101)[ENERGY]
8	VEK0Q74	FLASH U	1	
9	VYK4K28KIT	FRONT AL CASE UNIT	1	(P-S)
9	VYK4K29KIT	FRONT AL CASE UNIT	1	(P-A)
9	VYK4K30KIT	FRONT AL CASE UNIT	1	(P-K)
9	VYK4K31KIT	FRONT AL CASE UNIT	1	(P-R)
9	VYK4K32KIT	FRONT AL CASE UNIT	1	(EXCEPT:P-S)
9	VYK4K33KIT	FRONT AL CASE UNIT	1	(EXCEPT:P-A)
9	VYK4K34KIT	FRONT AL CASE UNIT	1	(EXCEPT:P-K)
9	VYK4K35KIT	FRONT AL CASE UNIT	1	(EXCEPT:P-R)
9-1	VGQ0S15	FRONT TAPE	1	
10	VGQ0B61	DPR SHEET	1	
11	VYK4K38	TOP CASE UNIT	1	(TS10)
11	VYK4K39	TOP CASE UNIT	1	(FT10)
11-1	VGQ0N94	BUTTON HOLDER	1	
11-2	VGU0G30	POWER BUTTON	1	
11-3	VGU0G31	SHUTTER BUTTON	1	
11-4	VGU0G32	iA BUTTON	1	
12	VKM8673	REAR ALMI CASE	1	(-K)
12	VKM8674	REAR ALMI CASE	1	(-R)
12	VKM8670	REAR ALMI CASE	1	(-S)
12	VKM8672	REAR ALMI CASE	1	(-A)
13	VMB4297	EARTH SPRING	1	(ET8503)
14	VWJ2193	MAIN STB FPC	1	
15	VWJ2194	MAIN SUB FPC	1	
16	L0AA01A00055	SPEAKER	1	
17	VYK4K36	FRONT CASE UNIT	1	
17-1	VQL2F13-A	BATTERY LABEL	1	
18	VGQ9405	WATER LABEL	1	
19	VKM8692	SIDE ORNAMENT R	1	
20	VMB4362	BATTERY OUT SPRING	1	
21	VMB4386	BATT DOOR SPRING	1	
22	VMB4387	JACK DOOR SPRING	1	
23	VMC2139	TOP EARTH PLATE A	1	
24	VMC2141	PCB EARTH PLATE	1	
25	VMP9700	BATT FRAME A	1	
26	VMP9702	CONDENSER HOLDER	1	
27	VMP9703	SPEAKER HOLDER	1	
28	VMP9705	LENS PLATE	1	
29	VMS8090	BATT DOOR SHAFT	1	
30	VMS8091	JACK DOOR SHAFT	1	
31	VGQ0N17	BATT DETECT LEVER	1	
32	VGU0F66	BATT LOCK KNOB	1	
33	VMB4226-B	BATT LOCK SPRING	1	
34	VMB4240-B	BATT DETECT SPRING	1	
35	VMC2144	BATT EARTH PLATE	1	
36	VMP9701	BATT FRAME B	1	
37	VMP9708	BATT LOCK PLATE	1	
38	VYF3355	BATT DOOR UNIT	1	(-K)
38	VYF3356	BATT DOOR UNIT	1	(-R)
38	VYF3353	BATT DOOR UNIT	1	(-S)
38	VYF3354	BATT DOOR UNIT	1	(-A)
39	VYF3358	JACK DOOR UNIT	1	
40	VXQ1984	LCD UNIT	1	
41	VYK4K37	REAR CASE UNIT	1	
41-1	VKM8696	REAR ORNAMENT R	1	
41-2	VKM8694	REAR ORNAMENT L	1	
42	VGQ0Q90	PCB CUSHION	1	
43	VGU0G33	ZOOM BUTTON WIDE	1	
44	VGU0G34	ZOOM BUTTON TELE	1	
46	VGU0G36	REAR BUTTON PLAY	1	
47	VGU0G37	REAR BUTTON MENU/SET	1	
48	VGU0G38	REAR BUTTON CROSS	1	
49	VMP9706	FRAME PLATE	1	
50	VQL2F52	BATT DOOR CAUTION LABEL	1	(EXCEPT:PC)
50	VQL2F53	BATT DOOR CAUTION LABEL	1	(ONLY:PC)
52	VGQ0P04	FPC SHEET	1	
54	VGU0G35	REAR BUTTON MODE	1	
55	VGU0G35	REAR BUTTON DISPLAY	1	
56	VGU0G35	REAR BUTTON Q.MENU	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
60	VGQ0S64	TOP PCB SHEET	1	
B1	VHD2212	SCREW	1	
B2	VHD2234	SCREW	1	(-K)
B2	VHD2214	SCREW	1	(-R,-S,-A)
B3	VHD2234	SCREW	1	(-K)
B3	VHD2214	SCREW	1	(-R,-S,-A)
B4	VHD2235	SCREW	1	
B5	VHD2235	SCREW	1	
B6	VHD2235	SCREW	1	
B7	VHD2235	SCREW	1	
B8	VHD1759	SCREW	1	
B9	VHD1759	SCREW	1	
B10	VHD1759	SCREW	1	
B11	VHD1759	SCREW	1	
B12	VHD1759	SCREW	1	
B13	VHD2182	SCREW	1	
B14	VHD2182	SCREW	1	
B15	VHD2182	SCREW	1	
B16	VHD2182	SCREW	1	
B17	VHD2182	SCREW	1	
B18	VHD2198	SCREW	1	
B19	VHD2212	SCREW	1	
B20	VHD2212	SCREW	1	
B21	VHD2235	SCREW	1	
B22	VHD2235	SCREW	1	
B23	VHD2235	SCREW	1	
B24	VHD2235	SCREW	1	
B25	VHD2236	SCREW	1	
B26	VHD2236	SCREW	1	
B27	VHD2213	SCREW	1	
B28	VHD2237	SCREW	1	
B29	VHD2237	SCREW	1	
B30	XQN14+BJ45FJ	SCREW	1	
B31	XQN14+BJ45FJ	SCREW	1	
B32	XQN14+BJ85FJ	SCREW	1	
B33	VHD1759	SCREW	1	
B34	VHD1759	SCREW	1	
B35	VHD1759	SCREW	1	
B36	VHD1759	SCREW	1	
B37	VHD1759	SCREW	1	
B38	VHD1759	SCREW	1	
B39	VHD1759	SCREW	1	
B40	VHD1759	SCREW	1	
B41	VHD1759	SCREW	1	
B42	VHD2182	SCREW	1	
B43	VHD2182	SCREW	1	
B44	VHD2182	SCREW	1	
B45	VHD2182	SCREW	1	
P	VUMG1937	WATER PROFF PACKING KIT	1	(Including "P-1 to P5")
P-1	-----	TOP BUTTON PACKING	1	(Included in "VUMG1937")
P-2	-----	BATT DOOR PACKING	1	(Included in "VUMG1937")
P-3	-----	JACK DOOR PACKING	1	(Included in "VUMG1937")
P-4	-----	CASE O-RING	1	(Included in "VUMG1937")
P-5	-----	REAR BUTTON PACKING	1	(Included in "VUMG1937")

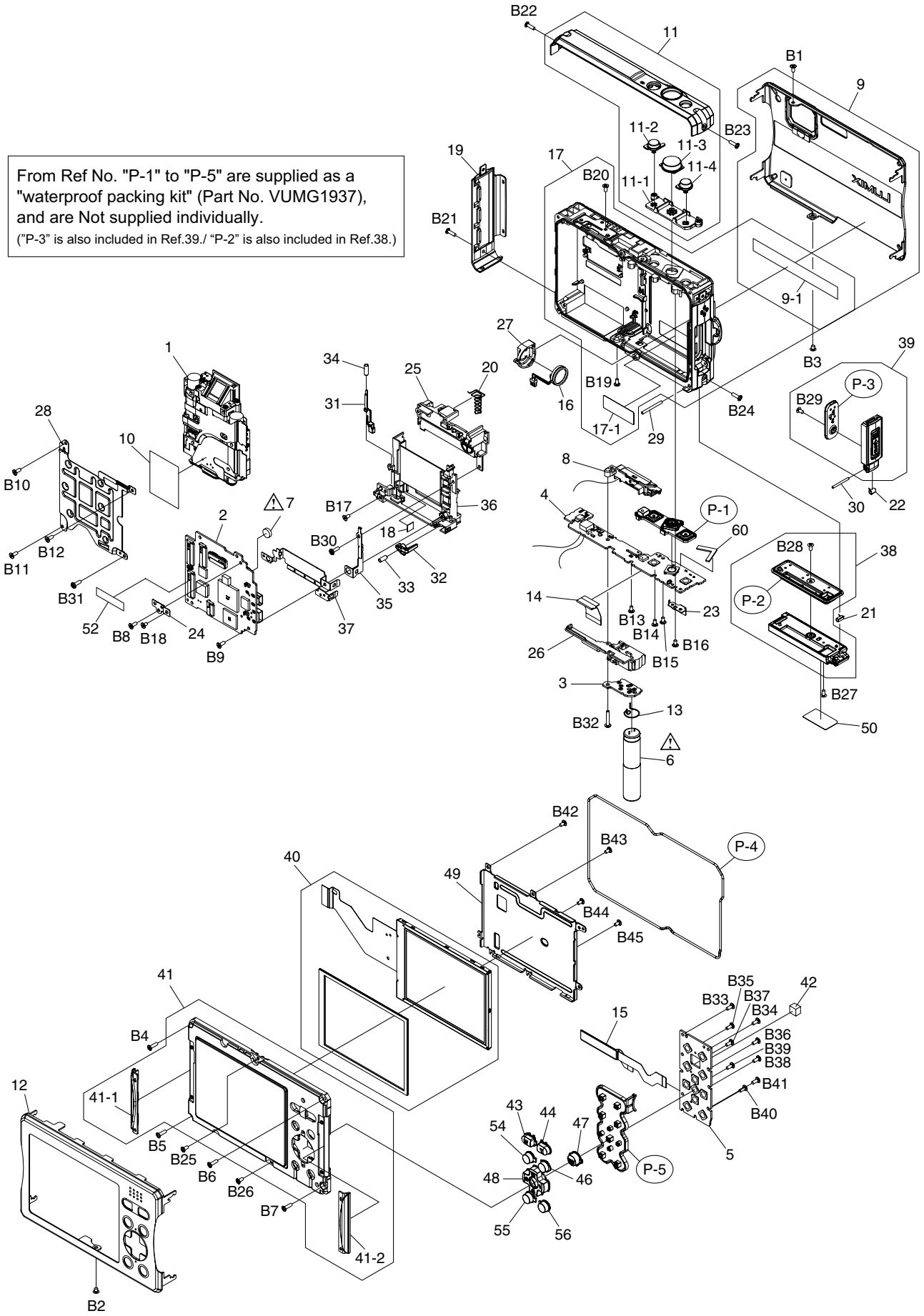
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
100	VPF1301	CAMERA BAG	1	EG,EB,EE,EF,EP,GC,GF,GN,GH
⚠ 101	-----	BATTERY PACK	1	EG,EB,EE,EF,EP,GC,GF,GN,GH
				(NOT SUPPLIED)
⚠ 102	DE-A76AA/SX	BATTERY CHARGER	1	EG,EB,EE,EF,EP,GF,GN,GH
⚠ 102	DE-A76DA/SX	BATTERY CHARGER	1	GC
103	K1HA08AD0001	USB CABLE	1	EG,EB,EE,EF,EP,GC,GF,GN,GH
104	K1HA08CD0027	AV CABLE	1	EG,EB,EE,EF,EP,GC,GF,GN,GH
105	VFC4393	HAND STRAP	1	EG,EB,EE,EF,EP,GC,GF,GN,GH
⚠ 106	VFF0684-S	CD-ROM	1	EG,EB,EF,EP [SPC]
		(SOFTWARE/INSTRUCTION BOOK)		
		(ENGLISH/GERMAN/FRENCH/		
		ITALIAN/DUTCH/SPANISH/		
		PORTUGUESE/TURKISH/		
		FINNISH/DANISH/SWEDISH/		
		POLISH/CZECH/HUNGARIAN)		
⚠ 106	VFF0685-S	CD-ROM	1	EE [SPC]
		(SOFTWARE/INSTRUCTION BOOK)		
		(RUSSIAN/UKRAINIAN)		
⚠ 106	VFF0686-S	CD-ROM	1	GC,GF,GN,GH [SPC]
		(SOFTWARE/INSTRUCTION BOOK)		
		(ENGLISH/		
		CHINESE(TRADITIONAL)/		
		ARABIC/PERSIAN)		
		(ENGLISH/SPANISH/		
		CANADIAN FRENCH/PORTUGUESE)		
107	VGQ0J54	BATTERY PROTECTION CASE	1	EG,EB,EE,EF,EP,GC,GF,GN,GH
108	VMG1951	SILICONE JACKET	1	EG,EB,EE,EF,EP,GC,GF,GN,GH
109	VPF1378	POLYETHYLENE BAG	1	EG,EB,EE,EF,EP,GC,GF,GN,GH
110	VQC7785	O/I SOFTWARE	1	EG
		(GERMAN/FRENCH/ITALIAN/		
		DUTCH/SPANISH/PORTUGUESE/		
		TURKISH)		
110	VQC7788	O/I SOFTWARE	1	EB,GN
		(ENGLISH)		
110	VQC7789	O/I SOFTWARE	1	EE
		(RUSSIAN/UKRAINIAN)		
110	VQC7787	O/I SOFTWARE	1	EF
		(FRENCH)		
110	VQC7786	O/I SOFTWARE	1	EP
		(FINNISH/DANISH/SWEDISH/		
		POLISH/CZECH/HUNGARIAN)		
110	VQC7790	O/I SOFTWARE	1	GC,GF,GH
		(ENGLISH/		
		CHINESE(TRADITIONAL)/		
		ARABIC/PERSIAN)		
⚠ 111	VQT2X45	SIMPLIFIED O/I	1	EG
		(GERMAN/FRENCH)		
⚠ 111	VQT2X46	SIMPLIFIED O/I	1	EG
		(ITALIAN/DUTCH)		
⚠ 111	VQT2X47	SIMPLIFIED O/I	1	EG
		(SPANISH/PORTUGUESE)		
⚠ 111	VQT2X48	SIMPLIFIED O/I	1	EG
		(TURKISH)		
⚠ 111	VQT2X53	SIMPLIFIED O/I	1	EB
		(ENGLISH)		
⚠ 111	VQT2X54	SIMPLIFIED O/I	1	EE
		(RUSSIAN/UKRAINIAN)		
⚠ 111	VQT2X52	SIMPLIFIED O/I	1	EF
		(FRENCH)		
⚠ 111	VQT2X49	SIMPLIFIED O/I	1	EP
		(SWEDISH/DANISH)		
⚠ 111	VQT2X50	SIMPLIFIED O/I	1	EP
		(PORTUGUESE/CZECH)		
⚠ 111	VQT2X51	SIMPLIFIED O/I	1	EP
		(HUNGARIAN/FINNISH)		
⚠ 111	VQT2X55	SIMPLIFIED O/I	1	GC,GF,GH
		(ENGLISH/		
		CHINESE(TRADITIONAL))		
⚠ 111	VQT2X56	SIMPLIFIED O/I	1	GC,GF
		(ARABIC/PERSIAN)		
⚠ 111	VQT2X57	SIMPLIFIED O/I	1	GN
		(ENGLISH)		
112	VYC1013	BRUSH U	1	EG,EB,EE,EF,EP,GC,GF,GN,GH

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
113	VPK4576	PACKING CASE	1	EG-K,EB-K,EE-K,EF-K,EP-K,
				GC-K,GN-K
113	VPK4584	PACKING CASE	1	EG-R,EB-R,EE-R,EF-R,EP-R,
				GC-R,GN-R
113	VPK4572	PACKING CASE	1	EG-S,GC-S
113	VPK4580	PACKING CASE	1	EG-A,GC-A,GN-A
113	VPK4577	PACKING CASE	1	GF-K
113	VPK4586	PACKING CASE	1	GF-R
113	VPK4574	PACKING CASE	1	GF-S
113	VPK4581	PACKING CASE	1	GF-A
114	VPN7085	CUSHION	1	EG,EE,EF,EP,GF
⚠ 115	K2CQ29A00002	AC CORD	1	EG,EE,EF,EP,GF
⚠ 115	K2CT39A00002	AC CORD	1	EB,GC,GH
⚠ 115	K2CJ29A00002	AC CORD	1	GN
117	VQL1S65	LABEL	1	EB
118	VPN7129	CUSHION	1	EG,EP
118	VPN7148	CUSHION	1	EB,EE,EF,GC,GF,GN,GH
116	VQL2C67-A	OPERATING LABEL	1	PC (CANADIAN FRENCH)
⚠ 119	DE-A75BA/SX	BATTERY CHARGER	1	P,PC,PU
120	K1HA08AD0001	USB CABLE	1	P,PC,PU
121	K1HA08CD0027	AV CABLE	1	P,PC,PU
122	VFC4393	HAND STRAP	1	P,PC,PU
⚠ 123	VFF0683-S	CD-ROM	1	P,PC,PU [SPC]
		(SOFTWARE/INSTRUCTION BOOK)		
125	VGQ0J54	BATTERY PROTECTION CASE	1	P,PC,PU
126	VMG1951	SILICONE JACKET	1	P,PC,PU
127	VPF1378	POLYETHYLENE BAG	1	P,PC,PU
128	VQC7783	O/I SOFTWARE	1	P,PC
		(ENGLISH/CANADIAN FRENCH)		
128	VQC7784	O/I SOFTWARE	1	PU
		(SPANISH/PORTUGUESE)		
⚠ 129	VQT2X42	SIMPLIFIED O/I	1	P
		(ENGLISH/SPANISH)		
⚠ 129	VQT2X43	SIMPLIFIED O/I	1	PC
		(ENGLISH/CANADIAN FRENCH)		
⚠ 129	VQT2X44	SIMPLIFIED O/I	1	PU
		(SPANISH/PORTUGUESE)		
130	VYC1013	BRUSH U	1	P,PC,PU
131	VPK4575	PACKING CASE	1	P-K,PC-K
131	VPK4582	PACKING CASE	1	P-R,PC-R
131	VPK4571	PACKING CASE	1	P-S
131	VPK4578	PACKING CASE	1	P-A
131	VPK4583	PACKING CASE	1	PU-R
131	VPK4579	PACKING CASE	1	PU-A
131	VPK4585	PACKING CASE	1	GH-R
131	VPK4573	PACKING CASE	1	GH-S
132	VPN7085	CUSHION	1	P,PC,PU
133	VPF1301	CAMERA BAG	1	P,PC,PU
⚠ 134	-----	BATTERY PACK	1	P,PC (NOT SUPPLIED)
⚠ 134	-----	BATTERY PACK	1	PU (NOT SUPPLIED)

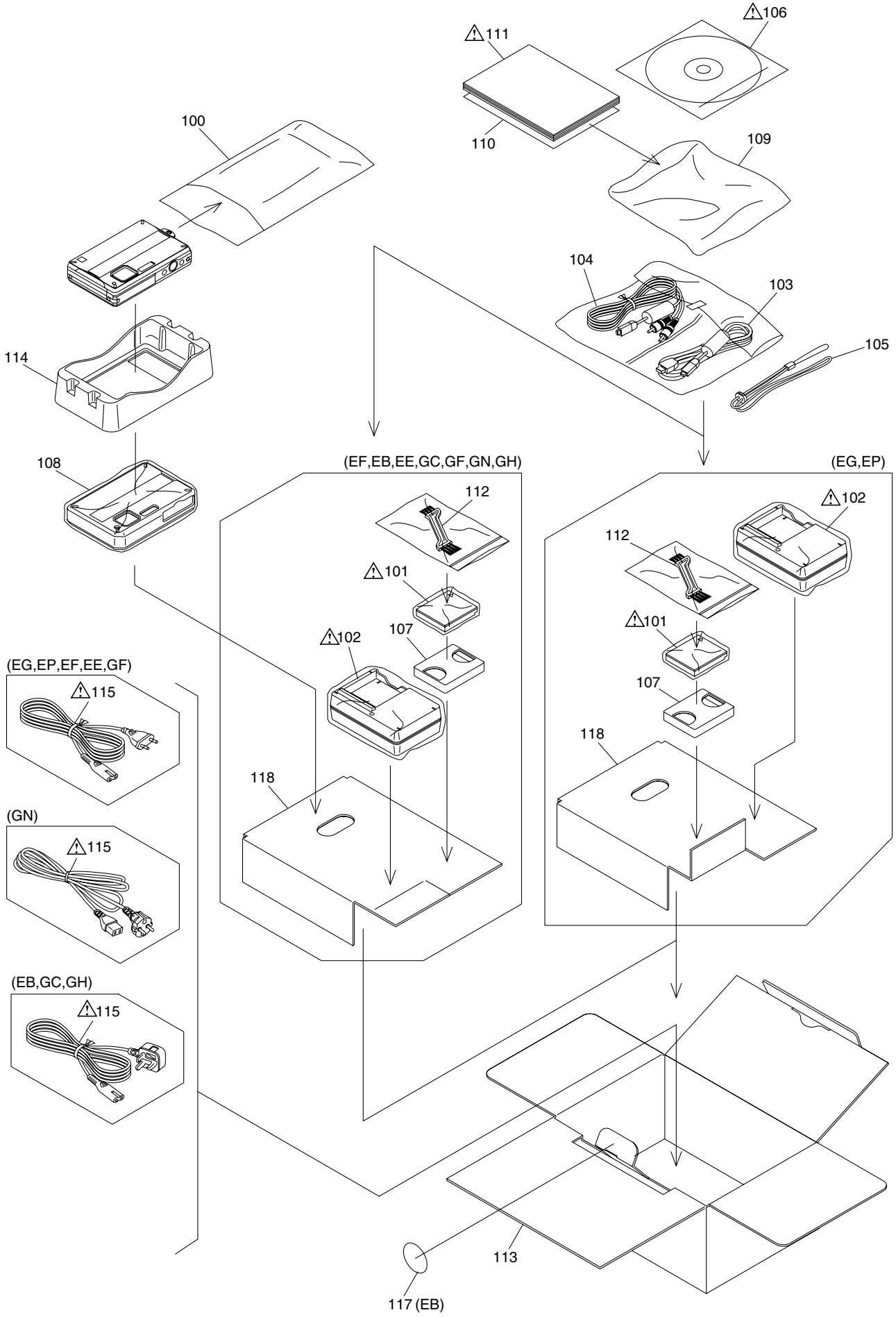
S7. Exploded View

S7.1. Frame and Casing Section

From Ref No. "P-1" to "P-5" are supplied as a "waterproof packing kit" (Part No. VUMG1937), and are Not supplied individually.
("P-3" is also included in Ref.39./ "P-2" is also included in Ref.38.)



S7.2. Packing Parts and Accessories Section (1)



S7.3. Packing Parts and Accessories Section (2)

< ONLY: P, PC, PU >