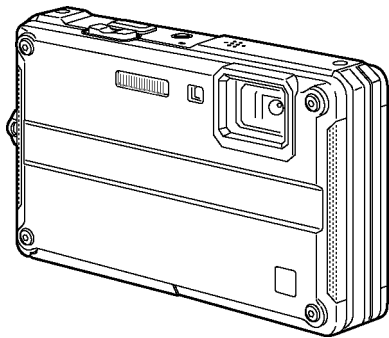


Service Manual

Digital Camera



Model No. **DMC-FT2EB**
DMC-FT2EE
DMC-FT2EF
DMC-FT2EG
DMC-FT2EP
DMC-FT2GC
DMC-FT2GN
DMC-FT2SG
DMC-TS2P
DMC-TS2PC
DMC-TS2PU
DMC-TS2GH
DMC-TS2GD
DMC-TS2GT

VOL.1

Colours

- (A).....Blue Type (Except DMC-FT2EE/EF,
DMC-TS2GT/GD)
- (D).....Orange Type (Except DMC-TS2GT)
- (S).....Silver Type (Except DMC-FT2EF, DMC-
TS2GT/PC)
- (Y).....Yellow Type (Except DMC-FT2EE/GC/
SG, DMC-TS2GH/GD/PC)

⚠ 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.

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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. If 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 $1M\Omega$ and $5.2M\Omega$. 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 $1.5k\Omega$, 10 W resistor, in parallel with a $0.15\mu F$ 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 $1 k\Omega/V$ 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

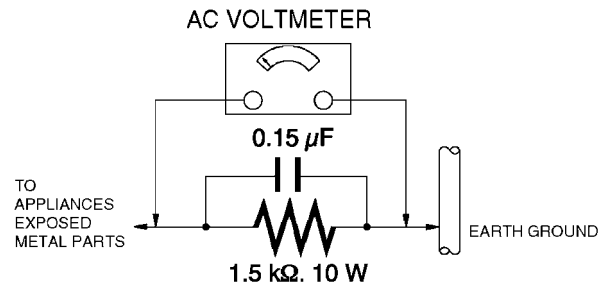


Figure 1

1.4. How to Discharge the Capacitor on Flash 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 P.C.B.**
2. **Be careful of the high voltage circuit on FLASH 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 (ERG5SJ102:1k Ω /5W).
(An equivalent type of resistor may be used.)
3. Put the resistor between both terminals of capacitor on FLASH P.C.B. for approx. 5 seconds.
4. After discharging confirm that the capacitor voltage is lower than 10V using a voltmeter.

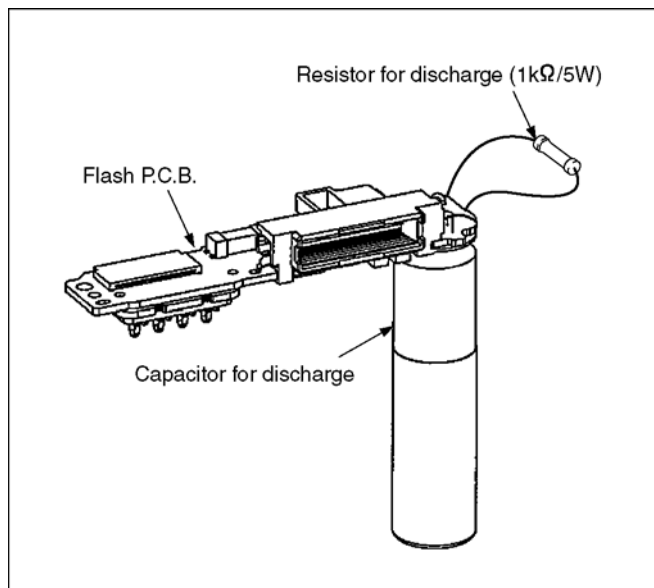


Fig. F1

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.



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 safely.

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:

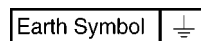
Blue	Neutral
Brown	Live

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.

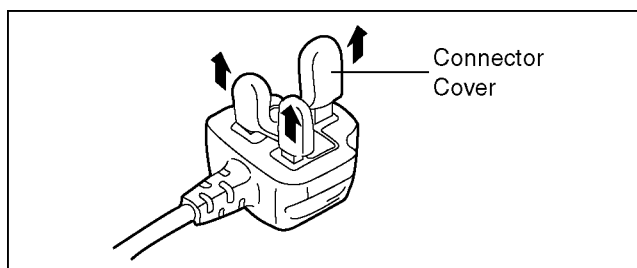
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

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.



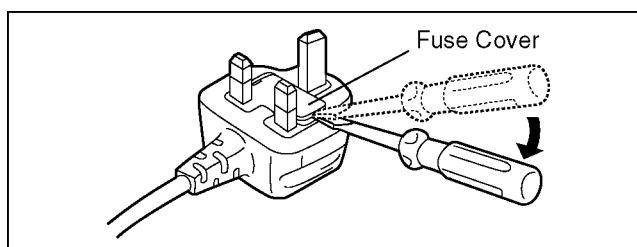
2.3.2.2. Before Use

remove the Connector Cover as follows.

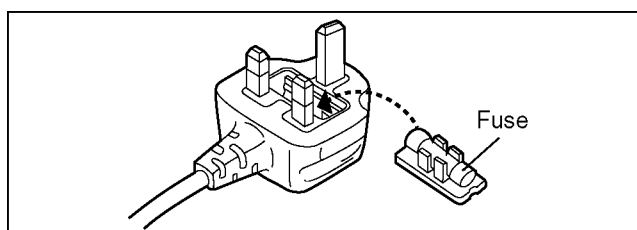


2.3.2.3. How to Replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



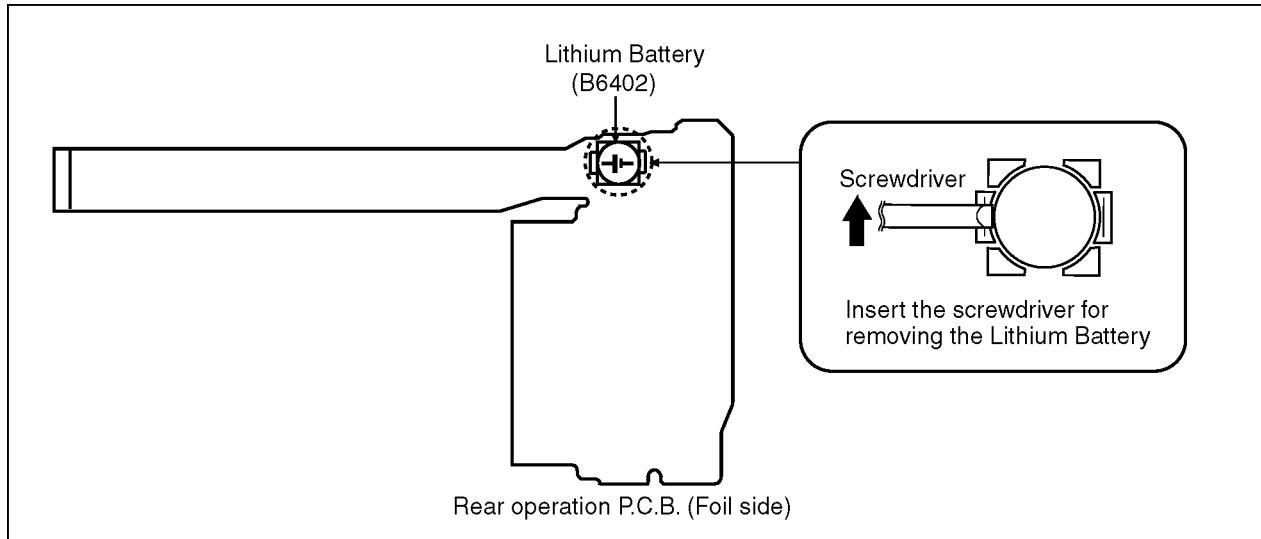
2. Replace the fuse and attach the Fuse cover.



2.4. How to Replace the Lithium Battery

2.4.1. Replacement Procedure

1. Remove the Rear Operation P.C.B. (Refer to Disassembly Procedures.)
2. Remove the Lithium battery (Ref. No. **B6402** at foil side of Rear Operation P.C.B.) and then replace it into new one.



CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

CAUTION

The battery used in this device may present a risk of fire or chemical burn if mistreated.
Do not recharge, disassemble, heat above 100 °C (212 °F), or incinerate.
Replace battery with Panasonic part number ML-421S/ZTK only.
Use of another battery may present a risk of fire or explosion.
Dispose of used battery promptly.
Keep away from children.
Do not disassemble and do not dispose of in fire.

Note:

The lithium battery is a critical component.

(Type No.: ML-421S/ZTK **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 fabricant.

Note:

Above caution is applicable for a battery pack which is for DMC-FT2 and DMC-TS2 series, as well.
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.

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)

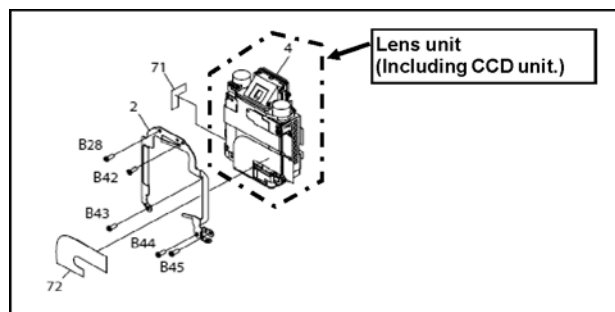
- The integrity of the waterproof packing may decrease about 1 year, with use and age.
(We recommend end users to replace the waterproof packing (waterproof seal) at least once each year described in the operating instructions.)
- As for replacement procedure, refer to the 7.1.2. Periodical maintenance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

3.4. Front case Unit

- Due to keep worterproof performance retention, the replacement part size of the front case unit for this model is including the Top Operation P.C.B., Speaker, Microphone and so on, and not replaceable, individually.
Confirm the replacement part list and exploded views for details.

3.5. 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.



3.6. 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%

3.7. 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.
 - b. Parts list for individual parts for MAIN P.C.B.When a part replacement is required for repairing MAIN P.C.B., replace as an assembled parts. (MAIN P.C.B.)
2. The following category is/are recycle module part. please send it/them to Central Repair Center.
 - MAIN P.C.B. (VEP56096B) : For EB, EF, EG, EP.
 - MAIN P.C.B. (VEP56096A) : For EE, GC, GN, GH, GT, GD, P, PC, PU, SG.

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

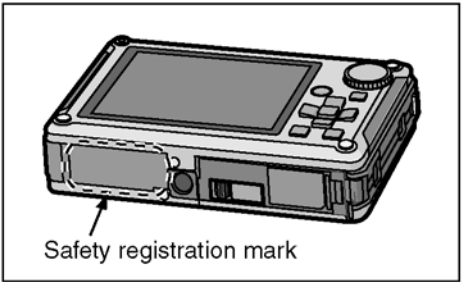





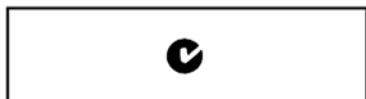

There are eight kinds of DMC-FT2/TS2, regardless of the colours.

- a) DMC-FT2 (Japan domestic model.)/SG
- b) DMC-TS2P/PC
- c) DMC-FT2EB/EF/EG/EP
- d) DMC-FT2EE
- e) DMC-TS2GT
- f) DMC-FT2GN
- g) DMC-TS2GD
- h) DMC-FT2GC, DMC-TS2GH/PU

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

3.8.1. Defining methods

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

<p>a) DMC-FT2 (Japan domestic model), DMC-FT2SG The nameplate for this model shows the following Safety registration mark.</p>	 <p>Safety registration mark</p>
	
<p>b) DMC-TS2P/PC The nameplate for these models show the following Safety registration mark.</p>	
	
<p>c) DMC-FT2EB/EF/EG/EP The nameplate for these models show the following Safety registration mark.</p>	
	
<p>d) DMC-FT2EE The nameplate for this model show the following Safety registration mark.</p>	
	
<p>e) DMC-TS2GT The nameplate for this model show the following Safety registration mark.</p>	
	
<p>f) DMC-FT2GN The nameplate for this model show the following Safety registration mark.</p>	
	
<p>g) DMC-TS2GD The nameplate for this model show the following Safety registration mark.</p>	
	
<p>h) DMC-FT2GC, DMC-TS2GH/PU The nameplate for these models do not show any above safety registration mark.</p>	

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".

3.8.2. 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. ---

[Other than "EG, EF, EB and EP" models : (VEP56096A is used as a Main P.C.B.)]

*.The model suffix can be chosen **JUST ONE TIME.**

(Effective model suffix : DMC-FT2 " EE/GC/GN/SG")

DMC-TS2 " GH/GD/GT/P/PC/PU")

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

[Only for "EG, EF, EB and EP" models : (VEP56096B is used as a Main P.C.B.)]

*.From the beginning, only "EG, EF, EB, and EP" are displayed as a model suffix lists, and these are displayed from the second times as well.

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. Set the mode dial to the NORMAL PICTURE mode.

Note:

If the mode dial position 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 DISPLAY button simultaneously, turn the Power on.

• **Step 2. The cancellation of "INITIAL SETTINGS":**

Press the PLAYBACK button.

Press "UP of Cursor button" and DISPLAY 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.

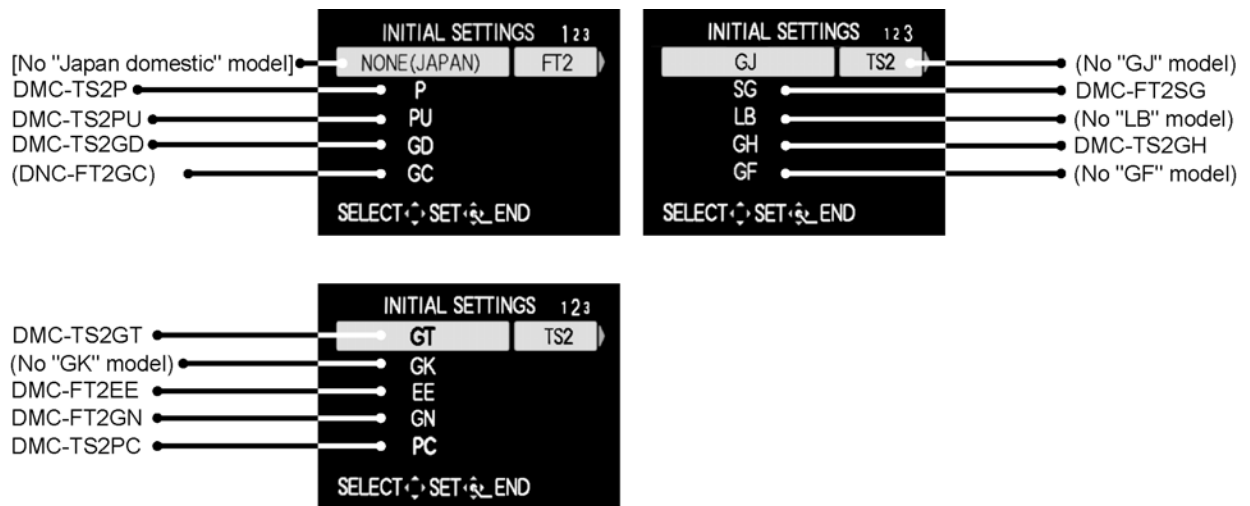
The "INITIAL SETTINGS" menu is displayed.

There are two kinds of "INITIAL SETTINGS" menu form as follows:

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

[Except "EG, EF, EB and EP" models : (VEP56096A is used as a Main P.C.B.)]

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



[Only for "EG, EF, EB and EP" models : (VEP56096B is used as a Main P.C.B.)]

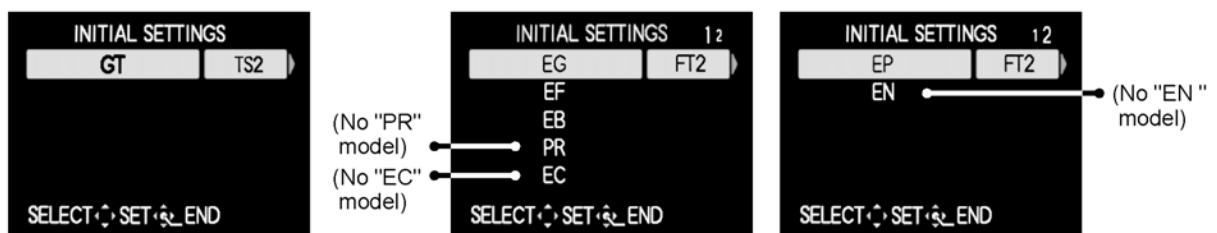
When MAIN P.C.B. has just been replaced, the following model suffix list is displayed as follows. (Two pages in total)



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

< Other than "EG/EF/EB/EP" models >

< Only "EG/EF/EB/EP" models >



• 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 : (VEP56096B is used as a Main P.C.B.))

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.

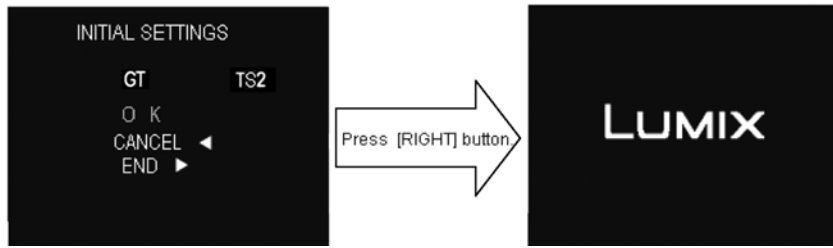
Select the area with pressing "UP / DOWN of Cursor buttons".

• 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-FT2(Japan domestic model)	NTSC	Japanese	Year/Month/Date	
b)	DMC-FT2EB	PAL	English	Date/Month/Year	
c)	DMC-FT2EE	PAL	Russian	Date/Month/Year	
d)	DMC-FT2EF	PAL	French	Date/Month/Year	
e)	DMC-FT2EG	PAL	English	Date/Month/Year	
f)	DMC-FT2EP	PAL	English	Date/Month/Year	
g)	DMC-FT2GC	PAL	English	Date/Month/Year	
h)	DMC-FT2GN	PAL	English	Date/Month/Year	
i)	DMC-FT2SG	PAL	English	Date/Month/Year	
j)	DMC-TS2GH	PAL	English	Date/Month/Year	
k)	DMC-TS2GD	NTSC	Korean	Year/Month/Date	
l)	DMC-TS2GT	NTSC	Chinese (Traditional)	Year/Month/Date	
m)	DMC-TS2P	NTSC	English	Date/Month/Year	
n)	DMC-TS2PC	NTSC	English	Date/Month/Year	
o)	DMC-TS2PU	NTSC	Spanish	Date/Month/Year	

4 Specifications

Digital Camera: Information for your safety

Power Source:	DC 5.1 V
Power Consumption:	1.2 W (When recording) 0.7 W (When playing back)

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 4.6× zoom, f=4.9 mm to 22.8 mm (35 mm film camera equivalent: 28 mm to 128 mm)/F3.3 to F5.9 Max. 4×
Digital Zoom:	
Extended Optical Zoom:	Max. 9.8×
Focus range:	Normal: 30 cm (0.99 feet) to ∞ Macro/Intelligent Auto/Clipboard Mode: 5 cm (0.17 feet) (Wide)/30 cm (0.99 feet) (Tele) to ∞ Scene Mode: There may be differences in the above settings.
Shutter system:	Electronic shutter+Mechanical shutter
Burst Recording	
Burst speed:	Approx. 1.8 pictures/second
Number of recordable pictures:	Max. 5 pictures (Standard), max. 3 pictures (Fine).
Hi-speed Burst	
Burst speed:	Approx. 10 pictures/second (Speed priority) Approx. 5 pictures/second (Image priority) (3M (4:3), 2.5M (3:2) or 2M (16:9) is selected as the picture size.)
Number of recordable pictures:	When using the built-in memory: Approx. 15 pictures (immediately after formatting) When using a Card: Max. 100 pictures (differs depending on the type of Card and the recording conditions)
Shutter speed:	8 seconds to 1/1300th of a second [STARRY SKY] Mode: 15 seconds, 30 seconds, 60 seconds
Exposure (AE):	Program AE Exposure compensation (1/3 EV Step, -2 EV to +2 EV)
Metering Mode:	Multiple
LCD monitor:	2.7" TFT LCD (Approx. 230,000 dots) (field of view ratio about 100%)
Flash:	Flash range: [ISO AUTO] Approx. 30 cm (0.99 feet) to 5.1 m (16.7 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 2.21" standard)/DPOF corresponding
Pictures with audio:	JPEG (based on "Design rule for Camera File system", based on "Exif 2.21" standard)+ "QuickTime"
Motion pictures with audio:	AVCHD Lite/QuickTime Motion JPEG

Interface	
Digital:	"USB 2.0" (High Speed)
Analog video/audio:	NTSC Audio line output (monaural)
Terminal	
[AV/DIGITAL/MULTI]:	Dedicated jack (14 pin)
[HDMI]:	MiniHDMI TypeC
Dimensions:	Approx. 99.3 mm (W)×63.1 mm (H)×24.3 mm (D) [3.91" (W)×2.48"(H)×0.96" (D)] (excluding the projecting parts)
Mass (weight):	Approx. 188 g/0.41 lb (with card and battery) Approx. 167 g/0.37 lb (excluding card and battery)
Operating temperature:	-10 °C* to 40 °C (24 °F* to 104 °F) * The performance of the battery (number of recordable pictures/operating time) may decrease temporarily when using the camera in a temperature between -10 °C to 0 °C (24 °F to 32 °F) (at the cold climate such as ski resorts).
Operating humidity:	10% to 80%
Language select:	[ENGLISH]/[ESPAÑOL]
Waterproof performance:	Equivalent to IEC 60529 "IPX8". (Usable for 60 minutes in 10 m (33 feet) water depth)
Crash resistance performance:	The camera has cleared a single unit drop test from a height of 2 m (6.6 feet) onto 3 cm (0.10 feet) plywood, which is compliant with "MIL-STD 810F Method 516.5-Shock".
Dustproof performance:	Equivalent to IEC 60529 "IP6X".
Battery Charger	
(Panasonic DE-A59B):	Information for your safety
Input:	110 V to 240 V~50/60 Hz, 0.2 A
Output:	4.2 V---0.65 A (Battery charging)
Operating temperature:	0 °C* to 40 °C (32 °F* to 104 °F) * The battery cannot be recharged in a temperature less than 0 °C (32 °F).(The [CHARGE] indicator blinks when the battery cannot be recharged.)
Equipment mobility:	Movable
Battery Pack	
(lithium-ion)	
(Panasonic DMW-BCF10PP):	Information for your safety
Voltage/capacity:	3.6 V/940 mAh

Note:

*Above specification is for DMC-TS2P. 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.

[2] Others:

1). [Analog video/audio:]

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



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

2). [Motion pictures:]

(Only "EB/EF/EG/EP" models:)






- Motion pictures (both AVCHD Lite and Motion JPEG) can be recorded continuously for up to 29 minutes 59 seconds.
- Also, motion picture recorded continuously in 'MOTION JPEG' is up to 2GB.
(Except "EB/EF/EG/EP" models:)
- AVCHD Lite motion pictures can be recorded continuously for up to 13hours, 3 minutes 20 seconds.
- Also, a maximum of approx.2GB of continuous motion picture can be recorded in Motion JPEG format.

About Motion Pictures (AVCHD Lite/Motion JPEG)

Recording format	Features
 [AVCHD Lite]	<ul style="list-style-type: none"> Select this format to record HD (high definition) video for playback on your HDTV using an HDMI connection. It can be played back as is by inserting the card into a device compatible with AVCHD. Refer to the instructions of the device used for details on compatibility. Use a card with SD Speed Class* with "Class 4" or higher.
 [MOTION JPEG]	<ul style="list-style-type: none"> Select this format to record standard definition video for playback on your PC. It can be recorded using less storage when there is not much space left on the memory card or when you want to attach the motion picture to an e-mail. Use a card with SD Speed Class* with "Class 6" or higher.

*The SD Speed Class Rating is the speed standard for successive writes.

When [AVCHD Lite] is selected

	Item	Quality (bit rate)* ¹	fps	Aspect ratio
High quality   Longer time	 ([SH])	1280×720 pixels Approx. 17 Mbps* ²	60p (Sensor output is 30 fps)	16:9
	 ([H])	1280×720 pixels Approx. 13 Mbps* ²		
	 ([L])	1280×720 pixels Approx. 9 Mbps* ²		







*¹ What is bit rate

This is the volume of data for a definite period of time, and the quality becomes higher when the number gets bigger. This unit is using the "VBR" recording method. "VBR" is an abbreviation of "Variable Bit Rate", and the bit rate (volume of data for a definite period of time) is changed automatically depending on the subject to record. Therefore, the recording time is shortened when a subject with fast movement is recorded.


*² What is Mbps


This is an abbreviation of "Megabit Per Second", and it represents the speed of transmission.

When [MOTION JPEG] is selected

	Item	Picture size	fps	Aspect ratio
High quality   Longer time	 ([HD])	1280×720 pixels	30	16:9
	 * ³ ([WVGA])	848×480 pixels		
	 ([VGA])	640×480 pixels		
	 ([QVGA])	320×240 pixels		4:3

*³ This item cannot be set in the Intelligent Auto Mode.

• With the [AVCHD Lite] or  for [MOTION JPEG], high quality motion pictures can be enjoyed on the TV by using the HDMI mini cable (optional).

• It cannot be recorded to built-in memory except for the .

Note

- The Motion Picture Recording may stop in the middle when any of the following cards are used.
 - Cards on which recording and deleting have been repeated many times
 - Cards which have been formatted using a PC or other equipmentBefore taking pictures, format the card in the unit. Because formatting will delete all data recorded on the card, save important data beforehand on the computer.
- **Motion pictures recorded in [AVCHD Lite] or [MOTION JPEG] may be played back with poor picture or sound quality or playback may not be possible even when played back with equipment compatible with these formats. Also, the recording information may not be displayed properly. In this case, use this unit.**
For details on AVCHD compatible devices, refer to the support sites below.
<http://panasonic.jp/support/global/cs/dsc/>
(This Site is English only.)
- Motion picture recorded in [AVCHD Lite] does not comply with the "DCF/Exif", so some information will not display while playback.
- **Sound from motion pictures (When [REC MODE] is set to [MOTION JPEG]) or pictures with audio recorded by this camera cannot be played back by older models of Panasonic digital camera (LUMIX) launched before July 2008.**
- A sound might be muffed or warped when there is water on the microphone or the speaker. Wipe the residues after letting the water drip out from the microphone and speaker by tipping it down, and use it after letting it dry for a while.
- When taking pictures of fast moving subjects, some residual images may appear during playback.

(Important) About the Waterproof/Dustproof and Anti-shock Performance of the Camera

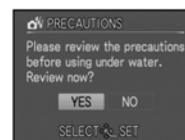
- Please observe the following precautions, and avoid using this camera in any situation where the camera is subject to high water pressure. This camera's waterproof/dustproof rating complies with the "IPX8" and "IP6X" ratings. Provided the care and maintenance guidelines described in this document are strictly followed, this camera can operate underwater, to a depth not exceeding 10 m (33 feet) for a time not exceeding 60 minutes.*1
 - 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
 - Supplied accessories are not waterproof (excluding hand strap/silicon jacket).
- *1 This means that the camera can be used underwater for 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.
- *2 This does not guarantee no destruction, no malfunction, or waterproofing in all conditions. Observe the following precautions and avoid using under water pressure exceeding the guaranteed performance, and in an environment with excessive dust or sand. Waterproofing is not guaranteed if the unit is subject to an impact as a result of being hit or dropped etc.
- If an impact to the camera occurs, it should be inspected (subject to a fee) by a Panasonic Service Center to verify that the waterproofing is still effective.
- Any malfunction caused by customer misuse, or mishandling will not be covered by the warranty.

■ Handling of the camera

- Do not leave the camera for a long period of time in places where temperature is very low (ski resort etc.) or very high [above 40 °C (104 °F)], inside a car under strong sunlight, close to a heater, on the beach, etc. Waterproof performance may be degraded.
- The inside of this unit is not waterproof. Do not open or close the card/battery door or terminal cover close to the water by the sea, a lake or river, or with wet hands.
- Waterproof function of the camera is for sea water and fresh water only.
- Operation may not be possible when snow or water on the zoom lever, mode dial or camera [OFF/ON] button freezes at cold places like ski resorts etc.

■ About the [PRECAUTIONS] demonstration display

- **Please check beforehand to maintain the waterproof performance.** [PRECAUTIONS] is displayed when the power is turned on for the first time after purchase, with the card/battery door completely closed.
- The [PRECAUTIONS] screen will not display the next time you turn on the power if you start the slide show by selecting [YES], and then select [EXIT] once it has completed. Select [REPLAY] to see the slide show again.



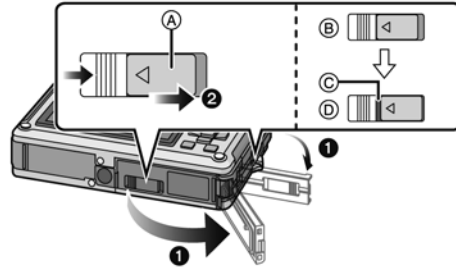
Note

- It will automatically skip to clock setting screen if [NO] is selected before the Slide Show starts.
- [PRECAUTIONS] is displayed every time the power is turned on if you exited the slide show using a method other than selecting [EXIT], such as turning off the power while the slide show is playing.
- This can be also confirmed from [PRECAUTIONS] in the [SETUP] menu.

Maintenance and Waterproof Performance

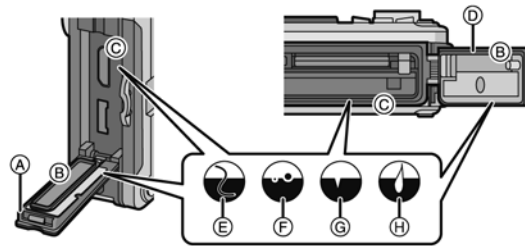
- To prevent water leaking into the camera, observe the following items before using it.
 - Check that there is enough remaining battery power or memory in the card.
 - Do not open or close the card/battery door or terminal cover in places with sand and dust, near water, or with wet hands.
 - At purchase, the [LOCK] switch is in the locked state. When opening the card/battery door and terminal cover, first release the lock.
- Release the lock by sliding the [LOCK] switch in the direction of the arrow until the red area becomes visible, and open the card/battery door and terminal cover.

- Ⓐ: [LOCK] switch (gray part)
- Ⓑ: Locked state
- Ⓒ: Red area
- Ⓓ: Released state



- 1** Confirm that there are no foreign objects on the inner side of the card/battery door or terminal cover (Ⓑ rubber seal and Ⓒ place where rubber seal meets).

- Ⓐ: Terminal cover
- Ⓑ: Rubber seal
- Ⓒ: Area where rubber seal sits
- Ⓓ: Card/Battery door
- Ⓔ: Hair and lint
- Ⓕ: Sand and dust
- Ⓖ: Crack and deformation
- Ⓗ: Fluid



- If there is any crack or deformation in the rubber seal inside the card/battery door and terminal cover, get the camera inspected or repaired by the dealer or an authorized Panasonic Service Center.

2 If there is any foreign object, remove with attached brush.

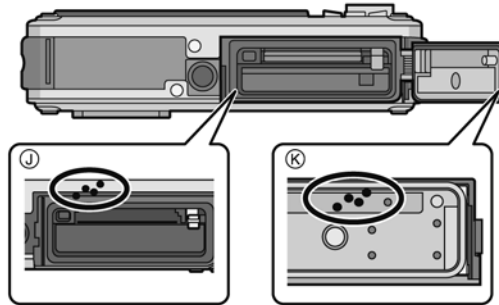


①: Brush (supplied)

- If there is any foreign object, such as lint, hair, sand, etc., on the surrounding area, water will leak within a few seconds causing malfunction.

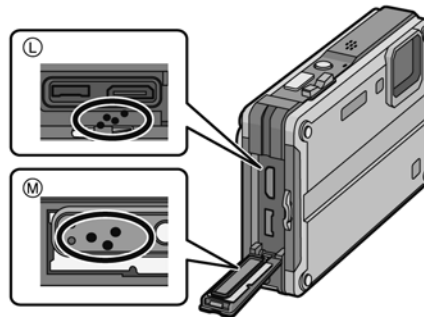
Example of foreign object on the inner side of the card/battery door

- Ⓧ: Area where rubber seal sits (around the card/battery compartment)
- Ⓚ: Rubber seal site (around the card/battery cover)



Example of foreign object on the inner side of the terminal cover

- Ⓛ: Area where rubber seal sits (around the connection terminal)
- Ⓜ: Rubber seal site (around the terminal cover)



- Wipe it off with a dry soft cloth if there is any liquid.
- The integrity of the rubber seals may decrease after about 1 year, with use and age. To avoid permanently damaging the camera the seals should be replaced once each year. Please contact Panasonic Service Center for related costs and other information.

3

1: With the [LOCK] switch released, close the card/battery door and terminal cover by pushing until you hear a click.

- To prevent water seeping into the camera, be careful not to trap foreign objects such as liquids, sand, hair or dust etc.
- Closing the door with the [LOCK] switch in the locked state may result in damage or leaks.

2: Slide the [LOCK] switch in the direction of the arrow until the visible red portion is no longer visible and the switch is locked.

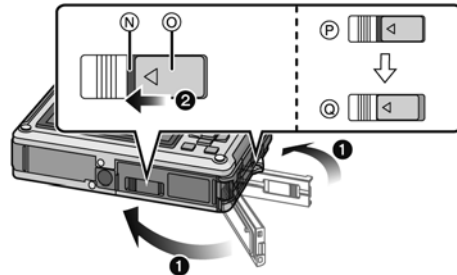
- If you use the camera without securely closing the door and cover, it may open and close on its own.

(N): Red area

(O): [LOCK] switch (gray part)

(P): Released state

(Q): Locked state



Note

- If there is any foreign object, remove it with attached brush.
- Sand and dust etc. will unintentionally adhere to the camera by lodging in between the gap around the card/battery door or terminal cover when used in the following locations:
 - Where sand is floating, such as in the sea or water etc.
 - Where there is a lot of sand or dust, such as at the beach or in a sand box etc.
- To prevent unintentional opening of the card/battery door and terminal cover, it is recommended to use the supplied silicon jacket.



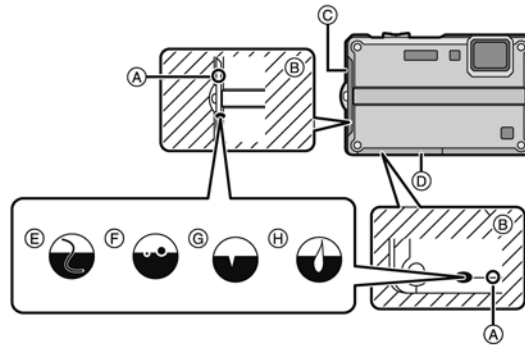
Using the camera underwater

- Use the camera underwater up to 10 m (33 feet) depth, water temperature from 0 °C to 40 °C (32 °F to 104 °F), and not longer than 60 minutes continuously.
- If there is water or dirt on the camera, use it after wiping it off with a dry soft cloth and have it dry out in a well ventilated area.
- Do not open or close the card/battery door or terminal cover.
- Do not apply shock to the camera underwater. (Waterproof performance may not be maintained, and there is a chance of water leak.)
- Do not dive into the water holding the camera. Do not use the camera at a location where water will splash strongly, such as rapid flow or a waterfall. (Strong water pressure may be applied, and it may cause malfunction.)
- The camera will sink in the water. Take care not to drop the camera and lose it underwater by securely placing the hand strap around your wrist or similar measure.
- Do not use it in hot water over 40 °C (104 °F) (in the bath or hot spring).
- When the camera is splashed with detergent, soap, hot spring, bath additive, suntan oil, sun screen, chemical, etc., wipe it off immediately.
- Card and battery are not waterproof. Do not handle with a wet hand. Also, do not insert wet card or battery into the camera.

Causes of water leak

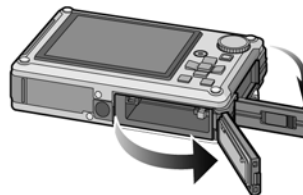
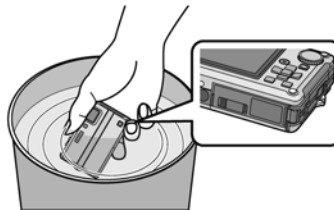
- When the camera is used in the following conditions, a gap may form between the camera and the card/battery door or terminal cover, causing water to leak and malfunction.
 - When there are foreign objects, such as lint, hair, sand, etc., between the card/battery door or terminal cover and the camera.
 - When the rubber seal has deteriorated.
 - When the [LOCK] switch is not closed on the card/battery door and terminal cover.

- (A): Water will leak through the gap formed remove.
- (B): Water
- (C): Terminal cover
- (D): Card/Battery door
- (E): Hair and lint
- (F): Sand and dust
- (G): Crack and deformation
- (H): Fluid



Caring for the camera after using it underwater

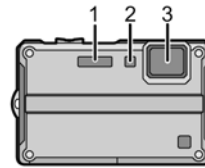
- 1 With the card/battery door and terminal cover closed, rinse with water, or if it was used in the sea, soak the unit in fresh water in a shallow container of for 10 minutes or less.**
 - If you have attached the silicon jacket, be sure to rinse the camera after removing it.
 - Leaving the camera with foreign objects or saline matter on it may cause damage, discoloration, corrosion, unusual odour, or deterioration.
- 2 Wipe off the water, and dry the camera by standing it on a dry cloth in a well ventilated shaded area.**
- 3 Confirm there is no water on the camera, and open the card/battery door and terminal cover.**
- 4 Wipe off any water or sand inside the card/battery door and terminal cover with a soft dry cloth.**



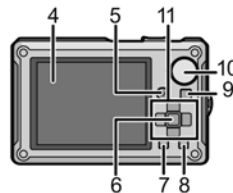
5 Location of Controls and Components

Names of the Components

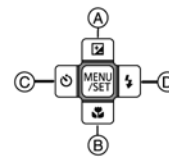
- 1 Flash
- 2 Self-timer indicator/
AF Assist Lamp/LED light
- 3 Lens



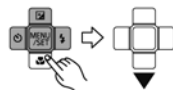
- 4 LCD monitor
- 5 Motion picture button
- 6 [MENU/SET] button
- 7 [DISPLAY] button
- 8 [Q.MENU]/Delete button
- 9 Playback button
- 10 Mode dial



- 11 Cursor buttons
 - (A): ▲/Exposure Compensation/Auto Bracket/White Balance fine adjustment
 - (B): ▼/Macro Mode/AF Tracking
 - (C): ◀/Self-timer button
 - (D): ▶/Flash setting button



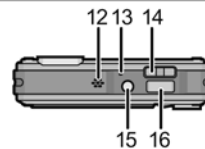
In these Operating Instructions, the cursor buttons are described as shown in the figure below or described with ▲/▼/◀/▶.
e.g.: When you press the ▼ (down) button



or

Press ▼

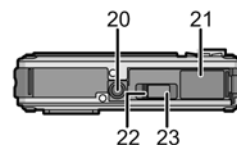
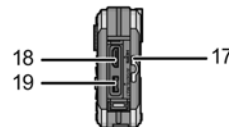
- 12 Speaker
- 13 Microphone
- 14 Zoom lever

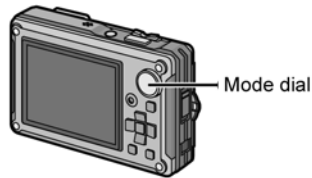


e.g.: To make subjects appear closer use (Tele)
Place your finger on the zoom lever, and press [T]



- 15 Camera [OFF/ON] button
- 16 Shutter button
- 17 Hand strap eyelet
 - Be sure to attach the hand strap when using the camera to ensure that you will not drop it.
- 18 [HDMI] socket
- 19 [AV/DIGITAL/MULTI] socket
 - When using an AC adaptor, ensure that the Panasonic multi conversion adaptor (DMW-MCA1; optional) and AC adaptor (DMW-AC5PP; optional) are used.
- 20 Tripod receptacle
 - When you use a tripod, make sure the tripod is stable when the camera is attached to it.
- 21 Card/Battery door
- 22 Release lever
- 23 [LOCK] switch





■ List of [REC] Modes

Intelligent Auto Mode

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

Normal Picture Mode

The subjects are recorded using your own settings.

Sports Mode

Use this mode to take pictures of sporting events, etc.

Snow Mode

This allows you to take pictures that show the snow as white as possible at a ski resort or a snow-covered mountain.

Beach & Surf Mode

This mode is optimal for taking pictures up to 3 m (10 feet) underwater and at the beach.

SCN Scene Mode

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

Clipboard Mode

Record as a memo.

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 dial other than "CLIPBOARD (memo)" mode (such as normal picture / iA / Sports / Snow / SCN) to display the error code.

• Step 1. The temporary cancellation of "INITIAL SETTINGS":

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

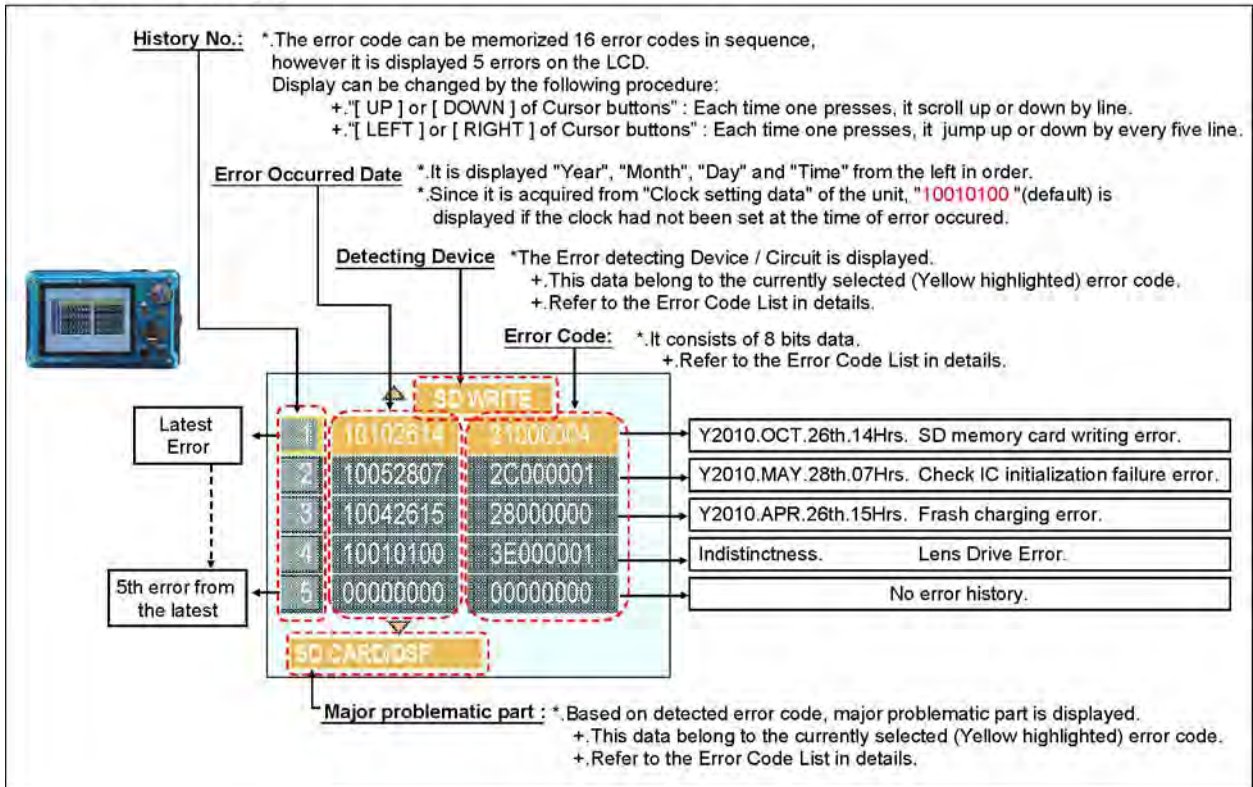
• Step 2. Execute the error code display mode:

Press the "LEFT of Cursor button", MENU/SET button and DISPLAY 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 Unit	OIS X	LENSu NG	
				2000	PSD (Y) error. Hall element (Y axis) position detect error in OIS unit. OIS Unit	OIS Y		
			3000	GYRO (X) error. Gyro (IC6301) detect error on Top P.C.B. IC6301 (Gyro element) or IC6001 (VENUS HD2)	GYRO X	GYRO NG		
				4000	GYRO (Y) error. Gyro (IC6302) detect error on Top P.C.B. IC6302 (Gyro element) or IC6001 (VENUS HD2)		GYRO Y	
			5000	MREF error (Reference voltage error). IC9101 (LENS DRIVE) or IC6001 (VENUS HD2)	OIS REF	LENSsd/DSP NG		
				6000	Drive voltage (X) error. LENS Unit, LENS flex breaks, IC6001(VENUS HD2) AD value error, etc.		OISX REF	LENSu/LENS FPC
			7000	Drive voltage (Y) error. LENS Unit, LENS flex breaks, IC6001(VENUS HD2) AD value error, etc.	OISY REF			
				Zoom	0?10	Collapsible barrel Low detect error (Collapsible barrel encoder always detects Low.) Mechanical lock, FP9002-(40) signal line or IC6001 (VENUS HD2)	ZOOM L	ZOOMm/ LENSu
			0?20			Collapsible barrel High detect error (Collapsible barrel encoder always detects High.) Mechanical lock, FP9002-(40) signal line or IC6001 (VENUS HD2)	ZOOM H	
			0?60		The zoom position jump is detected due to the impact (i.e. drop.) to the camera occurs. Lens unit	(No indication)	(No indication)	
			Focus	0?01	HP High detect error (Focus encoder always detects High, and not becomes Low) Mechanical lock, FP9002-(40) signal line or IC6001 (VENUS HD2)	FOCUS L	LENS FPC/ DSP	
					0?02	HP Low detect error (Focus encoder always detects Low, and not becomes High) Mechanical lock, FP9002-(40) signal line or IC6001 (VENUS HD2)		FOCUS H
			Lens	18*1	0000	Power ON time out error. Lens drive system	LENS DRV	LENSu
					18*2	0000		
		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 P.C.B./FPC	
					IC6001-(AC16) 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)			
					EEPROM write error			FROM WR
					IC6002 (FLASH ROM)			
					0005	Firmware version up error	(No indication)	(No indication)
					0008	Replace the firmware file in the SD memory card.		
	0009	SDRAM error						
	SYSTEM	RTC	2C*0	0001	SDRAM Mounting defective	SYS INIT	MAIN P.C.B.	
SYSTEM IC initialize failure error								
SOFT	CPU	Reset	30*0	0001 0007	Communication between IC6001 (VENUS HD2) and IC9101 (SYSTEM)	NMI RST	MAIN P.C.B.	
					Non Mask-able Interrupt (30000001-30000007 are caused by factors)			
	Card	Card	31*0	0001 0002 0004	Card logic error	SD CARD	SD CARD/DSP	
					SD memory card data line or IC6001 (VENUS HD2)			
					Card physical error			
					SD memory card data line or IC6001 (VENUS HD2)	SD WRITE		
					Write error			
	SD memory card data line or IC6001 (VENUS HD2)							
	39*0	0005	Format error	INMEMORY	FROM			
	CPU, ASIC hard	Stop	38*0	0001 0002 0100 0200 0300	Camera task finish process time out.	LENS COM	LENSu/DSP	
					Communication between Lens system and IC6001 (VENUS HD2)			
					Camera task invalid code error.	DSP	DSP	
					IC6001 (VENUS HD2)			
					File time out error in recording motion image			
					IC6001 (VENUS HD2)			
					File data cue send error in recording motion image			
	IC6001 (VENUS HD2)							
	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 connecting				
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 : Indication of additional Camera Settings 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 dial other than "CLIPBOARD (memo) "mode (such as normal picture / iA / Sports / Snow / SCN) to display the ICS data.

• Step 1. The temporary cancellation of "INITIAL SETTINGS":

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

• Step 2. Execute the ICS display mode:

Press the PLAYBACK button.

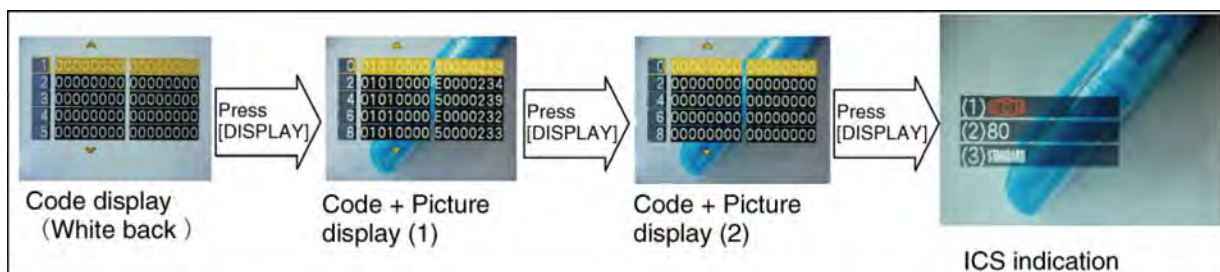
Select the concerned picture by pressing the "LEFT and RIGHT of Cursor button".

Press the "LEFT of Cursor button", MENU/SET button and DISPLAY button simultaneously.

Press the DISPLAY button, 3 times.

The display condition is changed as shown below when the DISPLAY 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.


(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?

(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.)

[ICS display (Sample)]



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

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.

[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

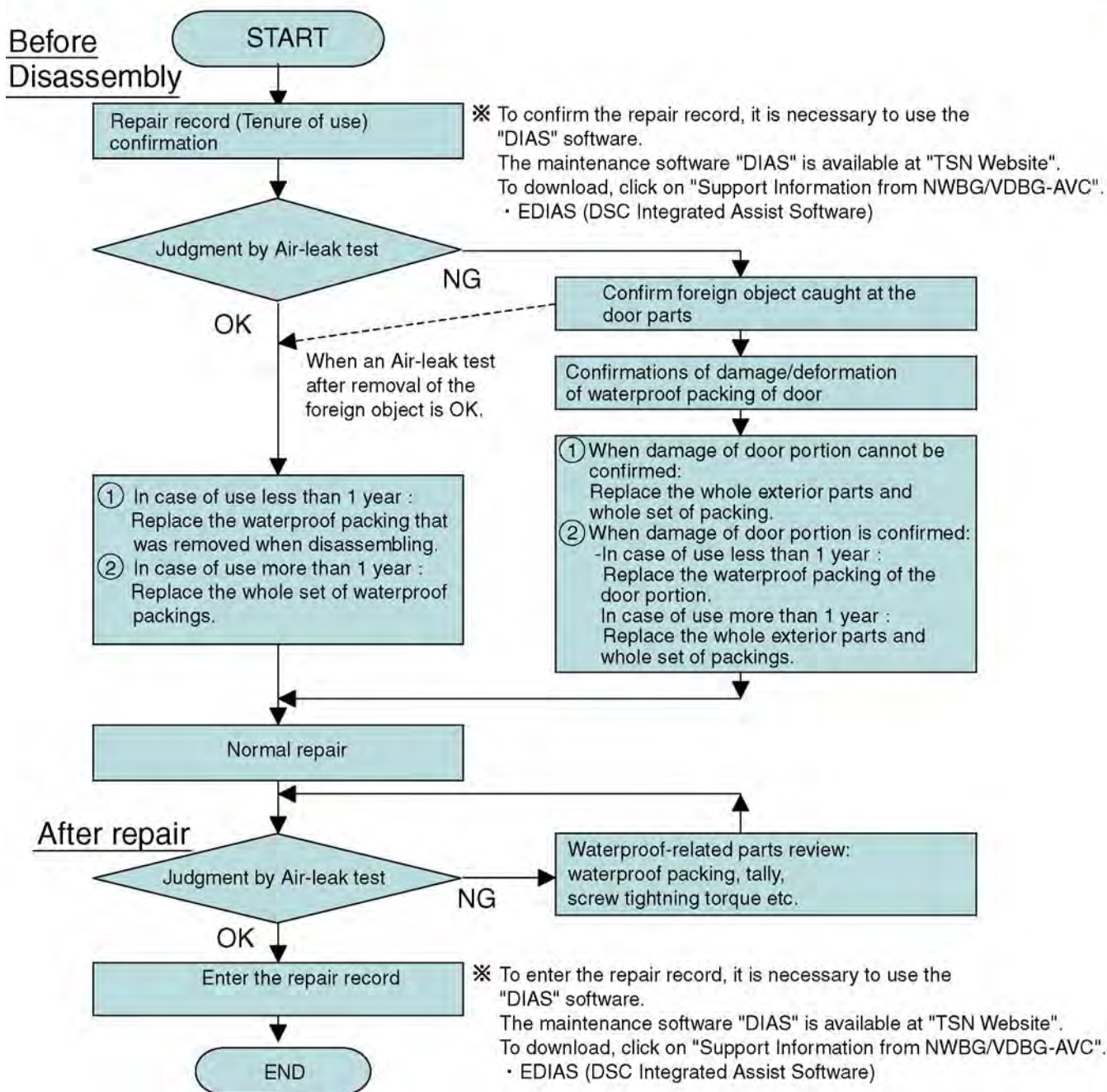
- The following is the servicing procedure including assembly/disassembly process.
- As for the air-leak test, refer to "7.2. Air-leak Test".

<Note>

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

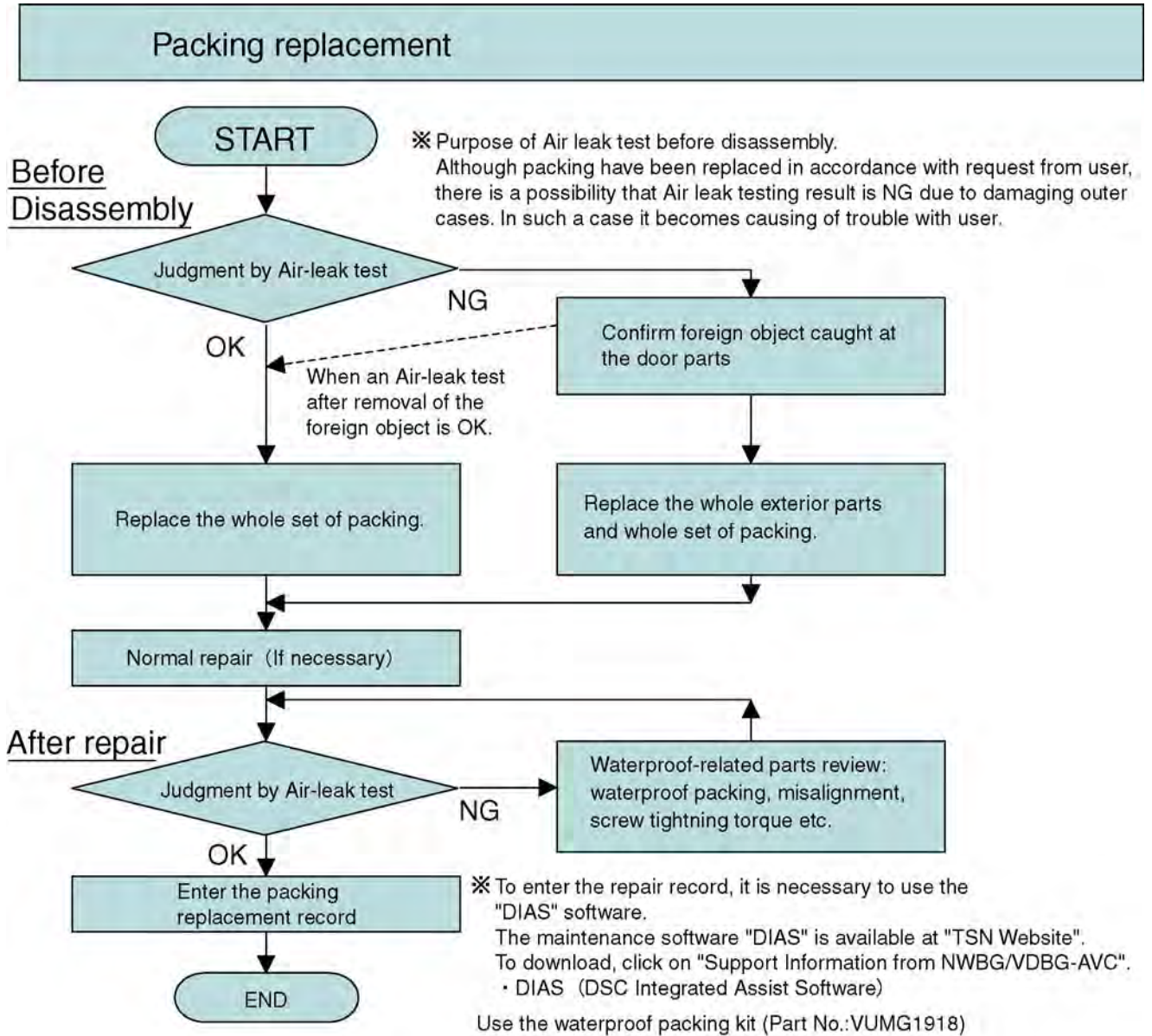
- When the first inspection, do not perform cleaning (removal of foreign objects caught etc.) of the waterproof packing parts (battery door and Jack door) from the viewpoint of the cause investigation at NG of test (inspection) result.
- When the test (inspection) result was NG, perform test again after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

1. Servicing flow



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.: VUMG1918). (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".



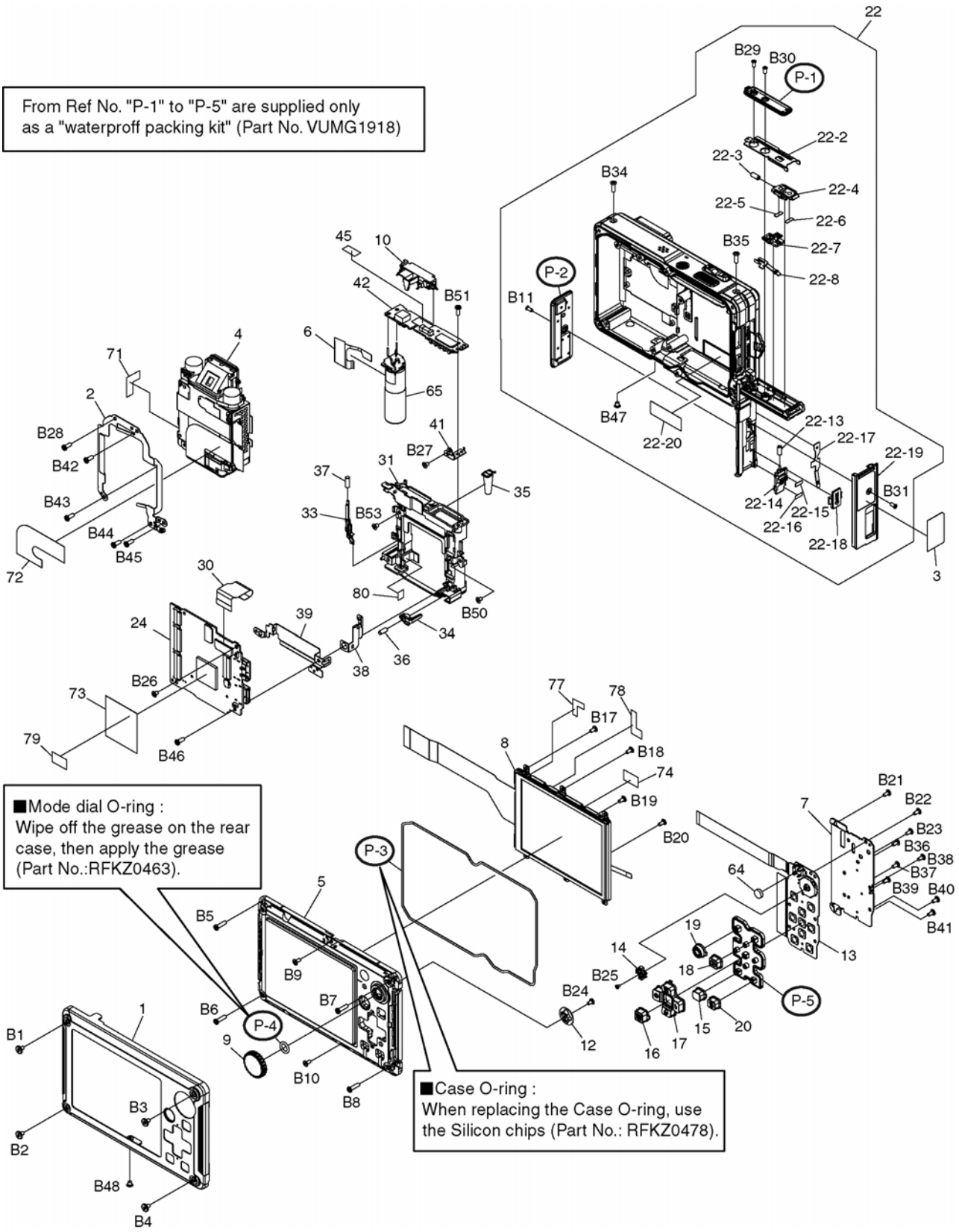
Replacing the waterproof packing

- 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.: VUMG1918).

<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.
- When replacing the mode dial O-ring, wipe the grease attached to the product first, then apply the grease (Part No.: RFKZ0463).

From Ref No. "P-1" to "P-5" are supplied only as a "waterproof packing kit" (Part No. VUMG1918)



■ Mode dial O-ring :
Wipe off the grease on the rear case, then apply the grease (Part No.:RFKZ0463).

■ Case O-ring :
When replacing the Case O-ring, use the Silicon chips (Part No.: RFKZ0478).

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).

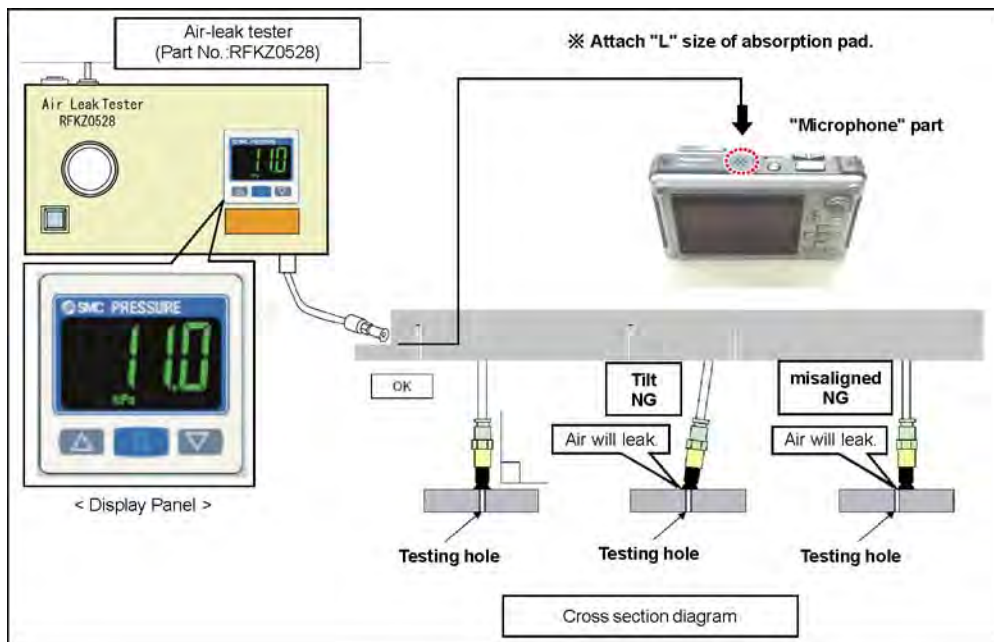
[Measurement pressure value] :- 33 kPa

*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-FT2, DMC-TS2)

Item	Specifications	Remarks
Setting pressure	- 33 kPa	
Setting stand value	- 30 kPa	
Exhausted 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	± 0.2 kPa	(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] : 3 0 seconds
[Testing Specification] :- 3 0 k P a ± 0 . 2 k P a

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".


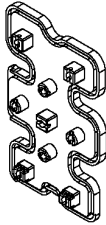
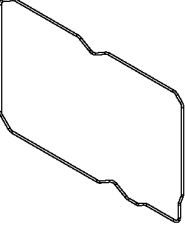

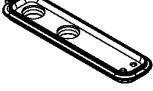
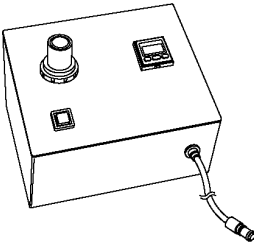
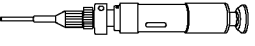
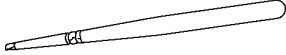

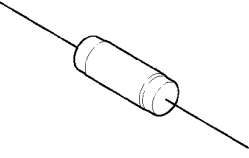
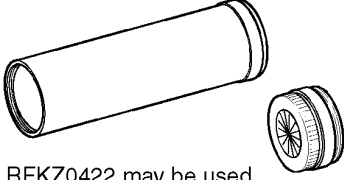
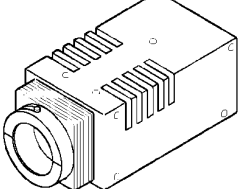
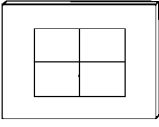

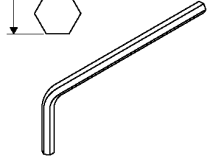
To download, click on "Support Information from NWBG/VDBG-AVC".

*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) VUMG1918			
Mode Dial O-ring 	Rear Button Packing 	Case O-ring 	Battery Door Packing 
		Jack Door Plate 	
Air-leak test jig (For Waterproof property test) RFKZ0528			
	Part No.	Usage	Spec.
	RFKZ0536	DC/banana conversion cable	For power supply
	RFKZ0533	Vacuum pad (2 included)	For power supply
	RFKZ0537	Air-leak test tube (without pad)	For air-leak test
Remarks			
		Optional goods (1 piece supplied with RFKZ0528)	
		Optional goods (1 piece supplied with RFKZ0528)	
		Optional goods (1 piece supplied with RFKZ0528)	
Torque driver RFKZ0542	Silicon chips RFKZ0478	Grease (FLOIL G-31SB) RFKZ0463	
 (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.	 (For replacing the packings/ For prevention sticking of dust when replacing the packings)	 (For the Mode dial O-ring)/Wipe the grease attached to the product and apply this grease.)	
Resistor for Discharging (1k Ω/5W) ERG5SJ102	Infinity Lens (Built-in Focus Chart) VFK1164TCM02	LIGHT BOX (with DC Cable) VFK1164TDVLB	
 An equivalent type of Resistor may be used.	 ※ RFKZ0422 may be used. ※ VFK1164TCM03 may be used.	 ※ RFKZ0523 may be used.	
TR Chart RFKZ0443	Lens Cleaning Kit VFK1900BK	Hex Wrench (Please purchase it, locally)	
		 1.5 mm	

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".

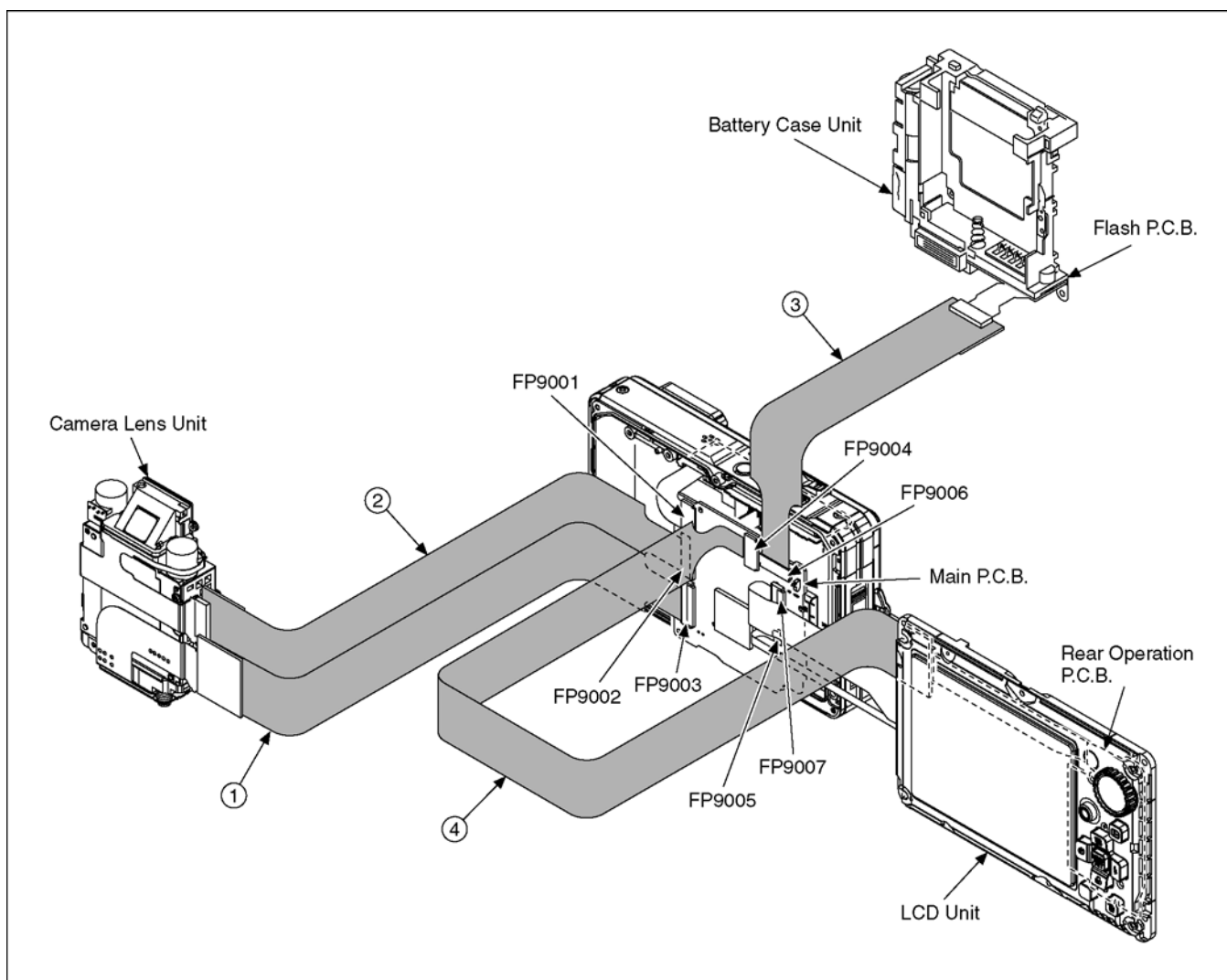
8.3. Service Position

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

Table S1 Extension Cable List

No.	Parts No.	Connection	Form
1	RFKZ0477	FP9003 (Main P.C.B.) - Lens with CCD unit (CCD section)	45PIN 0.3 FFC
2	RFKZ0416	FP9002 (Main P.C.B.) - Lens with CCD unit (Lens section)	41PIN 0.3 FFC
3	RFKZ0363	FP9006 (Main P.C.B.) - FP8001 (Flash P.C.B.)	19PIN 0.5 FFC
4	VFK1364	FP9004 (Main P.C.B.) - Rear Operation P.C.B.	14PIN 0.5 FFC

8.3.1. Extension Cable Connections

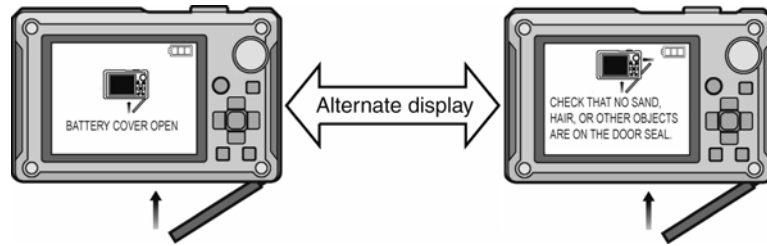


Note when repairing P.C.B.

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.

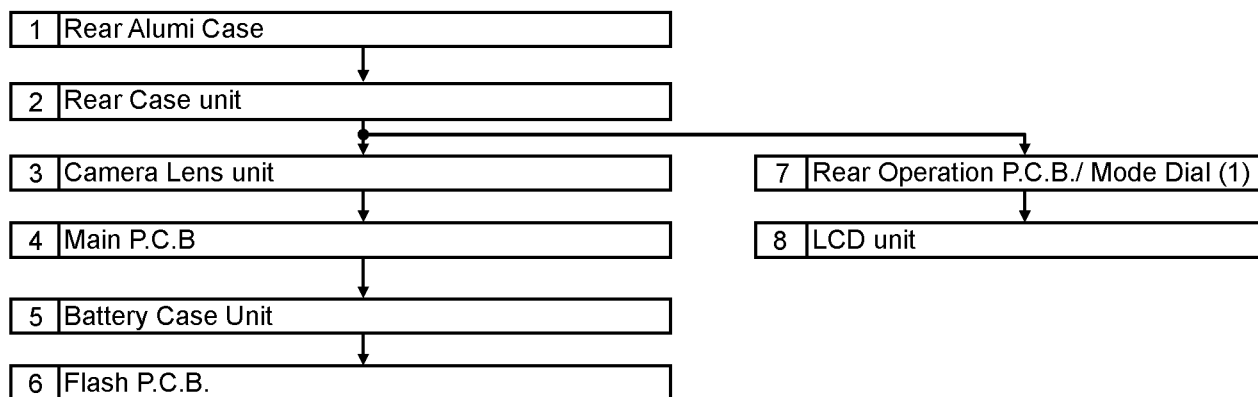
CAUTION-1. (When servicing FLASH P.C.B.)

1. Be sure to discharge the capacitor on FLASH P.C.B.
Refer to "HOW TO DISCHARGE THE CAPACITOR ON FLASH 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 P.C.B.
3. DO NOT allow other parts to touch the high voltage circuit on FLASH P.C.B.

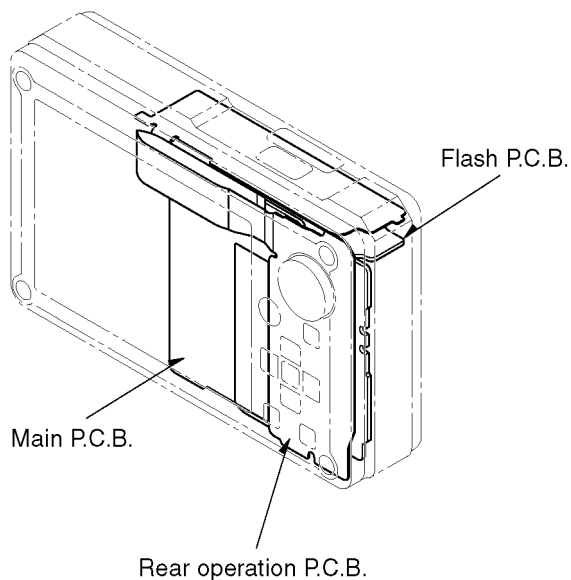
9 Disassembly and Assembly Instructions

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 replacing Mode dial O-ring, wipe the grease applied to the product first, then apply grease (RFKZ0463).
- 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	Fig. D1	Card
			Battery
			4 Hex Screws (A)
			1 Screw (B)
2	Rear Case Unit	Fig. D2	4 Screws (C) (Tightening torque is regretted)
			2 Screws (D) (Tightening torque is regretted)
			FP9004 (Flex)
			FP9005 (Flex)
		Fig. D3	FP9007 (Flex)
			Rear Case Unit
			Note when attaching Rear Case Unit
3	Camera Lens Unit	Fig. D4	Peel off Sheet
			4 Screws (E)
			1 Screw (F)
			FP9002 (Flex)
			FP9003 (Flex)
			Lens Plate
			Camera Lens Unit
4	Main P.C.B.	Fig. D5	Note before removal of Main P.C.B.
		Fig. D6	1 Screw (G)
			1 Screw (H)
			FP9001 (Flex) FP9006 (Flex) Main P.C.B.
5	Battery Case Unit	Fig. D7	2 Screws (I)
			1 Screw (J)
			Battery Case Unit
6	Flash P.C.B.	Fig. D8	1 Screw (K)
			Flash P.C.B.
7	Rear Operation P.C.B., Mode Dial (1)	Fig. D9	9 Screws (L)
			Rear FPC Plate
		Fig. D10	Rear Operation P.C.B.
			Fig. D11
	Mode Dial Piece		
	Mode Dial O-ring		
	Mode Dial (1)		
8	LCD Unit	Fig. D12	4 Screws (N)
			LCD Unit

9.3.1. Removal of Rear Alumi Case

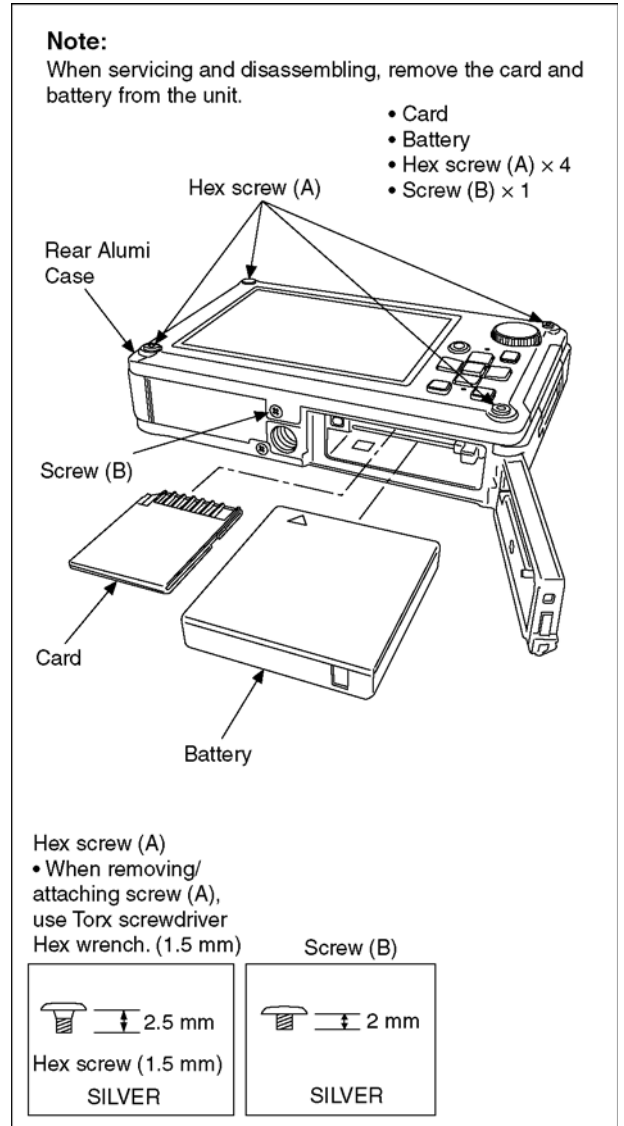


Fig. D1

9.3.2. Removal of Rear Case Unit

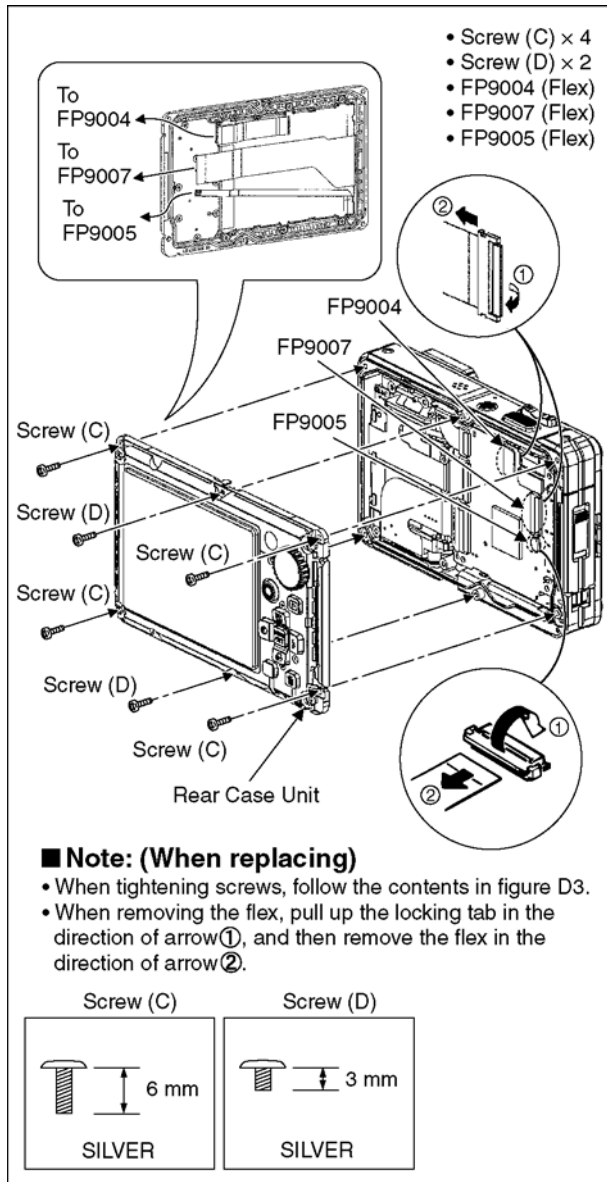
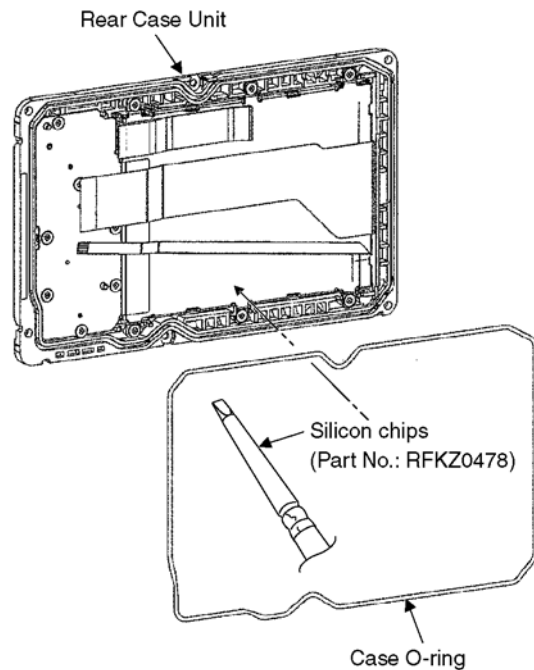


Fig. D2

SCREW TIGHTENING 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

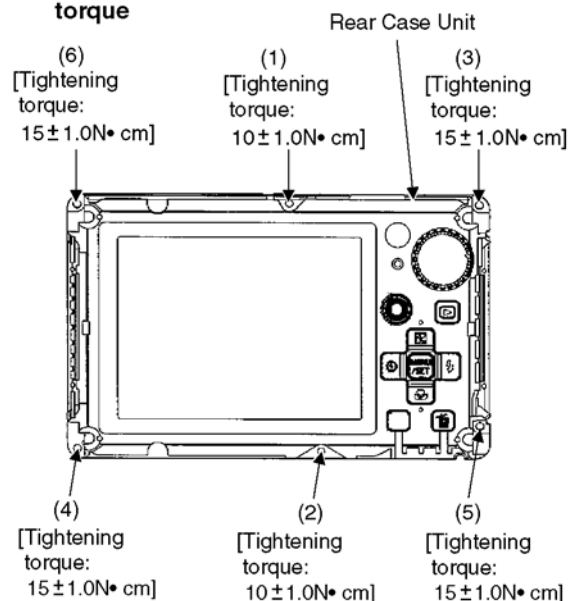


Fig. D3

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.

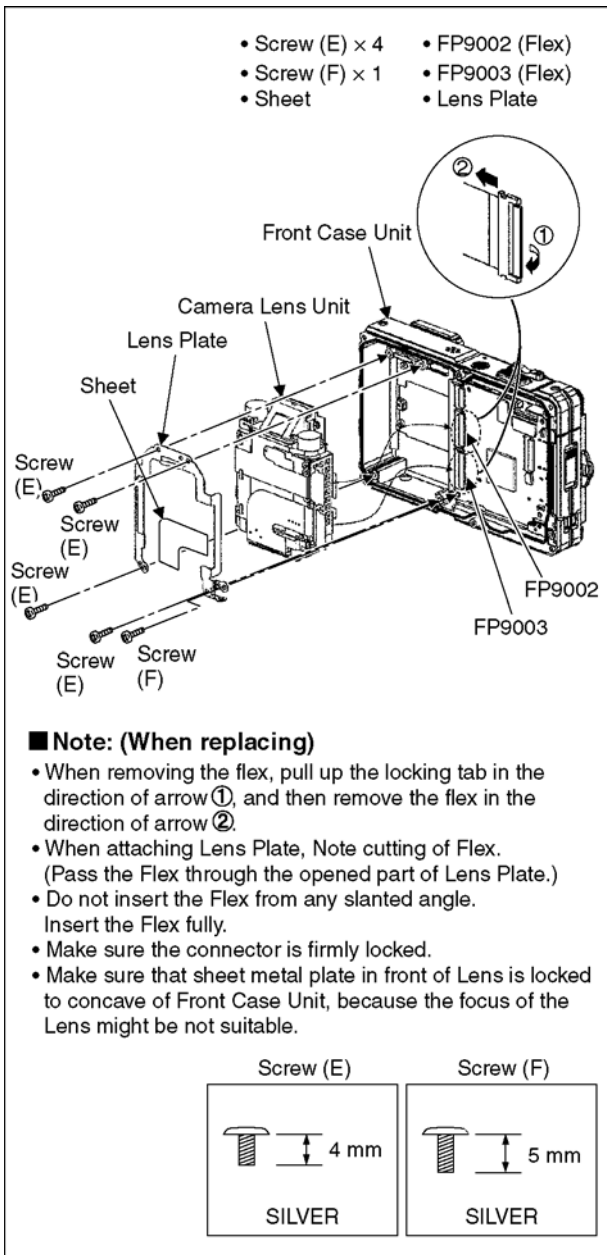


Fig. D4

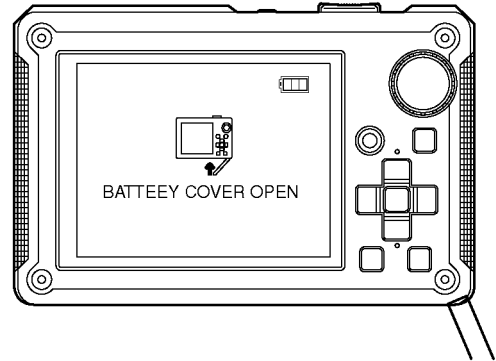
9.3.4. Removal of Main P.C.B.

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 "3.8.2. INITIAL SETTINGS").

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



<LCD display when battery door is opened>

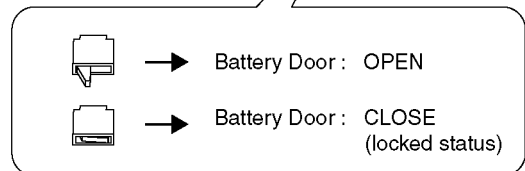
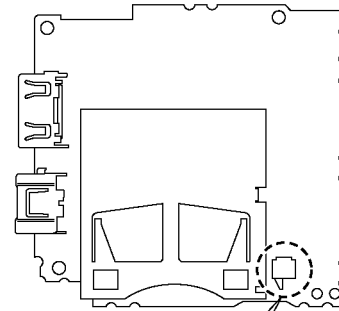


Fig. D5

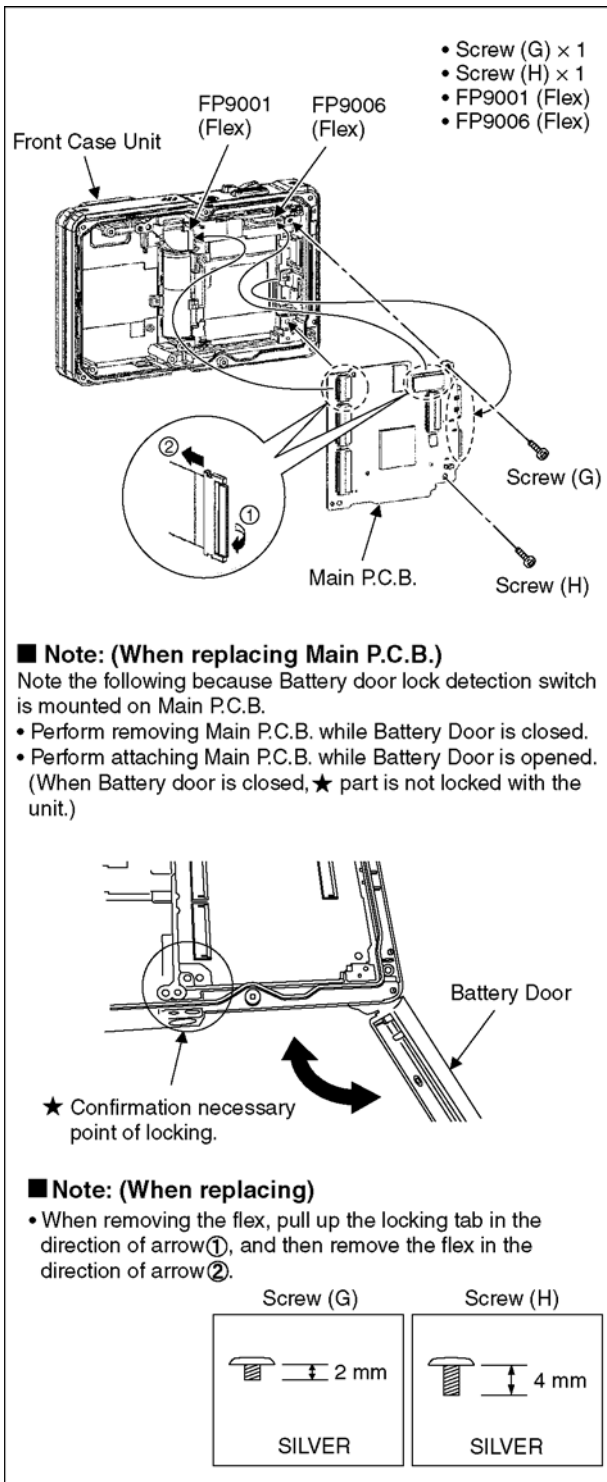


Fig. D6

9.3.5. Removal of Battery Case Unit

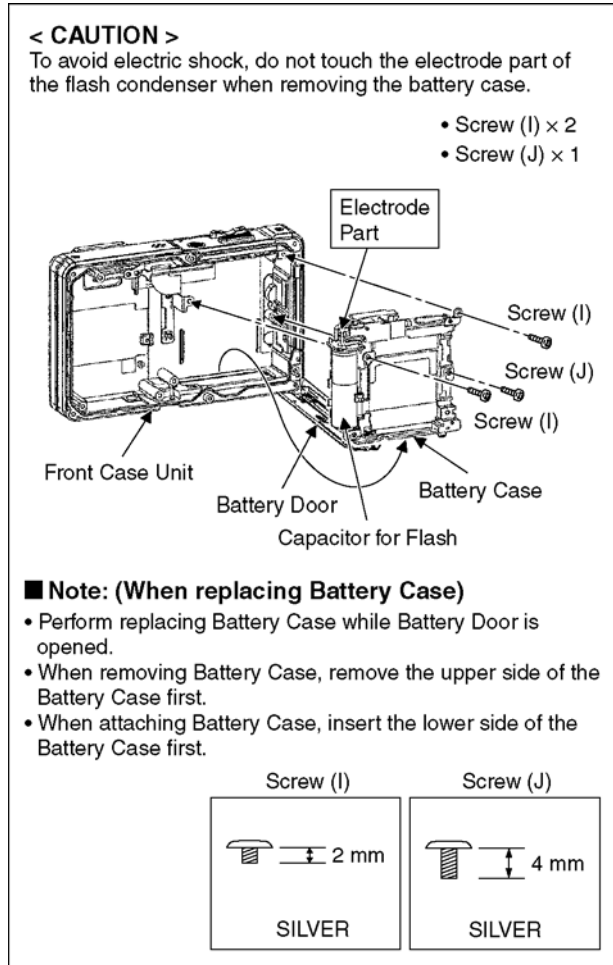


Fig. D7

9.3.6. Removal of Flash P.C.B.

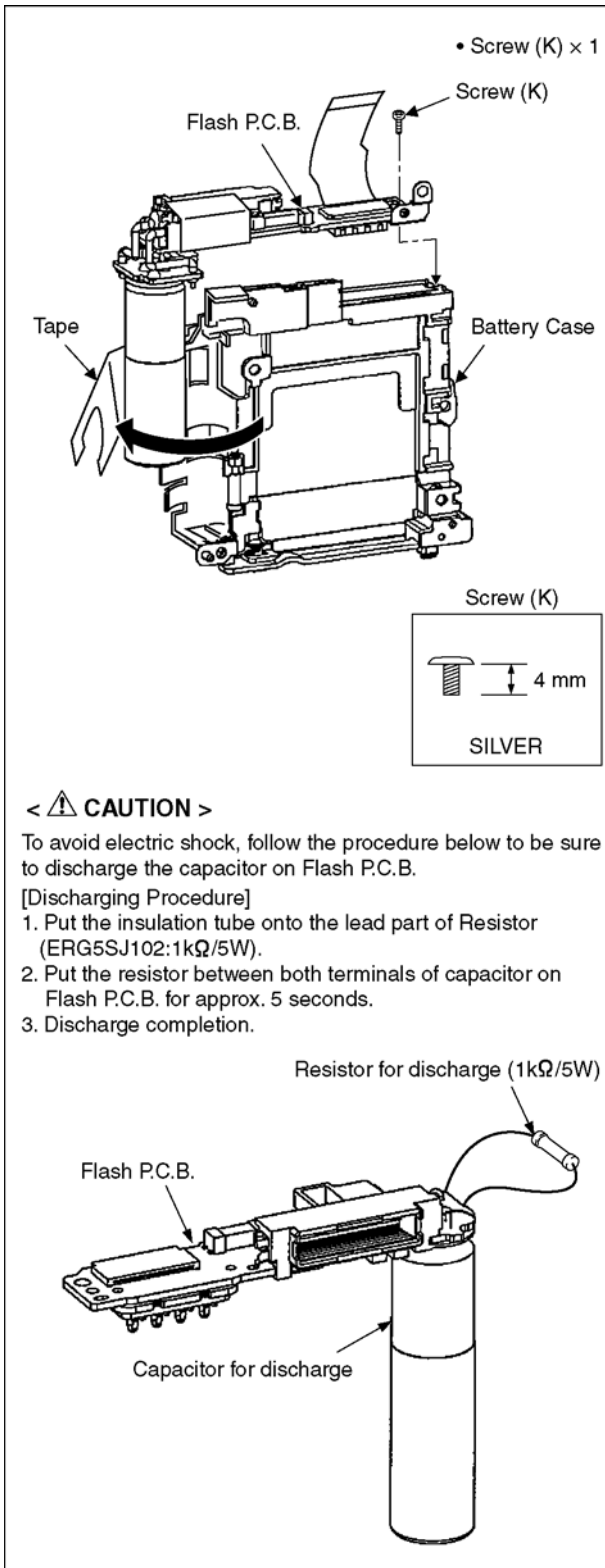


Fig. D8

9.3.7. Removal of Rear Operation P.C.B., Mode Dial (1)

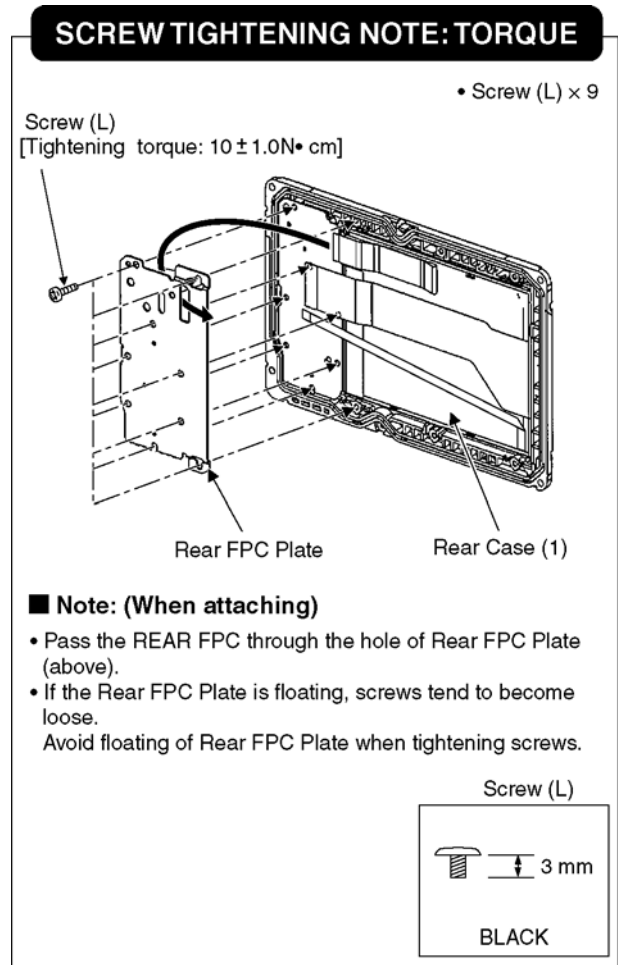


Fig. D9

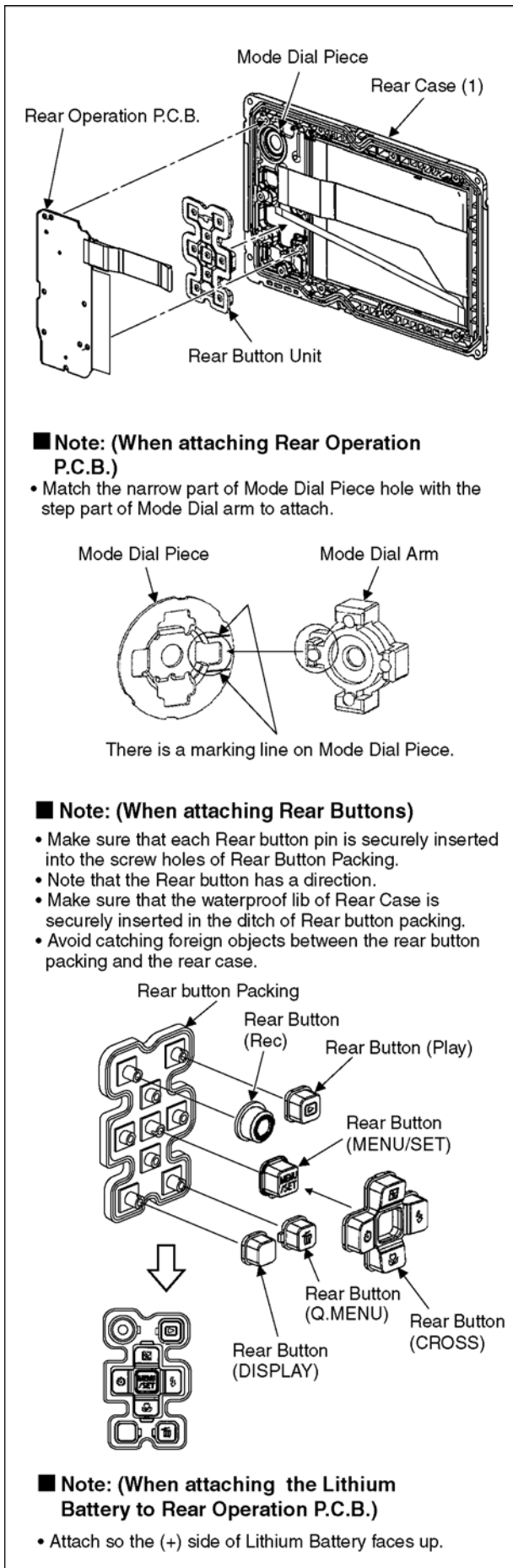


Fig. D10

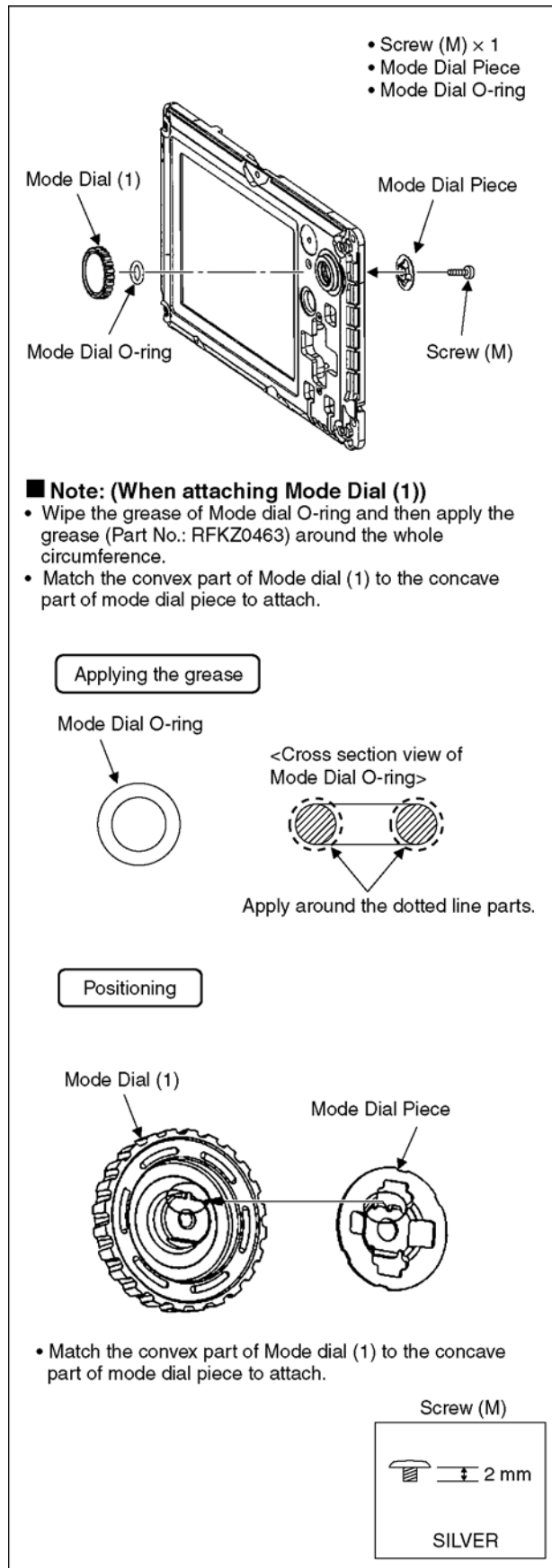


Fig. D11

9.3.8. Removal of LCD Unit

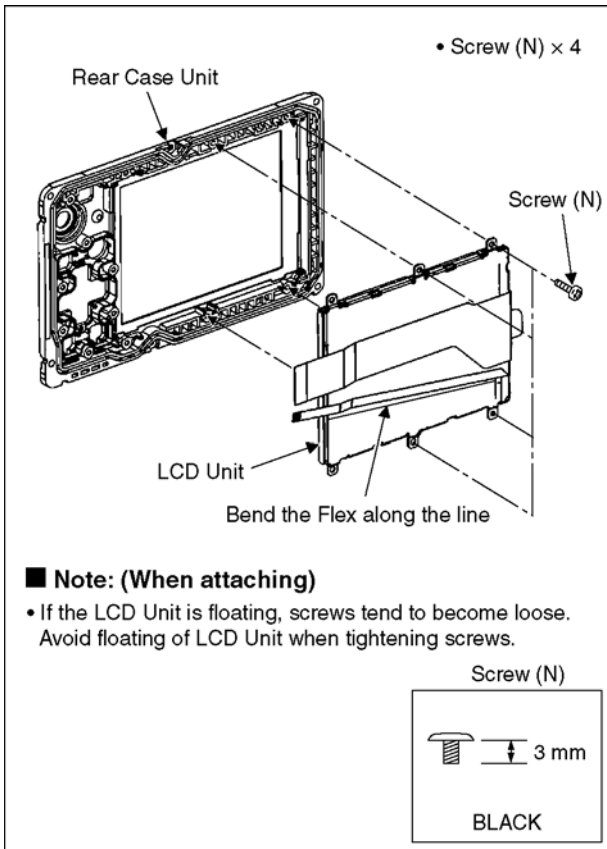


Fig. D12

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 "3.8.2. 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 DISPLAY 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 DISPLAY button simultaneously. (The camera will beep after this.)

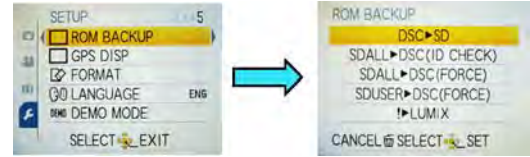
Turn the Power off. (The warning symbol " ! " is displayed on the LCD monitor.)

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.

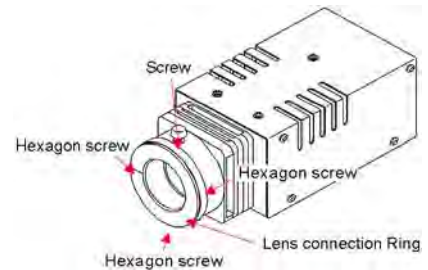
Item	Function	Details
DSC → SD	Save all the DSC's Flash-rom data to SD-CARD	<ul style="list-style-type: none"> • DSC's Flash-rom data is saved to the SD-CARD as a data file by the same format as the TATSUJIN software for the previous models. (DATA BACKUP) -File location: ROOT DIRECTORY in SD-CARD. -File Name: <ol style="list-style-type: none"> 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	<ul style="list-style-type: none"> • 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.
SDALL → DSC (FORCE)	Write the all data to DSC's Flash-rom from SD-CARD	<ul style="list-style-type: none"> • FORCE: Even if the model ID is different, data is transferred. * If the main PCB is replaced, select "SDALL → DSC(FORCE)".
SDUSER → DSC (FORCE)	Only "User setup information" is written from the saved file in the SD-CARD to DSC's Flash-rom.	<ul style="list-style-type: none"> • Only the user's "setup" setting condition is transferred to DSC unit. • FORCE: Even if the model ID is different, the data is transferred.
I → LUMIX	Shipping set without initializing "User setup information"	<ul style="list-style-type: none"> • 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 loosening 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)

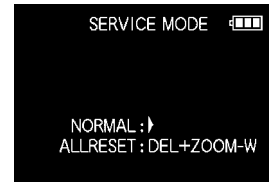


Fig. 3-1

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.

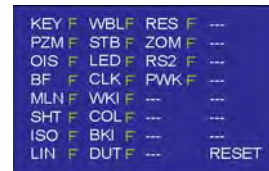


Fig. 3-2



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.

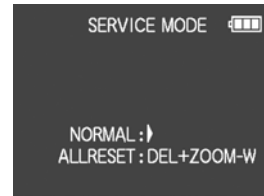


Fig. 3-6

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.

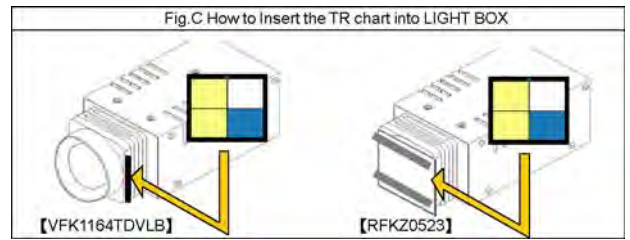
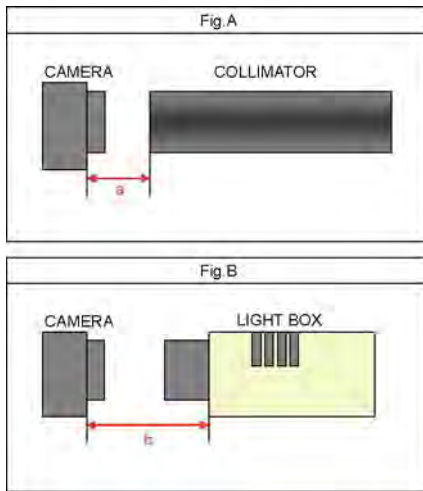
When a part is replaced, make sure to perform the necessary adjustment(s) in the order indicated.

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 (VFK1164TCMD2 or VFK1164TCM03 or RFK20422)	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 RFK20523)	1) Set the camera in front of LIGHT BOX so that the distance from collimator to camera becomes about 10 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 RFK20523) *TR CHART (RFK20443)	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 10 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 out 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 RFK20523)	1) Set the camera in front of LIGHT BOX so that the distance from collimator to camera becomes about 10 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.



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 "3.8.2. 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.

Service Manual

Diagrams and Replacement Parts List

Digital Camera

Model No.

DMC-FT2EB	DMC-TS2P
DMC-FT2EE	DMC-TS2PC
DMC-FT2EF	DMC-TS2PU
DMC-FT2EG	DMC-TS2GH
DMC-FT2EP	DMC-TS2GD
DMC-FT2GC	DMC-TS2GT
DMC-FT2GN	
DMC-FT2SG	

Vol. 1

Colour

- (A).....Blue Type (except DMC-FT2EE/EF, TS2GT/GD)
- (D).....Orange Type (except DMC-TS2GT)
- (S).....Silver Type (except DMC-FT2EF, TS2GT)
- (Y).....Yellow Type (except DMC-FT2EE/GC/SG, TS2GH/GD)

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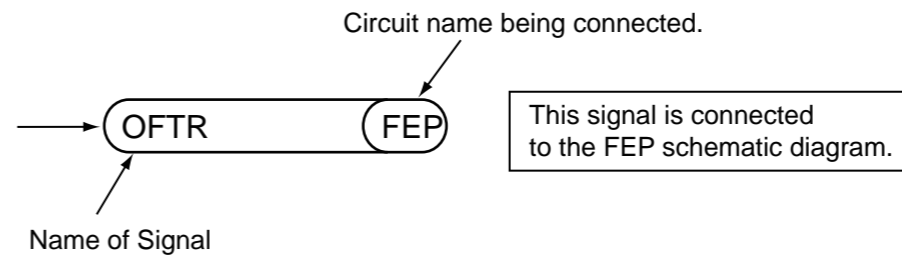
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S1. About Indication of The Schematic Diagram

S1.1. Important Safety Notice

COMPONENTS IDENTIFIED WITH THE MARK \triangle 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

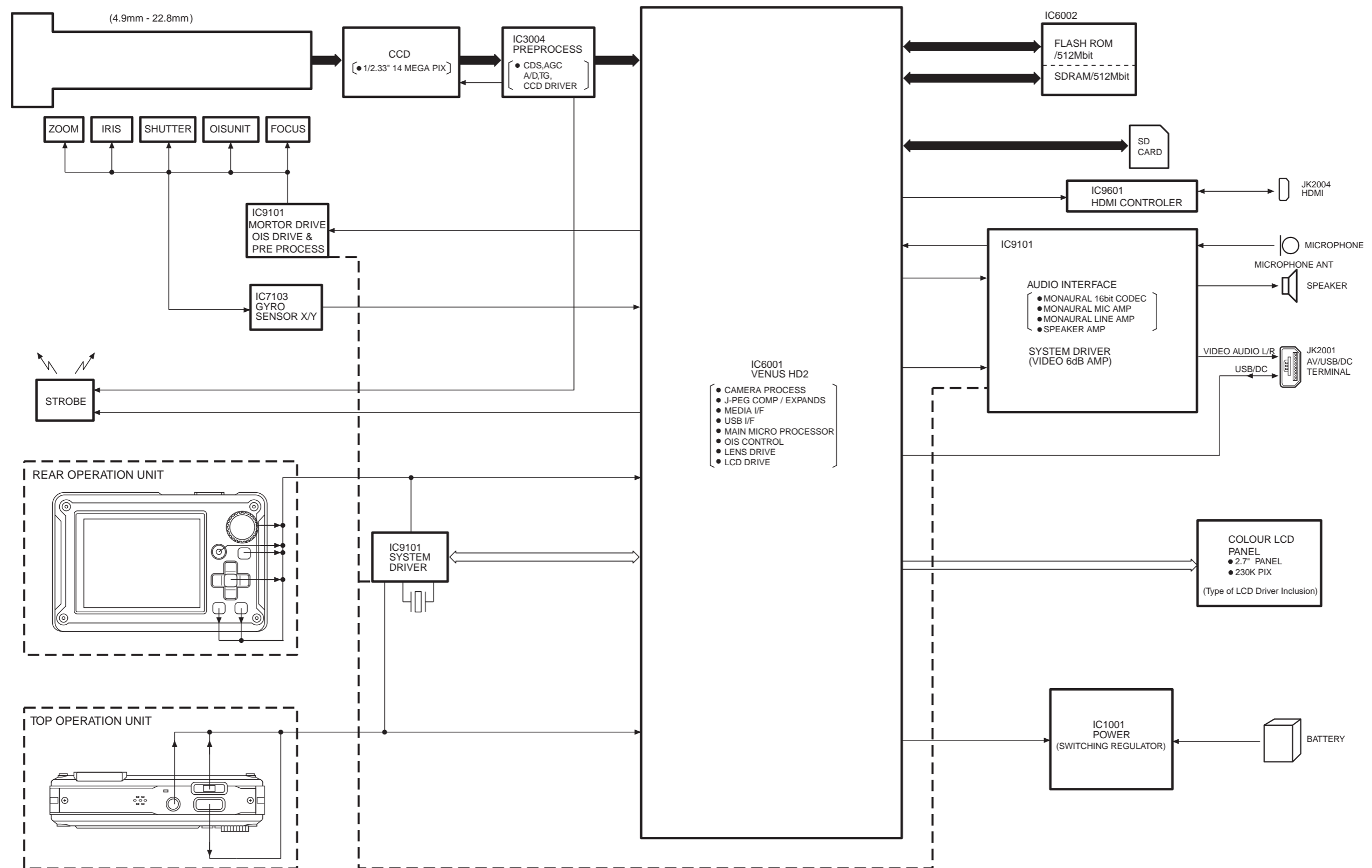
Note) Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.
Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

S2.1. Flash P.C.B.

REF No.	PIN No.	POWER ON
IC8001	1	0
IC8001	2	0
IC8001	3	0
IC8001	4	0
IC8001	5	3.4
IC8001	6	0
IC8001	7	0
IC8001	8	0
IC8001	9	3.1
IC8001	10	3.8

S3. Block Diagram

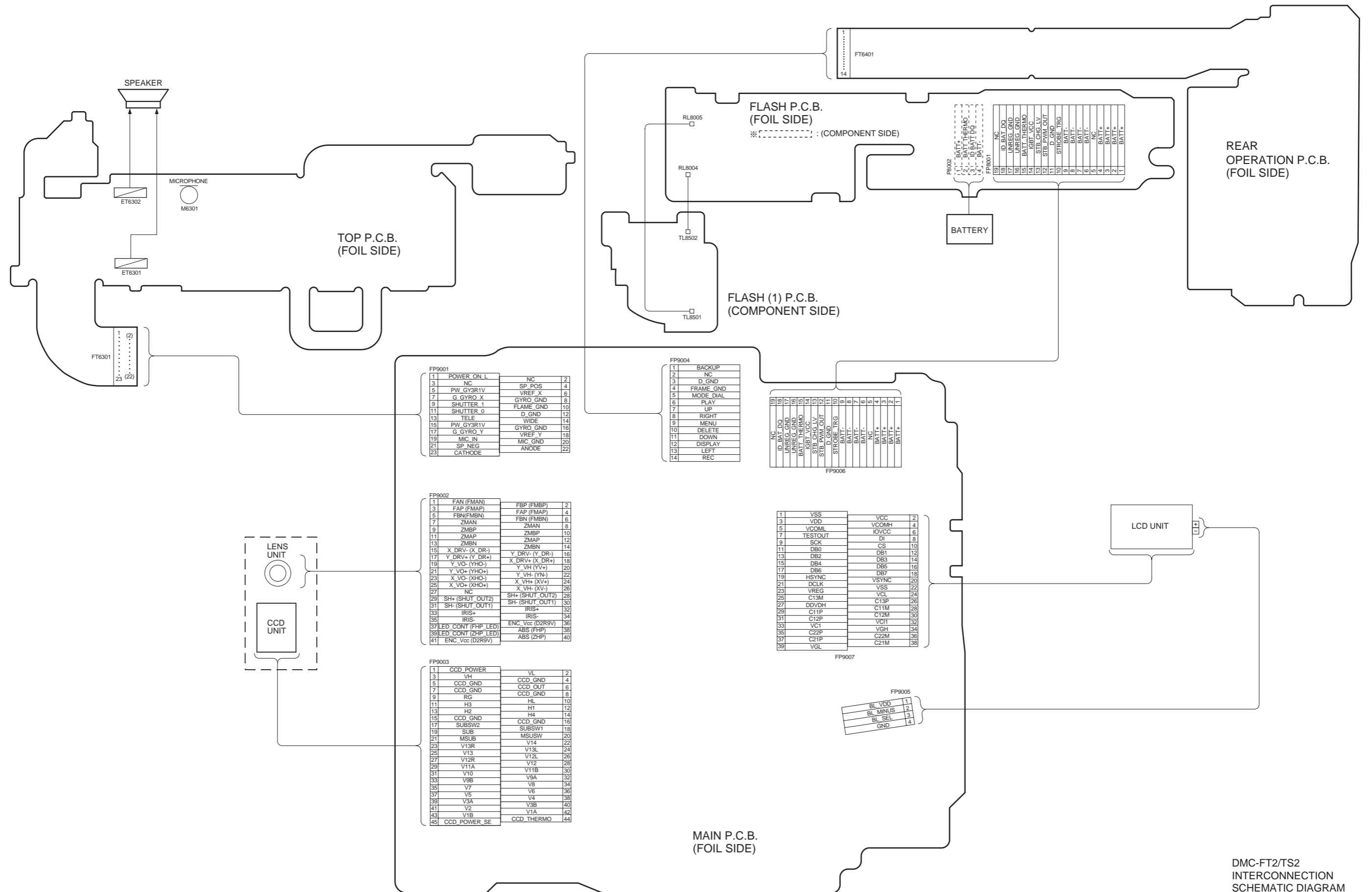
S3.1. Overall Block Diagram



DMC-FT2/TS2 OVERALL BLOCK DIAGRAM

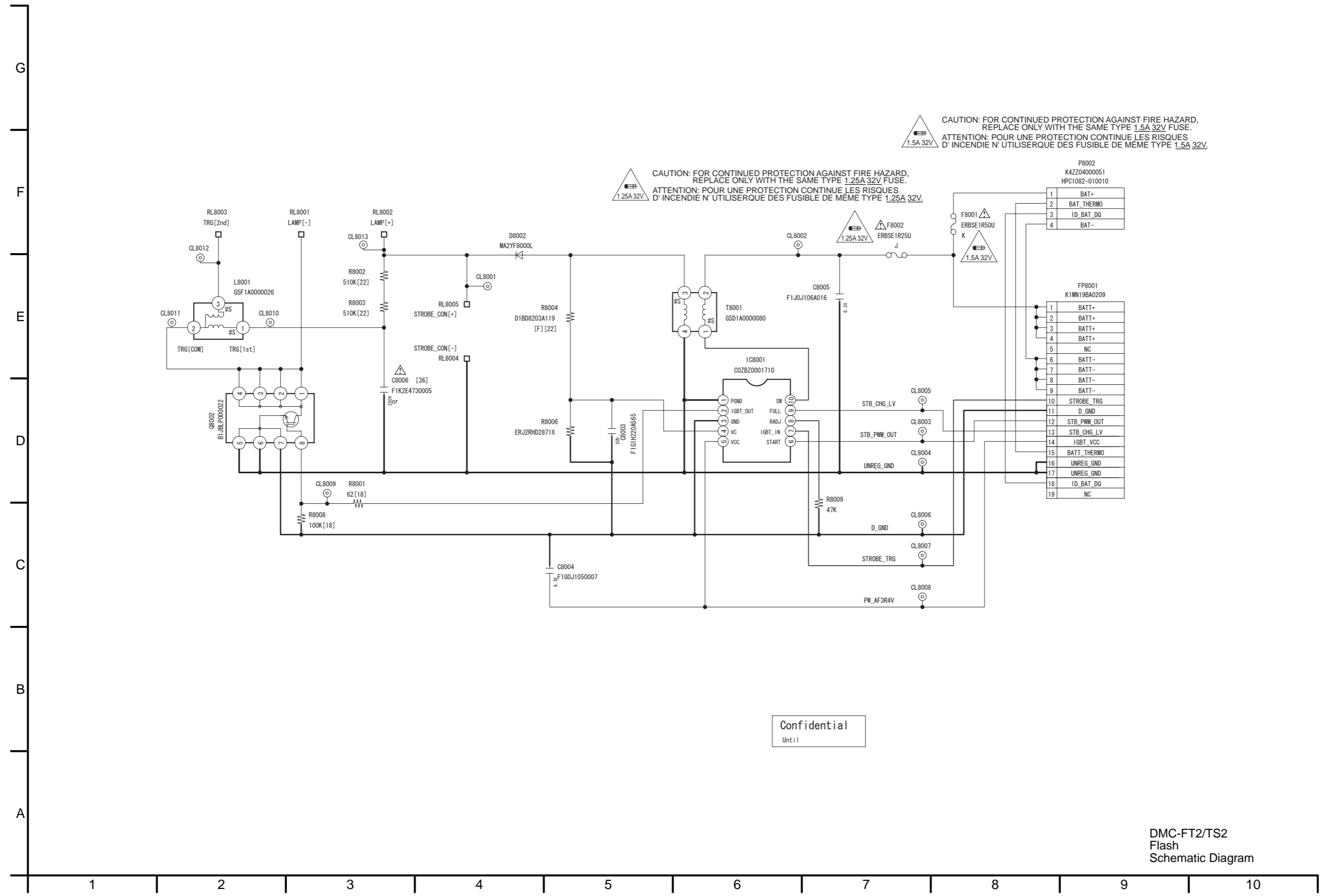
S4. Schematic Diagram

S4.1. Interconnection Diagram



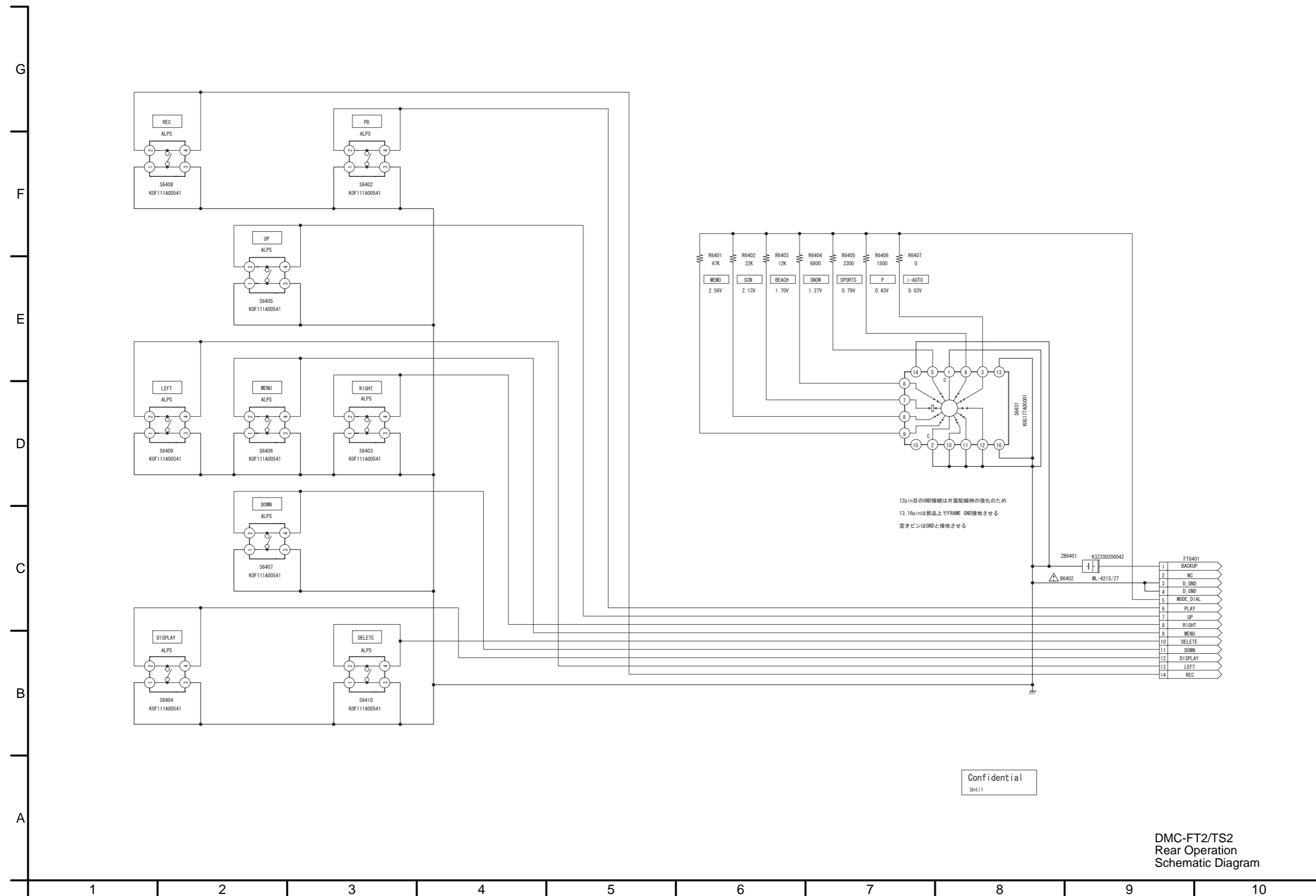
DMC-FT2/TS2
INTERCONNECTION
SCHEMATIC DIAGRAM

S4.2. Flash Schematic Diagram



Confidential
Until

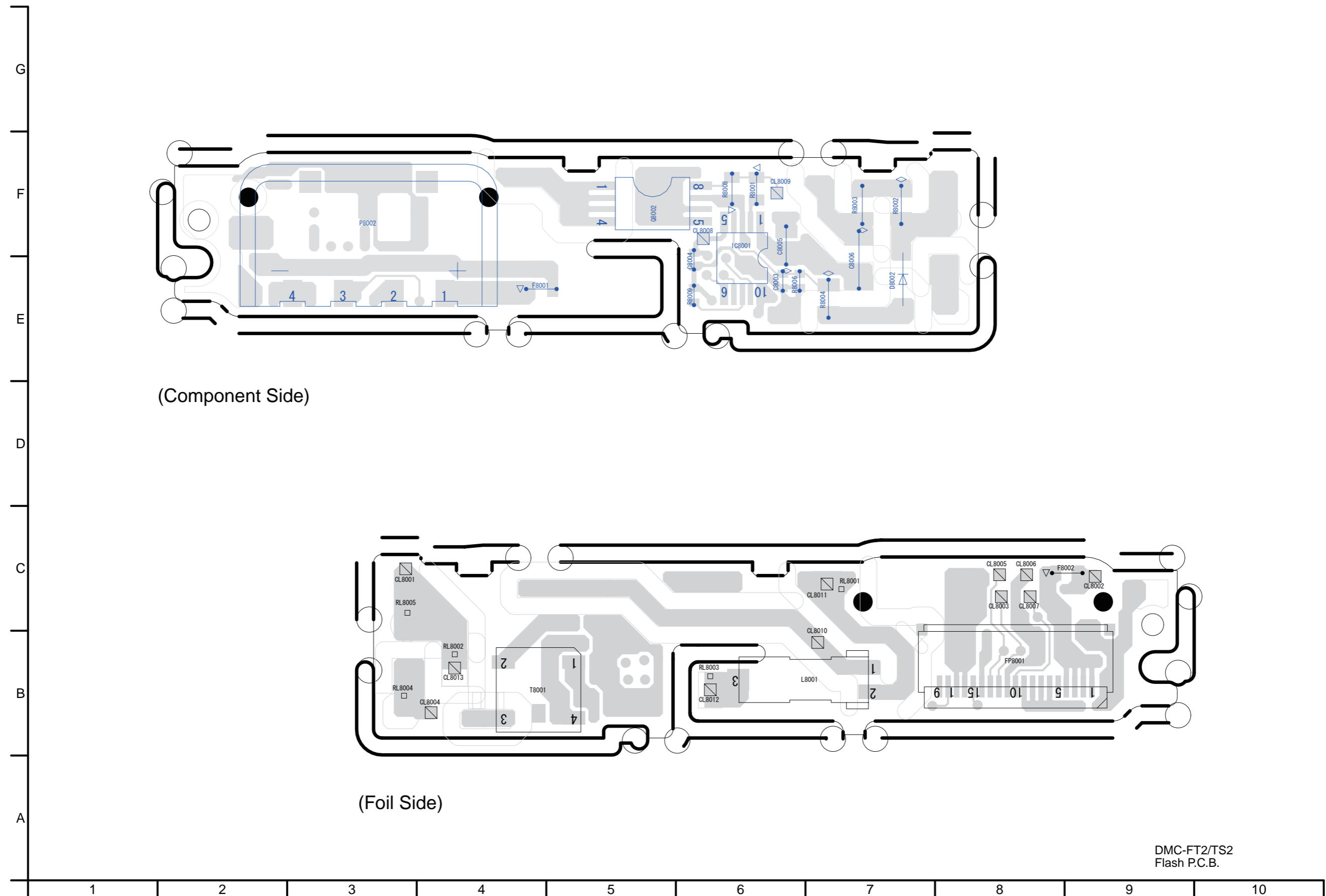
S4.3. Rear Operation Schematic Diagram



DMC-FT2/TS2
Rear Operation
Schematic Diagram

S5. Print Circuit Board

S5.1. Flash P.C.B.

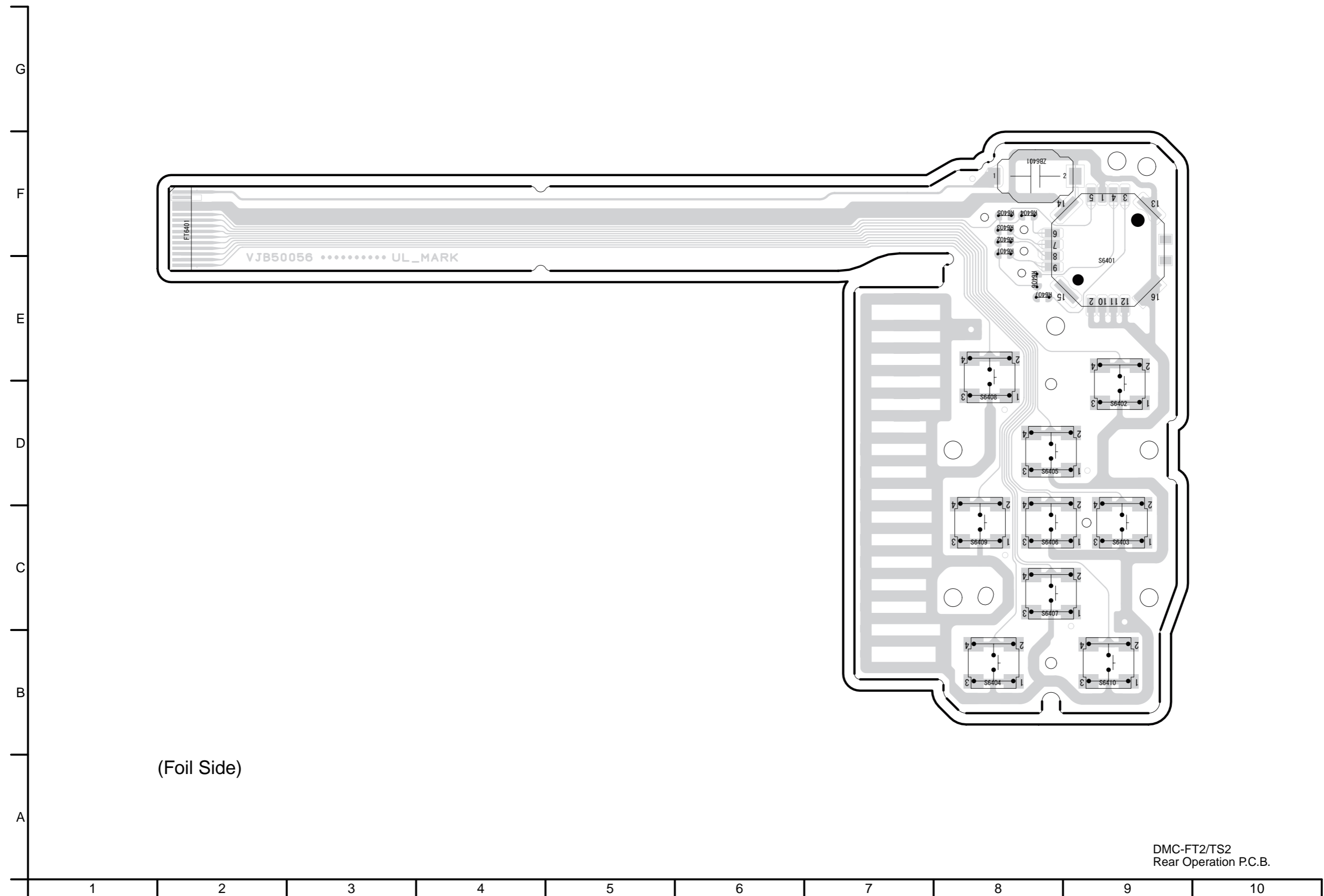


(Component Side)

(Foil Side)

DMC-FT2/TS2
Flash P.C.B.

S5.2. Rear Operation 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 \triangle 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 [PAVCSG] in the remarks column are supplied from PAVCSG. Others are supplied from AVC-CSC-SPC.**

DMC-FT2 / TS2 Series

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	##	VEP56096A	MAIN P.C.B.	1	EE,GC,GN,SG,P,PC,PU,GH,GT,GD (RTL) E.S.D.				
	##	VEP56096B	MAIN P.C.B.	1	EG,EB,EF,EP (RTL) E.S.D.				
	##	VEP58105A	FLASH P.C.B.	1	(RTL) E.S.D.[PAVCSG]				
	##	VEP50056A	REAR OERATION P.C.B.	1	(RTL) E.S.D.				
	##	VEP58105A	FLASH P.C.B.	1	(RTL) E.S.D.[PAVCSG]				
	C8003	F1G1H220A565	C.CAPACITOR CH 50V 22P	1	[PAVCSG]				
	C8004	F1G0J1050007	C.CAPACITOR CH 6.3V 1U	1	[PAVCSG]				
	C8005	F1J0J106A016	C.CAPACITOR CH 6.3V 10U	1	[PAVCSG]				
	A C8006	F1K2E4730005	C.CAPACITOR 250V 0.047 U	1	[PAVCSG]				
	D8002	MA2YF8000L	DIODE	1	E.S.D.[PAVCSG]				
	A F8001	ERBSE1R50U	FUSE 32V 1.5A	1	[PAVCSG]				
	A F8002	ERBSE1R25U	FUSE 32V 1.25A	1	[PAVCSG]				
	FP8001	K1MN19BA0209	CONNECTOR 19P	1	[PAVCSG]				
	IC8001	C0ZBZ0001710	IC	1	[PAVCSG]				
	L8001	G5F1A0000026	INDUCTOR	1	[PAVCSG]				
	P8002	K4ZZ04000051	CONNECTOR 4P	1	[PAVCSG]				
	Q8002	B1JBLP000022	TRANSISTOR	1	[PAVCSG]				
	R8001	ERJ3GEYJ620V	M.RESISTOR CH 1/10W 62	1	[PAVCSG]				
	R8002	ERJ6GEYJ514V	M.RESISTOR CH 1/10W 514K	1	[PAVCSG]				
	R8003	ERJ6GEYJ514V	M.RESISTOR CH 1/10W 514K	1	[PAVCSG]				
	R8004	D1BD8203A119	SURFACE MOUNTING PRECISIO	1	[PAVCSG]				
	R8006	ERJ2RHD2871X	M.RESISTOR CH 1/16W 2870	1	[PAVCSG]				
	R8008	ERJ3GEYJ104V	M.RESISTOR CH 1/10W 100K	1	[PAVCSG]				
	R8009	ERJ2GEJ473X	M.RESISTOR CH 1/16W 47K	1	[PAVCSG]				
	T8001	G5D1A0000080	TRANSFORMER	1	[PAVCSG]				
	##	VEP50056A	REAR OERATION P.C.B.	1	(RTL) E.S.D.				
	R6401	ERJ2GEJ473	M.RESISTOR CH 1/16W 47K	1					
	R6402	ERJ2GEJ223	M.RESISTOR CH 1/16W 22K	1					
	R6403	ERJ2GEJ123	M.RESISTOR CH 1/16W 12K	1					
	R6404	ERJ2RHD682X	M.RESISTOR CH 1/10W 6.8K	1					
	R6405	ERJ2GEJ332	M.RESISTOR CH 1/16W 3.3K	1					
	R6406	ERJ2GEJ152	M.RESISTOR CH 1/16W 1.5K	1					
	R6407	D0YAR0000007	M.RESISTOR CH 1/10W 0	1					
	S6401	K0G177A00001	SWITCH	1					
	S6402	K0F111A00541	SWITCH	1					
	S6403	K0F111A00541	SWITCH	1					
	S6404	K0F111A00541	SWITCH	1					
	S6405	K0F111A00541	SWITCH	1					
	S6406	K0F111A00541	SWITCH	1					
	S6407	K0F111A00541	SWITCH	1					
	S6408	K0F111A00541	SWITCH	1					
	S6409	K0F111A00541	SWITCH	1					
	S6410	K0F111A00541	SWITCH	1					
	ZB6401	K3ZZ00200042	BATTERY HOLDER	1					
---OTHER ELECTRICAL PARTS ---									
	A B6402	ML-421S/ZTK	BUTTON BATTERY	1	[ENERGY]				

DMC-FT2 / TS2 Series

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	VYK3Q30	REAR ALMI CASE U	1	(-S) [PAVCSG]	74	VGQ0N02	REAR BARRIER SHEET	1	
1	VYK3U37	REAR ALMI CASE U	1	(-A) [PAVCSG]	77	VGQ0N11	REAR LENS CUSHION B	1	
1	VYK3U38	REAR ALMI CASE U	1	(-D) [PAVCSG]	78	VGQ0N10	REAR LENS CUSHION A	1	
1	VYK3U39	REAR ALMI CASE U	1	(-Y) [PAVCSG]	79	VGQ0N03	PCB SPACER	1	
2	VMP9662	LENS PLATE	1		80	VGQ9405	WATER LABEL	1	[PAVCSG]
△ 3	VQL2D05	BATTERY DOOR CAUTION LABEL	1	EG,EB,EE,EF,EP,GC,GN,SG, P,PU,GH	B1	VHD2067	SCREW	1	
△ 3	VQL2D06	BATTERY DOOR CAUTION LABEL	1	PC	B2	VHD2067	SCREW	1	
3	VQL2D54	BATTERY DOOR CAUTION LABEL	1	GT	B3	VHD2067	SCREW	1	
3	VQL2D55	BATTERY DOOR CAUTION LABEL	1	GD	B4	VHD2067	SCREW	1	
4	VXW1116	LENS UNIT (WCCD)	1		B5	VHD2222	SCREW	1	
5	VYK4D91	REAR CASE U	1		B6	VHD2222	SCREW	1	
6	VGQ0M09	CONDENSER BARRIER TAPE B	1	[PAVCSG]	B7	VHD2222	SCREW	1	
7	VMP9567	REAR FPC PLATE	1		B8	VHD2222	SCREW	1	
8	VYK3Y46	LCD ASSY	1		B9	VHD2212	SCREW	1	
9	VYK3H61	MODE DIAL U	1		B10	VHD2212	SCREW	1	
10	VEK0N46	FLASH U	1	[PAVCSG]	B11	VHD2212	SCREW	1	[PAVCSG]
12	VMP9328	MODE DIAL PIECE	1		B17	VHD1909	SCREW	1	
13	VEP50056A	REAR OPERATION P.C.B.	1	(RTL) E.S.D.	B18	VHD1909	SCREW	1	
14	VGQ0E07	MODE DIAL ARM	1		B19	VHD1909	SCREW	1	
15	VGU0F60	REAR BUTTON DISPLAY	1	[PAVCSG]	B20	VHD1909	SCREW	1	
16	VGU0F62	REAR BUTTON CENTER	1	[PAVCSG]	B21	VHD1909	SCREW	1	
17	VGU0F63	REAR BUTTON CROSS	1	[PAVCSG]	B22	VHD1909	SCREW	1	
18	VGU0F64	REAR BUTTON PLAY	1	[PAVCSG]	B23	VHD1909	SCREW	1	
19	VGU0F65	REAR BUTTON REC	1	[PAVCSG]	B24	VHD1886	SCREW	1	
20	VGU0F61	REAR BUTTON Q.MENU	1	[PAVCSG]	B25	VHD1694	SCREW	1	
22	VYK4E71	FRONT CASE U	1	FT2(-S)	B26	VHD2078	SCREW	1	
22	VYK4E74	FRONT CASE U	1	FT2(-A)	B27	VHD2078	SCREW	1	
22	VYK4E72	FRONT CASE U	1	FT2(-D)	B28	XQN16+BJ4FN	SCREW	1	
22	VYK4E73	FRONT CASE U	1	FT2(-Y)	B29	VHD2212	SCREW	1	[PAVCSG]
22	VYK4E91	FRONT CASE U	1	TS2(-S: EXCEPT:TS2P)	B30	VHD2212	SCREW	1	[PAVCSG]
22	VYK4E94	FRONT CASE U	1	TS2(-A: EXCEPT:TS2P)	B31	VHD2213	SCREW	1	[PAVCSG]
22	VYK4E92	FRONT CASE U	1	TS2(-D: EXCEPT:TS2P)	B34	VHD2215	SCREW	1	
22	VYK4E93	FRONT CASE U	1	TS2(-Y: EXCEPT:TS2P)	B35	VHD2215	SCREW	1	
22	VYK4E75	FRONT CASE U	1	TS2P-S	B36	VHD1909	SCREW	1	
22	VYK4E78	FRONT CASE U	1	TS2P-A	B37	VHD1909	SCREW	1	
22	VYK4E76	FRONT CASE U	1	TS2P-D	B38	VHD1909	SCREW	1	
22	VYK4E77	FRONT CASE U	1	TS2P-Y	B39	VHD1909	SCREW	1	
22-2	VMP9570	JACK DOOR PLATE	1	[PAVCSG]	B40	VHD1909	SCREW	1	
22-3	VMB4227-A	DOOR KNOB SPRING	1	[PAVCSG]	B41	VHD1909	SCREW	1	
22-4	VGU0F68	JACK DOOR KNOB	1	[PAVCSG]	B42	XQN16+BJ4FN	SCREW	1	
22-5	VGQ0C31-A	BATT DOOR LOCK LABEL	1	[PAVCSG]	B43	XQN16+BJ4FN	SCREW	1	
22-6	VGQ0C31-A	BATT DOOR LOCK LABEL	1	[PAVCSG]	B44	XQN16+BJ4FN	SCREW	1	
22-7	VGQ0K09	JACK DOOR LOCK LEVER	1	[PAVCSG]	B45	XQN16+BJ6FN	SCREW	1	
22-8	VMB4346	JACK DOOR LEVER SPRING	1	[PAVCSG]	B46	XQN16+BJ4FN	SCREW	1	
22-13	VMB4227-A	DOOR KNOB SPRING	1	[PAVCSG]	B47	VHD2074	SCREW	1	
22-14	VGU0F67	BATT DOOR KNOB	1	[PAVCSG]	B48	VHD2214	SCREW	1	
22-15	VGQ0C31-A	BATT DOOR LOCK LABEL	1	[PAVCSG]	B50	XQN16+BJ4FN	SCREW	1	
22-16	VGQ0C31-A	BATT DOOR LOCK LABEL	1	[PAVCSG]	B51	XQN16+BJ4FN	SCREW	1	[PAVCSG]
22-17	VMB4345	BATT DOOR LEVER SPRING	1	[PAVCSG]	B53	VHD2078	SCREW	1	
22-18	VGQ0K08	BATT DOOR LOCK LEVER	1	[PAVCSG]					
22-19	VKF4647	BATT DOOR	1	(-S) [PAVCSG]					
22-19	VKF4697	BATT DOOR	1	(-A) [PAVCSG]	P	VUMG1918	PACKING KIT	1	
22-19	VKF4695	BATT DOOR	1	(-D) [PAVCSG]	P-1	-----	JACK DOOR PACKING	1	(Included in VUMG1918)
22-19	VKF4696	BATT DOOR	1	(-Y) [PAVCSG]	P-2	-----	BATT DOOR PACKING	1	(Included in VUMG1918)
22-20	VQL2F13	BATTERY LABEL	1		P-3	-----	CASE O-RING	1	(Included in VUMG1918)
24	VEP56096B	MAIN P.C.B.	1	EG,EB,EF,EP (RTL) E.S.D.	P-4	-----	MODE DIAL O-RING	1	(Included in VUMG1918)
24	VEP56096A	MAIN P.C.B.	1	EE,GC,GN,SG,P,PC,PU,GH, GT,GD (RTL) E.S.D.	P-5	-----	REAR BUTTON PACKING	1	(Included in VUMG1918)
30	VWJ2131	FPC	1						
31	VGQ0J97	BATT FRAME	1	[PAVCSG]					
33	VGQ0J98	BATT DETECT LEVER	1	[PAVCSG]					
34	VGU0F66	BATT LOCK KNOB	1	[PAVCSG]					
35	VMB4340	BATT OUT SPRING	1	[PAVCSG]					
36	VMB4226-A	BATT LOCK SPRING	1	[PAVCSG]					
37	VMB4240-A	BATT DETECT SPRING	1	[PAVCSG]					
38	VMC2119	FRONT EARTH PLATE C	1	[PAVCSG]					
39	VMP9568	BATT LOCK PLATE	1	[PAVCSG]					
41	VMC2113	FL EARTH PLATE	1	[PAVCSG]					
42	VEP58105A	FLASH P.C.B.	1	(RTL) E.S.D.[PAVCSG]					
45	VGQ0M64	STROBE BATTERY TAPE	1	[PAVCSG]					
△ 64	ML-421S/ZTK	BUTTON BATTERY	1	[ENERGY] (B6402)					
65	VEK0Q54	FLASH CHRQ CAPA. U	1	(C8006)					
71	VGQ0N12	LENS CUSHION	1						
72	VGQ0M54	EMC DPR SHEET A	1						
73	VGQ0N04	EMC DPR SHEET B	1						

DMC-FT2 / TS2 Series

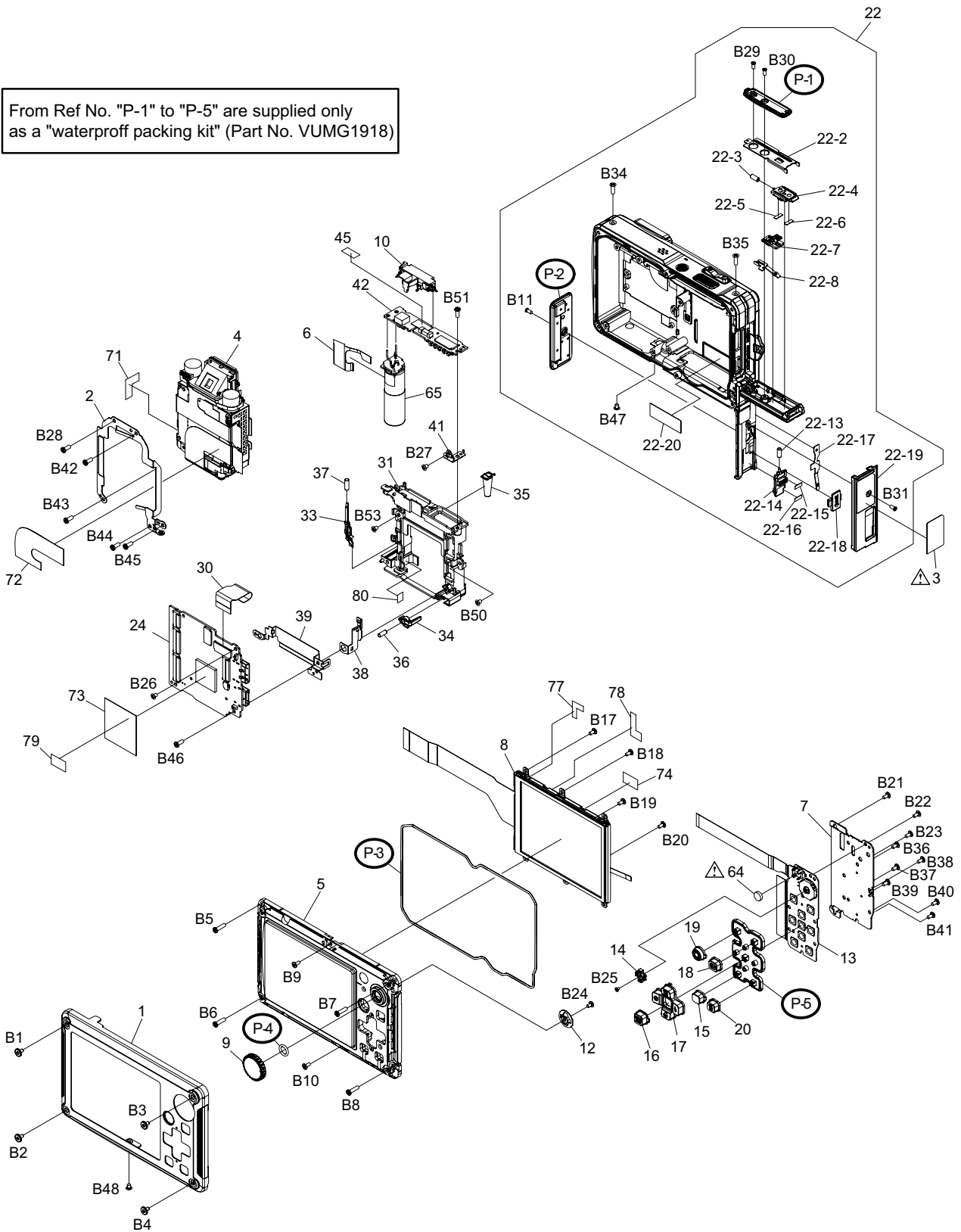
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
100	VPF1317	CAMERA BAG	1	
101	VPN6996	CUSHION	1	EG,EB,EE,EF,EP,GC,GN,SG, PU,GH,GT,GD
101	VPN7017	CUSHION	1	P,PC
△ 103	DE-A60AA	BATTERY CHARGER	1	EG,EB,EF,EP,GN
△ 103	DE-A60BB	BATTERY CHARGER	1	EE,GC,GH,GD
△ 103	DE-A60EA	BATTERY CHARGER	1	SG
△ 103	DE-A59BB	BATTERY CHARGER	1	P,PC,PU
△ 103	DE-A60CA	BATTERY CHARGER	1	GT
104	K1HA14AD0003	USB CABLE	1	
△ 105	K1HA14CD0004	AV CABLE	1	
106	VFC4393	HAND STRAP	1	
107	VFF0594-S	CD-ROM	1	EG,EB,EF,EP (SOFT AND INSTRUCTION BOOK)
107	VFF0595-S	CD-ROM	1	EE,SG (SOFT AND INSTRUCTION BOOK)
107	VFF0596-S	CD-ROM	1	GC,GN,GH (SOFT AND INSTRUCTION BOOK)
107	VFF0593-S	CD-ROM	1	P,PC,PU (SOFT AND INSTRUCTION BOOK)
107	VFF0597-S	CD-ROM	1	GT,GD (SOFT AND INSTRUCTION BOOK)
108	VGQ0D56	BATTERY PROTECTION CASE	1	
109	VPK4327	PACKING CASE	1	EGS,EBS,EES,EPS,GCS,GNS, SGS
109	VPK4331	PACKING CASE	1	EGA,EBA,EPA,GCA,GNA,SGA
109	VPK4335	PACKING CASE	1	EGD,EBD,EED,efd,EPD,GCD, GND,SGD
109	VPK4338	PACKING CASE	1	EGY,EBY,EFY,EPY,GN
109	VPK4326	PACKING CASE	1	PS
109	VPK4330	PACKING CASE	1	PA,PCA
109	VPK4334	PACKING CASE	1	PD,PCD
109	VPK4337	PACKING CASE	1	PY
109	VPK4328	PACKING CASE	1	PUS,GHS,GDS
109	VPK4332	PACKING CASE	1	PUA,GHA
109	VPK4336	PACKING CASE	1	PUD,GHD,GDD
109	VPK4339	PACKING CASE	1	PUY,GT
110	VMG1932	SILICON JACKET	1	
111	VPF1230	POLYETHYLENE COVER	1	
△ 113	VQT2M33	BASIC O/I	1	EG
△ 113	VQT2M34	BASIC O/I	1	EG
△ 113	VQT2M35	BASIC O/I	1	EG
△ 113	VQT2M36	BASIC O/I	1	EG
△ 113	VQT2M41	BASIC O/I	1	EB
△ 113	VQT2M42	BASIC O/I	1	EE
△ 113	VQT2M40	BASIC O/I	1	EF
△ 113	VQT2M37	BASIC O/I	1	EP
△ 113	VQT2M38	BASIC O/I	1	EP
△ 113	VQT2M39	BASIC O/I	1	EP
△ 113	VQT2M43	BASIC O/I	1	GC,SG,GH
△ 113	VQT2M44	BASIC O/I	1	GC
△ 113	VQT2M46	BASIC O/I	1	GN
△ 113	VQT2M30	BASIC O/I	1	P
△ 113	VQT2M31	BASIC O/I	1	PC
△ 113	VQT2M32	BASIC O/I	1	PU
△ 113	VQT2M45	BASIC O/I	1	GT
△ 113	VQT2M47	BASIC O/I	1	GD
△ 114	VQT2L83	O/I SOFTWARE	1	EG (GERMAN/ITALIAN/FRENCH/ DUTCH/SPANISH/PORTUGUESE)
△ 114	VQT2L86	O/I SOFTWARE	1	EB,GN (ENGLISH)
△ 114	VQT2L87	O/I SOFTWARE	1	EE (RUSSIAN/UKRAINIAN)
△ 114	VQT2L85	O/I SOFTWARE	1	EF (FRENCH)
△ 114	VQT2L84	O/I SOFTWARE	1	EP (FINNISH/SWEDISH/DANISH/ POLISH/CZECH/HUNGARIAN)
△ 114	VQT2L88	O/I SOFTWARE	1	GC,SG,GH (ENGLISH/ CHINESE(TRADITIONAL)/ ARABIC/PERSIAN)
△ 114	VQT2L81	O/I SOFTWARE	1	P,PC (ENGLISH/CANADIAN FRENCH)

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
△ 114	VQT2L82	O/I SOFTWARE	1	PU (SPANISH/PORTUGUESE)
△ 114	VQT2L89	O/I SOFTWARE	1	GT (CHINESE(TRADITIONAL))
△ 114	VQT2L91	O/I SOFTWARE	1	GD (KOREAN)
115	VFC4364	CLEANING BRUSH	1	
△ 116	-----	BATTERY PACK	1	(Not supplied) EG,EB,EE, EF,EP,GC,GN,SG,PU,GH,GT,GD
△ 116	-----	BATTERY PACK	1	(Not supplied) P,PC
△ 118	K2CQ29A00002	AC CORD	1	EG,EE,EF,EP,GC
△ 118	K2CT39A00002	AC CORD	1	EB,GC,GH
△ 118	K2CJ29A00002	AC CORD	1	GN
△ 118	K2CA29A00023	AC CORD	1	SG
△ 118	K2CA29A00021	AC CORD	1	GT
△ 118	K2CR29A00001	AC CORD	1	GD
119	VQL2C67	OPERATING LABEL	1	PC
119	VQL2C68	OPERATING LABEL	1	GT (TAIWAN)

S7. Exploded View

S7.1. Frame and Casing Section

From Ref No. "P-1" to "P-5" are supplied only as a "waterproof packing kit" (Part No. VUMG1918)



S7.2. Packing Parts and Accessories Section

