

Service Manual

Interchangeable Lens for Digital Camera



Model No. **H-FT012PP**
H-FT012E
H-FT012GK

Vol.1



Specifications

3D INTERCHANGEABLE LENS FOR DIGITAL CAMERA
"LUMIX G 12.5 mm/F12"

Focal length	f=12.5 mm [35 mm film camera equivalent: 65 mm (When the DMC-GH2 is used and the aspect ratio is set to [16:9])]* ¹
Aperture type	Fixed
Aperture	F12 (Fixed)
Lens construction	4 elements in 3 groups ×2
In focus distance	0.6 m to ∞ (from the focus distance reference line)
Maximum image magnification	0.02× [35 mm film camera equivalent: 0.1× (When the DMC-GH2 is used and the aspect ratio is set to [16:9])]* ¹
Optical image stabilizer	Not available
Mount	"Micro Four Thirds Mount"
Angle of view	37° (When the DMC-GH2 is used and the aspect ratio is set to [16:9])]* ¹
Stereo Base	10 mm
Max. diameter	Approx. 57 mm
Overall length	Approx. 20.5 mm (from the tip of the lens to the base side of the lens mount)
Mass	Approx. 45 g

*1 When using a digital camera other than the DMC-GH2, check details via the following support site.
<http://panasonic.jp/support/global/cs/dsc/> (This Site is English only.)

⚠ 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 INTRODUCTION

1.1. INTRODUCTION

This service manual contains technical information, which 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 supplement service manual.

1.2. IMPORTANT NOTICE

1.2.1. About Lens MAIN Block unit (Ref. 203)

1. This Service Manual does not contain the repair service information for "LENS MAIN BLOCK UNIT"(Ref.203), because it requires special facilities and equipment.
2. The "LENS MAIN BLOCK UNIT"(Ref.203) performance must be confirmed.
3. In case of the "LENS MAIN BLOCK UNIT"(Ref.203) defects, contact to the service department of sales company.

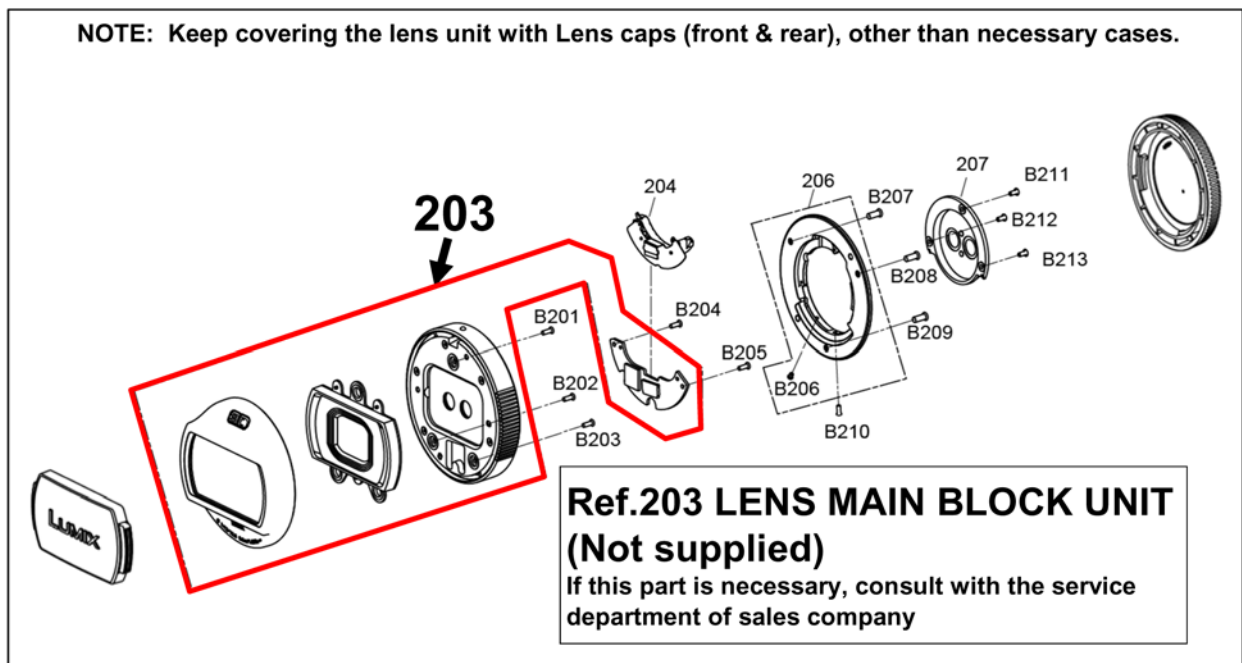


Fig. S1

4. No adjustment is required when replacing the part mentioned on Fig.S1. But, when tighten the concerned screws, apply proper torque mentioned on "4 Disassembly / Assembly procedures".

2 OPERATING GUIDE

2.1. BEFORE USE

(Information for Your Safety)

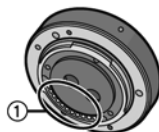
Keep the unit as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games, radio transmitters, high-voltage lines etc.).

- Do not use the camera near cell phones because doing so may result in noise adversely affecting the pictures and sound.
- If the camera is adversely affected by electromagnetic equipment and stops functioning properly, turn the camera off and remove the battery and/or the connected AC adaptor. Then reinsert the battery and/or reconnect the AC adaptor and turn the camera on.
- This lens is compatible with the lens mount standard for the Micro Four Thirds™ System. You can take impressive 3D pictures just by mounting it on a digital camera that supports 3D picture recording.
- It cannot be mounted on the Four Thirds™ mount specification camera.
- A TV compatible with 3D is required to playback pictures recorded in 3D.

Precautions

■ Lens Care

- **Sand and dust can damage the lens. Make sure that no sand or dust gets inside the lens or the terminals when using the lens on a beach, etc.**
- **This lens is not waterproof. If drops of water get onto the lens, wipe the lens with a dry cloth.**
- Do not press the protective glass with excessive force.
- When there is dirt (water, oil, and fingerprints, etc.) on the surface of the protective glass, the picture may be affected. Lightly wipe the surface of the protective glass with a soft, dry cloth before and after taking pictures.
- Do not place the lens mount facing downwards. Do not allow the lens contact points ① to become dirty.



- It does not support recording in vertical orientation.
- The digital camera illustrations in these operating instructions show DMC-GH2 as an example.
- The appearance and specifications of products described in this manual may differ from the actual products you have purchased due to later enhancements.
- Micro Four Thirds™ and Micro Four Thirds Logo marks are trademarks or registered trademarks of Olympus Imaging Corporation, in Japan, the United States, the European Union and other countries.
- Four Thirds™ and Four Thirds Logo marks are trademarks or registered trademarks of Olympus Imaging Corporation, in Japan, the United States, the European Union and other countries.
- G MICRO SYSTEM is a lens exchange type digital camera system of LUMIX based on a Micro Four Thirds System standard.
- Other names, company names, and product names printed in these instructions are trademarks or registered trademarks of the companies concerned.

■ About Condensation (Fogging of the Lens)

- Condensation occurs when there are differences in temperature and humidity as described below. Condensation can cause the lens to become dirty and lead to mold and malfunctioning, so exercise caution in the following situations:
 - When the camera is brought indoors from outside during cold weather
 - When the camera is brought into an air-conditioned car
 - When cold air from an air conditioner is directly blown onto the lens
 - In humid places
- Put the camera into a plastic bag to allow it to acclimatize to the surrounding temperature in order to prevent condensation. If condensation occurs, turn the power off and leave it for about two hours. Once the camera acclimatizes to the surrounding temperature the condensation will go away naturally.

2.2. CAUTIONS FOR USE

Take care not to drop or knock the lens. Also take care not to put a lot of pressure on the lens.

- Take care not to drop the bag that you inserted the lens in as it may strongly shock the lens. The camera may stop operating normally and pictures may no longer be recorded. Also, the lens may be damaged.

When using pesticides and other volatile substances around the camera make sure that they do not get onto the lens.

- If such substances get onto the lens they can damage the exterior case or cause the paint to peel.

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

- Under no circumstances should the unit be stored in any of the following locations since doing so may cause problems in operation or malfunctioning.
 - In direct sunlight or on a beach in summer
 - In locations with high temperatures and humidity levels or where the changes in temperature and humidity are acute
 - In locations with high concentrations of sand, dust or dirt
 - Where there is fire
 - Near heaters, air conditioners or humidifiers

- Where water may make the unit wet
- Where there is vibration
- Inside a vehicle

- Refer also to the operating instructions of the digital camera.
- When the unit is not going to be used for a prolonged period, we recommend storing with a desiccant (silica gel). Failure to do so may result in performance failure caused by mold, etc. It is recommended that you check the unit's operation prior to use.
- Do not leave the lens in contact with rubber or plastic products for extended periods of time.
- Do not touch the lens contact point. Doing so can cause failure of the unit.
- Do not disassemble or alter the unit.

Do not use benzine, thinner, alcohol or other similar cleaning agents to clean the lens glass or exterior cabinet.

- Using solvents can damage the lens or cause the paint to peel.
- Wipe off any dust or fingerprints with a soft, dry cloth.
- Do not use a household detergent or a chemically treated cloth.

2.3. About 3D

■ About 3D recording

With the 3D interchangeable lens attached, do not record a subject at less than the minimum focus distance.

- The 3D effects may be more pronounced, and therefore cause tiredness or discomfort.
- The minimum focus distance is 0.6 m.

When recording with the 3D interchangeable lens attached, be careful not to shake the digital camera.

- Tiredness or discomfort may result if the shake is pronounced, due to riding in a vehicle or walking etc.
- We recommend using a tripod.

■ About 3D viewing

Anyone who is hyper sensitive to light, suffers from heart disease or is otherwise unwell should avoid viewing 3D pictures.

- Doing may have an adverse affect on such medical conditions.

If you feel tired, uncomfortable or otherwise strange when viewing 3D pictures, stop viewing at once.

- Continuing to view may cause illness.
- Please rest appropriately after stopping the viewing.

When viewing 3D pictures, we recommend taking a break every 30 to 60 minutes.

- Viewing for extended periods may cause eye-fatigue.

Short-sighted or long-sighted persons, those with differences in the sight of their right and left eyes, and those with astigmatism are advised to correct their vision by wearing glasses etc.

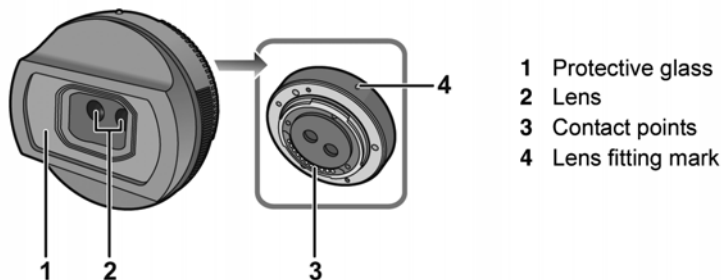
Stop viewing if you can clearly see a double image while viewing 3D pictures.

- There are differences in the way that different people experience 3D pictures. Please correct your sight appropriately before viewing 3D pictures.
- You can change the 3D setting of your television or 3D output setting of the digital camera to 2D.

When viewing 3D pictures on a 3D compatible television, position yourself a distance away that is least 3 times the effective height of the television.

- (Recommended distance):
 - For 106.7 cm (42"); approx. 1.6 m,
 - for 116.8 cm (46"); approx. 1.7 m,
 - for 127 cm (50"); approx. 1.9 m,
 - for 137.2 cm (54"); approx. 2.0 m.
- Viewing from a distance closer than the recommended distance may lead to eye-fatigue.

2.4. COMPONENTS



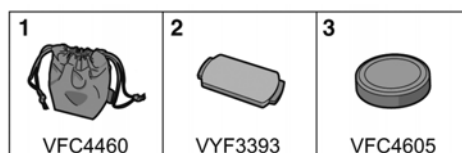
Note

- Zoom operation is not supported.
- It is recommended to use a tripod or a flash to record steady pictures.
- When a distance to the subject is 0.6 m to approximately 1 m, horizontal disparity becomes too great, and you may not see the 3D effect at the edges of the image.
- Functions that can be used depend on the digital camera you are using. Please refer to the operating instructions of the digital camera for details.

To ensure that the 3D pictures can be safely viewed, pay attention to the following points when recording.

- Where possible, record with the digital camera in a horizontal state.
- Do not get too close to the subject (record from a distance of at least 0.6 m).
- Be careful not to shake the camera while in a vehicle or walking.

2.4.1. Accessories



- 1 Lens Storage Bag
 - 2 Lens Cap
 - 3 Lens Rear Cap
- (The lens rear cap and lens cap are attached to the interchangeable lens at the time of purchase.)

2.4.2. Attaching/Detaching the Lens

Attaching/Detaching the Lens

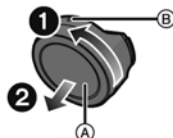
- Refer also to the camera's operating instructions for attaching and detaching the lens.

■ Attaching the Lens

- Check that the camera is turned off.

1 Turn the lens rear cap to detach it.

(A): Lens Rear Cap



2 Align the lens fitting marks (B) (red marks) on the camera body and the lens and then rotate the lens in the direction of the arrow until it clicks.

- Do not press the lens release button (C) when you attach a lens.
- Do not try to attach the lens when holding it at an angle to the camera body as the lens mount may get scratched.
- Check that the lens is attached correctly.



■ Detaching the Lens

- Check that the camera is turned off.

Press the lens release button (D) while turning the lens as far as possible in the direction of the arrow to detach it.

- Attach the lens rear cap so that the lens contact point does not get scratched.
- Attach the body cap to the camera so no dirt or dust will get inside the main unit.



■ Attaching and Detaching the Lens Cap




- Be careful not to lose the lens cap.



3 SERVICE FIXTURE & TOOLS

3.1. SERVICE FIXTURE AND TOOLS

The following Service Fixture and Tools are used for Checking & Servicing for this unit.

Lens Cleaning Kit (BK) VFK1900BK	TORQUE DRIVER RFKZ0456	Driver VFK1390
 * Only supplied as 10 set/box.	 Spec.:2-30N・cm (Equiv.0.2-3kgf/cm)	

3.2. CLEAN BOX

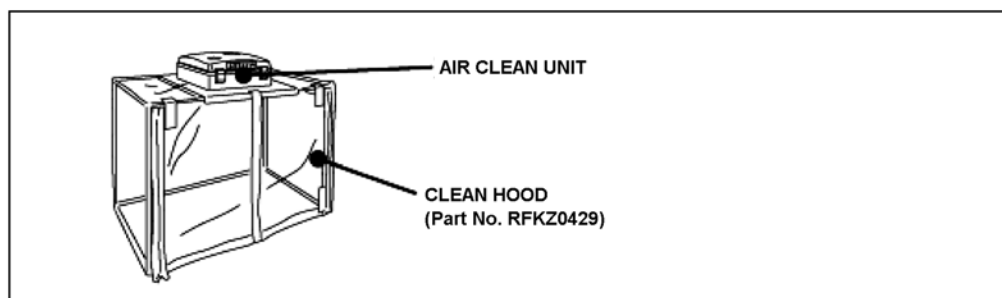
- The repair quality is considered, and it is recommended working in the environment of satisfied clean level less than class 10,000 (Federal Standard 209D).

(When remove the 1st lens frame, it is indispensable.)

[NOTE]

- Work in the environment of satisfied clean level less than class 10,000 (Federal Standard 209D) when remove the 1st lens frame for cleaning.

*Refer to “5.2. General description” section of this service manual for details



4 Disassembly/Assembly procedures

4.1. Disassembly/Assembly procedures

It is recommended dealing with Clean box, to keep maintaining the dustproof environment.
(Refer to “3.2. Clean Box” section of this service manual for details.)

IMPORTANT:

1. When servicing the surrounding part with red line (refer to Fig.D1), it must be performed inside of satisfied clean level.
(Satisfied clean level: Less than class 10,000 Federal Standard 209D).
As for procedure, refer to the “5 Maintenance” for details.
2. To minimize the possibilities/risk of getting the dust/dirt on the lens surface, keep covering the lens unit with Lens caps (front & rear), other than necessary cases.
3. Do not touch the surface of the lens glasses with your fingers.
4. Blow off the dust on the surface of the lens with a blower brush.
5. Use lens cleaning KIT (BK)(VFK1900BK).

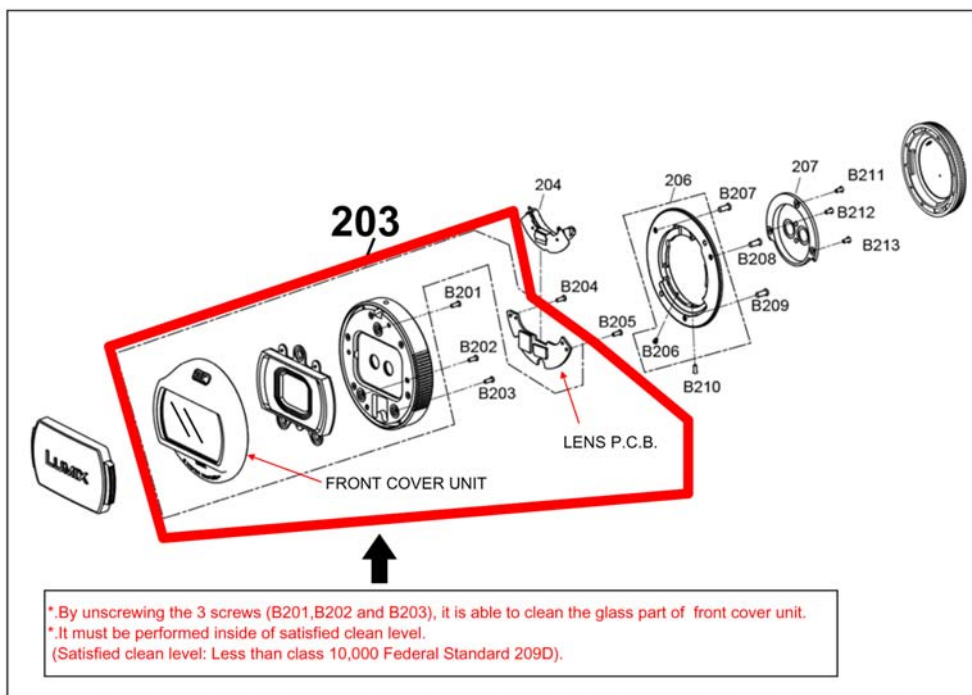
Proceed disassemble/ and assemble, by referring the following table and Fig.D1

NOTE:

1. When tightening the screw, use a Torque driver (RFKZ0456) by ordering the screwing order with specified torque mentioned in each step.
2. The screw Ref.B206 is no need to remove for disassembly.
3. Use VFK1390 (small driver) when screwing/unscrewing the B206 and B210.

CAUTION:
Keep covering the lens unit with Lens caps (front & rear), other than necessary cases.

CONCERNED PART		SCREW					REMARKS
Part Name	Ref No.	Ref. No.	Color	Length	Screwing order	Torque spec.	
SHADING FRAME	207	B211	Black	3mm	[1]	10±1.2N-cm	
		B212	Black	3mm	[2]	10±1.2N-cm	
		B213	Black	3mm	[3]	10±1.2N-cm	
L MOUNT UNIT	206	B207	Silver	5mm	[2]	20±1.2N-cm	
		B208	Silver	5mm	[1]	20±1.2N-cm	
		B209	Silver	5mm	[3]	20±1.2N-cm	
		B210	Silver	3mm	[4]	-----	Use VFK1390 (Small Driver)
LENS MAIN BODY UNIT							
LENS P.C.B.	---	B204	Black	4mm	[1]	10±1.2N-cm	
		B205	Black	4mm	[2]	10±1.2N-cm	
FRONT COVER UNIT	---	B201	Black	4mm	[1]	10±1.2N-cm	
		B202	Black	4mm	[2]	10±1.2N-cm	
		B203	Black	4mm	[3]	10±1.2N-cm	



5 MAINTENANCE

5.1. ABOUT THE LENS

5.1.1. DUST/DIRT ON THE OUTER CASING PART(S)

1. Blow off the dust first, then sweep out the dust from narrower spaces with soft cleaning brush.
2. Wipe up the Outer casing part with the dry fuzz-free cloth.

5.1.2. DUST/DIRT ON THE LENS GLASSES

Define the location of the dust/dirt first, whether it is outside lens surface or not.

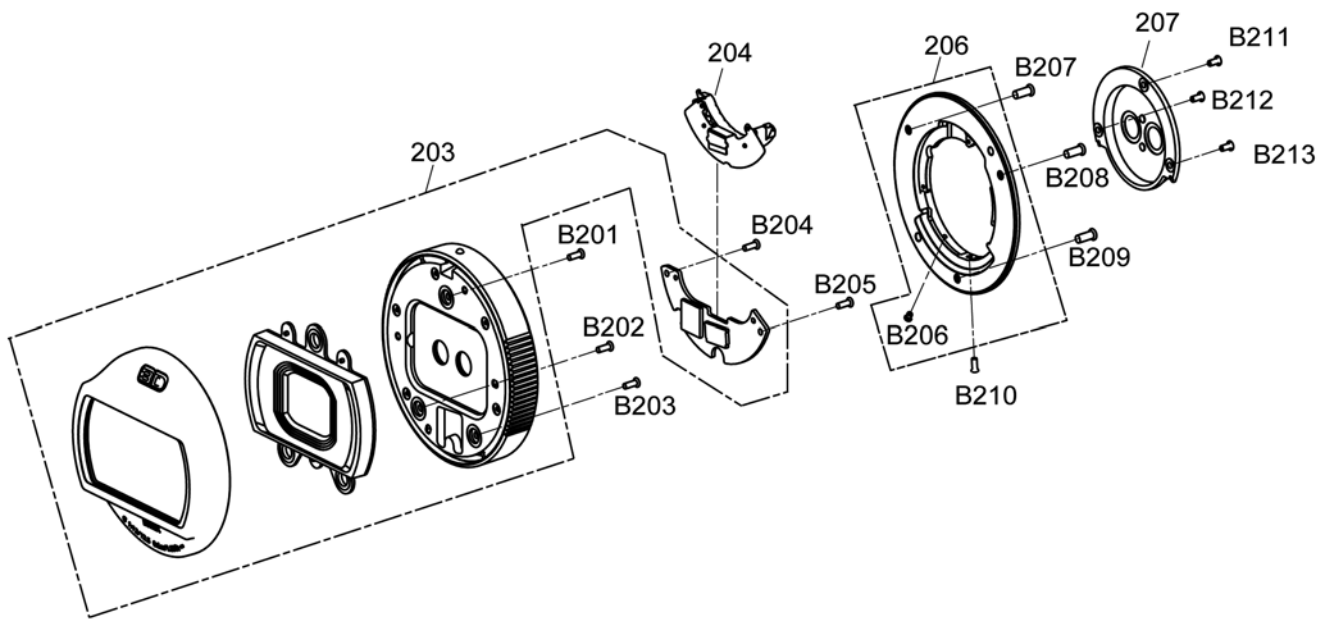
1. When it is outside surface of the lens:

When the dust and/or dirt gets on the outer side surface of the Lens glasses, order the following procedures.

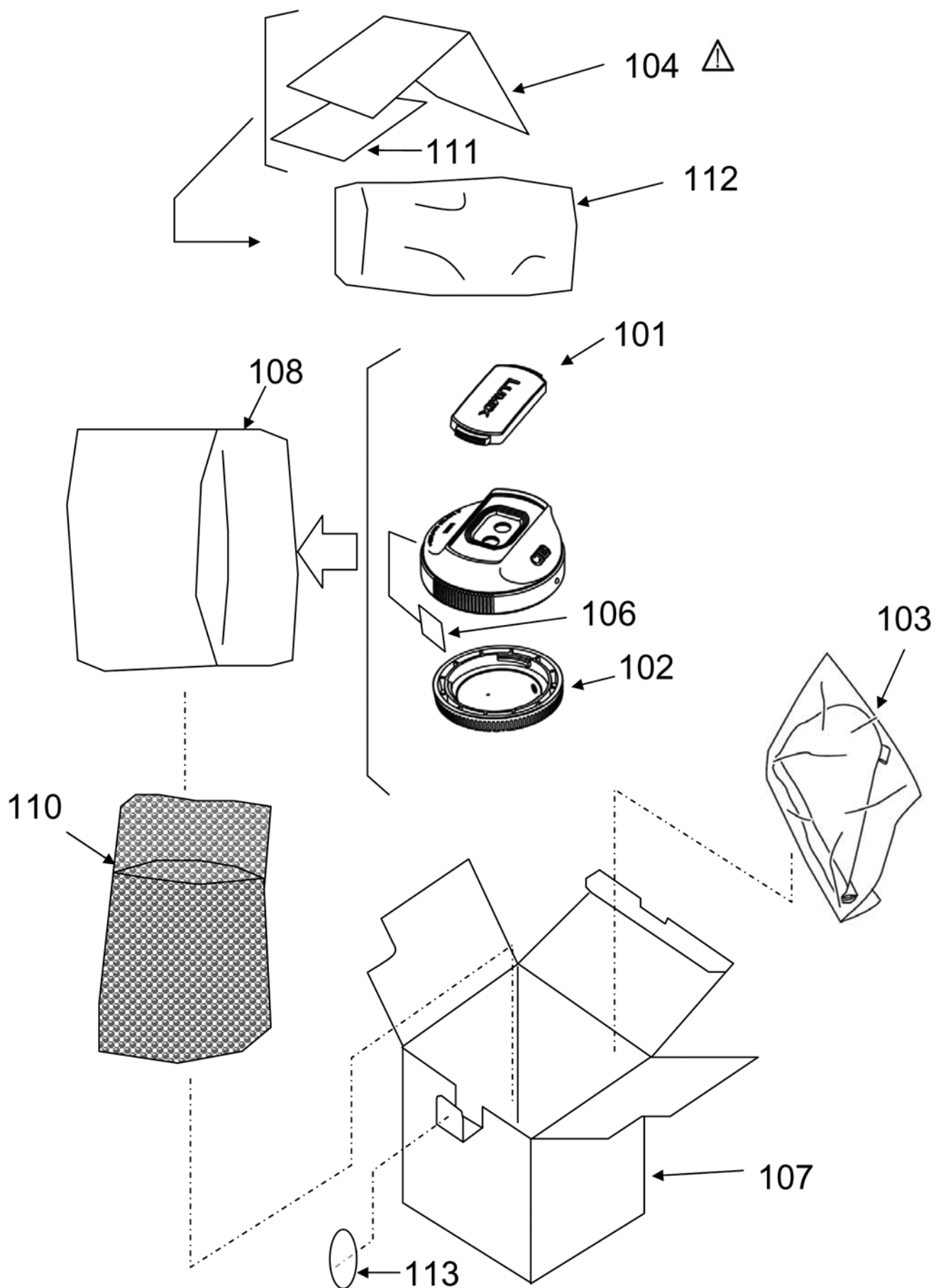
- a. Blow off the dust on the Lens glass surface with the Blower, gently. (Do not Blow too strongly.)
- b. Wipe out the dirt on the lens glass surface with Lens cleaning KIT (VFK1900BK) if necessary.
(Consult the Instruction sheet which is included in the Lens cleaning KIT in details.)

6 EXPLODED VIEWS

6.1. Frame & Casing Section




6.2. PACKING PARTS & ACCESSORIES SECTION



7 REPLACEMENT PARTS LIST

7.1. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1.* Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE
 Components identified with the mark  have the special characteristics for safety.
 When replacing any of these components, use only the same type.
 3. 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.
 4. Supply of CD-ROM, in accordance with license protection, is allowable as replacement parts only for customers who accidentally damaged or lost their own.

7.1.1. FRAME & CASING SECTION PARTS LIST

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
203	-----	LENS MAIN UNIT	1	
204	VEJ2295	MOUNT CONTACT UNIT	1	
206	VXQ1940	MOUNT CONTACT UNIT	1	
207	VDW2168	SHADING FRAME	1	
B201	XQN14+BJ4FNK	SCREW	1	
B202	XQN14+BJ4FNK	SCREW	1	
B203	XQN14+BJ4FNK	SCREW	1	
B204	XQN14+BJ4FNK	SCREW	1	
B205	XQN14+BJ4FNK	SCREW	1	
B206	VHD1868	SCREW	1	
B207	XQN2+AJ5FN	SCREW	1	
B208	XQN2+AJ5FN	SCREW	1	
B209	XQN2+AJ5FN	SCREW	1	
B210	XQN14+AJ3FN	SCREW	1	
B211	VHD2246	SCREW	1	
B212	VHD2246	SCREW	1	
B213	VHD2246	SCREW	1	

7.1.2. PACKING PARTS & ACCESSORIES SECTION PARTS LIST

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
101	VYF3393	LENS CAP	1	
102	VFC4605	LENS REAR CAP	1	
103	VFC4460	LENS STORAGE BAG	1	
104	VQT3B93	OPERATING INSTRUCTIONS (ENGLISH/GERMAN/FRENCH/SPANISH/ITALIAN/CHINESE (TRADITIONAL)/RUSSIAN)	1	E
104	VQT3B92	OPERATING INSTRUCTIONS (ENGLISH/CANADIAN-FRENCH/SPANISH)	1	PP
104	VQT3B94	OPERATING INSTRUCTIONS (CHINESE(SIMPLIFIED))	1	GK
106	VQL1V24	WEEE_LABEL	1	E
107	VPK4627	PACKING CASE	1	E
107	VPK4627BKIT	PACKING CASE U	1	PP
107	VPK4628	PACKING CASE	1	GK
108	VPF1371	LENS BAG	1	
111	VQL1M13	OPERATING LABEL (CANADIAN-FRENCH)	1	PP
112	VPF1230	POLYETHYLENE COVER	1	PP/E
113	VQL1S66	LABEL	1	GK