

# HAND-HELD FUNDUS CAMERA

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**Kowa** **GENESIS-D**

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## INSTRUCTION MANUAL



## INTRODUCTION

Accept our congratulations on your purchase of Kowa's HAND-HELD FUNDUS CAMERA **GENESIS-D**. This manual provides descriptions of the operating procedures of **GENESIS-D** along with important precautions to be observed during its use. Please read this entire manual carefully to assure that the instrument can demonstrate its full capabilities and be used effectively. After you have finished reading it, please keep it in an easily accessible location near the instrument for future reference.

## Operational Considerations for Safety and Accident Prevention

This manual describes important precautions to be observed during its use to assure that the instrument can be used safely without causing any damage to the body and property of its purchaser and other persons. The designations and their pictorial symbols have the following meanings. These should be fully comprehended before reading the text of this manual.

### ■ Meanings of designations

#### **Warning**

If the instrument should be operated wrongly, there may occur a danger of causing death or serious injury.

#### **Caution**

If the instrument should be operated wrongly, there may result an injury to the body (not so serious as to cause death though) or damage to property.

- 1 : An injury to the body means any injury, burn, electrical shock and so forth that will not necessitate hospitalization or long-term outpatient treatment.
- 2 : Damage to property means an extensive damage to the house and household goods as well as the domestic animal and pet.

### ■ Meanings of symbols



Indication of any danger (including warning and caution)

What is warned is explicitly and pictorially indicated by a picture or its associated message on or near a pictorial symbol.



Graphical indication of prohibited operation (prohibitive item)

What is prohibited is explicitly and pictorially indicated by a picture or its associated message on or near a pictorial symbol.



Indication of mandatory action (obligatory item)

What must be always done is explicitly and pictorially indicated by a picture or its associated message on or near a pictorial symbol.

### ■ Exclusion

Kowa is not responsible for:

- Any damage caused by fire, earthquake, third party's action, any other accident or user's intentional or unintentional error, abuse or use under abnormal conditions;
- Any damage resulting from use of the product or its malfunction (e.g., operating loss, shutdown, change/loss of stored data and so forth);
- Any damage resulting from disobedience of what is described in the instruction manual; and
- Any damage resulting from, for instance, malfunctioning of the instrument caused by a combination of connected devices.

## ⚠ Warning



Unplug

If any abnormal smell or sound, or overheating or smoke should be detected, turn OFF the instrument immediately and then unplug it.

If it should continue in use, a fire may break out on the instrument resulting in its malfunctioning. Contact your Kowa dealer where you purchased it or your nearest repair shop for inspection.



Unplug

Before replacing the electric flash light tube, make sure that the instrument is turned OFF and the plug has been pulled out of the wall outlet. Allow at least five minutes to cool it off before replacement. Otherwise, you may burn your fingers on the hot tube and/or get an electrical shock.



Unplug

When replacing the fuse, make sure the instrument is turned OFF and unplugged out of the socket. If the fuse holder cover is removed with the instrument unplugged, you may get an electrical shock.



Obligatory

Make sure that the instrument or AC adapter is properly plugged into the socket. If not, there may occur a fire or you may get an electrical shock.



Obligatory

Use an accessory or designated fuse. Otherwise, the instrument may malfunction or a fire may break out.



Obligatory

Make sure that the instrument is properly grounded to protect the body. Put the plug in the three-core socket with ground wire. Otherwise, you may get an electrical shock.



Prohibitory

Install in a location away from, for instance, a cup containing liquid. If liquid should be spilled into the instrument, you may get an electrical shock. If so, turn OFF the instrument and then unplug it from the socket. Contact your Kowa dealer where you purchased it or your nearest repair shop for inspection.



Disassembly prohibited

Do not disassemble, modify or repair the instrument yourself. Otherwise, there may occur a fire and resultant instrument malfunctioning or you may get an electrical shock and a bodily injury. Contact your Kowa dealer where you purchased the instrument for repair. The product assembled by yourself will not get warranty or any other service.



Prohibitory

The socket or plug board must not be loaded in excess of its rated capacity. If the main power cable should share an outlet with many other devices, there may occur a fire or you may get an electrical shock.



Prohibitory

If any metallic object in air vent slots should be inserted, there may occur a fire and resultant instrument malfunctioning .or you may get an electrical shock.



Prohibitory

Do not damage the power cable. If it should be damaged, there may result a fire or you may get an electrical shock. Therefore, strictly observe the following:  
-Neither modify nor damage the power cable.  
-Do not place any heavy object on the power cable or pull it with a sudden jerk.  
-Neither bring the power cable close to any hot surface of heater nor directly heat it.



Obligatory

Be sure to use an accessory or designated lamp. Otherwise, there may occur a fire or resultant instrument malfunctioning.

## ⚠ Caution



For unplugging from the socket, pull the power cable with its plug being held by your hand. Otherwise, there may occur a fire or you may get an electrical shock.



Do not plug into or unplug out of the socket with your wet hand to avoid an electrical shock.



Do not place the instrument in an unstable location, for instance, on a shaky base or a tilting surface. Otherwise, if it should drop off or fall over, you may get injured.



Do not replace the electric flash light tube and the illumination light immediately after their service. Otherwise, you may burn your fingers on the hot surface of the tube or lamp. Allow 30 minutes or so to cool it off before replacement.



Do not increase the amount of illumination light more than is required. Otherwise, the eye may get a pain or injured.



For illumination and photography, do not select any higher exposure than it is required. Otherwise, the examined eye may suffer a pain or disorder.



Be careful about the gap between the light projecting prism and the patient's face. Otherwise, when bringing the fundus camera unit closer to the patient, the prism may touch and hurt his or her face (the eye, nose and so on).



Do not use the instrument in a location having too much moisture, dust, soot or steam. In such a location, there may occur a fire or you may get an electrical shock.



Do not touch the instrument with your wet hand to avoid an electrical shock.



If there is no need to use it for a long period of time, store the instrument with its power cable disconnected from the socket. Otherwise, there may occur a fire.



Use or carry the instrument with its being firmly held by your hand. Otherwise, if it should drop off, you may get injured.

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## OPERATING PRECAUTIONS

- Carefully handle the instrument so that a strong shock will not be exerted on it. After it sustained a strong shock or damage resulting from dropping off or any other mishandling, do not turn on the instrument.
- The instrument should be placed or stored in a place free from dust, high temperatures, high humidity and direct sunlight. The environmental conditions described below should be observed strictly.

	in operation	In storage and transportation
Environmental temperature	10 to 40°C	-15 to +55°C
Relative humidity	30 to 75%	10 to +95%

- When not in use, make sure the camera unit is protected by its objective lens cap or cover.
- If it has not been in service for a long period of time, make sure the instrument has no abnormality prior to use.
- Be careful not to let any condensation form on this instrument when in use, storage, or transportation.

### Precautions in operating electric system

- Be careful about where the camera is placed to keep its power plug from being disconnected during fundus photography.
- If the plug should accidentally come off, be sure to turn OFF the power switch before putting it again into the socket.
- If you put the plug back into the socket with the power switch ON and as a result any abnormality should occur on the circuit inside of the power supply unit, be sure to turn OFF the power switch and then wait for a while before turning it ON again.
- The input voltage should be maintained within  $\pm 10\%$  of the rated voltage.
- Do not turn the power switch ON and OFF in succession. Allow an interval of at least 5 seconds between switch operations. Be sure to turn OFF the power switch before plugging and unplugging.
- The power line from the wall outlet should be exclusively used for the fundus camera.

### Other precautions

- The manufacturer is not liable for malfunctions or injuries resulting from maintenance or repairs performed by a person other than a designated repair shop.
- The manufacturer is not liable for malfunctions or injuries resulting from modification, maintenance or repairs using parts other than designated repair parts.
- Because the camera is composed of precision parts, it needs a special set of tools for adjustment. Do not attempt to disassemble or adjust them by yourself.
- "Compact Flash" is U.S. Sun Disk Corporation's registered trademark.
- "Windows" is Microsoft Corporation's registered trademark.
- <sup>TM</sup> and ® marks are not indicated in the text of this manual.

### Disposal Precautions

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- When disposing of this instrument, comply with the regulations of countries or areas in which the instrument is used.
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## **Operational Precautions in Use of Hospital Grade Electrical Equipment of Medical Electrical Equipment (Safety and Accident Prevention)**

This section describes general precautions in use of medical electrical equipment based on Notification No. 495 of the Pharmaceutical Affairs Bureau of the Ministry of Health and Welfare dated June 1, 1972.

1. Only qualified personnel should operate this equipment
2. The following items shall be considered when installing equipment.
  - (1) Install in a location away from water or accidental splashing.
  - (2) Install in a location which will not be adversely affected by atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, air containing salt, sulfur and other substances.
  - (3) Take care to protect the equipment against tilt, vibration and strong impacts, for instance, during transportation.
  - (4) Equipment must not be installed in locations where chemicals are stored or gasses are generated.
  - (5) Be careful with the radio frequencies, voltages and allowable amperes (power consumption) of the power supply.
  - (6) Make sure that all batteries are installed properly and in good working order (discharging curve, polarity, and so forth).
  - (7) Properly connect ground wires.
3. The following items shall be considered when using the instrument.
  - (1) Make sure that equipment activates properly after checking switch contact. polarity, dial setting and meters and so forth.
  - (2) Make sure that the instrument is properly grounded.
  - (3) Make sure that all cables are properly connected and secured.
  - (4) Use of other instruments and appliances on the same power circuit is liable to cause errors and incorrect flash output resulting in incorrect diagnosis or hazards.
  - (5) External circuits and connectors that may come in direct contact with the patient must be checked frequently.
  - (6) Before operation, make sure that the camera back battery is sufficiently charged.
4. The following items shall be considered when using the instrument.
  - (1) Be sure to minimize the time and quantity required for diagnosis and treatment.
  - (2) Always assure that the equipment and patient are in good condition.
  - (3) When an abnormality is found in the equipment and patient, take proper measures: for instance, stopping the instrument while assuring the patient's safety.
  - (4) Do not allow the patient to touch any part of the equipment where he or she is not instructed to do so.
5. The following items shall be considered after using the instrument.
  - (1) Follow a specified procedure of setting their control switches, dials and so forth to their original position before turning OFF the instrument.
  - (2) Do not pull off cables by your hand to avoid exerting an excessive force on them.
  - (3) The following shall be considered regarding storage location.
    - (a) Store the instrument in locations free from splashes of water.
    - (b) Store in a location which will not be adversely affected by atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, air containing salt, sulfur and other substances.
    - (c) Take care to protect the instrument against tilt, vibration and strong impacts, for instance, during transportation.
    - (d) Equipment must not be stored in a location where chemicals are stored or gasses are generated.
  - (4) Clean and rearrange accessories, cables, cable restraints and the like in a proper manner.
  - (5) The instrument must be cleaned beforehand so that there will be no problem with subsequent service.
6. If it has some trouble, affix on the equipment a label describing the trouble and then ask a repair shop for repair.
7. Equipment shall not be modified.
8. Maintenance and inspection
  - (1) Periodically check the equipment and its components for any abnormality.
  - (2) If you have not used it for a significant period of time, check the instrument beforehand to assure that it is in normal condition and operates safely.
9. Be careful of the possibility that incorrect operation may be caused by strong electromagnetic waves.

This instrument may suffer from incorrect operation when surrounded by strong electromagnetic waves. Electromagnetic waves emitted by this instrument may also affect other external instruments.

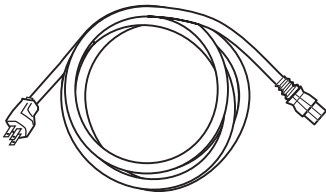
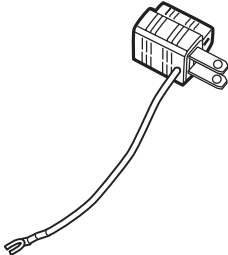
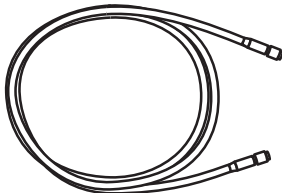
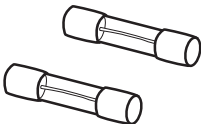
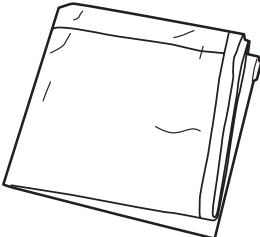

General examples

  - (1) Electric waves emitted by cellular phones may cause unexpected incorrect operation.
  - (2) Use of this instrument may cause incorrect operation of a pacemaker.

## Outline

Kowa **GENESIS-D** is a compact, lightweight hand-held fundus camera which is capable of photographing mydriasis in color. This instrument is equipped with a digital camera which provides 2.0 million pixels of resolution and a LCD monitor screen.

## ACCESSORIES

<b>Power cable: 1 pc.</b>	<b>3-pin plug: 1 pc.</b>	<b>Connector cable: 1pc</b>
		
<b>Fuse: 2 pc</b>	<b>Dust protective cover: 1 pc</b>	<b>Instruction manual: 1 pc.</b>
		

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# 1. Name and function of each part

## Main unit (camera unit)

### **Screws for fitting the tripod**

Tapped hole for fitting the indirect ophthalmoscope holder

### **Forehead rest**

Spring-type expandable forehead rest

### **Objective lens**

Lens for photographing the fundus

### **Light projecting prism:**

For illuminating the examined eye, from which illumination light is emitted

### **Examined eye diopter scale:**

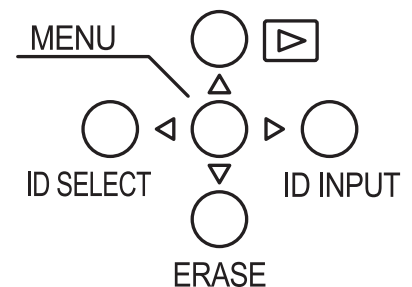
For indicating the examined eye's diopter

### **LCD monitor screen**

On this 2.5-inch size monitor, desired settings can be selected for the camera and pictures taken can be displayed thereon.

### **Control buttons**

-Used for selecting desired settings for the camera and for displaying photographed images  
-Five buttons in all: MENU-, UP-, DOWN-, LEFT-, and RIGHT- buttons.



### **Cable terminal**

**(on the bottom surface):**

For connecting the power cable to the power supply unit.

### Ocular (eyepiece)

If you wear glasses, turn the ocular's (eyepiece's) rubber rest outward. The ocular diopter can be adjusted in a range of  $-8 \text{ m}^{-1}(\text{D})$  to  $+5 \text{ m}^{-1}(\text{D})$  to fit the examiner's eye. Double-cross hairs are incorporated for focusing.)

### CF protective cover

- For protecting the Compact Flash memory card
- Open the cover to find Compact Flash memory card insert slot and USB terminals.

### Light supply

#### protective cover:

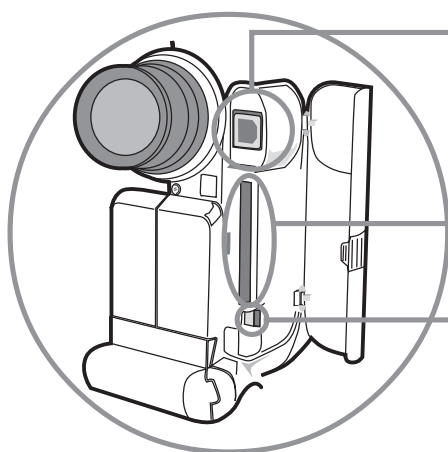
Open this cover when replacing the flash light tube.

### Focus knobs

- Provided on both sides of the camera unit and are used for focusing.

### Shutter switch

- Provided on both sides of the camera unit
- Slide the switch down



### USB terminal

- For connecting the USB cable

### Compact Flash memory card Insert slot

- Opening into which to insert Compact Flash memory card

### Ejector button

- Used for taking out Compact Flash memory card

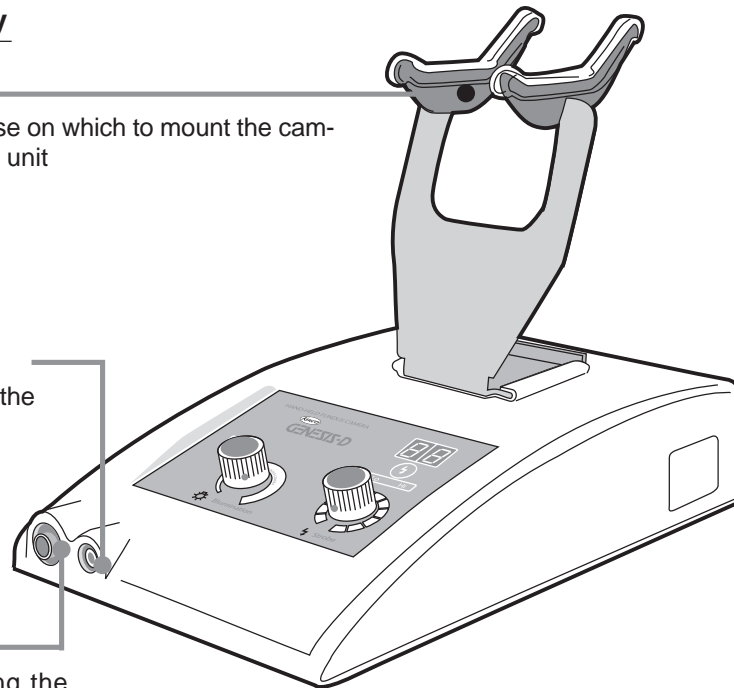
## 1. Name and function of each part

### Power supply

**Stay**  
Base on which to mount the camera unit

**External shutter terminal**  
-Terminal for connecting the optional foot switch

**Cable terminal**  
-Terminal for connecting the connector cable to the camera unit



### **Control panel**

**READY indicator light**  
-Will come ON when the camera becomes ready to photograph,

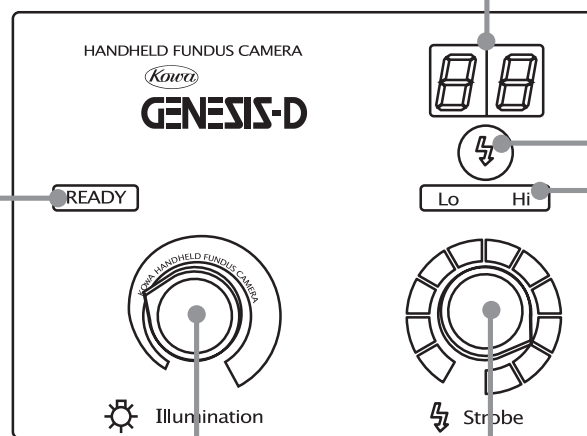
**Illumination light intensity selector knob**  
-for adjusting the illumination light intensity

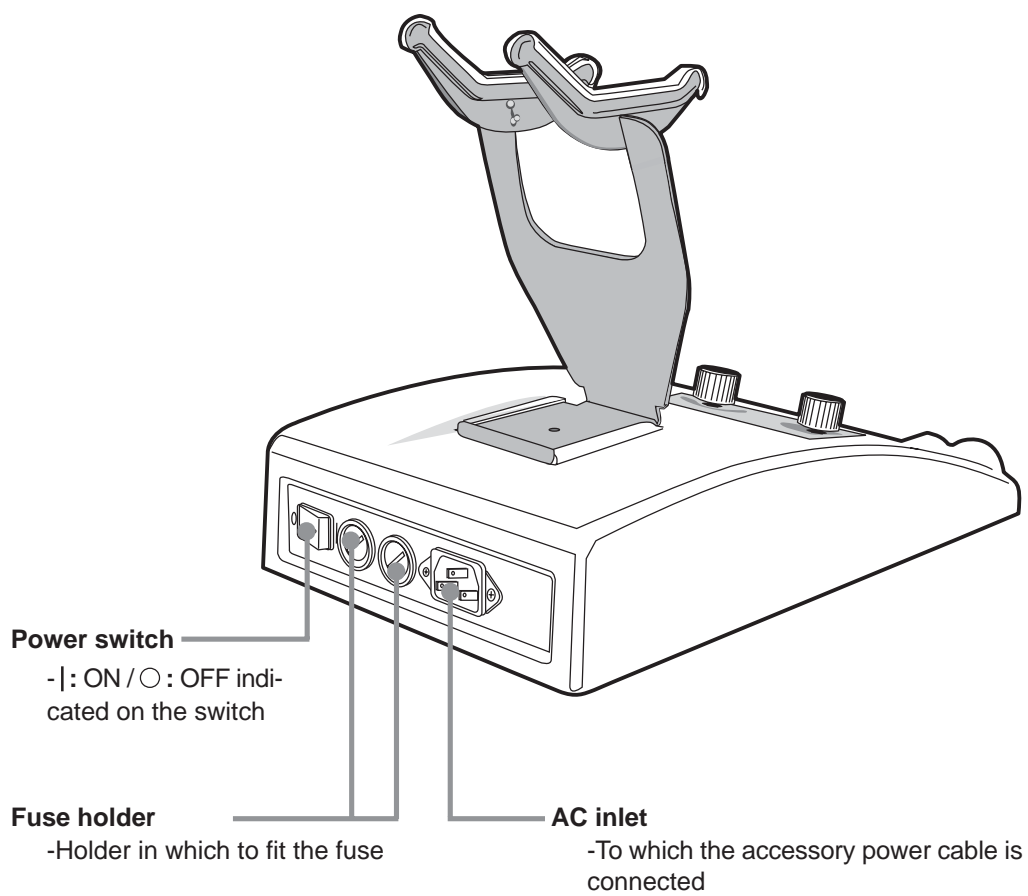
**Flash light intensity indicator**  
-For indicating the current flash light intensity

**Hi / Lo selector switch**  
-For selecting Hi or Lo level of light intensity for photography

**Hi / Lo indicator light**  
-For indicating the current light intensity for photography

**Flash light intensity selector knob**  
-Used for adjusting the flash light intensity for photography

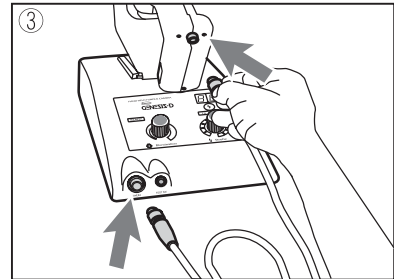
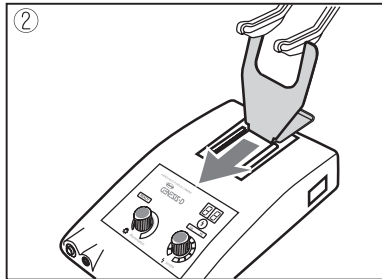
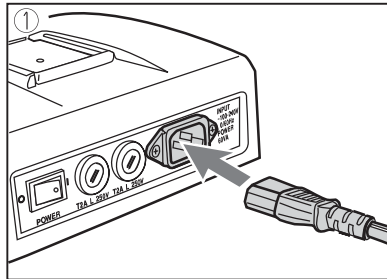




## 2. Preparation

### 2-1 Connecting

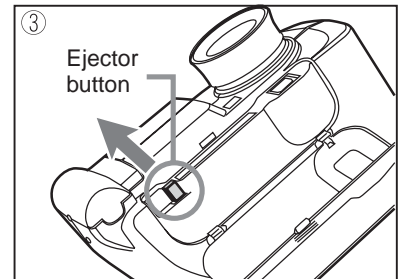
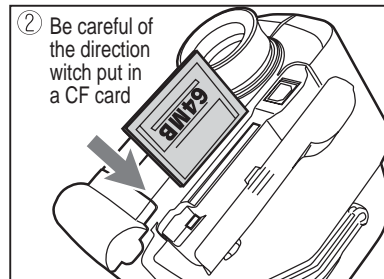
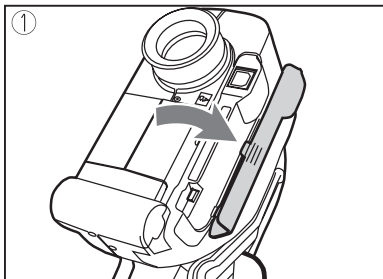
- ① Place the power supply on a stable table and then connect the power cable to the power inlet in the rear of power supply unit and the wall outlet.
- ② Fit the stay to the power supply unit.
- ③ Mount the camera unit on the stay and then connect the connector cable to the camera unit and the cable terminal of the power supply unit.



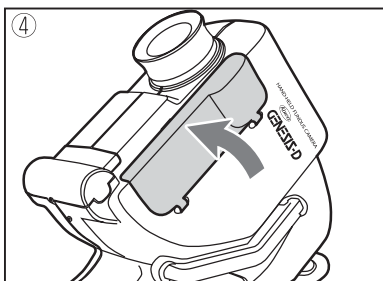
### 2-2 How to insert / take out Compact Flash memory card

#### 2-2-1 How to take out Compact Flash memory card from the camera unit

- ① Open CF card protective cover on the camera unit.
- ② Insert Compact Flash memory card into the slot to its full depth with good care about the direction in which it is to be put into the slot.
- ③ Make sure the ejector button will project. (If the card is improperly inserted, the ejector button will not project properly.)

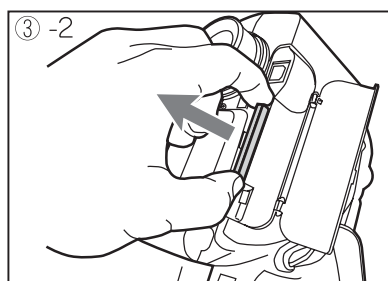
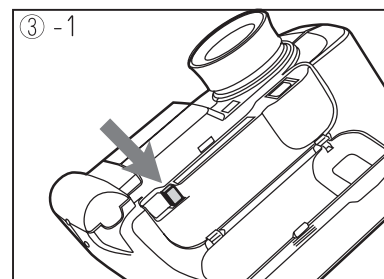
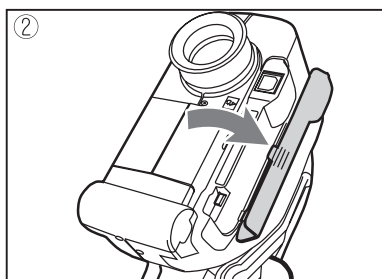
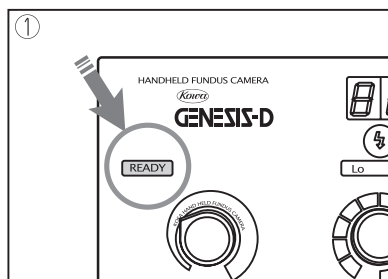


- ④ Close the CF card protective cover.



**2-2-2 How to take out Compact Flash memory card from the camera unit**

- ① Make sure that "READY" indicator light is ON or that the power supply is OFF.
- ② Open the CF protective cover.
- ③ To push in the ejector button will cause the Compact Flash memory card to project. Pull out the Compact Flash memory card from the camera unit with its protruded portion being held by your fingers.

**Note**

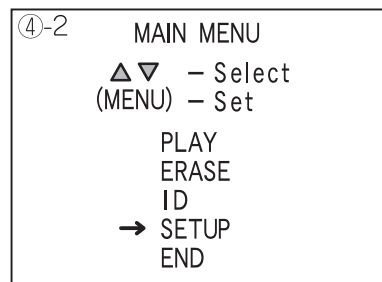
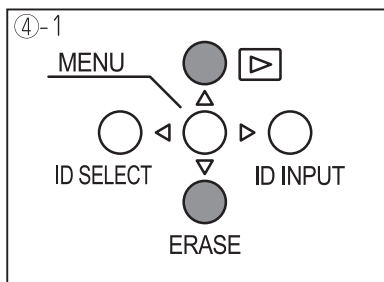
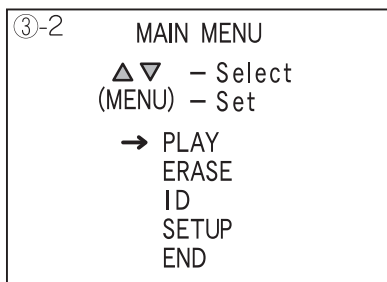
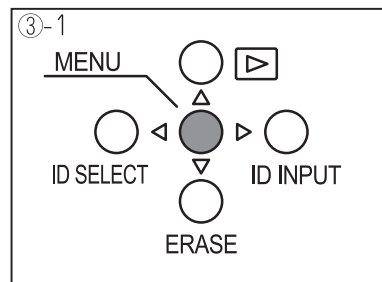
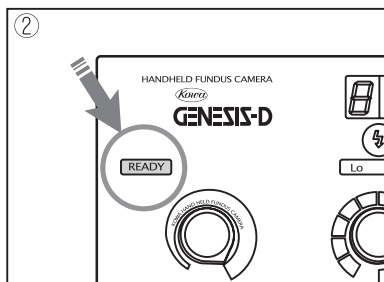
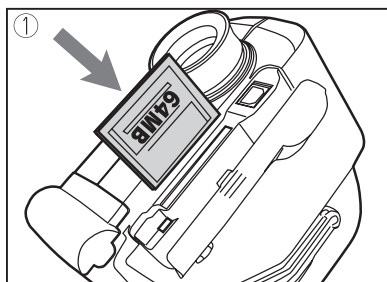
- When the power supply is ON and "READY" lamp is OFF, never pull out the Compact Flash memory card nor turn OFF the power supply with the card held in the slot. Otherwise the CF memory card's data may be destroyed.
- When the power supply is ON, never pull it out from the slot immediately after inserting Compact Flash memory card therein. Otherwise, next time Compact Flash memory card is inserted, "No Compact Flash" message will nevertheless remain on the monitor screen. In this case, it is necessary to turn OFF the power supply and then turn it ON again.

## 2. Preparation

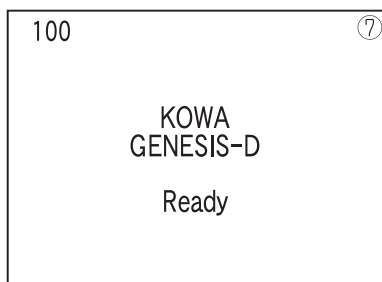
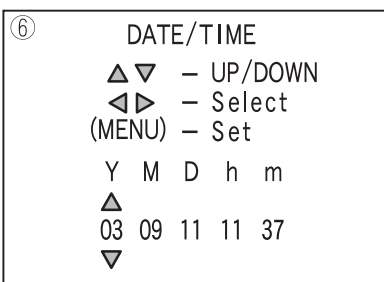
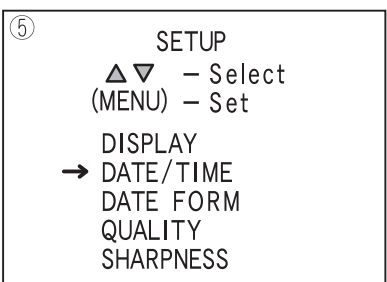
### 2-3 Initializing the camera

#### 2-3-1 Setting date / time

- ① Open CF card protective cover and insert Compact Flash memory card into the slot.
- ② Turn ON the power switch in the rear of power supply unit and then make sure the power supply's "READY" indicator light will come ON. (After turning ON the power switch, it will take some time for "READY" indicator light to come ON.)
- ③ Press MENU button to switch the LCD monitor screen to MAIN MENU where READY indicator light is OFF.
- ④ With → made to point at SETUP by △ / ▽ buttons, press MENU button to switch to SETUP screen.



- ⑤ With → made to point at DATE / TIME by △ / ▽ buttons, press MENU button to switch to DATE / TIME screen.
- ⑥ Move △ / ▽ by ◀ / ▶ buttons as far as either of them can point at a desired item and then change DATE / TIME by △ / ▽ buttons.
- ⑦ After DATE / TIME change is complete, press MENU button to switch back to SETUP screen. On this screen, with → made to point at END by △ / ▽ buttons, press MENU button to switch back to "READY" display. Now, DATE / TIME is complete.

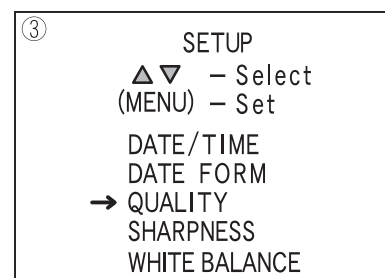
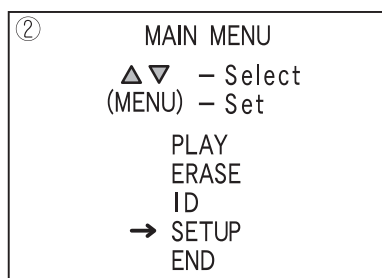
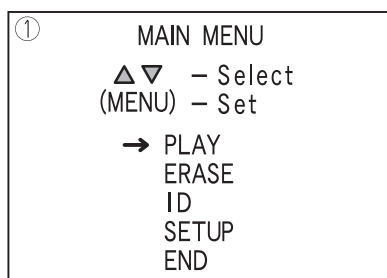


#### Range of DATE / TIME settings enabled on display screen

- Y :Denotes the Christian era which can be set in a range of 2000 to 2099.
- M :Denotes the month which can be set in a range of 01 to 12.
- D :Denotes the day which can be set in a range of 01 to 31.
- h :Denotes the time in terms of 24-hour designations which can be set in a range of 00 to 23.
- m :Denotes the minute which can be set in a range of 00 to 59.

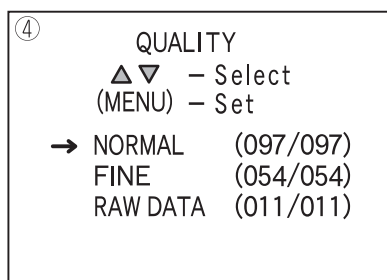
### 2-3-2 Changing the quality level of picture stored

- ① Press MENU button to switch LCD monitor screen to MAIN MENU display screen.
- ② With "→" made to point at SETUP by  $\Delta$  /  $\nabla$  buttons, press MENU button to switch to SETUP display screen.
- ③ With "→" made to point at QUALITY by  $\Delta$  /  $\nabla$  buttons, press MENU button to switch to QUALITY display screen



- ④ With "→" made to point at a desired quality by  $\Delta$  /  $\nabla$  buttons, press MENU button to finalize it.

: (Initial quality is NORMAL. A higher quality needs a longer recording time. See approximations of average picture record size and average record time in terms of picture quality in the table below.



#### Number of unexposed frames for photography

Number of unexposed frames for photography \_\_\_\_\_ NORMAL(97/97)

(The number will decrease as you go on to photograph.)

Maximum number of pictures recorded  
(The number of pictures recorded will vary depending on the capacity of Compact Flash memory card.)

NORMAL	Ordinary picture quality
FINE	High picture quality mode
RAW DATA	Non-compressed data: Pictures are recorded in bit-mapping.

Approximations of record size and record time in terms of quality level of picture stored

Quality of image	Data form	Average recorded time <sup>*1</sup>	Capacity of Compact Flash memory (The values indicated are rough approximate.)			
			32MB	64MB	128MB	256MB
NORMAL (Standard)	JPEG	2 seconds	100 frames	200 frames	400 frames	512 frames <sup>*2</sup>
FINE (high picture quality)	JPEG	4 seconds	50 frames	100 frames	200 frames	400 frames
RAW DATA (non-compressed)	Bit mapping	15 seconds	5 frames	11 frames	22 frames	44 frames

\*1 The recording time changes slightly depending on recorded objects.

\*2 The maximum number of files this camera unit can record is 512 regardless of the capacity of the card.

■ This camera unit corresponds to Compact Flash memory card TYPE I of no more than 256 megabytes, not to the same type of memory card exceeding this capacity nor to Compact Flash memory card TYPE II.

■ This camera unit is not compatible with FAT32 format. "ERR:WRONG FORMAT" will be displayed on LCD monitor screen if Compact Flash Memory card formatted in FAT32 format is used for this camera unit. Use a Compact Flash Memory card after reformatting it in FAT by Windows XP etc.

- ⑤ After the picture quality change is complete, press MENU button to switch back to SETUP screen. On this screen, with "→" made to point at END by  $\Delta$  /  $\nabla$  buttons, press MENU button to switch back to "READY" display, now picture quality change is complete.

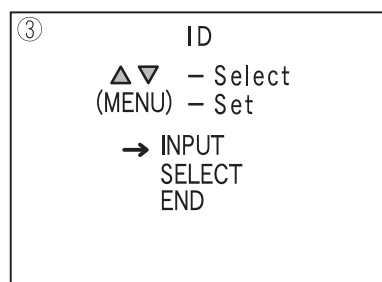
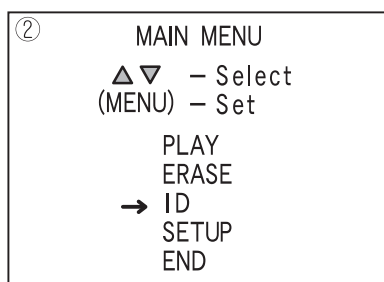
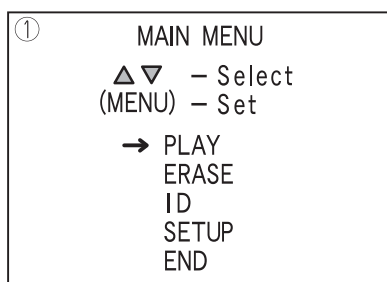


## 2. Preparation

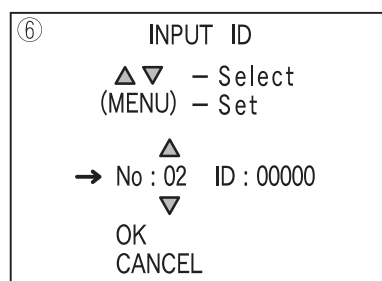
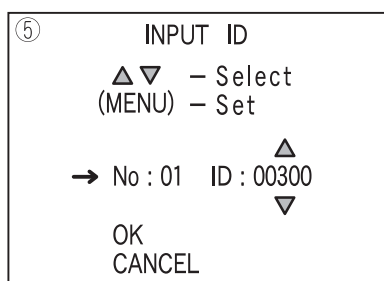
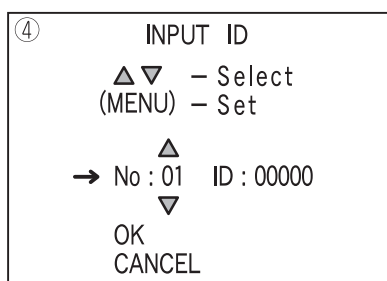
### 2-4 Inputting ID

The camera unit is capable of registering no less than ten 5-digit IDs collectively. These registered IDs will be erased when the power supply is turned OFF.

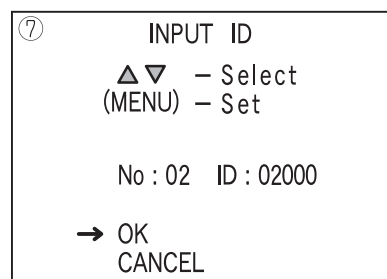
- ① Press MENU button to switch LCD monitor screen to MAIN MENU display screen.
- ② With → made to point at ID by △ / ▽ buttons, press MENU button to switch to ID display screen.
- ③ With → made to point at INPUT by △ / ▽ buttons, press MENU button to switch to INPUT ID display screen.



- ④ Make sure → is located on the left-hand side of No: \* \* and then press MENU button to display △ ▽.
- ⑤ For registering the first ID, after assuring it is No:01, shift the digit position one after another to change to a constituent digit in each digit position by △ / ▽ buttons.
- ⑥ When registering the second ID in succession, with △ ▽ made to point at No. 01 by ◀ / ▶ buttons, press △ / ▽ button to switch to No: 02. Then, in the same manner as in ⑤, change to constituent digits. For registering the third and later IDs, repeat the same steps.

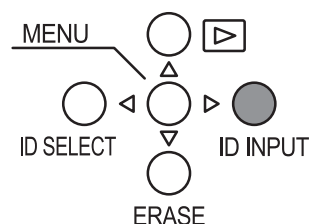


- ⑦ To end the registration of ID, press MENU button, and with → being made to point at OK by △ / ▽ buttons, press MENU button to switch to "READY" display again. Now ID entry is complete. (The ID appearing on this display screen is the one that was established when OK was selected. )



#### Short cut to INPUT ID display screen

- To take a short cut to "INPUT ID" display screen, press "▶" button on the PREVIEW or "READY" display screen.

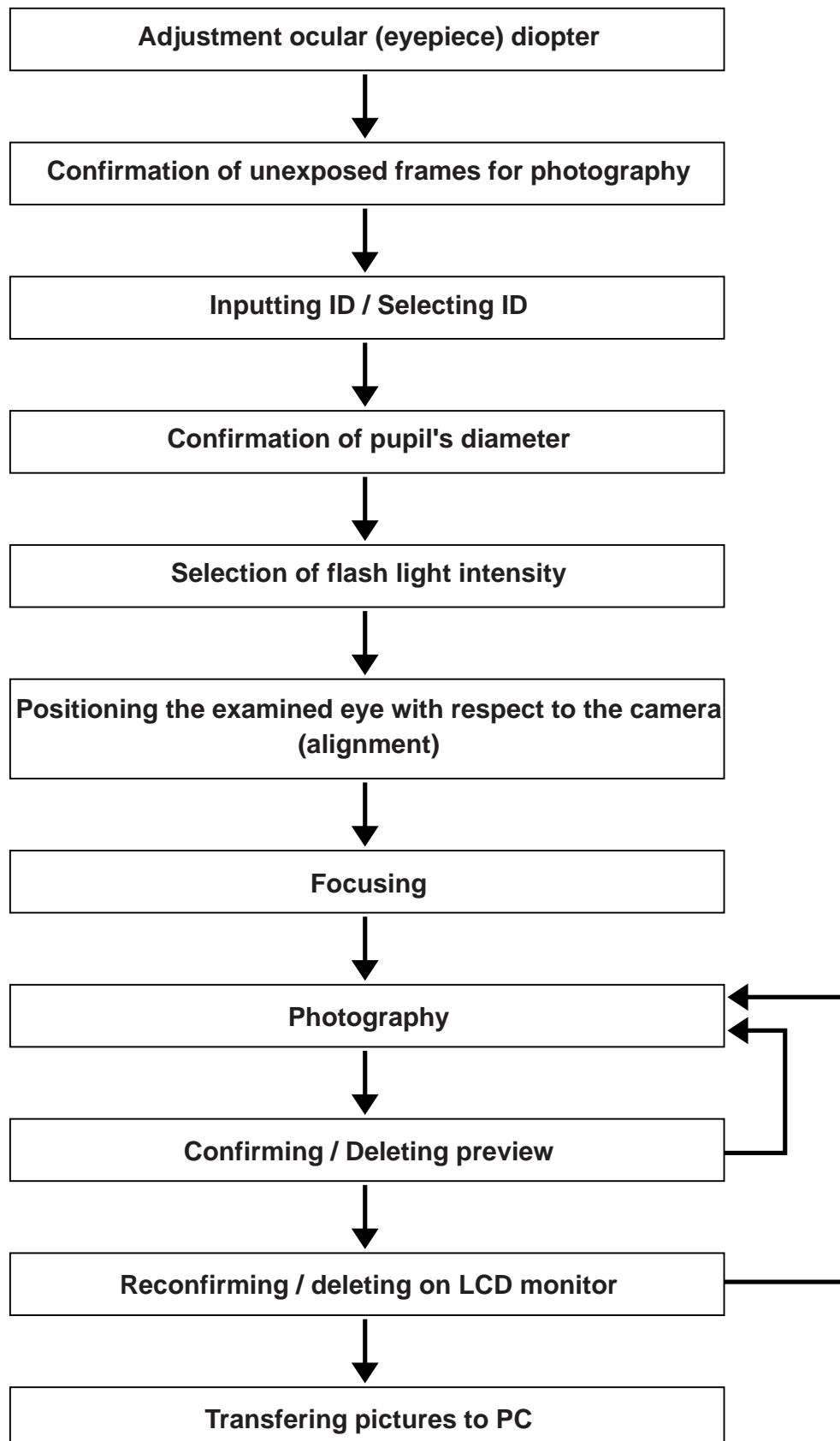


## **2-5**      **Conditioning the examined eye**

- ① Before examination, apply mydriatic (drop) to the examined eye. After the pupil of the eye is sufficiently dilated, guide the patient to the photography room.
- ② Make sure the pupil reaches satisfactory dilation level. To get an sufficiently bright picture, it is recommended that the dilated pupil has a diameter of 8 mm or more.

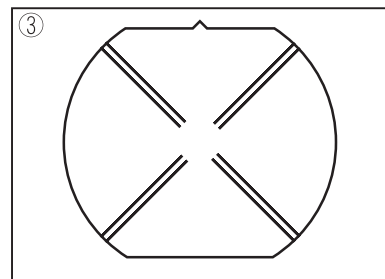
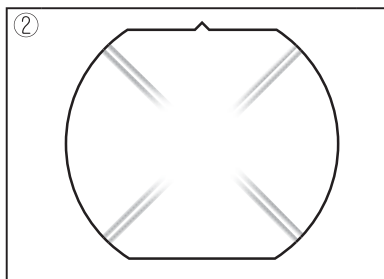
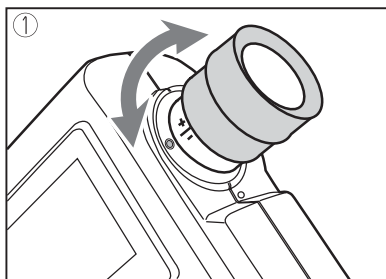
# 3. Operating procedures in color photography

## 3-1 Operation procedure chart



### 3-2 Adjusting ocular (eyepiece) diopter

After turning it counterclockwise to a full scale on the + side, slowly turn the diopter adjust ring clockwise. When reticle comes in clear sight, then stop turning it. If the diopter has been improperly selected, pictures will become out of focus. If you wear glasses, turn the ocular's (eyepiece's) rubber rest outward.



Out of focus

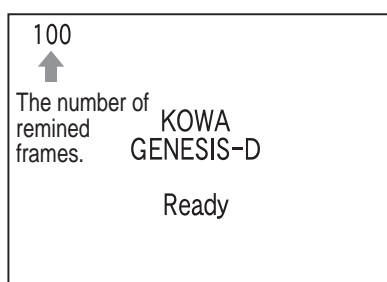
In focus

#### Note

Make sure the ocular's diopter is properly set.  
If not, pictures may become out of focus.

### 3-3 Confirming the number of unexposed frames available for photography

- ① Open the CF memory card protective cover to insert Compact Flash memory card.
- ② Turn ON the power switch in the rear of the power supply unit, and make sure that "READY" indicator light on the power supply unit is ON. (After turning ON the power switch, it takes some time for the READY indicator light to come ON.)
- ③ The number of unexposed frames remaining for photography is indicated on the upper left-hand side of LCD monitor screen. Make sure a sufficient number of unexposed frames remain for photography.  
(You can replace Compact Flash memory card by a fresh one. When replacing the card with the power supply ON, make sure READY indicator light on the power supply unit is ON before replacement. For the steps of inserting/taking out Compact Flash memory card, see "2-2 Inserting/Taking out Compact Flash memory card.")

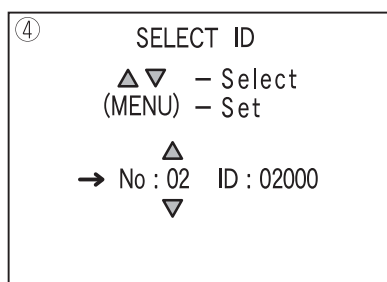
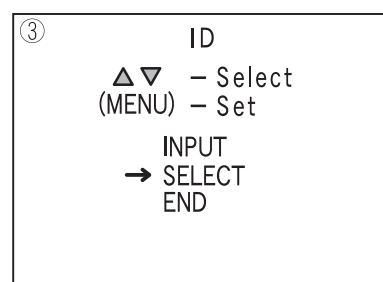
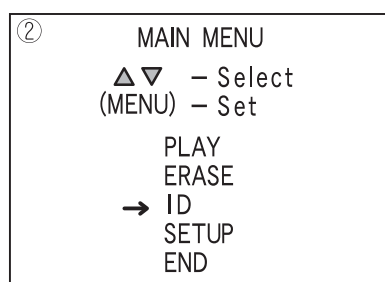
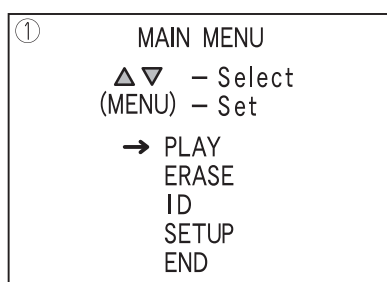


### 3. Operating procedures in color photography

#### 3-4 Inputting ID / Selecting ID

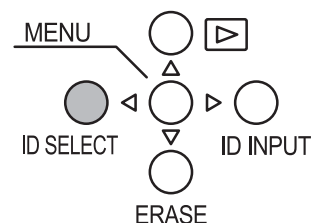
If you have not entered your ID beforehand, see "2-4 Inputting ID."

- ① Press MENU button to switch the LCD monitor screen to MAIN MENU display screen.
- ② With → made to point at ID by △ / ▽ buttons, press MENU button to switch to ID display screen.
- ③ With → made to point at SELECT by △ / ▽ button, press MENU button to switch to SELECT ID display screen.
- ④ Press △ / ▽ buttons to point at a desired patient's ID from those which have been entered beforehand. When MENU button then is pressed, the ID will be decided, switching back to "READY" display screen. Now ID selection is complete.



#### Shortcut to SELECT ID display screen

- To take a shortcut to SELECT ID display screen, press ◀ button on PREVIEW or "READY" display screen.

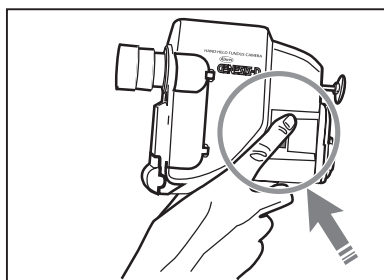
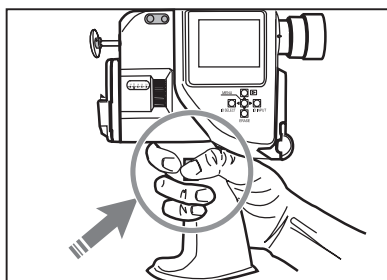


#### 3-5 Confirming the pupil's diameter

Make sure the examined eye's pupil is sufficiently dilated.

#### 3-6 How to photograph with the camera

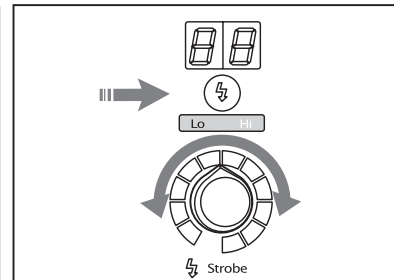
You can operate the camera with either your right or left hand. Firmly hold the camera's grip by your hand such that the shutter switch can be placed on the thumb and the focus knob on the forefinger.



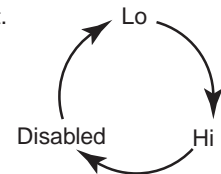
### 3-7 Selecting the flash light intensity

- On this camera unit, 28 levels of flash light intensity are available for selection.
- The flash light intensity will be indicated on the flash light intensity indicator. Normally, the flash light intensity will be set to NORMAL (level 6).
- If there is a need to correct the amount of exposure based on the dilation level of examined eye's pupil and the density of reflected light from the retina, you can select a desired level of flash light intensity by the flash light intensity select knob on the power supply unit.
- If the amount of exposure cannot be corrected by the knob only, push Hi / Lo select switch of the power supply unit to switch to "Hi" level of the Hi / Lo indicator light. Now a higher level of exposure (Levels 8 to 19) is available.
- On the other hand, the amount of exposure is too large, press the Hi / Lo select switch to disable the Hi / Lo indicator light. Now a smaller amount of exposure (Levels 0.1 to 0.9) is available.

Hi / Lo indicator light	Flash light intensity indicated	Fundus photography (std.)
Disabled	0.1	
Disabled	0.2	
Disabled	0.3	
Disabled	0.4	
Disabled	0.5	
Disabled	0.6	
Disabled	0.7	
Disabled	0.8	
Disabled	0.9	
Lo	1	
Lo	2	
Lo	3	
Lo	4	
Lo	5	
Lo	6	Subject for photography
Lo	7	
Lo or Hi indicated	8	
Lo or Hi indicated	9	Anterior segment photography standard.*
Lo or Hi indicated	10	
Lo or Hi indicated	11	
Lo or Hi indicated	12	
Hi	13	
Hi	14	



Each time you press the Hi / Lo select switch, neither Hi nor Lo will be indicated on the Hi / Lo indicator light.



\* It is assumed that an image of anterior segment is approximately 4 times its real size. Set the focus knob on the camera unit at +15D and the distance between the examined eye and the camera unit at 7 cm. When a higher magnifying power is applied in photography, turn the focus knob incrementally to the (+) side so that the camera unit can be as close to the examined eye as practicable.

#### ⚠ Caution

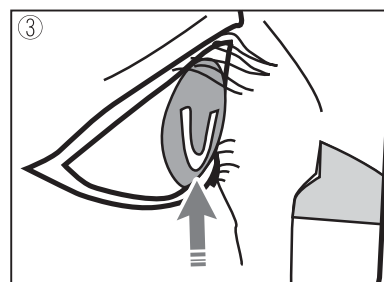
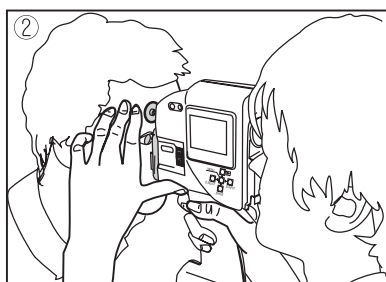
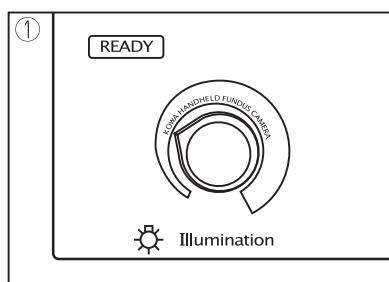
For illumination and photography, do not select any higher exposure than it is required. Otherwise, the examined eye may suffer a pain or disorder.

### 3. Operating procedures in color photography

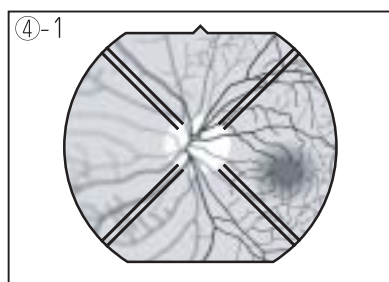
#### 3-8 Positioning the camera with respect to the examined eye (alignment)

In fundus photography, it is necessary to guide an amount of exposure necessary for photography to the fundus through the pupil. Therefore, the location of camera with respect to the examined eye is limited.

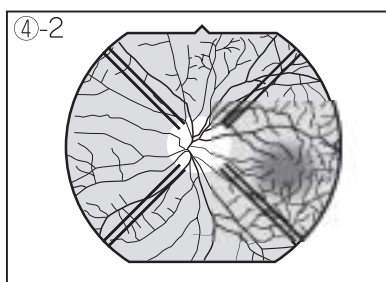
- ① Set the illumination lamp intensity select knob of the power supply unit pointing at 10 o'clock (position of "K" as in KOWA indicated along the periphery).
- ② Adjust its position while looking at the examined eye from the side of the camera unit with the forehead being set against the forehead rest such that the examined eye is about 5 mm away from the light projecting prism.
- ③ Looking at the examined eye from the side of the camera unit, make sure the illuminated image can be formed on the cornea of the examined eye.



- ④ Looking into the ocular, fine-adjust the position of the camera unit with respect to the examined eye such that illumination light is uniformly guided into the fundus to prevent a formed image from getting out of focus.



NG In focus in the right-hand half while out of focus in the left-hand half.



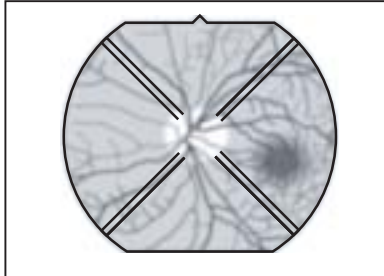
OK In focus around the periphery of image

#### ⚠ Caution

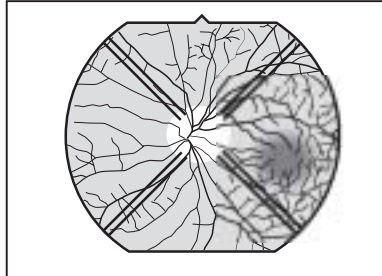
Operate the fundus camera with good care such that patient's eye, nose and face do not touch any part of the camera other than the forehead rest.

### 3-9 Focusing

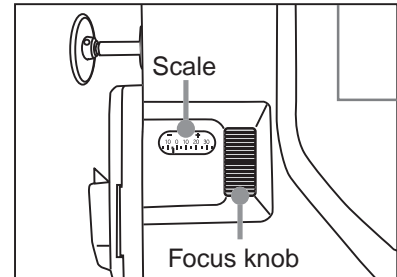
Looking into the ocular, turn the knob upward and downward so that reticle and targeted part of fundus each can be in focus. (Looking into the ocular, check an image for its brightness. If improper, compensate it by adjusting the brightness by the illumination lamp intensity select knob.)



NG Reticle is in focus but image of fundus is out of focus.



OK Reticle and image of fundus each are in focus.



#### Note

The scale on the cover on the left-hand side of the camera unit indicates the examined eye's diopter. When photographing the anterior segment, set a focus on the (+) side beforehand and then fine-adjust it on the (-) side until a subject for photography is in focus.

### 3-10 Photograping

Photography is enabled by pressing the shutter switch downward. (Note that the shutter switch will operate only when pressing it downward, instead of pressing it in or upward.)

- To maintain the shutter switch pressed downward will enable continuous photography. But when an image is being recorded on the camera, the shutter will not click (prohibiting photography). (For the amount of time required to record an image, see "2. Preparation 2-3-2 Changing the quality level of picture recorded.")
- When the optional foot switch is connected to the camera unit, the shutter will click by either the shutter switch on the camera unit or the optional foot switch.

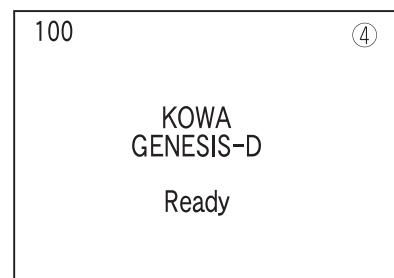
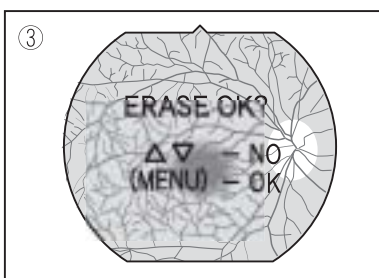
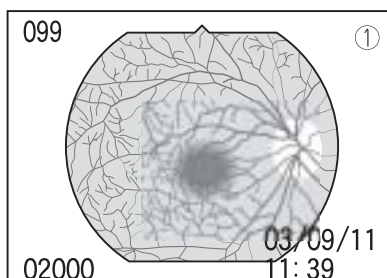
#### Note

The shutter will not click when READY indicator light is OFF, more specifically while the menu display is ON, USB terminal is in connection, or recorded images are being reconfirmed in PLAY mode.

### 3-11 Confirming/deleting the preview

Immediately after a picture was taken, it can be displayed on the LCD monitor screen for your confirmation.

- ① When a picture is taken, it will be displayed on the LCD monitor screen on the camera unit simultaneously.
- ② To delete a picture after confirmation, press ERASE button with the picture being displayed on the LCD monitor screen.
- ③ A message "ERASE OK?" appears on the picture on the LCD monitor screen. For deletion, press MENU button on the camera unit. To cancel deletion, press either "△" button or "▽" button.
- ④ When deletion is complete, LCD monitor screen will be switched to "READY" display. If deletion is canceled, it will be changed to the display as in ①.





### 3. Operating procedures in color photography

#### 3-12 Reconfirming/deleting pictures on LCD monitor screen

A picture taken can be reconfirmed on the LCD monitor screen on the camera unit.

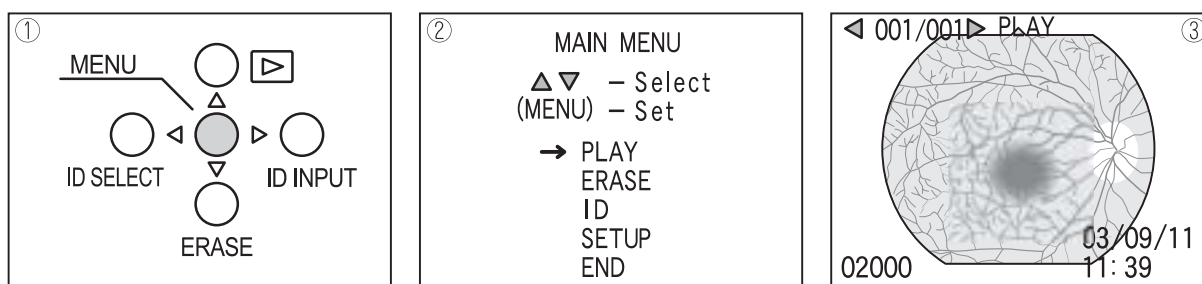
When reproduced, the pictures are shown in an ascending order of dates photographed.

You can also delete the pictures one by one from PLAY display screen.

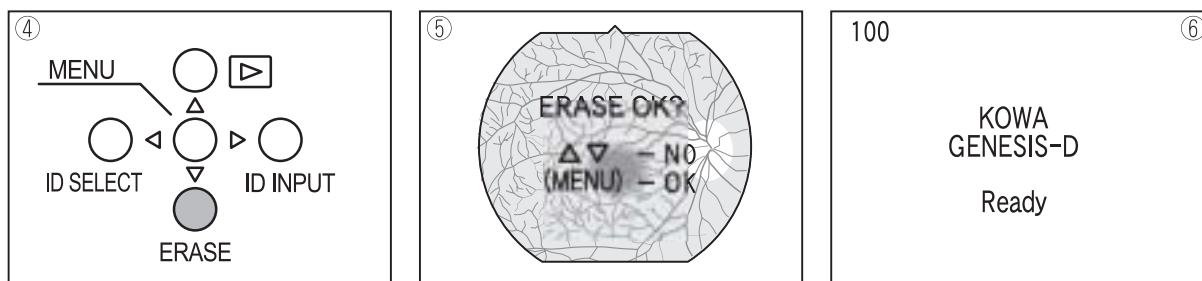
(To delete pictures collectively, see "4-1 How to delete pictures at a time.")

- ① Press MENU button to switch the LCD monitor screen to MAIN MENU display screen.
- ② To select PLAY, press MENU button by pressing  $\Delta$  /  $\nabla$  buttons to make  $\rightarrow$  point at PLAY, to switch the LCD monitor screen to PLAY display screen.
- ③ Select pictures by  $\triangleleft$  /  $\triangleright$  buttons.

(A preceding picture is displayed by  $\triangleleft$  button and the next one by  $\triangleright$  button.)

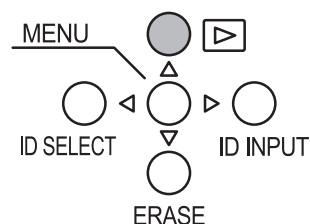


- ④ To delete a picture taken, press ERASE button with the picture being displayed on the LCD monitor screen.
- ⑤ A message "ERASE OK?" appears on the picture on the LCD monitor screen. For deletion, press MENU button. To cancel deletion, press either  $\Delta$  or  $\nabla$  button.
- ⑥ To exit Play display screen, press MENU button to switch to READY display screen.



#### Shortcut to PLAY display screen

- To take a shortcut to PLAY display screen, press  $\Delta$  (  $\triangleright$  ) button when you are confirming the PREVIEW or on Ready display screen.



### 3-13 How to transfer pictures to PC

There are two ways to transfer pictures to PC.

- One method is to take out Compact Flash memory card, and then transfer recorded pictures to PC via a commercially available Compact Flash memory card reader or adapter connected to PC.
- The other method is to connect the camera unit to PC by USB cable and transfer the image in Compact Flash memory card to PC.

This paragraph describes how to connect the camera unit to PC by USB cable.

#### 3-13-1 How to connect the camera unit to PC by USB cable.

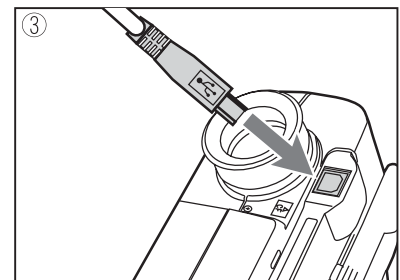
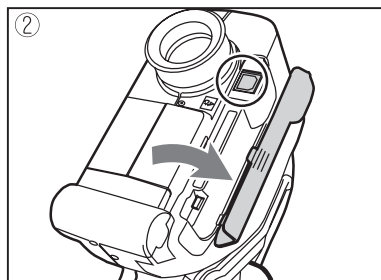
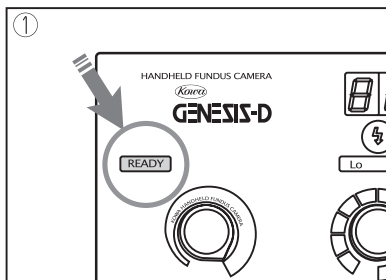
This camera unit can serve as Compact Flash memory card reader if it is connected to PC via USB cable (separately and commercially available as accessory).

#### Note

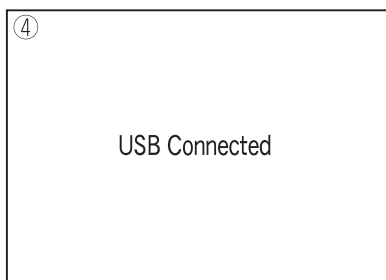
Operating system installed on PC connected to this camera unit is Windows ME / 2000 / XP.

(If your PC has a different type of operating system, it is recommendable to see "2-2 How to insert/take out Compact Flash memory card" and use commercially available Compact Flash memory card or adapter.

- ① Make sure READY indicator light on the power supply unit is ON.
- ② Open CF memory card protective cover on the camera unit.
- ③ Connect one end of commercially available USB cable (Type A-B) to USB terminal of the camera unit and the other end thereof to PC. (READY indicator light is OFF at this stage.)



- ④ A message "USB Connected" appears on the LCD monitor screen and a new removable disk is recognized on the PC. (This will be installed on PC automatically.)



#### 3-13-2 File Name

The file name is managed in 8-digit numbers.

□□□□□■ ■ ■ .jpg

□□□□□ : The first 5-digit section denotes ID number.

■ ■ ■ : The last 3-digit section denotes a serial picture number under the ID above.

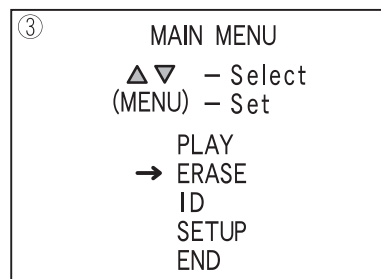
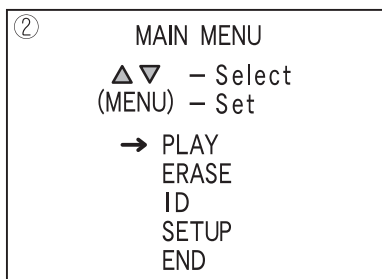
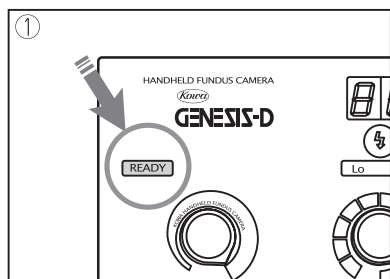
Example:

The file Name 12345012.jpg denotes a picture with serial picture number 12 of a patient with ID 12345.

## 4. Other functions

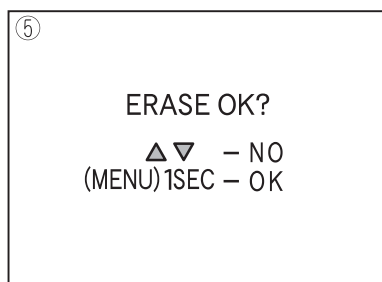
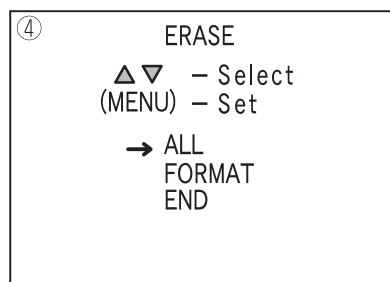
### 4-1 How to delete pictures at a time

- ① Make sure READY indicator light on the power supply unit is ON.
- ② Press MENU button to switch the LCD monitor screen to MAIN MENU display screen.
- ③ With → made to point at ERASE by △ / ▽ buttons, press MENU button to switch to ERASE display screen.



- ④ With → made to point at ALL or FORMAT by △ / ▽ buttons, press MENU button.
- ⑤ A message "ERASE OK?" appears on the display screen. To delete the picture, maintain MENU button pressed at least one second. (After a message "Deleted" appears on the display screen, automatically READY display screen appears again.)

To cancel deletion, press △ or ▽ button to bring the display back to ERASE display screen.



### Note

If you delete a number of pictures collectively, the more pictures in Compact Flash memory card, the longer time it will take to do so.

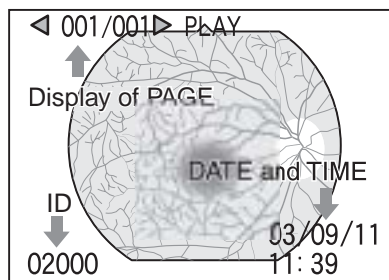
The deleted number of pictures cannot be returned. Be fully careful when you delete files.

#### ALL and FORMAT

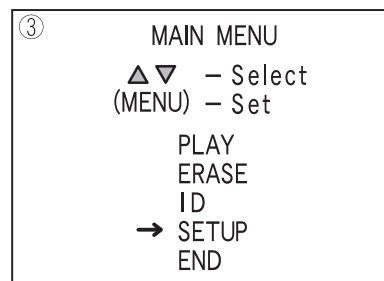
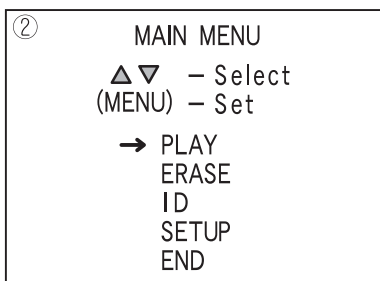
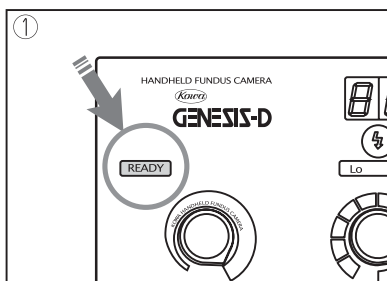
- ALL : Used to delete all pictures with IDs which have been currently selected
- FORMAT : Used to delete all pictures in Compact Flash memory card regardless of what IDs are currently selected
- END : Used exit ERASE display screen if you cancel deletion.

## 4-2 Display / non-display of ID, date and page on LCD monitor screen

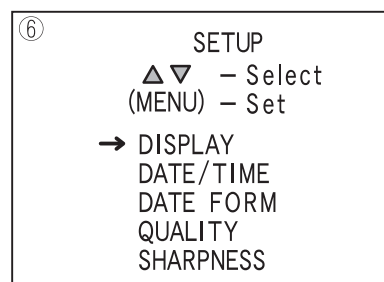
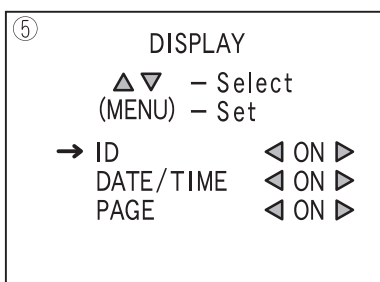
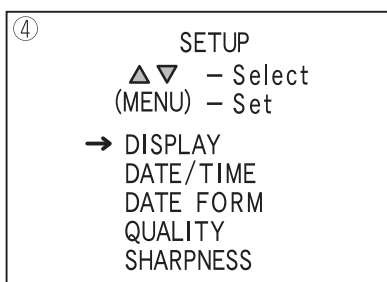
To display pictures on the LCD monitor screen (review / reproduction), select display / non-display of ID, date and page.



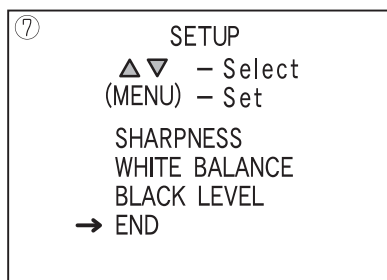
- ① Make sure READY indicator light on the power supply unit is ON.
- ② Press MENU button to switch the LCD monitor screen to MAIN MENU display screen.
- ③ With → made to point at SETUP by △ / ▽ buttons, press MENU button to switch to SETUP display screen.



- ④ With → made to point at DISPLAY by △ / ▽ button, press MENU button to switch to DISPLAY screen.
- ⑤ With → made to point at ID, DATE / TIME, PAGE by △ / ▽ buttons, press ◀ / ▶ buttons. to select ON / OFF.
- ⑥ After settings are complete, press MENU button to switch back to SETUP button.



- ⑦ With → made to point at END by △ / ▽ buttons, press MENU button to switch back to READY display screen and exit.



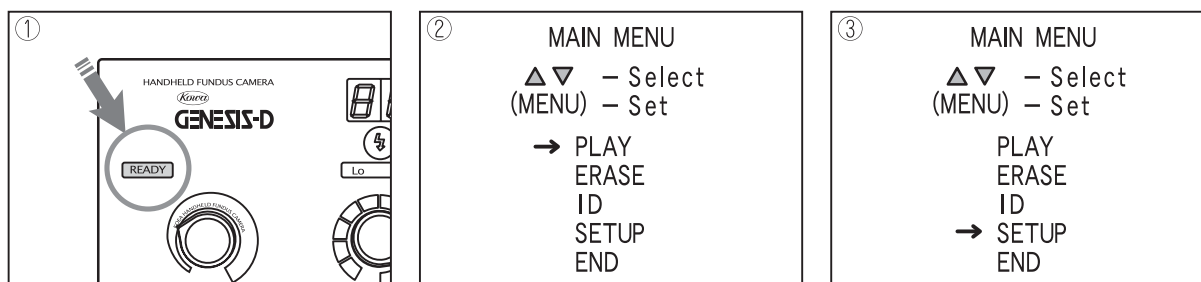
## 4. Other functions

### 4-3 Selecting a desired type of date description

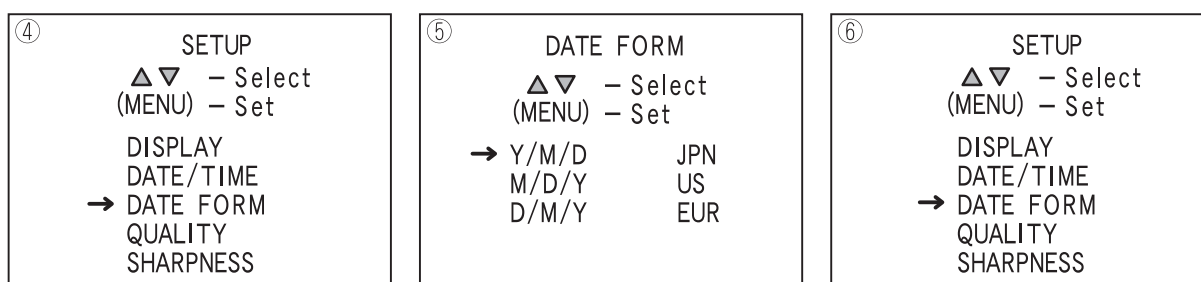
The camera unit has three types of date descriptions: "Year / Month / Day," "Month / Day / Year," and "Day / Month / Year."

This paragraph describes how to change the type of date description. The initial date description is set to "Year / Month / Day."

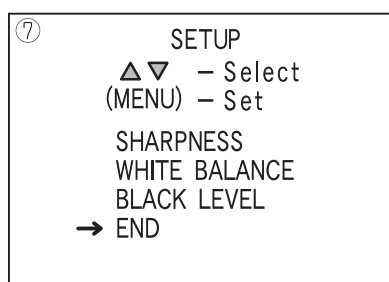
- ① Make sure READY indicator light on the power supply unit is ON.
- ② Press MENU button to switch the LCD monitor screen on the camera unit to MAIN MENU display screen.



- ③ With → made to point at SETUP by ▲ / ▼ buttons, press MENU button to switch to SETUP display screen.
- ④ With → made to point at DATE FORM by ▲ / ▼ buttons, press MENU button to switch to DATE FORM.
- ⑤ Press ▲ / ▼ buttons to make → point at a desired type of description.



- ⑥ Press MENU button to switch to SETUP display screen.
- ⑦ With → made to point at END by ▲ / ▼ buttons, press MENU button to switch to READY display screen.



# 5. Troubleshooting

This paragraph describes a remedy when abnormality occurs on the camera unit. In case any abnormality should occur on the camera unit, check the following before you contact your dealer where you purchased it.

Be sure to turn OFF the power supply before repair.

Trouble	Description of trouble	Remedy
To press the shutter switch will not cause the shutter to click.	MENU display screen has been selected on the LCD monitor screen.	Exit MENU display screen by control button to switch to READY display screen.
	Connector cable is improperly connected	Connect the connector cable properly.
	Compact Flash memory card has not been inserted in the slot.	Insert Compact Flash memory card. See "2-2 How to insert/take out Compact Flash memory card"
	No unexposed frame remains on the Compact Flash memory card	Replace Compact Flash memory card by a fresh one or delete unwanted pictures from it. See "3-12 Reconfirming/deleting pictures on LCD monitor screen" and "4-1 How to delete pictures at a time."
	Shutter switch has been pressed in or upward.	To press in or press upward the shutter switch will disable shutter-clicking. Pressing downward only will enable shutter-clicking.
	Message "BUSY" appears on the LCD monitor screen.	A preceding picture is being recorded. Wait till the message "BUSY" comes OFF. Recording time will vary depending on which quality of picture (to be saved) you select. See "2-3-2 Changing the quality level of picture recorded"
	USB cable has been in connection.	Remove USB cable.
READY indicator light is OFF.	READY indicator light is OFF.	See "READY indicator light is OFF" described below.
	MENU display screen has been selected on the LCD monitor screen.	Exit MENU display screen by control button to switch to READY display screen.
	Connector cable is improperly connected	Connect the connector cable properly.
	Compact Flash memory card has not been inserted in the slot.	Insert Compact Flash memory card. See "2-2 How to insert/take out Compact Flash memory card"
	No unexposed frame remains on the Compact Flash memory card	Replace Compact Flash memory card by a fresh one or delete unwanted pictures from it. See "3-12 Reconfirming/deleting pictures on LCD monitor screen" and "4-1 How to delete pictures at a time."

## 5. Troubleshooting

Trouble	Description of trouble	Remedy
READY indicator light is OFF.	Message "BUSY" appears on the LCD monitor screen.	A preceding picture is being recorded. Wait till the message "BUSY" comes OFF. Recording time will vary depending on which quality of picture (to be saved) you select. See "2-3-2 Changing the quality level of picture recorded"
	USB cable has been in connection.	Remove USB cable.
Flash lamp for photography does not come ON.	Flash lamp is improperly fitted.	Properly fit the flash lamp. See "6. Maintenance and inspection."
	The flash lamp is clouded in white.	Replace the flash lamp by a new one. See "6. Maintenance and inspection."
	The fuse has run out.	Replace the fuse by a new one. See "6. Maintenance and inspection."
	Flash light intensity indicator on the power supply unit is set to 0.1.	If the value is set to of 0.1, the amount of exposure is so low that the flash light may look as if emitting no light. Set a proper amount of exposure for photography.
Illumination lamp will not come ON.	LED unit is improperly mounted.	Properly mount LED unit. See "6. Maintenance and inspection."
When looking into the ocular, nothing is seen.	Lens is covered by lens protective cap.	Remove the cap.
A shadow of white dot appears in the identical location in a series of pictures taken.	Dust deposits on the objective lens.	Clean the objective lens. See "6.Maintenance and inspection."
	Objective lens is fouled by tear etc.	Clean the objective lens. See "6.Maintenance and inspection."
	Examined eye's eyelashes are in the way.	Keep eyelashes out of the way in the pupil.
	Light projecting prism is fouled.	Clean the light projecting prism. See "6. Maintenance and inspection."
Upper part of picture taken darkens.	The camera unit is located too away from the examined eye.	Re-align the fundus camera properly with respect to the examined eye.
Lower part of picture taken darkens.	The camera is too close to the examined eye.	Re-align the fundus camera properly with respect to the examined eye.
A shadow of dark dot appears in the identical location in a series of pictures taken.	Dust deposits inside of the camera.	Contact your dealer where you purchased it for cleaning.
ID does not appear on the LCD monitor screen.	Neither PREVIEW nor PLAY display screen has been selected.	ID will be indicated on -PREVIEW or PLAY display screen only.
	ID/OFF has been selected from DISPLAY items on the SETUP display.	Select ID/ON from DISPLAY items on the SETU display Instead.

Trouble	Description of trouble	Remedy
Page will not be indicated on PLAY display.	PLAY display has been selected.	PAGE will be indicated on PLAY display only.
	PAGE / OFF has been selected from DISPLAY items on SETUP display screen.	Select PAGE / ON from DISPLAY items on the SETUP display screen instead.
DATE will not be indicated on the LCD monitor screen.	Neither PREVIEW nor PLAY display has been selected.	ID will be indicated on PREVIEW or PLAY display screen only.
	DATE / TIME-OFF has been selected from DISPLAY items on the SETUP display screen.	Select DATE / TIME-ON from DISPLAY items on the SETUP display screen instead.
Picture taken will not be displayed in proper (ascending) order on PLAY display screen.	Date and time has not been properly set.	On PLAY display, pictures taken will be displayed in an ascending order of date/time photographed. If wrong date and time were entered, they will not be displayed in right serial order. Set correct date from DATE / TIME items on the SETUP display screen.
Flash light intensity is indicated in "Cd" on the power supply unit.	Connector cable has been disconnected.	Connect the connector cable.
"ERR:WRONG FORMAT" will be displayed on LCD monitor screen.	Compact Flash Memory card is formatted in FAT32 format.	This camera unit is not compatible with FAT32 format. Use a Compact Flash Memory card after reformatting it in FAT by Windows XP etc.
"No Compact Flash" is displayed on the LCD monitor screen.	The Compact Flash is not inserted correctly.	Insert a Compact Flash card correctly.
"Card is full" is displayed on the LCD monitor screen.	The remaining number of files which can be recorded is 0.	Delete unnecessary files or insert another Compact Flash which is not full.
"ERR:Root is full" is displayed on the LCD monitor screen.	The number of files in the Compact Flash is over 512.	Delete unnecessary files or insert another Compact Flash which is not full.
"ERR:Broken File" is displayed on the LCD monitor screen.	The Compact Flash is removed or the camera power is turned off when the READY indicator light is off while the camera power is on.	Files may be damaged if Compact Flash is removed or the camera power is turned off when the READY indicator light is off while the camera power is on. Keep in mind that the damaged files cannot be recovered.
"ERR:Cannot Decode" is displayed on the LCD monitor screen.	Files recorded by a camera other than this camera unit are contained in the Compact Flash.	Delete the files recorded by a camera other than this camera unit, or format the Compact Flash. If this still does not solve the problem, the Compact Flash may be damaged. Replace the Compact Flash with a new one.



# 6. Maintenance and Inspection

Because fundus camera is a precision instrument, picture quality may depend on how well your daily maintenance and inspection have been conducted. To use the product properly and safely, it is recommendable to read these items carefully.

## 6-1 Daily inspection

- 1) After photography is complete, be sure to turn OFF the power switch and replace the objective lens cap.
- 2) Care must be used to protect the objective lens and the light projecting prism against dust, fingerprints, teardrops and so on.

Be sure to check objective lens and light projecting prism for any foul before starting photography for the day.

- 3) If fouled, clean camera unit, power supply unit and forehead rest with soft cloth. If stubbornly fouled, apply diluted neutral detergent to them. If applied to them, chemical or solvent such as thinner and benzene will degrade, deform the objective lens and light projecting prism or peel off their paint.
  - ① Wipe off their exterior with soft cloth which was moistened with water and whose moisture was then tightly squeezed off.
  - ② Softly wipe off the LCD monitor screen with soft cloth like gauze because it is liable to suffer damage.
  - ③ If stubbornly fouled, wipe it off with soft cloth which was moistened with neutral detergent diluted by water or luke-warm water and whose moisture was then tightly squeezed off.
- 4) If there is no need to use the fundus camera for a long period of time, keep the power cable unplugged from the wall outlet.

### ▶ Note

- If all of a sudden, the fundus camera that has been stored in a cool room should be moved to a warm room, the objective lens or other internal lens may be misted. In this case, allow some time for mist to disappear from them. Otherwise, pictures taken may be out of focus.
- If lens is repeatedly misted, it may become moldy. In this case, contact your dealer where you purchased the fundus camera for overhaul.

### ⚠ Caution

Do not wipe off the exterior of the fundus camera with solvent such as benzene, alcohol, thinner and ether that may cause discoloration and deformation.

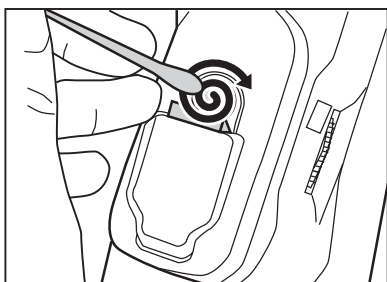
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## 6-2 Inspecting/cleaning objective lens and light projecting prism

A shadow of white maybe reflected to the same place of the picture when objective lens and light projecting prism were dirty with the fingerprint. Clean a lens in the following procedure.

- ① Lightly wipe in a circular motion the objective lens and light projecting prism from their center little by little to their outer side using cotton swab slightly moistened with a mixture (1:1) of absolute alcohol and ether.
- ② If even the dirt should resist the mixture, you may do the job by slightly wiping them around with a cotton swab slightly moistened this time with water.

After going through these steps, thoroughly wipe them again with this mixture. For stubborn dirt still existing on them, contact your dealer where you purchased the fundus camera.

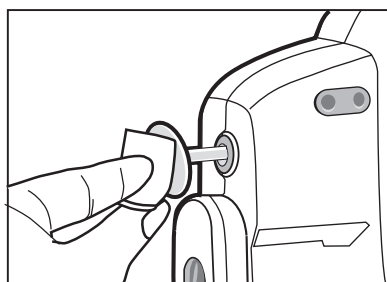


### Note

- If the objective lens should be wiped hard with dust depositing on it, it may suffer damage.
  - Do not use chamois leather or silicone cloth.
  - Be very careful about handling the mixture because it is liable to evaporate or catch fire.
- 

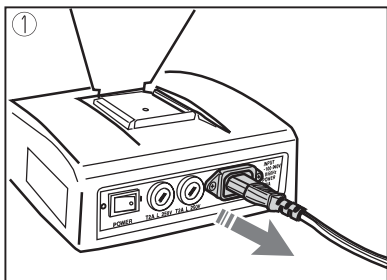
## 6-3 Cleaning/disinfecting the forehead rest

Every time photography is complete for one patient, lightly wipe the forehead rest with soft cloth slightly moistened with ether beforehand for photography of another patient to come.

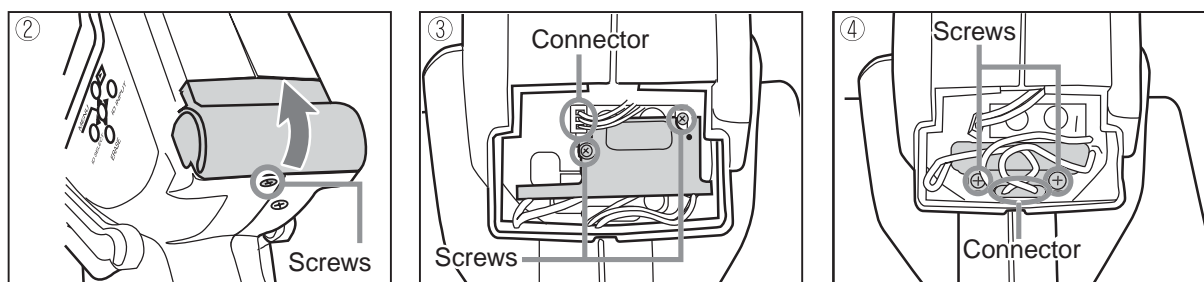


## 6-4 Replacing electric flashlight tube by a new one

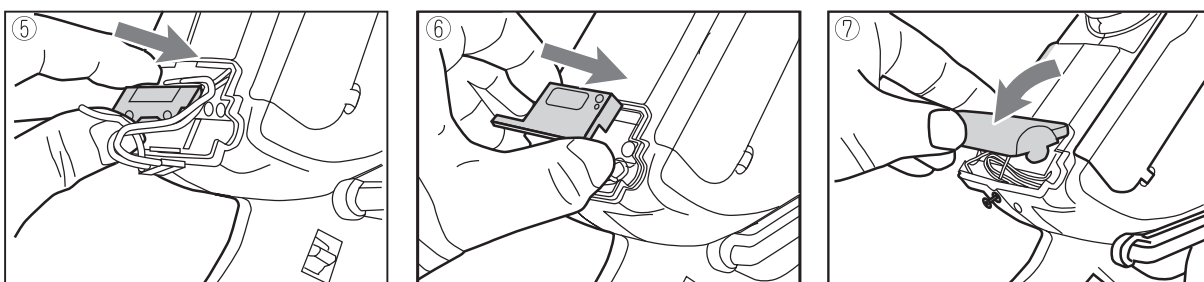
- ① Unplug the power cable from the wall outlet with the power supply OFF.



- ② For removal, loosen screws for fitting the light supply protective cover by ⊕ screw driver.
- ③ Remove the connector and then loosen screws of two places indicated in drawing by ⊕ screw driver to remove LED unit.
- ④ Flash lamp unit will come into sight. Loosen screws of two places by ⊕ screw driver indicated in drawing to remove the connector.



- ⑤ Connect the connector to a new flash lamp unit and fit it by ⊕ screw driver in reverse order of removal while being careful about the direction in which it is to be fitted.
- ⑥ Fit LED unit which was removed in ③, by ⊕ screw driver in reverse order of removal and then connect the connector to it.
- ⑦ Mount the light source unit and then tight-screw it.



### Note

- Remove and fit the connectors of the flash lamp unit and LED unit in a straight line.
- Push in the connectors of the flash lamp unit and LED unit to their full depth.
- When fitting flash lamp unit, LED unit and light source protective cover, care must be used not to get their connector cables pinched in between.
- Care must be used not to touch the flash lamp with bare hand. Otherwise, greasy substance on your finger may transfer to the surface of the lamp, which will burn by heat resulting in a shorter service life.

### Warning

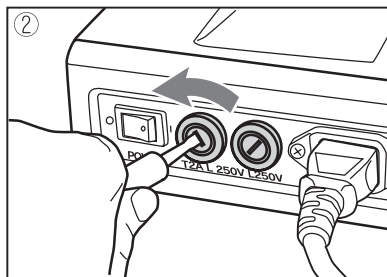
Before replacing flash lamp unit, turn OFF the power switch and remove unplug the power cable from the wall outlet to avoid electrical shock.

### Caution

Do not replace Flash lamp unit immediately after use.  
Otherwise, the hot surface of the Flash lamp may burn your finger. Allow at least 30 minutes for the lamp to cool off before replacement.

## 6-5 Replacing fuse by a new one

- ① Plug the power cable from the wall outlet with the power supply OFF.
- ② Turn counterclockwise the screws of the fuse holder cover on the power supply unit to take out the fuse.
- ③ After replacing the fuse, close the fuse holder cover. Confirm the capacity and type indicated on it before fitting.



### ⚠ Warning

Before replacing the fuse, turn OFF the power switch and unplug the power cable from the wall outlet to avoid electrical shock.

Use the designated accessory fuse. Otherwise, there may occur a fire resulting in malfunction.

## 6-6 Replenishing consumables

Designated order numbers for following items:

Consumables	Order number
Flash lamp unit	K9L-FU51
Fuse	
Dust protective cover	K9L51#12

Optional items

	Type name
Foot switch	VK-FS2
Indirect ophthalmoscope holder	K9L-LH51
Trunk case	
CF card / USB cable set	K9L-MC51

## 6-7 Regular inspection

In order to use this instrument safely for a long time, we recommend that you carry out a regular inspection. Consult your Kowa dealer where you purchased this instrument for details and cost of the inspection.

## 7. Specifications

Angle of field	Horizontal 30° / Vertical 25°
Working distance	5 mm (between the top of cornea of examined eye and prism)
Effective dioptic range of focusing	-15 m <sup>-1</sup> (D) to +35 m <sup>-1</sup> (D)
Range of eyepiece correction	-8 m <sup>-1</sup> (D) to +5 m <sup>-1</sup> (D)
illumination	LED
illumination	Xenon flash lamp
Record media	Compact Flash memory card (TYPE 1)
Output terminal	USB (1.1) terminal (B connector) (Corresponding operating system: Windows ME / 2000 / XP)
Input voltage	100 - 240 V a.c. (50 Hz / 60 Hz)
Power supply input	60 VA
Electromagnetic compatibility	IEC 60601-1-2 (1993)
Dimensions (camera unit)	74.5 mm (W) × 197 mm (D) × 278.5 mm (H)
Weight (camera unit)	1070 grams
Dimensions (power supply unit)	180 mm (W) × 300 mm (D) × 230 mm (H)
Weight (power supply unit)	1930 grams



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