



KOWA HAND-HELD FUNDUS CAMERA

GENESIS™

INSTRUCTION MANUAL



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Technology for Lifescience

Introduction

●
Thank you for purchasing the Kowa Genesis Hand-Held Fundus Camera.

This instruction manual provides practical information about the operations of your Genesis, particularly for color fundus photography.

Keep this manual by your side for quick reference.

●

Precautions

General Precautions

- Protect the camera from strong shocks.
- The camera should be stored in a place free from high temperature and humidity, dust and direct sunlight.
- The camera is designed to be operated in a dimly lit (5 lux) room, say, where a newspaper can be barely read.
- When the camera has not been used for long periods, be sure to check the operational condition of the camera before using it.
- It is absolutely necessary to keep the lens surfaces clean. Stains and scratches on the objective lens surface may cause white blur-like artifacts on the pictures.
- Do not leave the camera mount uncovered while the camera back is not in use. Whenever the camera is expected not to be used for a long period of time, take the film out of the camera back.
- Do not attempt to repair, adjust, or modify the inside of the power supply. It may result in unexpected hazards. All maintenance including after-sales service, with the exception of consumable parts, should be entrusted to your authorized Kowa representative or Kowa.
- Do not turn on the power if a severe shock or any other damages are caused to the camera unit, or it is dropped.
 - Contact your distributor.
- To avoid shock hazards, unplug the camera unit from the outlet before performing maintenance or cleaning.
- Never attempt to repair, adjust or modify the inside of the camera unit. It may result in unexpected hazards.
- The modifications by a user is prohibited by Section 7 of the "Operational (Safety and Accident Prevention) Considerations for Hospital Grade Electrical Equipment", the 495th publication of pharmaceutical information, by the Pharmaceutical Affairs Bureau of the Ministry of Health and Welfare dated on June 1, 1972.
- Contact Kowa Company, Ltd. or your authorized Kowa distributor in the event of failure.
- Kowa Company, Ltd. shall not be liable for the following.
 - (1) Failure or damages occurred by modifications, repair or maintenance conducted by any party other than Kowa Company, Ltd. or authorized Kowa distributors.
 - (2) Failure or damages occurred by modifications, repair or maintenance using any parts other than those designated by Kowa Company, Ltd.
 - (3) Failure or damages resulted from operation by not following the precautions and operating procedures described in this instruction manual.
 - (4) Failure or damages resulted from use under circumferential conditions which deviate from the conditions for use in terms of power, setting environment, etc. described in this instruction manual.
 - (5) Failure or damages resulted from acts of God such as fires, earthquakes, floods, lightning, etc.

Precautions Concerning Electrical System

- During camera set-up precautions should be taken to protect the power cord so it will not be unplugged during photographic operations. Should the Genesis become unplugged during operation, be sure to turn the main switch off before reconnecting the power cord.
- If the camera is plugged in while the main power switch is ON, the ALARM lamp may light up. If this occurs the unit is inoperative and incapable of taking pictures. You should then turn off the main power switch for 15 seconds and then turn it back on. If the ALARM light does not come back on you can proceed with operations.
- The actual value of connecting voltage should be within + 10% of the rated value.
- The flash intensity should not be switched while the electronic flash is in process.
- Do not turn the main power switch on and off in rapid succession.

Precautions in Handling Camera Main Unit

- Protect the objective lens and the eyepiece tube from accidental strong shock or external pressure.
- The camera back should be fastened securely on its mount to the main unit (scope), if not, there is a risk that the camera back might drop during operations, this could lead to damage which would make photography impossible.
- Since the camera back and main unit have been manufactured to precise specifications using special tools, DO NOT try to disassemble and adjust the Genesis by yourself.

Precautions in Handling Electrical System

- The camera unit should be placed so that ventilation is not obstructed.
- Fluctuations in the connected live voltage should be within + 10% of rated value.
- DO NOT change the flash intensity when the shutter has been triggered.
- Turn off the power switch before unplugging or plugging the power cord.

Caution For Storage

1. Carefully handle the fiber optic light guide and store it without severe looping or bends.
2. Putting the small protection cap onto the top and bottom of the fiber optic light guide is recommended to keep its surface in as good of condition as possible.
3. When not in use keep the rubber lens cap on.
4. Store each component as shown below (Fig. 1).

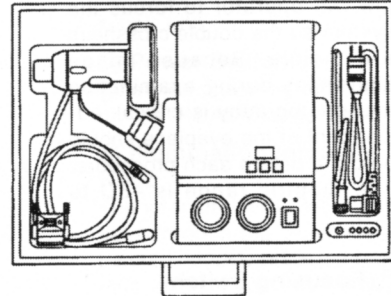


Fig. 1

WARNING

To avoid personal injury hazard, make sure that the camera unit is grounded. Never modify the inside of the camera unit.

Names and Functions of Operating Parts

MAIN UNIT

① Eyepiece

The eyepiece is designed to allow the operator to focus the system so the double crosshairs are visible. Because image sharpness during examination and photography is critical, adjustment of the eyepiece should be done before each procedure. The dioptric range is $-5D$ to $+2D$.

② Focusing Switch

This is used by the operator to bring the object to be photographed into sharp focus. The focusing range is $-15D$ to $+35D$.

③ Light Guide Connector

This is used to connect the fiber optic light guide to the main unit.

④ Light Guide

This forms the optical path to transmit the viewing and flash light to the main unit from the power supply unit.

⑤ Power Cord

This is the electrical connection with the power supply unit as well as the flash synchronization path.

⑥ Lock Lever

This releases the camera back lock which allows the camera back to be removed.

⑦ Shutter Button

When this button is pressed the electronic flash fires and the film advances.

⑧ Frame Counter

The number of frame exposed can be checked.

⑨ Rewind Button

When this button is depressed, the film finished is rewound automatically.

⑩ Battery Compartment Lid

For replacement of lithium batteries (CR123A n=2) open this lid.

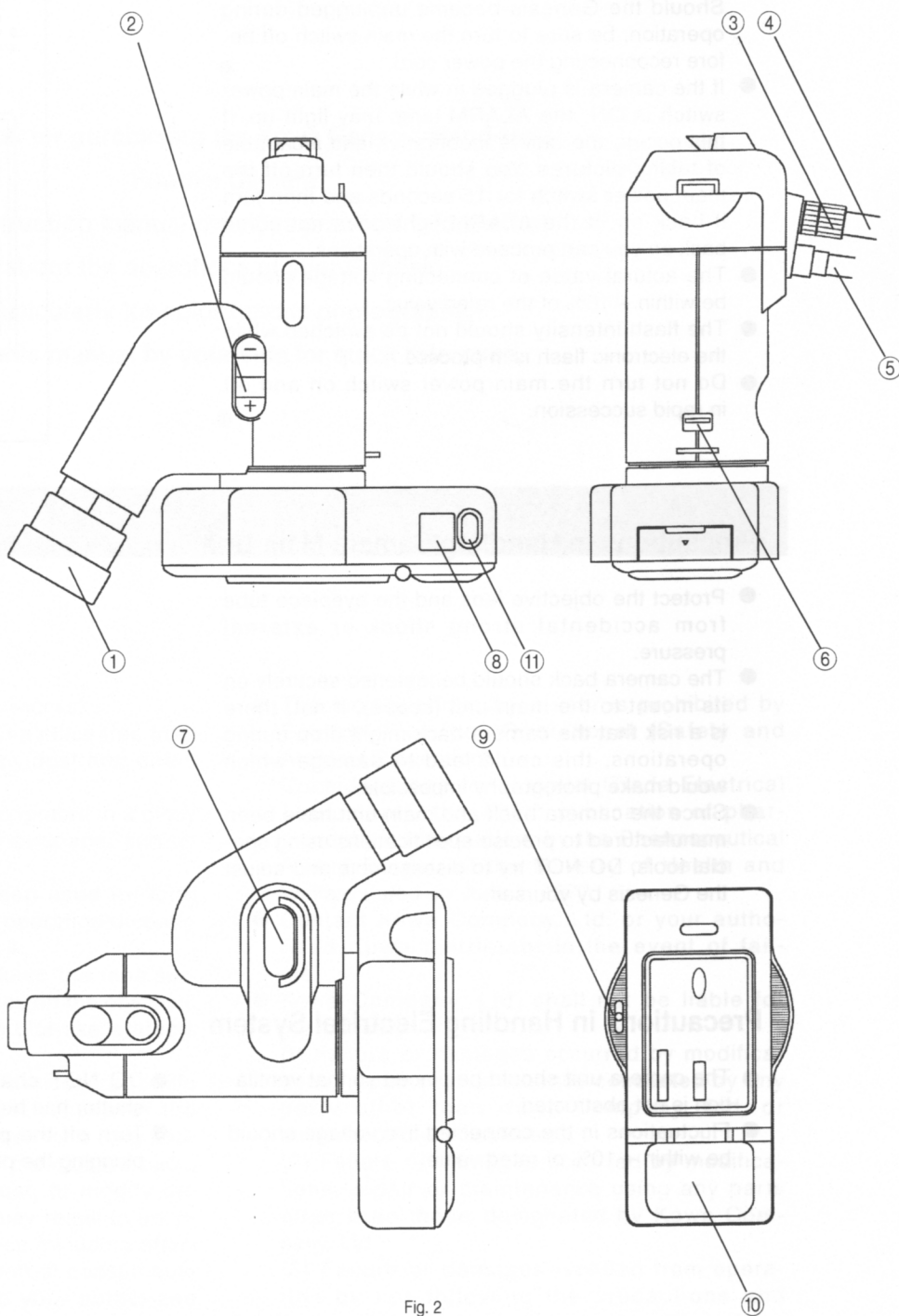


Fig. 2

⑪ Battery Check Button

The LCD window indicates [H] or [L] when this button is pressed. [L] denotes that the batteries are to be replaced. When the button is released, the window returns to display the number of exposed frame.

POWER SUPPLY UNIT

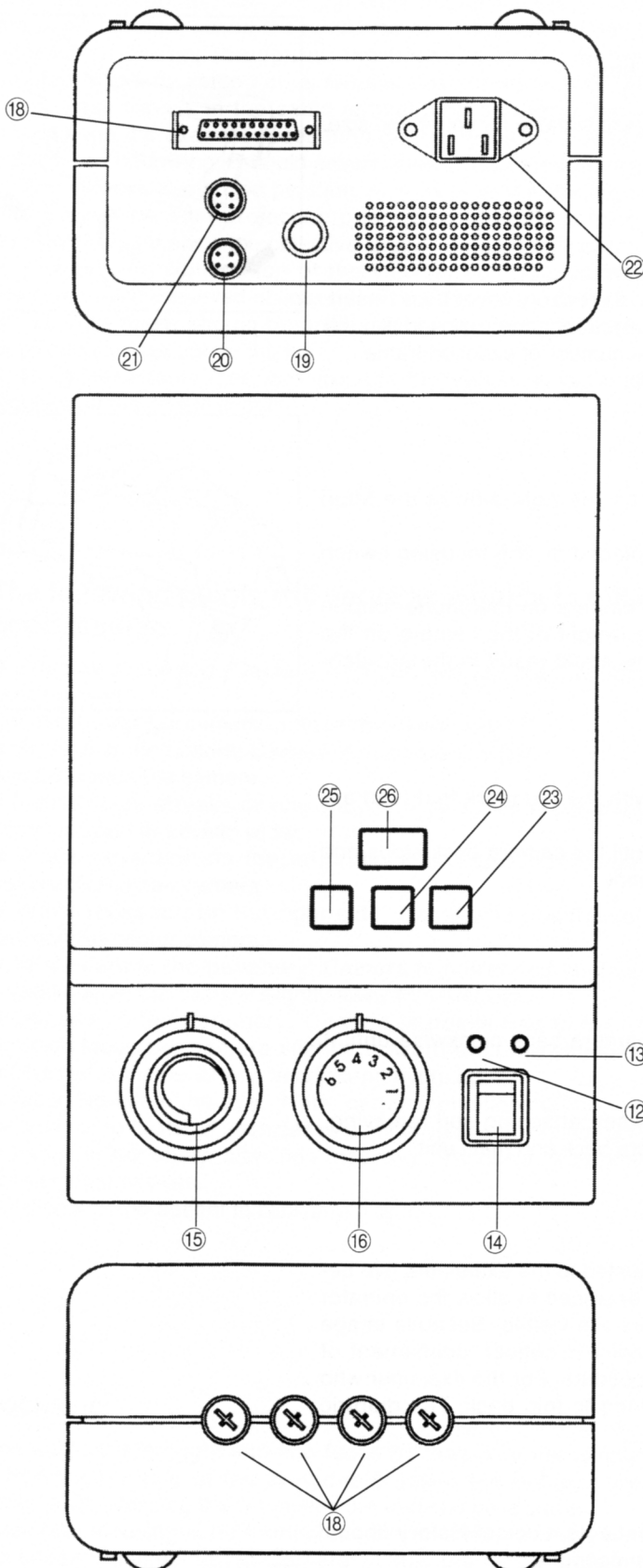


Fig. 3

⑫ READY Indicator

Indicates the charge for the electronic flash is completed and is ready to fire.

⑬ ALARM Indicator

Illuminates when excessive power fluctuations are present or a failure occurs inside the power supply unit.

⑭ Power Switch

When the power switch is turned on the READY lamp lights up.

⑮ Illumination Intensity Knob

The intensity of the viewing light seen through the viewfinder can be continuously adjusted regardless of the Flash Intensity. The viewing light intensity increases when the knob is turned clockwise.

⑯ Flash Intensity Knob

There are six levels of flash intensity with level 4 (100WS) standard for use with ISO 100 films.

⑰ Main Unit Electrical Connector

This connector is where the Power/Flash sync. cord from the Main Unit is attached.

⑱ Fuse Holder

Contains four 10A fuses.

⑲ Light Guide Connector

The light guide is attached here which transmits the viewing and flash light to the Main Unit.

⑳ Foot Switch Connector

For use with the external foot switch to trigger flash.

㉑ Still Video Connector

㉒ AC Power Connector

㉓ INC. Switch

If changes the number which is imprinted on each photo when a photo is taken. One push of this switch increases the number by one.

㉔ DISPLAY Switch

You can switch between imprinting and not imprinting the number on a photo with this switch.

㉕ RESET Switch

This switch resets the number to be imprinted on a photo.

㉖ Display Window

The number to be imprinted on a photo is displayed in this window.

Procedures In Color Photography

Method for the strap setting

1. Dismount the camera back from the optical head.
2. Attach the strap as shown in Fig.4
3. Pull and adjust the strap (A) and (B) as they are suitable for your hand size. After that, hold them by the cover (C) and (D).

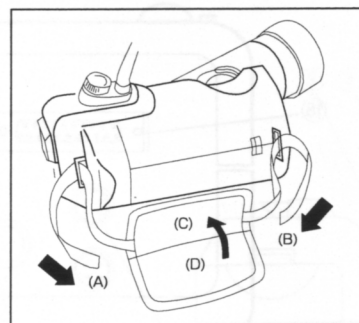


Fig. 4

Before You Start

- A roll film of sensitivity ISO 100 should be used.
- Before starting operations on camera, open the battery cover 0 and insert the back-up battery (lithium battery: CR123A). (If not, the exposed film roll will not be rewound completely because the number of exposed frame cannot be known and stored in the memory.)

Holding The Camera

1. Place the right hand through the strap on the right side of the Main Unit, grasping the camera firmly.
2. The middle and third fingers should be placed on the focusing switch ②.
3. The thumb is positioned underneath the camera on the shutter button ⑦. Caution should be taken not to rest the weight of the camera on the thumb when it is on the shutter button ⑦, this could result in the accidental firing of the flash.

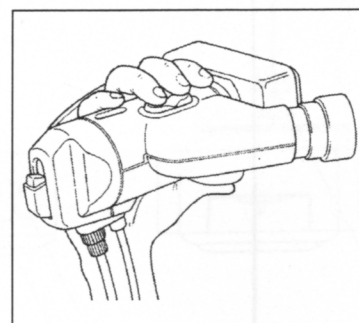


Fig. 5

Attaching Camera back

1. Align the red mark on the camera back with the red mark that is at approximately 45 % on the Main Unit.
2. Turn the camera back counterclockwise until the camera back stops and the red mark is aligned with the second red mark.

Removing Camera back

1. Pull the lock lever ⑥.
2. While pulling the lock lever ⑥ turn the camera back clockwise until it stops.
3. Detach camera back from Main Unit.

Note: Be careful handling the camera back when attaching and removing. A severe shock or drop can damage the camera back and main unit.

Eyepiece Adjustment

It is essential that the camera Genesis be adjusted to the examiners eye before any procedures begin. The eyepiece is designed to allow the operator to focus the system so the double crosshairs are visible. Because image sharpness during examination and photography is critical, adjustment of the eyepiece should be done before each procedure. For the examiner who wears glasses the eyecup has been designed to fold back. The dioptic range is -5D to +2D.

Preliminary Steps for Examination

1. Before administering any mydriatic the patients medical history should be known to indicate contraindications to the procedure.
2. Administer the mydriatic and allow the patient sufficient time for mydriasis to occur.
3. The patient should be seated with their head resting securely on the headrest of the chair.

Positioning the Camera

To perform fundus photography the volume of light necessary to illuminate and photograph the patient's ocular fundus must pass through the pupil. In some cases the pupil size can be small enough to restrict the light which passes through it, and because of this the position of the camera is strictly limited in its relative position to the eye. Also, the electronic flash travels in the same optical path as that of the viewing light, if the image the examiner sees through the eyepiece is uniformly illuminated with no shadowing it should assure a well illuminated picture.

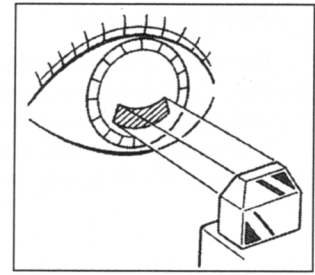


Fig. 6

1. The camera should be positioned in front of the patient perpendicular to the eye. The light projecting prism should be 8mm from the patients eye which would place the objective lens at 18mm from the eye.
2. The slit ring illumination of the viewing light should be projected on the cornea and observed obliquely from the side of the camera.
3. The light beam should be positioned so its passes cleanly through the pupil opening just above the iris.
4. Examiner should then look through the eyepiece and perform fine adjustment of the retinal image.

The following points will serve as a guide to obtain good results.

- Shadow at the top; Camera is positioned too high, or the patient's lid is half-closed.

Solution: Lower the camera or open the eyelid wider.

- Shadow at the bottom; Camera is positioned to low.

Solution: Raise the camera.

- Whitish blur, streaks or ring shapes; Eyelashes are in the optical path.

Solution: Open the eyelid wider.

- White reflection on the left side; Camera is positioned to far left.

Solution: Re-center camera.

- White reflection on the right side; Camera is positioned to far right.

Solution: Re-center camera.

- White flare in the periphery; Camera is positioned to close to the eye.

Solution: Move the camera slightly away from the eye.

- Shadow in the periphery; Camera is positioned to far from the eye.

Solution: Move the camera slightly forward until the shadow disappears.

- Shadow in the periphery; Insufficient mydriasis.

Solution: Re-dilate the eye. (Note: certain conditions of the eye may cause the eye not to dilate, in such cases photography may be impractical.)

- Image is not sharp after fine focusing; The corneal surface has an excess amount of tears.

Solution: Ask the patient to blink 2 or 3 times.

Focusing

The subject is brought into fine focus by means of the focusing switch②.

When the (+) side of the switch is pressed the in-focus area is moved away, while pressing the (-) moves the in-focus area closer.

Generally focusing is performed as follows; Perform steps 1 through 4 listed under "Positioning the Camera". Once the retina is seen in the viewfinder, coarse focusing should first be performed on a large vein by pressing the focusing switch (+ or -) until the vein is clear. Fine focusing is then performed by selecting an area of the retina to view and bringing the fine veins in that area into focus.

Film Indicator

Before photographing check that film is loaded in the camera back. For the purpose depress and release Battery Check Button, and the LCD window indicate current number of frame exposed.

In case the main unit is turned OFF, the figures will disappear in 4 seconds for the sake of saving battery.

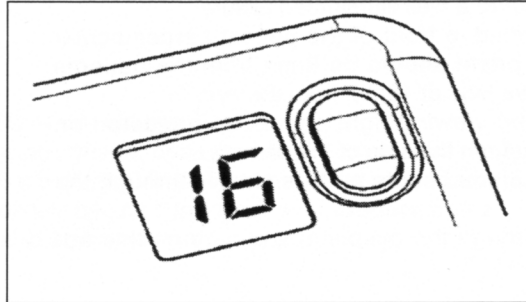


Fig.7

● Function to imprint the number

How to operate

1. Setting the number

Display your desired number to be imprinted on a photo in the Display Window ⑳ by operating the INC. Switch ㉓ and RESET Switch ㉔.

One push of the INC. Switch ㉓ increases the number by one.

Pressing the RESET Switch ㉔ rests the number to 01.

2. Switching between imprinting and not imprinting the number

A photo without the number imprinted on it can be taken by operating the DISPLAY Switch ㉕.

If the DISPLAY Switch ㉕ is pressed, the display of the number is disappeared so that the number will not be imprinted on a photo.

If the DISPLAY Switch ㉕ is pressed again, the number is displayed to be imprinted.

● Caution In Photographic Process

1. Under-exposure; when photographs are under exposed the flash intensity knob ⑯ should be turned clockwise one click stop.

2. Over-exposure; when photographs appear over-exposed the flash intensity knob ⑯ should be turned counterclockwise one click stop.

3. Shutter Button; by pressing the shutter button ⑦ the camera flash is triggered and the film is advanced automatically by one frame.

4. If the camera is not scheduled to be used for a while, turn of the Power Switch ⑭.

5. The examiner should caution the patient to remain still with both eyes wide open. Excessive movement, blinking and eyelashes in the optical path can severely effect the quality of the photographic results.

● Flash Intensity

For photography under normal conditions, with a clear media, the electronic Flash Intensity Knob ⑯ should be positioned at the " 3 " setting.

Index Number	1	2	3	4	5	6	
Flash Intensity	25	50	75	100	125	150	WS

Note: Because the condition of the patient's eye can vary, such as mydriasis and/or retinal reflections, the flash intensity should be adjusted up or down to compensate appropriately.

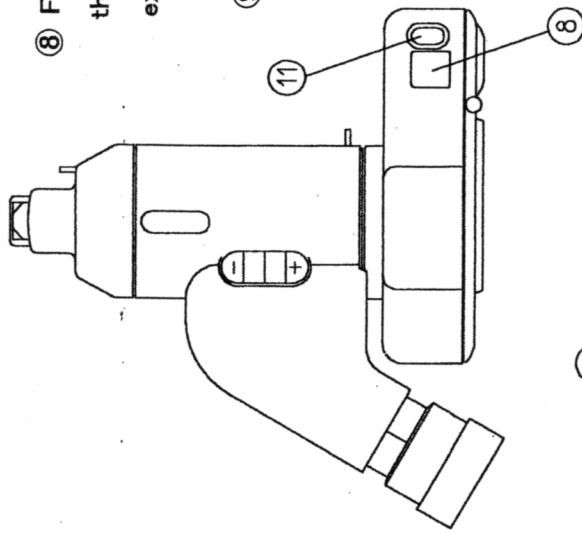
● Over-advancing Film

During photography the film counter may indicate the film has advanced beyond the specified number of exposures (12,24 or 36). If the film is over advanced, it can not be assured that the extra frames were exposed at regular intervals. Overlapping may occur.

Engineering—change notice of camera back

From this model on the camera back is made changes [for improvement with some modifications in location of external functional parts], and in accordance the instruction manual is to be altered as described below.

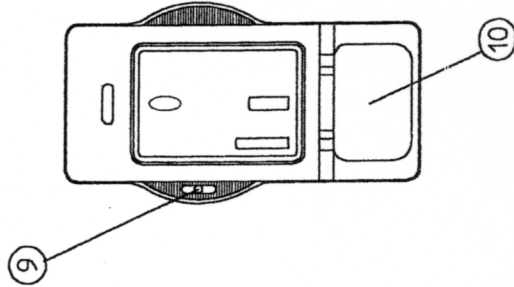
Page3 Names and Functions of Operating Parts MAIN UNIT



⑧ Frame Counter
the number of frame
exposed can be checked.

⑨ Rewind button
When this button is depressed,
the film finished is rewound
automatically.

⑩ Battery Compartment Lid
For replacement of lithium
batteries (CR123A n=2)
open this lid.



⑪ Battery Check Button
The LCD window indicates [H] or [L]
when this button is pressed.
[L] denotes that the batteries are to
be replaced. When the button is
released, the window returns to display
the number of exposed frame.

Procedures In Color Photography

Page 7 Film Indicator

Before photographing check that film is loaded in the camera back.
For the purpose depress and release Battery Check Button,
and the LCD window indicate current number of frame exposed.
In case the main unit is turned OFF, the figures will disappear
in 4 seconds for the sake of saving batteries.

NOTE: No indications are given for both film loading and film winding.

Camrback Operations

Page 9 Changing Film

If AUTO-LOADING functions improperly, [Er] is indicated on the
LCD display. In this case repeat film loading anew.
The camera back permits film loading in AUTO-LOADING
when it is detached from the main body.

With film loaded, be sure to check that the frame counter
reads [0] before you begin photographing.

Page 9 Back-up Battery

The betteries (two lithium batteries CR123A) should be replaced
with new ones when [L] is indicated on battery check.

Standard Flash Settings

The following flash settings can be used as a guide during photography under normal conditions.

Normal fundus photography "3"
Anterior segment photography
Focusing scale setting Flash Setting

35D.....	3
30D.....	3
25D.....	4
20D (5cm).....	4
15D.....	4
10D (10cm).....	5
5D (20cm).....	5

Figures in () are distances from the projecting prism to the patient's eye.

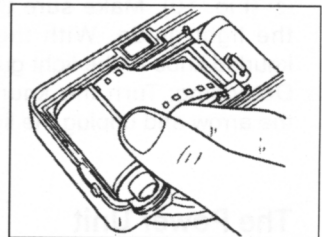
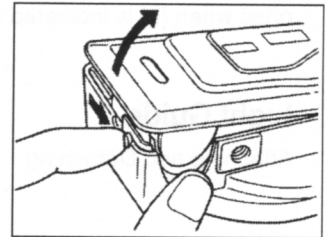
Camerasback Operations

Loading Film

1. Open the camera back rear cover by pulling the cover release the left side of the camera back (camera should be pointed away).
2. Take a new roll of film, and place in the film compartment on the left side. Attach the film perforations to the sprocket teeth, so that the plane of the film is flat and even.
3. Close the camera back and the film will automatically load and be advanced to the first position.
4. Completion of the films advance is indicated by a number "1" on the Frame Counter ⑧ .

Note: The power switch should be turned ON during film loading procedures, this assures the positioning of the film for correct exposures. When the power switch is turned ON, the motor is activated for one second regardless film has been loaded or not. This is to detect if a new cartridge has been loaded.

If film loading has been done on the camera back without a back-up battery, the ON/OFF power switch has no effect on the frame counter.



Rewinding Film

When all frames are exposed, the film is rewound automatically. To rewind the film in the middle of a roll, press the Rewind button ⑨ located below the Film Counter ⑧ window on the rear of the camera back.

- When rewinding is completed, the frame counter reads "0".
- The motor stops at the point when the film leader disengages. (The remaining length of the film leader may vary.)
- During film rewinding:

If the back cover is opened during rewinding, the remaining film will be completely rewound into the film cartridge, leaving no film leader exposed. This occurs because when the back was opened, the film counter was disabled, so the unit could not count down to zero.

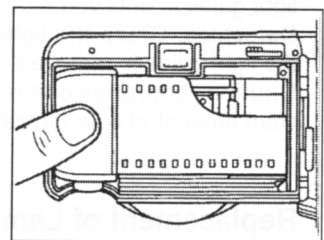


Fig. 8

* Notice: Distances between frames cannot be guaranteed if the number of photographs taken exceeds the prescribed numbers of the frames (12, 24 or 36).

Changing Film

If AUTO-LOADING functions improperly, [Er] is indicated on the LCD display. In this case repeat film loading anew.

The camera back permits film loading in AUTO-LOADING when it is detached from the main body.

With film loaded, be sure to check that the frame counter reads [01] before you begin photographing.

Back-up Battery

The lithium battery CR123A (+ 3V) is used only as a back-up battery for the Frame Counter ⑧. The battery is not used for the film advancing or rewinding motor.

The number on the Frame Counter ⑧ display will disappear when the Power Switch ⑬ is turned OFF, but the number is stored in the memory and comes back on when the Power Switch is turned on. The battery symbol mark indicates when the battery needs to be replaced. (Fig. 10)

Back-up Battery Replacement

The batteries (two lithium batteries CR123A) should be replaced with new ones when [L] is indicated on battery check.

Light Guide

Attaching and Detaching

The Main Unit

Attaching: plug the Light Guide ④ fully into the Light Guide Connector ③ (Fig. 10). Make sure the tab on the light guide connector is seated in the light guide. With the light guide securely positioned, tighten the knurled knob of the light guide to the light guide connector.

Detaching: Turn the knurled knob of the light, guide in the direction of the arrow and unplug the light guide (Fig. 11).

The Power Unit

Attaching: Plug the light guide into the light guide connector pushing the light guide in until you hear a click (Fig. 12).

Detaching: Grasp the light guide at the three grooves and gently pull until the light guide is removed.

Caution: Improper connection of the light guide may cause an insufficient amount of light for viewing and photography.

Replacement of Lamps

Remove the four screws ⑫ and cover to access the viewing and flash lamps.

1. Strobo*

Remove the old tube, holding the base, then insert the new strobo tube in the lamp socket. Note the strobo tube's pins can only go into the corresponding socket one way (Fig. 13).

2. Halogen Lamp*

Holding the base, remove the old halogen lamp (caution lamp may be hot). Insert the new lamps and two plugs into the two pin-holes in the base.

* Note: Do not handle new lamps with bare hands. Finger prints on the surface of the tube glass can cause carbonized high temperature which will decrease the useful lifetime of the lamp.

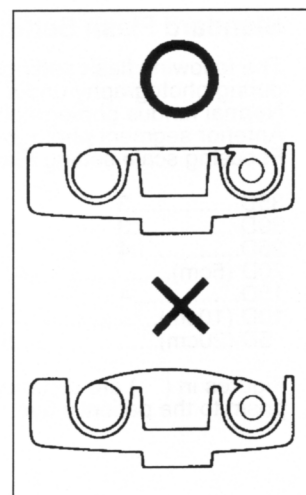


Fig. 9

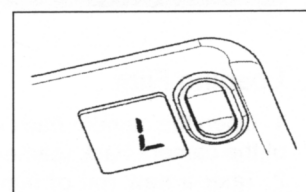


Fig. 10

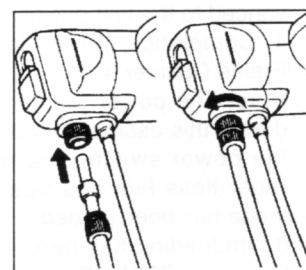


Fig. 11

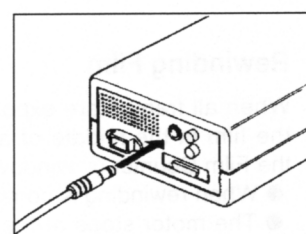
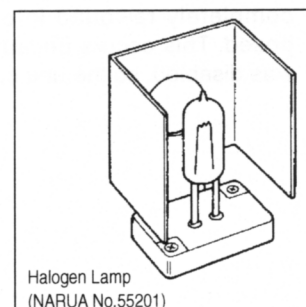


Fig. 12



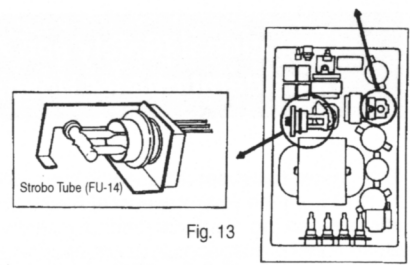


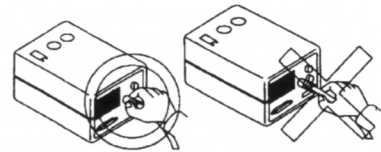
Fig. 13

Light Guide Precautions

The light guide is a precise optical equipment. Therefore, a strain could damage inside and cause an insufficient amount of light for viewing and photography. Be careful not to fold or damage the light guide when using.

To detach the light guide from power source, pull it, holding the metal part.

If you hold the Fiber part when removing the light guide, it could be damaged.



SPECIFICATIONS

■ Main Unit	
Angle of field	Horizontal 30 vertical 25
Effective dioptric range of focusing	-15D to + 35D
Working distance	5mm
Magnification, observation	7X
Range of eyepiece correction	-5 D to + 20
Coverage (picture size)	24mmx20mm
Magnification, photography	1X

■ 35mm camera back	
Film advance	Motor-driven, 1 frame/sec.
Camera mount	Bayonet

■ Power supply unit	
Light source, observation	12V, 50W, halogen lamp
Electronic flash source, light intensity	Xenon lamp, 25, 50, 75, 100, 125, 150ws
Charge time:	5 sec/frame
Input voltage, frequency, power consumption	AC 100, 117, 220, 240V, 50/60Hz, 400VA

■ Dimensions, Weight (standard set)	
Main unit with 35mm camera back	178(W) × 182.2(L) × 80(H), approx. 1kg
Power supply unit	200(W) × 320(L) × 10(H), approx. 7kg

	CAUTION	Do not replace the strobo and lamps just after using the camera unit because it is hot.
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	WARNING	Turn OFF the power switch before replacing the strobo and lamps to avoid shock hazards.
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○ Replacement of Fuse

Turn OFF the power switch, and wait five minutes.

Unplug the unit from the outlet. Check to see whether the fuse on the back of the power part is burnt. If it is burnt, replace it (with a new one.) Turn the fuse holder into the arrow direction to remove it, and see the fuse inside. Confirm the capacity of the fuse indicated before putting a new one.

	WARNING	Turn OFF the power switch, unplug the unit from the outlet, and wait five minutes to replace the fuse. If you do not follow this operation procedure, you could get an electric shock.
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Operational (Safety and Accident prevention) Considerations for Hospital Grade Electrical Equipment

This directional sheet is based on the 495th publication of pharmaceutical information dated June 1, 1973 from the Pharmaceutical Affairs Bureau of the Ministry of Health and Welfare, and describes general operational considerations regarding electrical medical instruments.

Operational precautions for each apparatus are described in the respective information manuals.

1. Only experts shall use instruments.

2. The following items shall be considered when installing equipment:

- (1) Install at locations where water will not splash.
- (2) Install at locations where bad effects from atmospheric pressure, temperature, humidity, wind intensity, sunlight, air containing dust, salt and sulfur, or the like, will not occur.
- (3) Take care to guard against tilting, vibrating, impact including during transporting, and the like.
- (4) Equipment shall not be installed at locations where chemicals are stocked, or gas is present.
- (5) Be careful with frequencies, voltages and allowable amperes (or power consumption).
- (6) Be certain of conditions of the battery power supply (discharging status, polarity, etc.).
- (7) Properly connect ground wires.

3. The following items shall be considered when using instruments:

- (1) Be certain that equipment activate properly after checking contacting conditions of switches, polarity, setting of dials, meters, and the like.
- (2) Be certain that ground wires are securely connected.
- (3) Be certain that all cords are properly connected and secured.
- (4) Since to use together with appliances is liable to cause errors of correct diagnosis or hazard, take care enough.
- (5) External circuits connected directly to the patient shall be checked repeatedly.
- (6) Be certain of the battery power supply.

4. The following items shall be considered while using instruments:

- (1) Be sure that time and quantity required to diagnose or treat may be not too long.
- (2) Always ensure that the equipment and the patient are in good condition.
- (3) When an abnormality in the equipment or the patient is found, take proper measures in such a way as to stop their operations while keeping the patient in safe condition.
- (4) Be certain the patient cannot touch the instruments.

5. The following items shall be considered after using instruments:

- (1) Switch OFF the power after resetting all the switches, dials, and the like in conditions before using according to the specified procedure.
- (2) When removing cords or the like, do not force unnecessarily in such a way as to pull out by holding them.
- (3) The following shall be considered regarding storage locations.
 - (a) Keep at locations where they will not be exposed to water.
 - (b) Keep at locations where they shall not be effected by atmospheric pressure, temperature, humidity, wind intensity, sunlight, air containing dust, salt, sulfur, and the like:
 - (c) Take care to guard against tilting, vibrating, impacting (include when transporting), or the like:
 - (d) Do not keep at locations where chemicals are stocked, or gases are present.
- (4) Accessories, cords, conductors, and the like shall arranged in order after cleaning.
- (5) Instruments must be cleaned in advance so that there will be no problem with their use the following time.

6. When failures occur, detail carefully and entrust repairs to specialists don't do them yourself.

7. Equipment shall not be modified.

8. Maintenance and Check

- (1) Instruments and parts must be checked periodically.
- (2) When re-using equipment which has not been used for a while, they must be checked in advance to ensure they function normally and safety.

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