

FUNDUS CAMERA

Kowa nonmyd 7

INSTRUCTION MANUAL



KOWA nonmyd 7

EU



Introduction

Accept our congratulations on your purchase of KOWA FUNDUS CAMERA *nonmyd 7*. KOWA *nonmyd 7* is a fundus camera which is designed to perform fundus photography and is capable of non-mydriasis photography. This manual provides a description of the operating procedures of KOWA *nonmyd 7* along with important precautions to be observed during its use. Please read this entire manual carefully to assure that the instrument can its full capabilities and be used safely.

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 revention

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 people.

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



CAUTION

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



WARNING

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



ATTENTION

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 an 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 animals and pets.

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 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

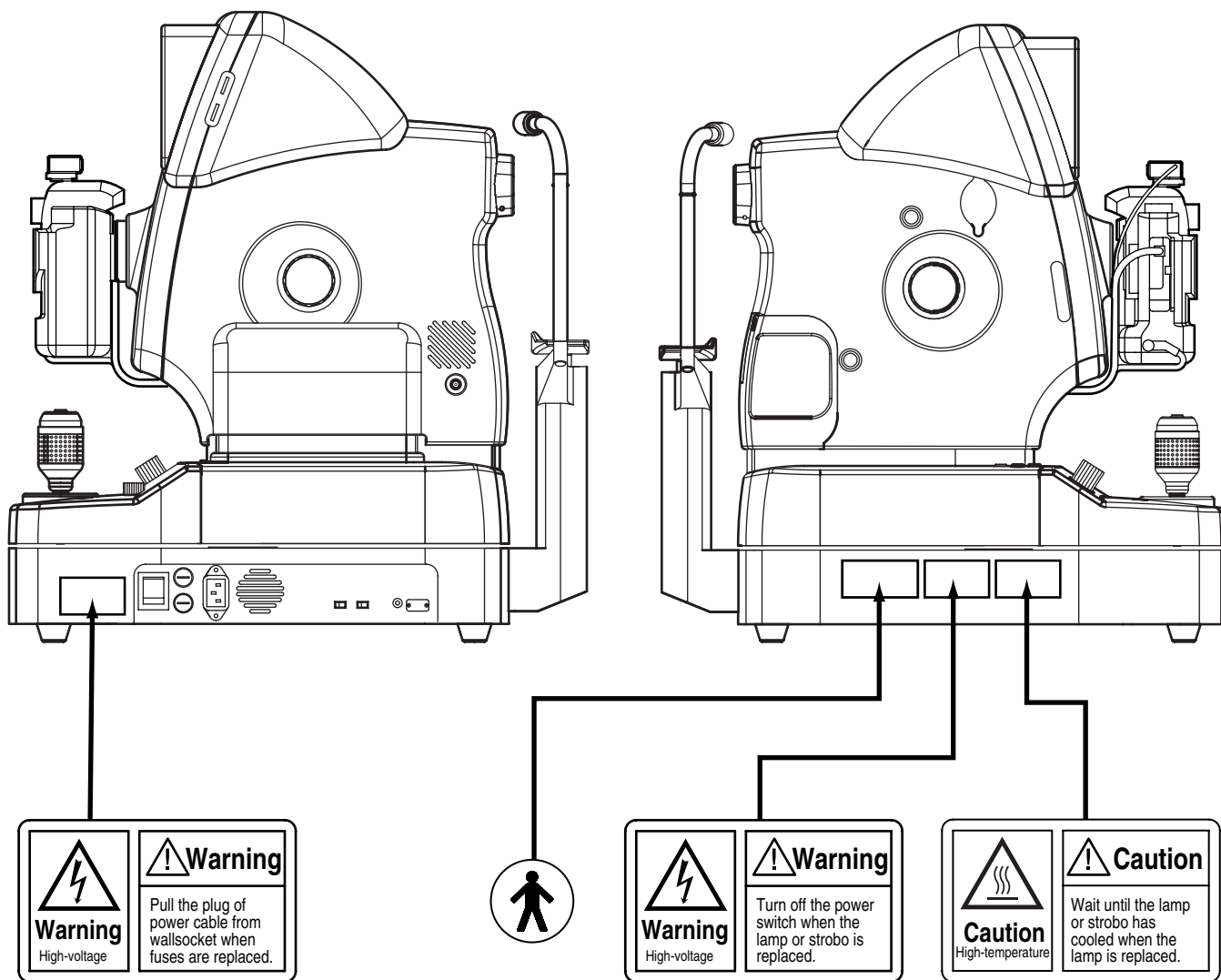
 Unplug	<p>If any abnormal smell, sound, overheating or smoke should be detected, turn off the instrument immediately and then unplug it. If it should continue in use, a fire may break out on the instrument resulting in its malfunctioning. Contact your Kowa dealer which you purchased it or your nearest repair shop for inspection.</p>	
 Unplug	 Warning High-voltage	<p>When replacing the illumination lamp or the flash lamp, make sure the instrument is turned off and unplugged from the socket. Otherwise, there may occur electrical shock.</p>
 Unplug	 Warning High-voltage	<p>When replacing the fuse, make sure the instrument is turned off and unplugged from the socket. If the fuse holder cover is removed with the instrument unplugged, there may occur electrical shock.</p>
 Unplug	 Warning High-voltage	<p>This instrument is equipped with a storage capacitor for photography light. Replacing the flash lamp or the illumination lamp while this capacitor is still not yet fully discharged causes a danger of an electric shock. Check that the Discharge indicator LED is completely turned off before replacing the flash lamp or the illumination lamp.</p>
 Obligatory		<p>Make sure that the instrument is properly plugged into the socket. If not, there may occur a fire or electrical shock.</p>
 Obligatory		<p>Use a designated fuse. Otherwise, the instrument may malfunction or a fire may break out.</p>
 Obligatory		<p>Make sure that the instrument is properly grounded to protect the body. Put the plug in the three-wire grounding type socket. Otherwise, there may occur electrical shock.</p>
 Prohibitory		<p>Install at a location away from, for instance, a cup containing liquid. If liquid should be spilled into the instrument, there may occur electrical shock. If so, turn off the instrument and then unplug it from the socket. Contact your Kowa dealer which you purchased it or your nearest repair shop for inspection.</p>
 Disassembly prohibited		<p>Do not disassemble, modify or repair the instrument yourself. Otherwise, there may occur a fire, electrical shock, instrument malfunctioning or the human body may be injured. Contact your Kowa dealer which you purchased the instrument for repair. The product assembled by yourself will not get warranty or any other service.</p>
 Prohibitory		<p>The socket or plug board must not be loaded in excess of its rated capacity. If the main power cord should share an outlet with many other devices, there may occur a fire or electrical shock.</p>
 Prohibitory		<p>Insertion of any metallic object in air vent slots may cause electrical shock resulting in malfunction.</p>



ATTENTION

	<p>The power supply must be dedicated for the sole use of the fundus camera. Connection with the same power supply as that for any external device may cause the instrument to malfunction.</p>
Obligatory	
	<p>When operating the fundus camera, take good care that the patient's examined eye, nose and face do not come in contact with the fundus camera.</p>
Obligatory	
	<p>When adjusting its height, move the chin rest vertically with good care while watching a patient's face. Otherwise, if too small, the face may be pinched in the chin rest.</p>
Obligatory	
	<p>For unplugging from the socket, pull the power cord out of it while holding the plug with your hands. Otherwise, there may occur a fire or electrical shock.</p>
Prohibitory	
	<p>Do not put in, or pull out of the plug with your wet hands to avoid electrical shock.</p>
Prohibitory	
	<p>Do not install the equipment at unstable locations, for instance, on a shaky base or a tilting surface. Otherwise, if it should drop off or fall over, the body may be injured.</p>
Prohibitory	
	<p> Do not replace the flash lamp and the illumination lamp immediately after its service. Otherwise, you may burn your fingers on the hot lamp. Allow sufficient time to cool it off before replacement.</p>
Prohibitory	<p>Caution High-temperature</p>
	<p>Do not touch the flash lamp and the illumination lamp with your bare hands. Otherwise, the lamp may have a lower quantity of light and a shorter expected life.</p>
Prohibitory	
	<p>Do not increase the amount of observation light more than it is required. Otherwise, the eye may be injured.</p>
Prohibitory	
	<p>Do not increase the amount of illumination light more than it is required. Otherwise, the eye may be injured.</p>
Prohibitory	
	<p>The air vent must not be obstructed. Such obstruction will cause internal temperature to increase resulting in occurrences of breakdown, malfunction, or a fire on the fundus camera.</p>
Prohibitory	
	<p>Insertion of any metallic objects in the air vent slots may cause a severe electrical shock.</p>
Prohibitory	
	<p>When operating the fundus camera, keep your fingers off the gap between the optical head base and the power supply, the gap between the chin rest support and the forehead rest support and the gap below the chin rest. Otherwise, the fingers may be pinched and injured. Instruct the patient not to place his or her fingers</p>
Prohibitory	
	<p>Do not wipe the outer surface of the instrument with solvents such as benzene, alcohol, thinner, ether and the like. Otherwise, such substances may cause discoloration or deterioration.</p>
Prohibitory	

Indication of caution lable



Emblem list

	Type B mount
	A.C.
	OFF
	ON

	Caution (See APPENDIX)
	Warning High-voltage (See P25 ~ P29)
	Caution High-temperature (See P25 ~ P28)

OPERATING PRECAUTIONS

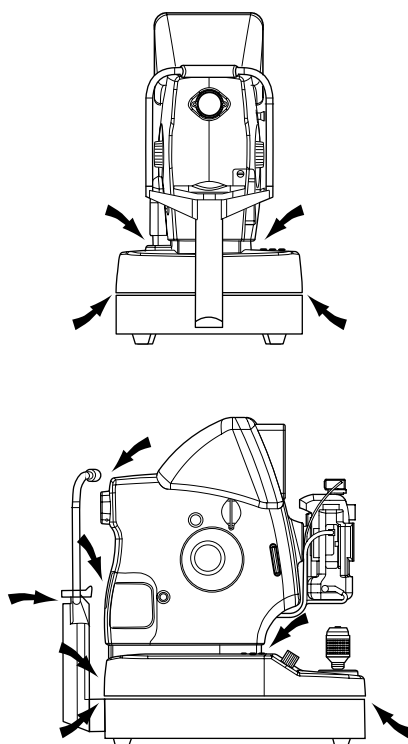
- The instrument should be Installation, Transportation, Storage in a dust free place, free from high temperatures, high humidity and direct sunlight. The environmental conditions described below should be observed strictly.

	in operation	Installation, Transportation, Storage
Environmental temperature	10 to 40 °C	-15 to +60 °C
Relative humidity	30 to 75 %	10 to 95 %

- Install the camera in a room which illumination can be reduced to no higher than 5 luxes (as bright as to make news paper barely readable).
- Do not jar or shock the instrument.
- Do not shock or exert a strong force on the objective lens tube.
- Stains, smears and scratches on the objective lens will appear as white dots on your photograph. It is essential to always keep the objective lens clean and free of contamination.
Make sure that all control knobs and levers with click tops "click" securely in place.
- Misalignment of Small pupil adjust knob and Diopter correction knob will cause partly obscured or poorly exposed pictures.
- Always cover the instrument when not in use, to protect the optics from dust contamination.
- Do not turn the power off during data transmission or data writing.

- After a long period of non-use, always inspect and check the following:
 - the objective lens is clean and dust free; and
 - the amount of observation light can vary properly.
- Install in a location where the plug cannot be accidentally disconnected from the socket during fundus camera photography.
If it should be pulled off, make sure that the camera is always turned off before plugging into an AC outlet.
- Kowa is not responsible for product failure and damage caused by modifications with non-factory parts as expressed and implied in the warranty certificate.
- The line voltage should be within $\pm 10\%$ of the rated value.
- Never change simultaneously the instrument's flash cycle and the electronic flash intensity.
- Do not turn ON/OFF the instrument consecutively and rapidly. When turning off the instrument, always wait at least 10 seconds before turning it on again.
- When plugging or unplugging, make sure that the instrument is turned off.
- The power outlet used for the fundus camera should not be shared with any other instruments or devices.
- Do not connect the instrument to any other external devices with the main power switch turned ON.
- Disinfect the position where the patients come in contact with each other by alcohol.
- When disposing of this instrument, comply with the regulations of countries or areas in which the instrument is used.

Keep your fingers off the gap in the direction of the arrows as shown below. Otherwise, they may be injured.



⚠ ATTENTION

When operating the fundus camera, keep your fingers off the gap between the optical head base and the power supply, the gap between the chin rest support and the forehead rest support and the gap below the chin rest. Otherwise, the fingers may be pinched and injured. Instruct the patient not to place his or her fingers on the fundus camera.

⚠ ATTENTION

When operating the fundus camera, take good care that the patient's examined eye, nose and face do not come in contact with the fundus camera.

⚠ ATTENTION

When adjusting eye height, move the chin rest vertically with good care while watching a patient's face. Otherwise, if too small, the face may be pinched in the chin rest.

⚠ ATTENTION

The air vent must not be obstructed. Such obstruction will cause internal temperature to increase resulting in occurrences of breakdown, malfunction or a fire.

⚠ ATTENTION

Insertion of any metallic objects in air vent slots may cause electrical shock, resulting in malfunctioning.



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Operational Considerations for Hospital Grade Electrical Equipment (Safety and Accident prevention)

- 1. Only qualified personnel should operate this equipment.**
- 2. The following items shall be considered when installing the instrument.**
 - (1) Install at a location away from water or accidental splashing.
 - (2) Install at a location which will not be adversely affected by atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, air containing salt, sulfur and other substances, and the like.
 - (3) Take care to guard against tilt, vibration and strong impacts, for instance, during transportation.
 - (4) Equipment must not be installed at 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 before 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 cords 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 for signs of wear.
 - (6) Before operations, make sure that battery is sufficiently if applicable.
- 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 on the equipment, take proper measures, for instance, to stop the operation of the instrument while assuring the patient's safety.
 - (4) Do not allow the patient to touch any of the instrument controls.
- 5. The following items shall be considered after using the instrument.**
 - (1) Turn off the instrument after setting control switches, dials and so forth to their initial status following with a specified procedure.
 - (2) Do not pull cords for removal because an excessive force is exerted on them.
 - (3) The following shall be considered regarding storage location.
 - (a) Store the instrument at locations free from splashes of water.
 - (b) Store at a location which will not be adversely affected by atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, air containing salt, sulfur and other substances, and the like.
 - (c) Take care to guard against tilt, vibration and strong impacts, for instance, during transportation.
 - (d) Equipment must not be stored at locations where chemicals are stored or gasses are generated.
 - (4) Clean and rearrange accessories, cords, cord restraints and the like.
 - (5) The instrument must be cleaned prior to use so that there will be no problem when using it again.
- 6. If it has some trouble, a label describing the trouble should be affixed on the instrument and contact a repair shop for repair.**
- 7. Equipment shall not be modified.**
- 8. Maintenance**
 - (1) Periodically check the equipment and its components for any abnormality.
 - (2) When using again the equipment that has not been used for a while, it must be checked 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.**

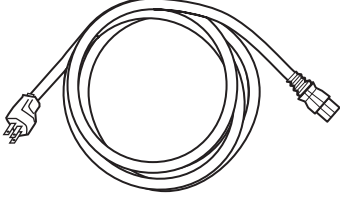
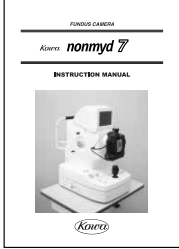
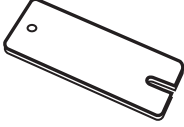

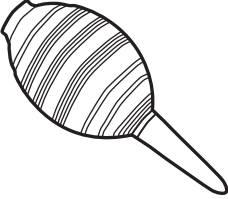
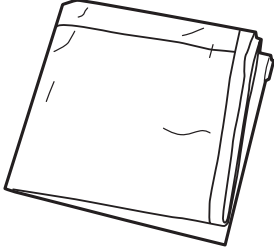
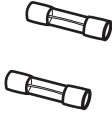
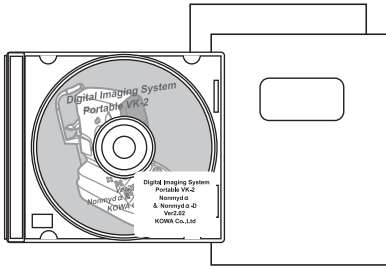
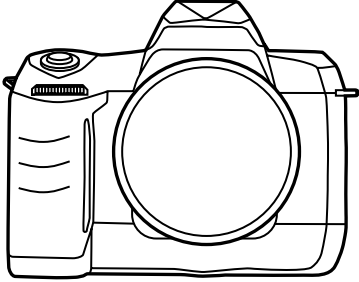
This equipment is examined based on IEC 60601-1-2:2001.

The purpose of this standard is to keep safety against the dangerous obstacle in typical medical facilities.

When this equipment is influenced by other equipment, or when it affects other equipment or when there is such fear, please devise to move this equipment and other apparatus or to make the distance between those equipment.

Moreover, if there is an unknown point, please consult our company, or an agency beforehand.

ACCESSORIES

<p>Power cable:1 KP-4819Y KS-31A</p>	<p>Instruction manual:1</p>	<p>Chin rest's paper for covering chin rest:1 K9L-TB45 #102</p>
		
<p>Chin rest's pins:2 K9L-TB45 #101</p>	<p>Blower:1 UN-1301</p>	<p>Dust cover:1 AFT2 #179</p>
		
<p>Fuses:2 21802.5M</p>	<p>Application software Portable VK-2:1 Installation manual:1 User's guide:1</p>	<p>Digital camera back</p>
		

1

Name and function of each part

① Objective lens

Aspheric lens with protective lens cap.

② Focusing knobs

Knobs located on both sides of camera optical head unit, used for focusing.

③ Monitor

Black-and-white live image used for alignment or focusing of anterior chamber and fundus.

④ Air vent slots

Air vent slots are located in two places.

⑤ IR filter knob

IR FILTER
 IN
 OUT

When cleaning the objective lens, pull this knob to change the illumination light to visible radiation. (Dust on the lens exposed to the visible radiation can be easily found.)

⑥ Power switch

| : ON ○ : OFF-

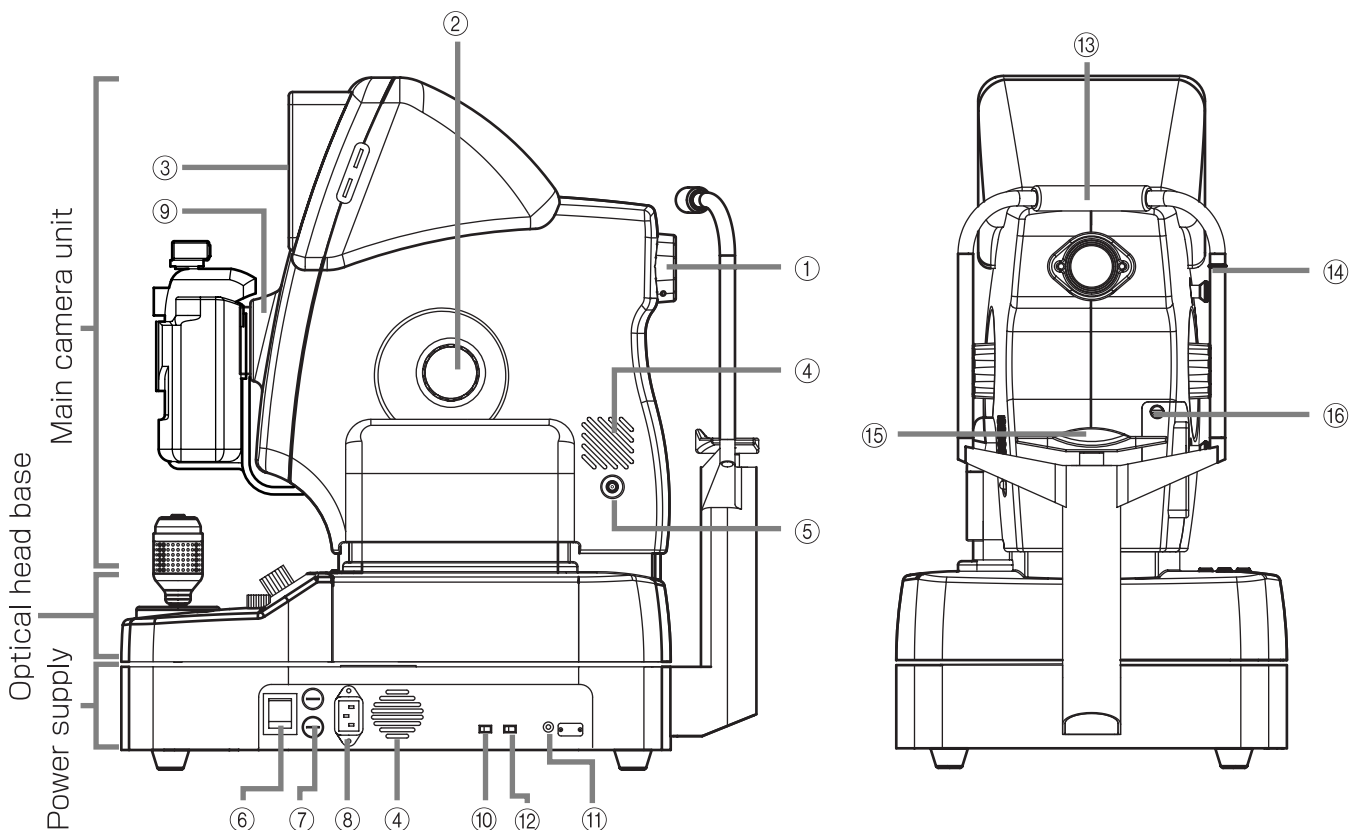
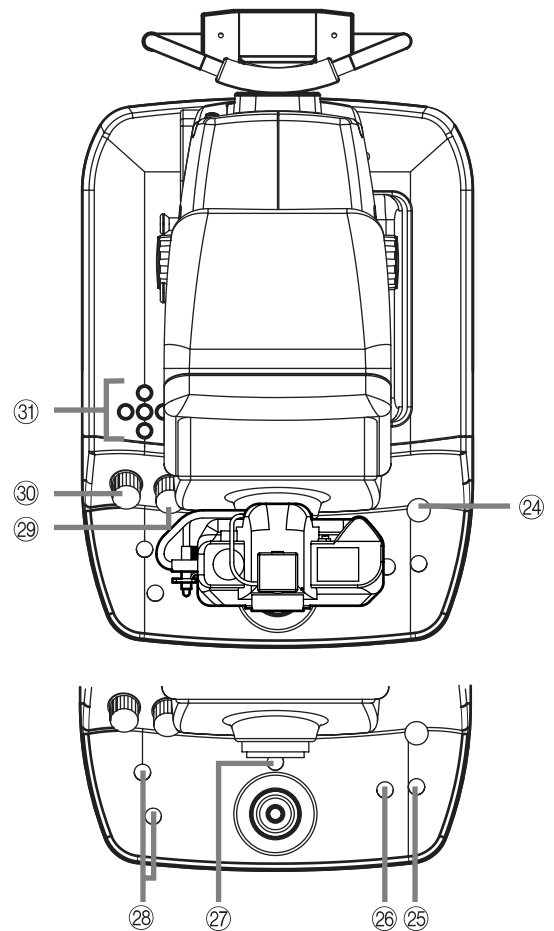
⑦ Fuse holder

⑧ Power supply inlet

⑨ Camera mount

⑩ Blue/brown selection switch

The switch for setting the intensity which is suitable for blue and brown eyes.



11 External fixation lamp terminal

The terminal for connecting optionally available external fixation lamp.

12 Fixation lamp selection switch

The switch for switching between internal and external fixation lamps.

13 Forehead rest

To fix patient's forehead position.

14 Eye level mark

To align the patient's vertical head position with this mark.

15 Chin rest

To fix the patient's chin position.



16 Lamp cover screw

To loosen the screws to remove the lamp cover.

17 Lamp cover




To remove this cover to replace an illumination lamp or flash lamp.

18 Small pupil adjust knob


  If the patient's dilation diameter is too small, pull this knob when photographing.




19 Diopter correction knob

0  If a focus point cannot be found by turning the focus knob, pull the diopter correction knob to make (-) or (+) correction until the focus point is found.
- 
+ 

20 Brightness adjust dial control

 To adjust the brightness of monitor. If it pushes in, the brightness of monitor will return to the initial setting.

21 Contrast adjust dial control

 To adjust the contrast of monitor. If it pushes in, the contrast of monitor will return to initial setting.

22 Shutter button

To push this switch to energize the flash when photographing.

23 Control lever

To move around (forward/backward and leftward/rightward) the optical head base and to turn the control lever to move the head vertically.

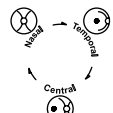
24 Lock screw

To fix the movement of the optical head base.


25 Picture angle selector

To select a picture angle of either 45° /20° When an angle of 20° is selected, the angle indicator will glow.


26 Internal fixation target button

 To select either of the internal fixation target lamp from Center, Nasal, Temporal. The button will be lit when Nasal is selected, while the button will blink when Temporal is selected.


27 Anterior chamber button

 To select either of anterior chamber and fundus displays of the monitor screen. When the anterior chamber is selected, the indicator will glow.


28 Chin rest height adjust button

 Used to raise or lower the chin rest.

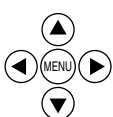
29 Exposure compensation knob

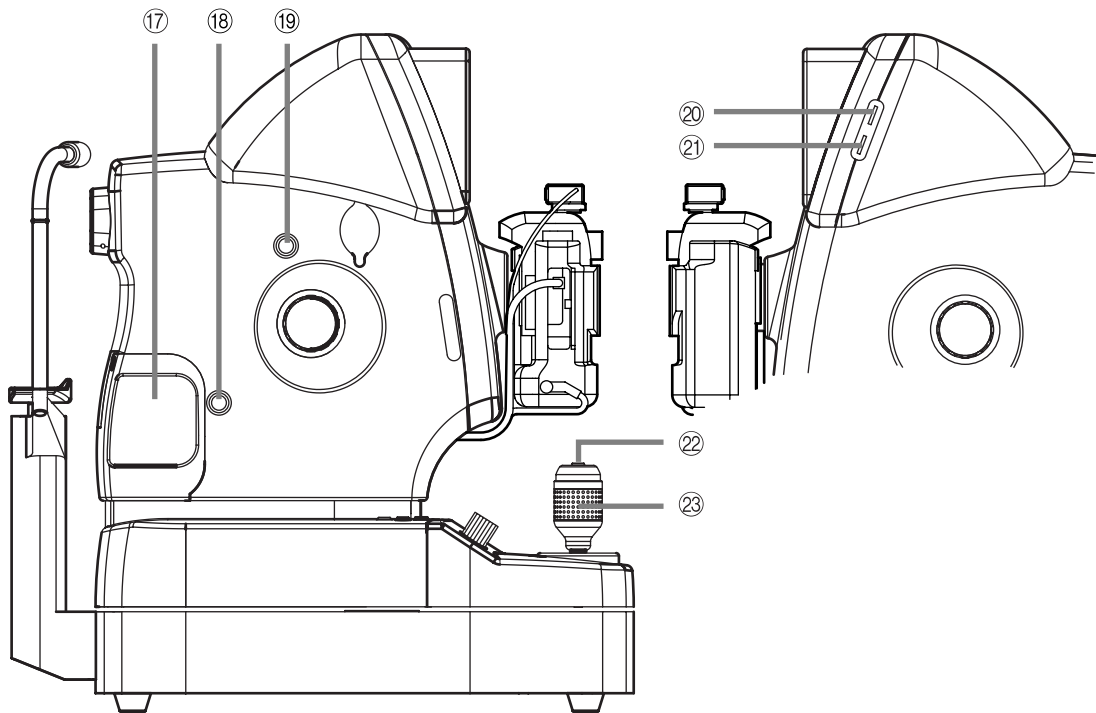
 Used to adjust the flash intensity level when photographing.

30 Observation light intensity control knob

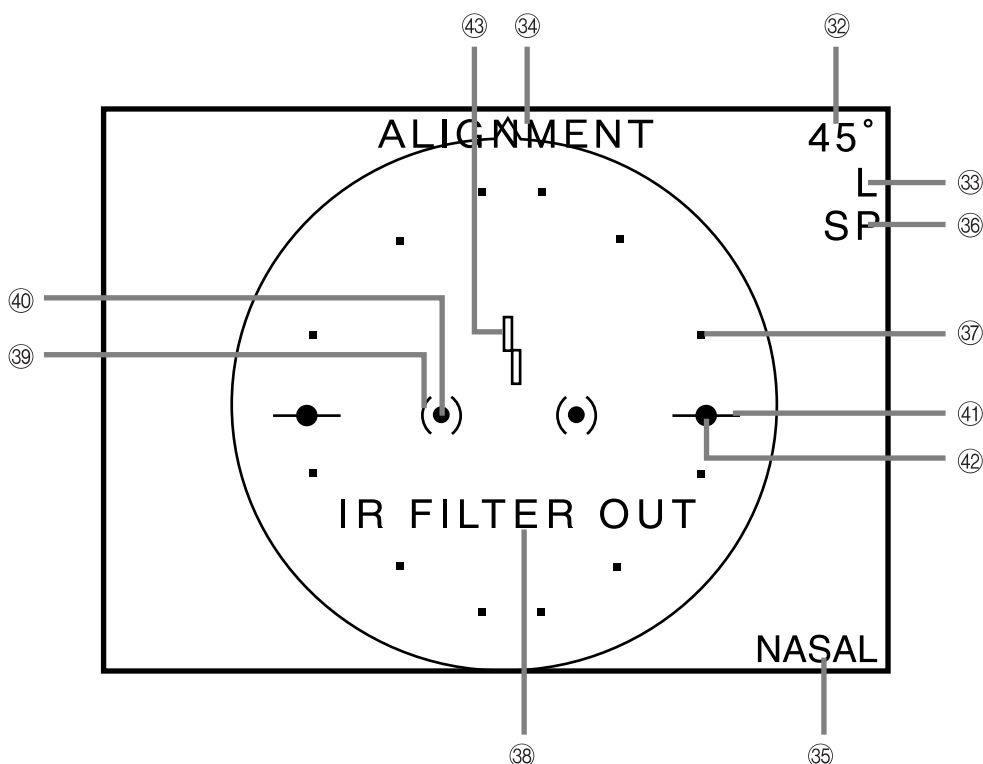
 Used to adjust observation light intensity when photographing.

31 Menu Setting button

 Used to set display item and Auto OFF mode.



monitor screen indicated



32 Picture angle

Either 45° or 20° is indicated .

33 Left and right eyes

The left eye is indicated as L and the right eye as R.

34 Observation of anterior chamber

The monitor screen appears when observing the anterior chamber.

(Does not appear in the photographed image.)

35 Internal fixation target position

The present position of the internal fixation target is indicated. The position is indicated as follows; CENTRAL (posterior), NASAL (optic disk) or TEMPORAL (ear side circumference part).(Does not appear in the photographed image.)

36 Small pupil mode

The indication appears when the Small pupil mode is selected.

37 Photographing range

The range of photographing in Small pupil mode. (Does not appear in the photographed image.)

The photographing range may vary depending on a patient.

38 IR filter retreat

This indication appears when the IR filter has retreated from the optical path.

When this indication appears, photography is disabled.

Push 5 IR filter knob to make this indication disappear.

39 Anterior chamber working dot position

This indication appears on the anterior chamber observation display.

(Does not appear in the photographed image.)

40 Anterior chamber working dots

Align the fundus camera position such that each of the pair of dots comes in () in 39.

(Does not appear in the photographed image.)

41 Fundus working dot position

This indication appears on the fundus observation display.

(Does not appear in the photographed image.)

42 Fundus working dots

Align the fundus camera position such that each of the pair of dots is located on top of the horizontal bar of 41 at its center.(Does not appear in the photographed image.)

43 Focus dots

When the fundus is focused, these target bars will form a single line.

2

Installation

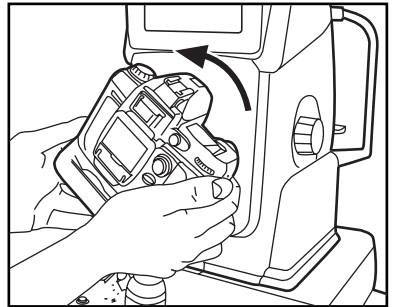
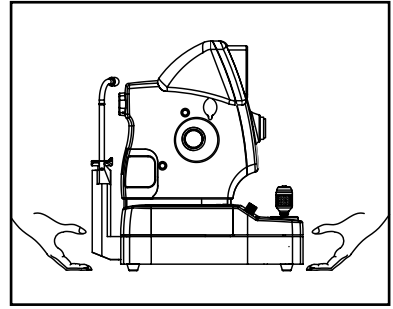
① Install the fundus camera on a motorized table (optionally available).

Keep the following cautions when moving this equipment.

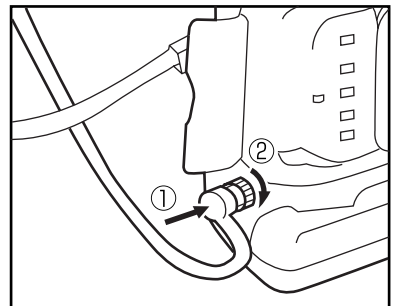
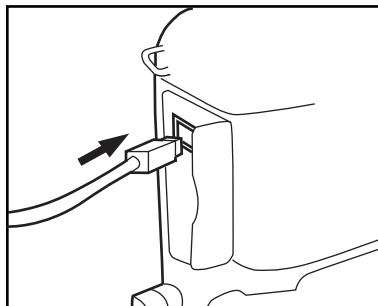
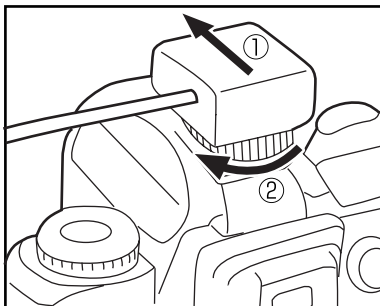
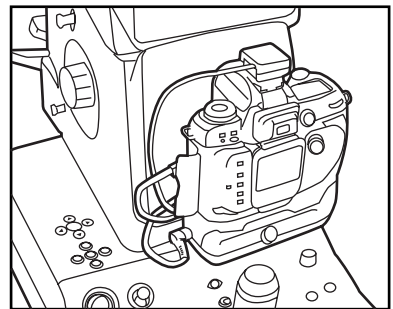
- Fasten the optical head base fixing screw.
- Put your hand under the power supply beneath the control lever and the objective lens as shown in the right figure and lift.
- Do not lift this equipment with holding any parts other than the above.
- Check that the place where you are going to set this equipment is not uneven to pinch your hand.
- Be careful not to pinch your hand in the case of installation.

② Make sure that ⑥ Power switch on the instrument is OFF (select "○").

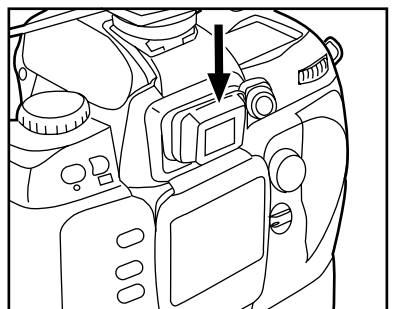
③ Attach the attached digital camera back to ⑨ camera mount.



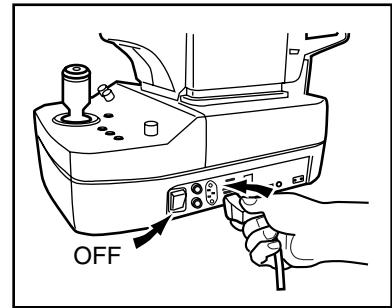
④ Connect three cables to the digital camera back.



⑤ Check that the cap is attached to the finder of the digital camera back.



- ⑥ Plug the power cable (accessory) in the ⑧ Power supply inlet.



- ⑦ Put the power cable's three-wire grounding type plug into the socket.
- ⑧ Connect the picture output terminal of the attached digital camera back and the digital interface cable terminal of the personal computer in which the bundled application is installed by the provided cable.
- Turn on the digital camera back.
- For details, see "3. Connection to Personal Computer."

About personal computer

The personal computer (optionally available) is required to display and store the pictures taken by the instrument. For the Specification of the necessary personal computer, see the attached "Portable VK-2 installation manual".

Note

Do not attach except the attached digital camera back.

Although the digital camera back is removable, do not attach or remove the digital camera back when not necessary. Doing so may cause dirt or dust to get inside this equipment as well as the digital camera back. It is necessary, however, to remove and attach the digital camera back when moving the installation location of the equipment or cleaning the inside of the digital camera back. In this case, consult our sales representative or an agency for how to remove and attach the digital camera back as well as the precautions.

Note

Do not change a setup of the digital camera back.

Do not remove the eye piece cap from digital camera back.

Do not remove the cables connected to the digital camera back.



WARNING



Obligatory

Make sure that the instrument is properly grounded to protect the body.
Put the plug in the three-wire grounding type socket.
Otherwise, there may occur electrical shock.



ATTENTION



Obligatory

The power supply must be dedicated for the sole use of the fundus camera.
Connection with the same power supply as that for any external device may cause the instrument to malfunction.

3

Connection to Personal Computer

Connect the ⑨ Image signal output terminal of the attached digital camera back and the digital interface cable terminal of the personal computer in which the bundled application is installed by the provided cable.

Note

Do not use the digital interface cable other than the one provided.
Using the cable other than the one provided may cause the fundus camera to malfunction.

- For information on how to connect the instrument to the personal computer as well as the details of the software, see the attached "Portable VK-2 installation manual" and the user's guide.
- Pictures can also be saved in the optional Compact Flash memory card not to be connected to USB cable.

About the connection with external equipment

The external equipment connected with this equipment and the equipment connected to the external equipment should use the apparatus which conforms to related IEC standard.

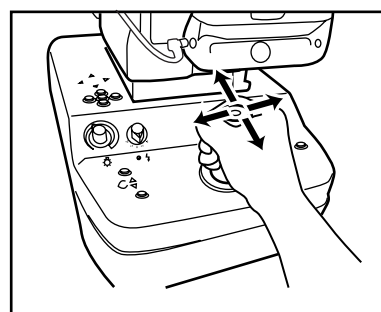
(Example: data-processing apparatus should use the apparatus which conforms to IEC 60601-1 or IEC 60950-1.)

Moreover, you have to make it the composition which fills the matter for which IEC 60601-1-1 is asked with the whole system. The person in charge who builds a system shall undertake the duty to satisfy the required matter of IEC60601-1-1. If there is an unknown point, please inform us beforehand.

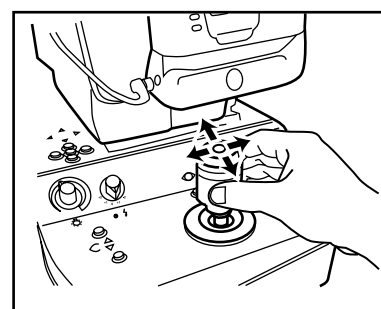
4 Operational procedure in photography by fundus camera

Manipulate ② Control lever to move the fundus camera forward/backward, leftward/rightward, or upward/downward.

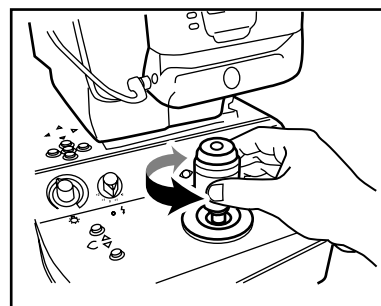
Move ② Control lever in its upright position, firmly held by your hand, forward/backward or leftward/rightward, to greatly move the fundus camera.



Move ② Control lever with its upper part held by your fingers, forward/backward or leftward/rightward, to slightly move the fundus camera.



Rotate the rubber ring on ② Control lever so that the fundus camera can electrically and vertically move synchronizing with the rotation of control lever . Slowly rotate the control lever to vertically and slowly move the fundus camera. Quickly rotate ② Control lever to vertically and speedily move the fundus camera.



 **ATTENTION**



When operating the fundus camera, take good care that the patient's examined eye, nose and face do not come in contact with the fundus camera.

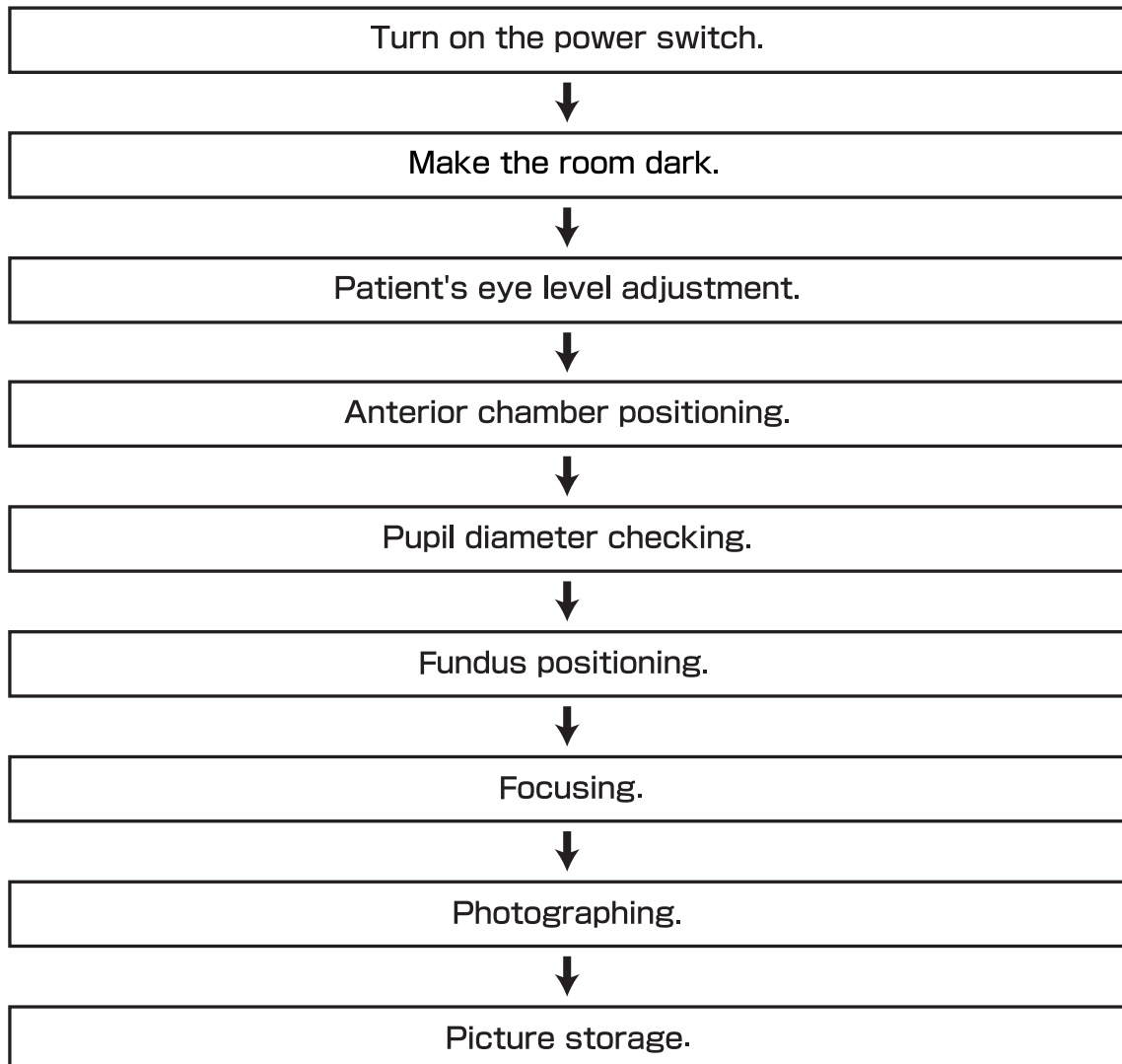
 **ATTENTION**



When operating the fundus camera, keep your fingers off the gap between the optical head base and the power supply, the gap between the chin rest support and the forehead rest support and the gap below the chin rest. Otherwise, the fingers may be pinched and injured. Instruct the patient not to place his or her fingers on the fundus camera.

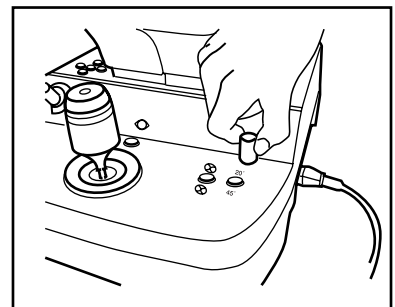
1. Operational procedure

< Example of photography: Picture angle of 45° Posterior >

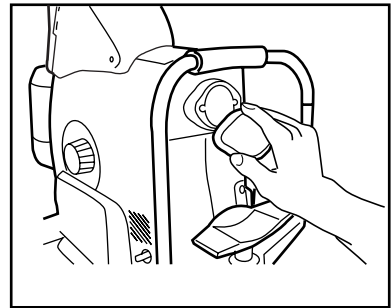


2. Preparations for fundus camera

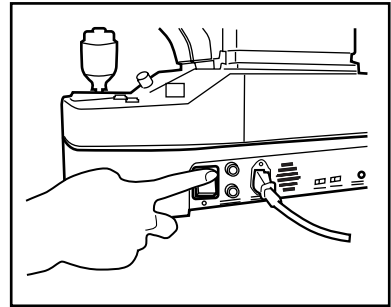
- ① Loosen ② Lock screws if tightened.



- ② Remove objective lens cap.

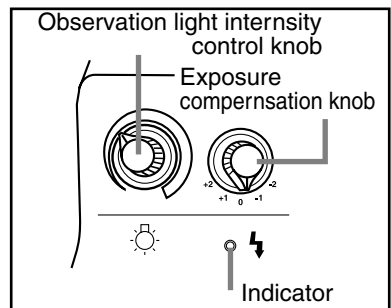


- ③ Turn ON ⑥ Power switch (select " | " side).

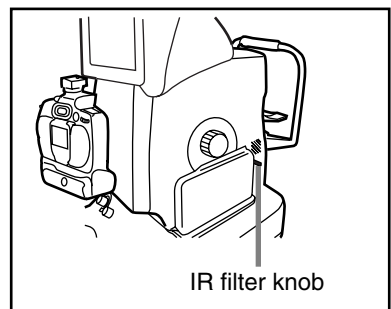
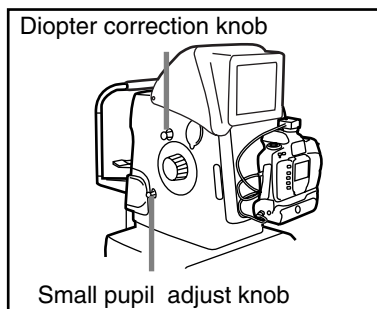


- ④ Set ⑳ Exposure compensation knob to "0" value.
(When "0" value is set, the indicator below the knob will glow.)

- ⑤ Set ⑳ Observation light intensity control knob to the ten o'clock position.



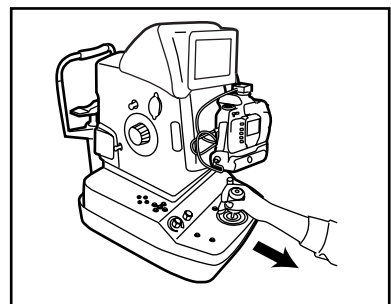
- ⑥ Make sure that ⑱ Small pupil adjust knob, ⑲ Diopter correction knob and ⑤ IR filter knob is pushed in place.



- ⑦ Make sure that the objective lens is clean and free of contamination.
For inspection and cleaning, see "8. MAINTENANCE and INSPECTION" dealing with: ■ Daily inspection ■ ■
Cleaning of objective lens ■

3. Preparations for patient's eye examination

- ① Reduce room's illumination to no higher than 5 luxes (as bright as to make news paper barely readable) so that patient's pupil can naturally turn to a state of dilation suitable for photographing.
- ② Instruct the patient to take off his or her glasses or contact lenses.
- ③ Before placing the patient's chin on ⑮ Chin rest, manipulate the ㉓ Control lever to keep the fundus camera as close as possible to you so that the patient does not come in contact with the camera.





ATTENTION



Obligatory

When the patient places his or her chin on the chin rest, take good care that the patient's examined eye, nose and face do not come in contact with the fundus camera.



ATTENTION



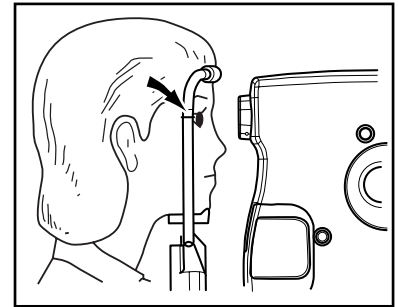
Prohibitory

When operating the fundus camera, keep your fingers off the gap between the optical head base and the power supply, the gap between the chin rest support and the forehead rest support and the gap below the chin rest.

Otherwise, the fingers may be pinched and injured. Instruct the patient not to place his or her fingers

- ④ Adjust height of electric optical table (optionally available) so that the patient can place his or her chin on ⑮ Chin rest with ease.
- ⑤ After the patient place his or her chin on ⑮ Chin rest, operate ⑳ Chin rest height adjust button to adjust the patient's eye height to the position of ⑭ Eye level mark.

Instruct the patient to rest his or her forehead on ⑬ Forehead rest.



ATTENTION



Obligatory

When adjusting the eye height, move the chin rest vertically with good care while watching a patient's face. Otherwise, if too small, the face may be pinched in the chin rest.

4. Operational procedure in photography

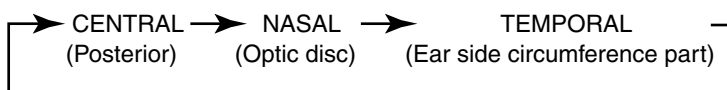
- ① Selecting picture angle

Operate ⑳ Picture angle selector to select a picture angle of either 45° or 20°. When the power is turned on, a picture angle of 45° is selected. If a picture angle of 20° is selected, ⑳ Picture angle selector will glow. Picture angle is displayed on the upper right side of the monitor.

- ② Selecting internal fixation target

Use ㉑ Internal fixation target button to select the position from Central, Nasal, or Temporal.

When the power is turned "ON", the fixation target for Central is selected. Each press of the internal fixation target button cycles through the indications in the following order;



Currently selected position is displayed on the lower right of the ③ Monitor.

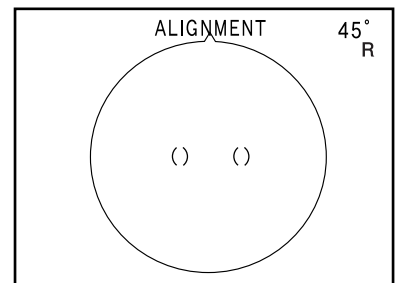
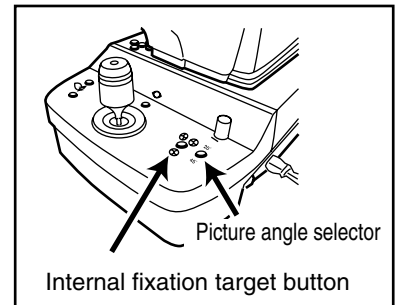
- ③ Instruct the patient to look at the center (front) of objective lens.

- ④ Checking Anterior chamber observation display

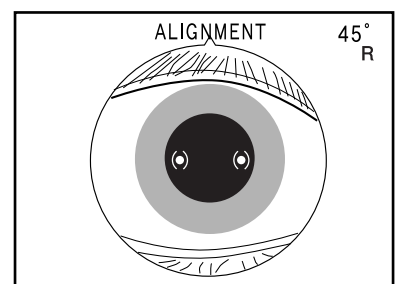
When the fundus observation display appears, switch to the anterior chamber observation display by ㉒ Anterior chamber button. "ALIGNMENT" and " () () " will be indicated on ③ Monitor.

- ⑤ Checking patient's eyelids

If the eyelids are closed, fundus photography will not be well performed. For instance, white eyelid reflection will appear on the picture. In such a case, instruct the patient to widely open his or her eyes. You may need to instruct the patient to open his or her eyelids manually.



Anterior chamber observation display



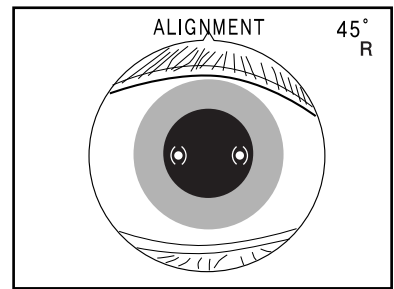
⑥ Anterior chamber positioning

Operate the fundus camera so that the pupil can come in the center of round mask on ③ Monitor.

⑦ Aligning anterior chamber working dots

Operate the fundus camera to align ④ Anterior chamber working dots (luminous dots) so that they can come in two pairs of round brackets (), respectively on ③ Monitor.

Depending on which eye (right or left) is examined, the location of the two round brackets () are switched when the internal fixation lamp is switched to the optic disk fixation lamp or the aural peripheral fixation lamp. Perform positioning of the two pairs of round brackets () so that luminous dots come in the two pairs of brackets ().



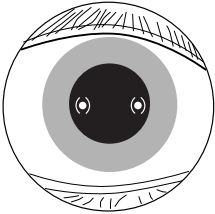
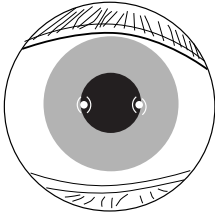
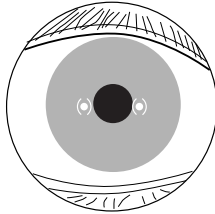
Keys to operation

Move the fundus camera vertically to move the working points (luminous dots) upward/downward and rightward/leftward.

Move the fundus camera forward and backward to change the distance between dots.

⑧ Checking pupil diameter

Check the condition of dilation by comparing the patient's pupil diameter and Pair of luminous dots.

Dilation in good condition	Insufficient dilation (photography enabled)	Pupil diameter insufficient for photography
		
Luminous dots in pupil	Dot on top of the pupil	Luminous dots outside of pupil
Photography enabled at zero flash intensity	Photograph at a flash intensity of +1 or +2. If the flash intensity is still insufficient, photograph in Small pupil.	Photography disabled

● Photographing conditions described above may not be applicable to some patients.

Insufficient dilation

In case of insufficient dilation, make the room even darker, or take more time to get accustomed to darkness so that natural dilation can be facilitated.

⑨ Switching to fundus observation display

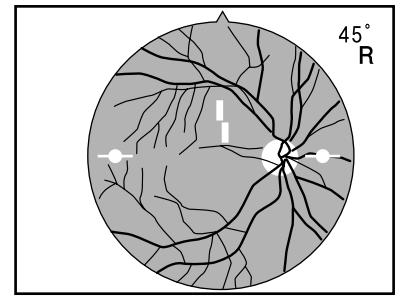
Switch to fundus observation display by ⑳ Anterior chamber button.
Adjust brightness by ㉑ Observation light intensity control knob.

⑩ Fixation of Patient's eye

Instruct the patient to look at the internal blinking green light (internal fixation lamp).

⑪ Aligning fundus working dots

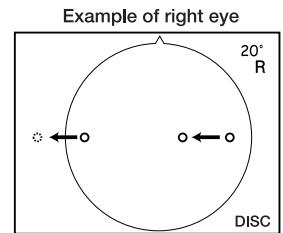
Operate the fundus camera to equally position the pair (left and right) of working dots (luminous dots) on top of the left and right bars "-", respectively on the ③ Monitor.



When photographing optic disk

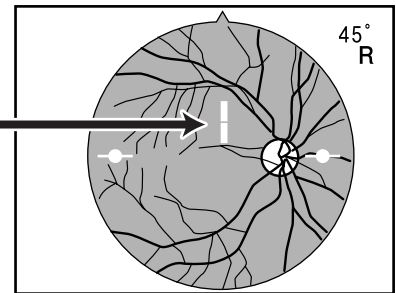
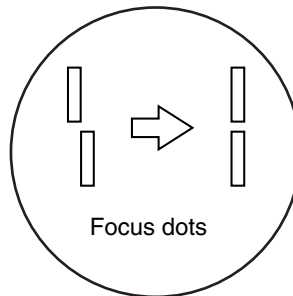
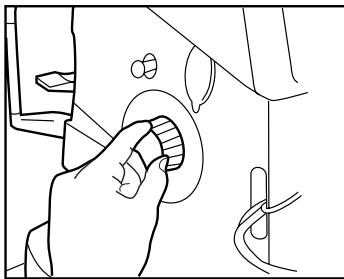
When optic disk is in the center of the display, photograph with working dots (luminous dots) positioned off toward macula so that brightness of fundus on the monitor can be equal on the right and left side.

Position the right eye off toward the left side and the left eye off toward the right side. Photographing without dislocating working dots (luminous dots) will cause either of the left and right sides to appear darker.



⑫ Focusing

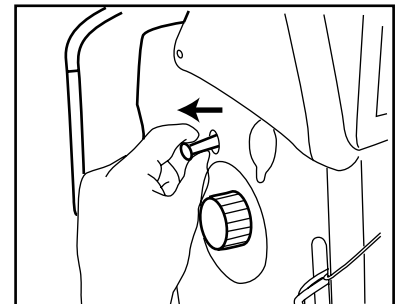
Turn ㉒ Focus knob so that focus dots on the display can form a single line.



⑬ Diopter compensation

If focussing is disabled, pull out ㉓ Diopter correction knob to replace the diopter lens by a proper one.

Because the focus dots disappears at this stage, focus while watching fundus image on the monitor.

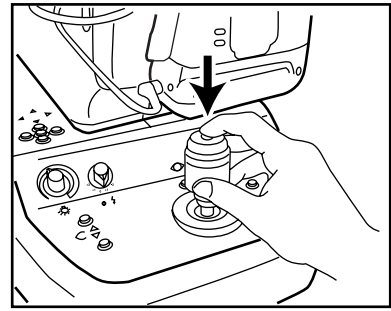


Make sure to switch to a proper lens at a "click" point by ㉓ Diopter correction knob.

0	□	-15D~+13D
-	□	-33D~-11D
+	□	+10D~+40D

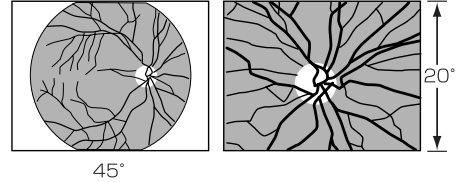
⑭ Photography

Push ⑳ Shutter button to energize the flash for photographing.



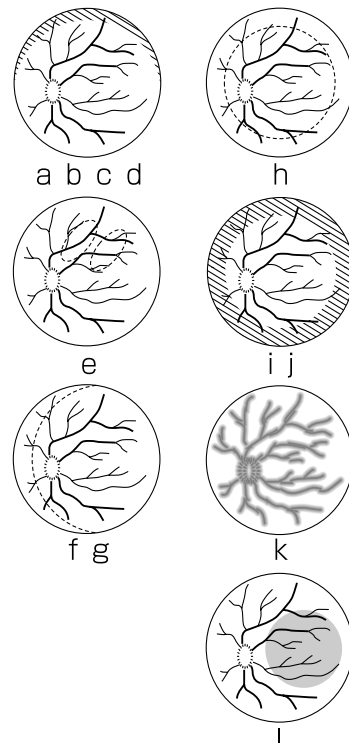
Pictures taken at picture angles of 45° and 20°

Picture taken at a picture angle of 45° is a masked round one.
 Picture taken at a picture angle of 20° is an unmasked full-screen one.
 The angle of 20° in this instrument shows the vertical picture angle of the pictures taken.



The following items should be considered to take better pictures:

a Shadow at top	The camera was positioned too high or patient's eyelid was encroaching the pupil. Lower the optical head. Raise the patient's eyelid manually.
b Shadow at bottom	Optical head was too low.
c Shadow at left	Either of the following wrong operations was made: ·Diopter lens was not switched to a proper position. ·Small pupil knob was not switched to a proper position. ·When photographing the optic disk at the center of the display, working dots of fundus were not located off toward macula.
d Shadow at right	See "C. Shadow at left.
e Circular or linear white blur	Eyelash in optical path
f White reflection at left	Optical head too far to the left
g White reflection at right	Optical head too far to the right
h White flare in the periphery	Optical head too close to subject eye
i Shadow in the periphery	Optical head too far from subject eye
j Shadow at center	Insufficient dilation
k Out of focus in general	Too much tear on cornea surface. Instruct the patient to blink a few times.
l Partially blue	Objective lens is dirty. Clean the lens.



⑮ Display/Storage of picture taken

Pictures taken can be displayed by and stored in the connected personal computer.

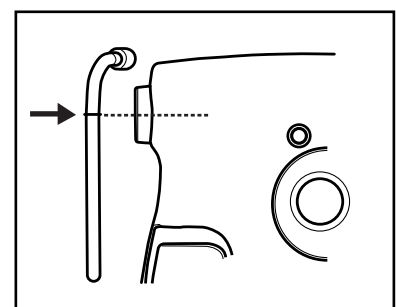
- To display and store the pictures taken, a personal computer (optionally available) is necessary.
- Pictures can also be saved in the optional Compact Flash memory card without connecting to a personal computer.

⑯ When you continue in photography

When you continue in photography, follow the operational procedure as described above.

When photographing a patient's other eye, pull the fundus camera toward you so that it will not contact his or her eyes, nose or face and then move the camera toward the other eye, which must then be aligned.

- Before photographing another patient, turn ㉓ Control lever to align the position of ① Objective lens of fundus camera with ⑭ Eye level mark. This will facilitate positioning in subsequent photographing.



⑰ Termination

Turn off the power supply of the fundus camera and the personal computer (select "○" side).

Seal the objective lens with the protective lens cap.

Manipulate ⑳ Control lever to move the fundus camera to a location where the power supply is located on top of the optical head base.

Press down and tighten ㉑ Lock screws to fix the fundus camera.

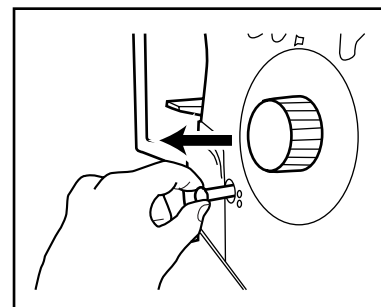
Lastly, seal the fundus camera with the dust cover (accessory) to guard against dust.

5. Small pupil mode

When photographing a patient's eye whose dilation is insufficient, pull out the ⑱ Small pupil adjust knob.

Pull out ⑱ Small pupil adjust knob to display "SP" on the upper right side of ③ Monitor.

When Small pupil adjust mode is selected, a pupil diameter of 3.7 mm or more is sufficient for photography.



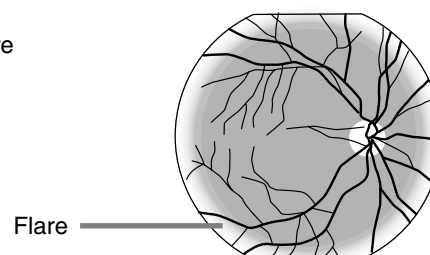
Be sure to switch to a desired pupil diameter by the Small pupil adjust knob.

If switching is at half way, pictures taken will have a shadow either at left or at right.

Flare in the periphery

Pictures taken at a picture angle of 45° in Small pupil mode will have a flare in the periphery.

Flare level will vary with the individual patient.



6 Auto OFF function

The instrument has an Auto OFF function, which will activate if no operation is made on it within a specified period of time.

When the function activates, the monitor and the illumination lamp will turn off and ㉒ Chin rest height adjust button will flash.

Pushing an arbitrary button in the operation panel will deactivate the Auto OFF function.

The Auto OFF function is set such that it will activate after a period of ten-minute non-operation.

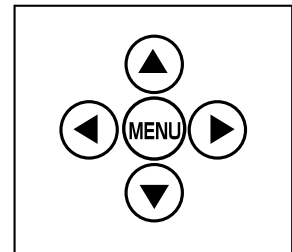
- For information about Auto OFF function set time change and ON/OFF selection, see "7. Menu mode."

7

Menu mode

A mode in which a variety of functions of KOWA *nonmyd 7* can be set.

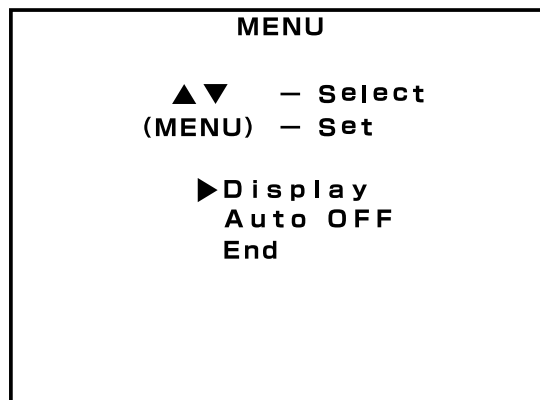
Keys used for setting are ▲, ▼, ◀, ▶ keys on the ③ Menu setting button and the menu key.



■ Menu mode activation ■

Maintain pushing the menu key about two seconds.

Upon menu activation, a display as illustrated below will appear.



■ Selecting an item ■

Selection of an item using the ▲ and ▼ keys will cause the "▶" mark to move on the screen.

Establish the item selected by the menu key. Upon its establishment, the item display will appear.

■ Menu mode termination ■

Selection of "End" and establishment of an item by the menu key will cause the menu mode to be canceled to return to the observation display.

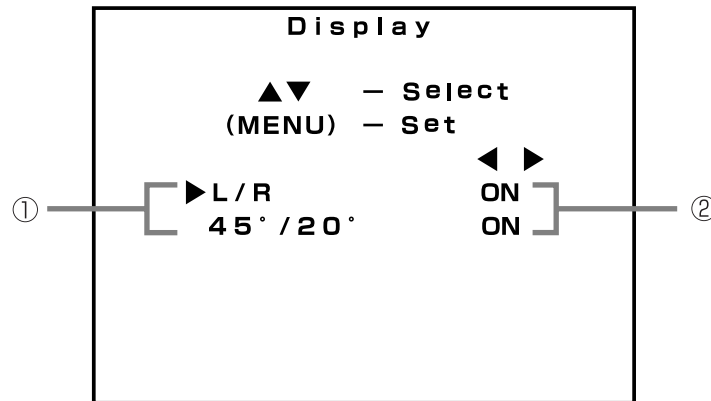
What was set in the menu mode will remain stored even after turning off the power.

■ Item description ■

Display

Upon selection of Display, there will appear the display as illustrated below. Select either of ON/OFF for displaying items on the observation and photography displays.

When ON is selected, the items will appear on the observation and photography displays. When OFF is selected, it will not be displayed.



- ① Move the "▶" mark to the items (L/R, 45° / 25°) to be set, by using the "▲" and "▼" keys.
- ② Select either of ON/OFF by using the "◀" and "▶" keys.
- ③ To press the menu key will cause the menu mode display to return to its first one, in which Display is set.

Auto OFF

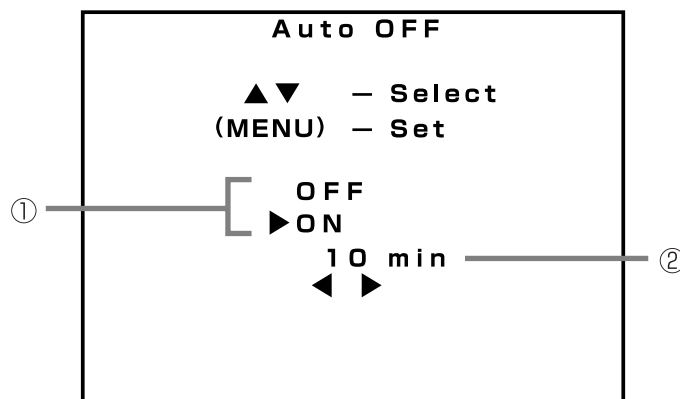
Upon selection of Auto OFF, there will appear a screen as illustrated below, on which the Auto OFF function can be set.

ON: The Auto OFF function is set such that it will activate if no operation was made within a specified period of time. The period can be set between 1 and 99 minutes.

Pushing an arbitrary switch will deactivate the Auto OFF function and return to the screen for immediate photography.

- What has been set on the menu before the Auto OFF function activates can be stored.

OFF: The Auto OFF function does not activate. An area for setting a period of non-operation will appear as * *.period of time.



- ① Move the "▶" mark to either of items (ON/OFF) by the "▲" and "▼" keys.
- ② If ON is selected, set by the "◀" and "▶" keys a desired period of time elapsing before the Auto OFF function activates.
- ③ To press the menu key will cause the menu mode display to return to its first one, on which Auto OFF can be set.

Your fundus camera is a precision instrument for which frequent check-ups and maintenance are essential. To keep your KOWA *nonmyd 7* in good operating condition, please read the following with care.

■ Daily inspection ■

When using the fundus camera for the group examination or when you have used the camera for more than one year, make sure to provide a spare illumination lamp or flash lamp.

- After finishing photography, always turn off the instrument and seal the objective lens with the protective lens cap. Enclose the fundus camera with the dust cover (accessory) to guard against dust as well.
- Take care that the objective lens is free of dust, fingerprints and bodily fluid like sweat.
- Right before starting photography for a day, always make sure that the objective lens is free of dirt. Darken the room and then pull ⑤ IR filter knob to change the illumination light to visible radiation so that dirt on the lens exposed to the visible radiation can be easily found. Set the lamp intensity knob to its maximum, If the objective lens is dirty, see "■ Cleaning objective lens ■."
- If the fundus camera in a cool room should be suddenly moved to a warmer room, or if the room in which the camera is located should be suddenly heated, the objective lens and/or internal lens may be prohibitively fogged. Wait for a while until the lens is defogged, and after defogging, start photography.
- If it has been repeatedly fogged, the lens may get moldy. In this case, contact our company or Kowa's dealer where you purchased it.
- If you intend not to use the camera for a long period of time, pull the plug out of the socket.

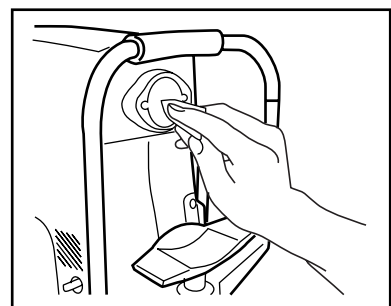
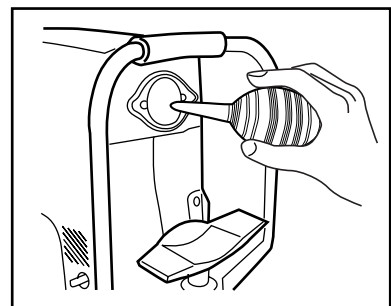
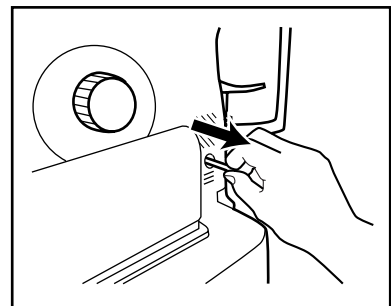
■ Regular inspection ■

In using the instrument for a long period of time, have it checked and maintained regularly at least once every two years in order to confirm and maintain the product's safety. Consult your Kowa's dealer where you purchased this instrument for details and cost of the inspection.

■ Cleaning objective lens ■

Using the objective lens with dirt or fingerprints etc. may cause pictures to be partly blue, wholly whitish, or partly light. Clean the lens by the following procedure.

- ① Turn on ⑥ Power switch.
- ② Darken the room and then pull ⑤ IR filter knob to change the illumination light to visible radiation so that dirt on the lens exposed to the visible radiation can be easily found. Set ⑩ Observation light intensity control knob to its maximum.
- ③ Blow off any dust on the objective lens by the dust blower (accessory).
- ④ If the dust blower is inefficient, wipe the surface with lens cleaning paper moistened with a mixture of pure alcohol and ether (in a 1 to 1 ratio). Be sure to wipe carefully and mildly without applying force. Rotate the wipe little by little in a circular motion from in the center of the lens toward the edge.



Keys to cleaning

For cleaning all over again, discard the used lens cleaning paper (or gauze) and use the fresh one moistened with the mixture, for complete cleaning.

- If it is wiped with dust on it or with force applied on it, the lens may scar on its surface.
 - Never use chamois skin or silicone-treated cloth.
 - Because the suggested cleaning solution is highly volatile and flammable, pay special attention when handling and storing.
- ⑤ Dirt, which cannot be cleaned off with the mixture, may be removed by lightly wiping the lens with cotton swab moistened with a small amount of water.
After this step, fully wipe the lens with the solution all over again.
If dirt should still resist cleaning, contact our company or your Kowa dealer where you purchased the instrument.
- ⑥ After finishing the objective lens cleaning, press down ⑤ IR filter knob and set ⑩ Observation light intensity control knob back to ten o'clock position.

■ Outer cleaning ■



ATTENTION



prohibitory

Do not wipe the outer surface of the instrument with solvents such as benzene, alcohol, thinner, ether and the like.

Otherwise, such substances may cause the surface to be discolored or deteriorated.

Wipe the outer surface with soft cloth, from which water (used to moisten the cloth) was firmly squeezed off.

Lightly wipe the monitor cover with soft cloth such as gauze because it is open to scar.

Wipe off the obstinate dirt with soft cloth, from which water or lukewarm water used to dilute a small amount of neutral detergent was squeezed off.

■ Replacing illumination lamp ■



WARNING



Unplug



Warning
High-voltage

When replacing the illumination lamp or the flash lamp, make sure the instrument is turned off and unplugged from the socket. Otherwise, there may occur electrical shock.



WARNING



Unplug



Warning
High-voltage

This instrument is equipped with a storage capacitor for photography light. Replacing the flash lamp or the illumination lamp while this capacitor is still not yet fully discharged causes a danger of an electric shock. Check that the Discharge indicator LED is turned off before replacing the flash lamp or the illumination lamp.



ATTENTION



Prohibitory



Caution
High-temperature

Do not replace the flash lamp and the illumination lamp immediately after its service.

Otherwise, you may burn your fingers on the hot lamp. Allow 30 minutes to cool it off before replacement.



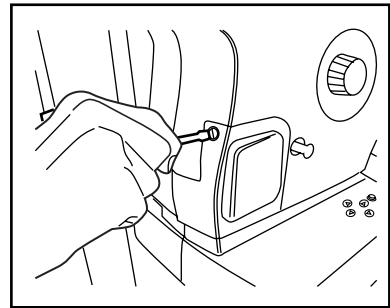
ATTENTION



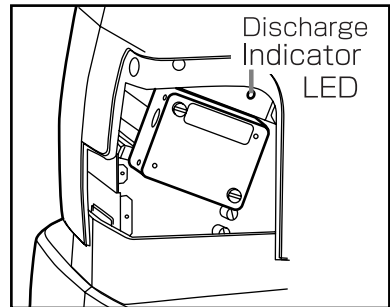
Prohibitory

Do not touch the bulb in the illumination lamp with your bare hands. Otherwise, the lamp may have a lower quantity of light and a shorter expected life.

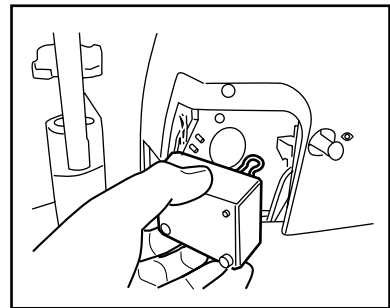
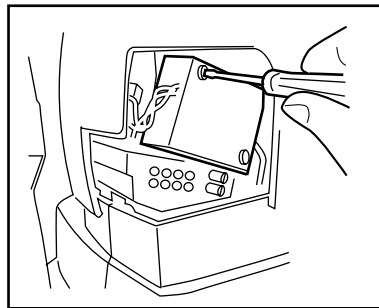
- ① Rotate ⑬ Control lever to move the fundus camera to the uppermost location.
- ② Turn off ⑭ Power switch and pull the plug from the socket.
- ③ Remove ⑮ Lamp cover by unscrewing ⑯ Lamp cover screws with a coin or ⊖ driver.
Make sure that the lamp has cooled off enough and then proceed to the next step.



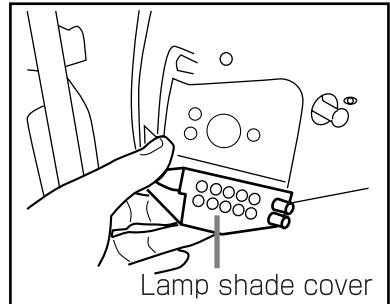
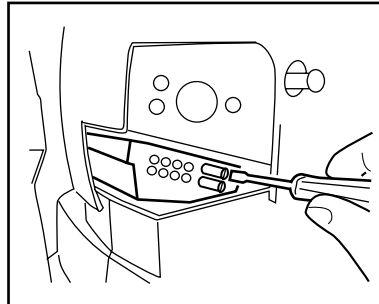
- ④ Check that the Discharge indicator LED shown in the figure is completely turned off. It normally turns off completely within three minutes after the instrument is turned off. If it does not turn off even after above period of time, contact your dealer or sales representative as there is a risk of failure. Also, never touch the instrument.
 - Discharge indicator LED turns on only when it discharges after the instrument is turned off.



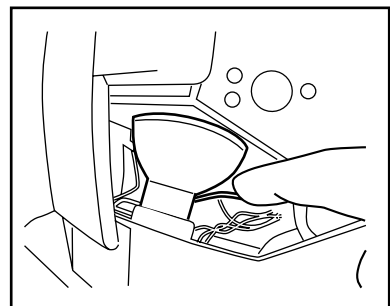
- ⑤ After the Discharge indicator is turned off and the illumination lamp is fully cooled down (about 30 minutes after the power is turned off), unscrew two screws by a ⊖ driver and remove the flash lamp socket in advance.
 - Do not touch the flash lamp



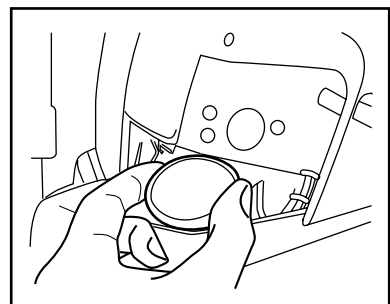
- ⑥ Unscrew two screws of lamp shade cover with a ⊖ driver, for removal.



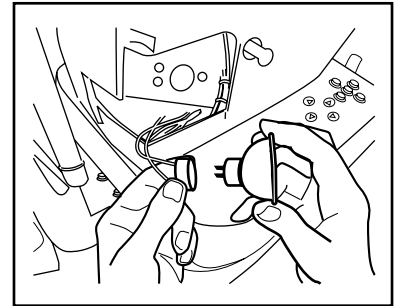
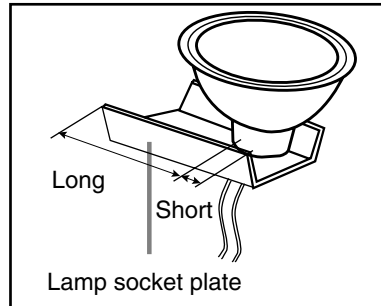
- ⑦ Lower the internal lever so that the illumination lamp can be removed toward you.



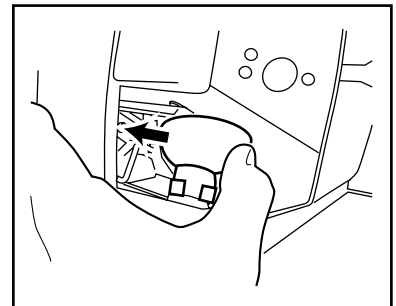
- ⑧ Pull the illumination lamp from its socket as it is fitted, holding the lamp shade in your hand.



- ⑨ Remove the illumination lamp by holding its shade and socket.
Fit a new lamp in the socket.
- Do not twist the illumination lamp when fitting or removing it.
 - Press down and push the illumination lamp deep into the socket to fit it securely.



- ⑩ Push inside the illumination lamp and its socket. Press down the illumination lamp deep into the fitting base with shorter plate of illumination lamp directed toward you, and fit it securely.



- ⑪ After putting the lamp shade cover over the lamp socket plate, tighten two screws with a \ominus driver to fit the lamp shade cover.
- ⑫ Tighten two screws with a \ominus driver to fit the flash tube socket. Pay attention not to pinch the surrounding cables when fixing the flash lamp socket.
- ⑬ Mount ⑰ Lamp cover and tighten ⑰ Lamp cover screws with a coin or a \ominus driver.
- When installing the lamp cover, make sure that the cord of the illumination lamp socket is internally accommodated in place without interference with the external sheath.
- ⑭ Connect the plug to the socket, and turn on the power switch.
- ⑮ Turn on the instrument and perform test photography.

■ Replacing flash lamp ■



WARNING



Unplug



Warning
High-voltage

When replacing the illumination lamp or the flash lamp, make sure the instrument is turned off and unplugged from the socket. Otherwise, there may occur electrical shock.



WARNING



Unplug



Warning
High-voltage

This instrument is equipped with a storage capacitor for photography light. Replacing the flash lamp or the illumination lamp while this capacitor is still not yet fully discharged causes a danger of an electric shock. Check that the Discharge indicator LED is turned off before replacing the flash lamp or the illumination lamp.



ATTENTION



Prohibitory



Caution
High-temperature

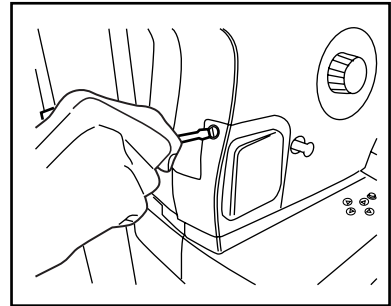
Do not replace the flash lamp and the illumination lamp immediately after its service. Otherwise, you may burn your fingers on the hot lamp. Allow 30 minutes to cool it off before replacement.

ATTENTION

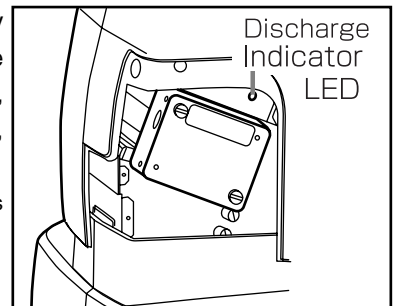


Do not touch the bulb in the illumination lamp with your bare hands. Otherwise, the lamp may have a lower quantity of light and a shorter expected life.

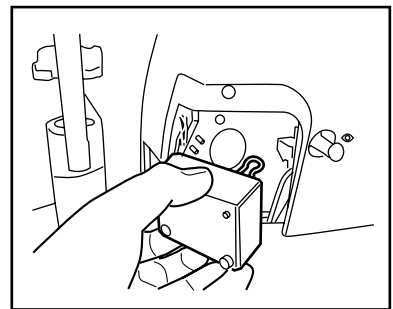
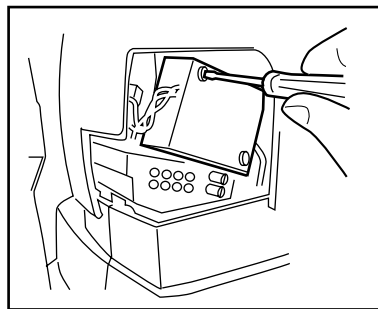
- ① Turn off ⑥ Power switch and pull the plug out of the socket.
- ② Loosen ⑩ Lamp cover screws with a coin or a \ominus driver and then remove ⑪ lamp cover.
Make sure that the lamp has cooled off enough and then proceed to the next step.
- ③ Loosen two screws of the flash lamp socket for removal.



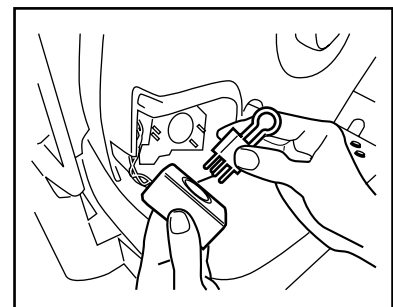
- ④ Check that the Discharge indicator LED shown in the figure is completely turned off. It normally turns off completely within three minutes after the instrument is turned off. If it does not turn off even after above period of time, contact your dealer or sales representative as there is a risk of failure. Also, never touch the instrument.
 - Discharge indicator LED turns on only when it discharges after the instrument is turned off.



- ⑤ After the Discharge indicator is turned off and the illumination lamp is fully cooled down (about 30 minutes after the power is turned off), unscrew two screws by a \ominus driver and remove the flash lamp socket in advance.



- ⑥ Remove the flash lamp holding the lamp and its socket in your hand, and fit a new lamp in the socket.
 - Do not twist the illumination lamp when fitting or removing it.
 - Press down and push the flash lamp deep into the socket and fit it securely.



- ⑦ Tighten two screws of the flash lamp socket with a \ominus driver. Pay attention not to pinch the surrounding cables when fixing the flash lamp socket.
- ⑧ Place ⑪ Lamp cover and ⑩ Lamp cover screws with a coin or a \ominus driver.
 - When installing the lamp cover, make sure that the cord of the flash lamp socket is internally accommodated in place without interference with the external sheath.
- ⑨ Connect the plug to the socket, and turn on the power switch.
- ⑩ Turn on the instrument and perform test photography.

■ Replacing fuse ■



WARNING



Unplug



Warning
High-voltage

When replacing the fuse, make sure the instrument is turned off and unplugged from the socket. If the fuse holder cover is removed with the instrument unplugged, there may occur electrical shock.



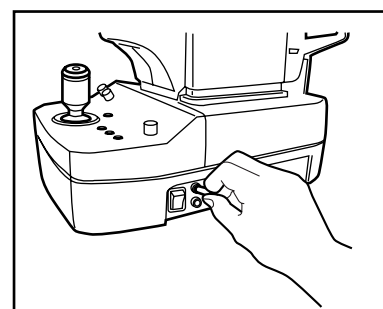
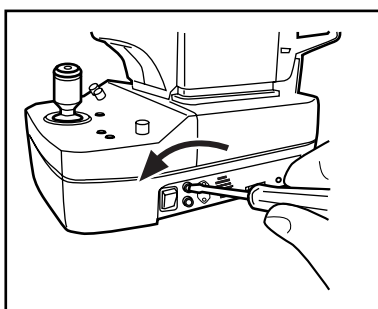
WARNING



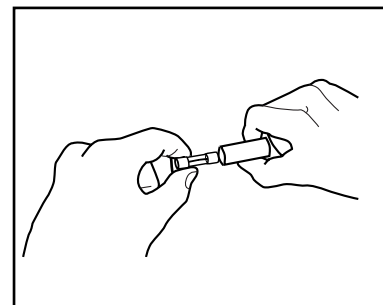
Obligatory

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

- ① Turn off ⑥ Power switch and pull the plug out of the socket.
- ② When replacing any fuses, make sure that the instrument is turned off and then waited for discharge at least 5 minutes for the safety.
- ③ Press down the fuse holder with a ⊖ driver and turn the fuse holder in the direction of the arrow (counterclockwise) for removal.



- ④ Pull the old fuse and replace it by the new.
Make sure that the type and rating are the same as those on the old.



- ⑤ Press down the fuse holder with a ⊖ driver and turn the fuse holder in the opposite direction of that of the arrow (clockwise) and fit it.
- ⑥ Connect the plug to the socket.

■ Replenishing consumables ■

Please order spare parts by part number listed below.

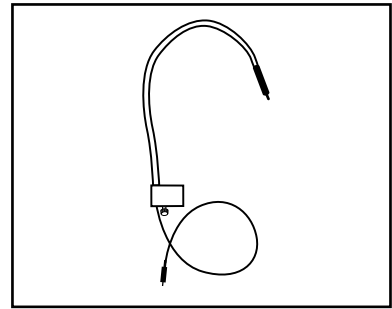
Part name	Purchase order number
Illumination Lamp	K9L39A26
Electronic flash lamp	K9L39FU
Fuse 2.5AS	021802.5M
Disposable paper for chin	K9L-TB45#102
Chin rest pin	K9L-TB45#101
Dust cover	AFT2#179

9 Option

■ External fixation lamp ■

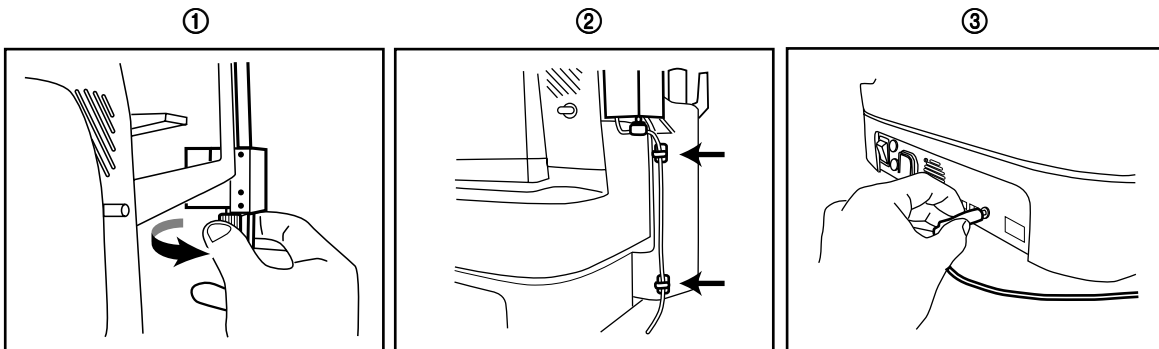
Optional external fixation lamp allows guiding the patient's fixation to a desired position.

Internal fixation lamp is switched to external fixation lamp when you fix external fixation lamp and switch ⑫ Fixation lamp selection switch.



Installing the external fixation lamp

- ① Aligning the groove on the external fixation lamp mount and the chin rest, tighten the mounting screw to lock the lamp.
- ② Adhere attached cord clamps at two places indicated in the figure and then fix the cord with the code clamps.
- ③ Insert the pin jack of external fixation lamp in ⑪ External fixation lamp terminal.

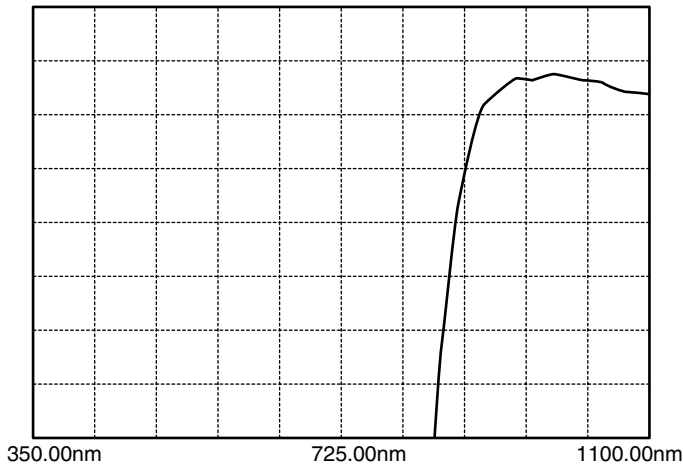


Picture angle	45° /20° Two angles (see P-20)
Working distance	30 mm (distance of examined eye to front end of objective lens)
Effective pupil diameter	ø4 mm. (Small pupil mode: ø3.7 mm.)
Compensation range of examined eye	Without correction : $-15\text{m}^{-1}(\text{D}) \sim +13\text{m}^{-1}(\text{D})$ -compensation : $-11\text{m}^{-1}(\text{D}) \sim -33\text{m}^{-1}(\text{D})$ +compensation : $+10\text{m}^{-1}(\text{D}) \sim -40\text{m}^{-1}(\text{D})$
Focusing	Split luminous bars coincidence
Working distance adjustment	2-luminous dot indication type
Internal fixation lamp	4 fixed dots switching type
External fixation lamp	Red light, blinking (option)
Monitor	5.5-inch LCD
Auto OFF function	With time setting function
Optical head base moving distance	Movable 40 mm forward/backward, 100 mm leftward/rightward Movable 30 mm vertically(electric)
Chin rest moving distance	Movable 60 mm (electric)
Power supply	Input : AC100 V – AC240 V 50/60Hz Power consumption : 200 VA (normal)/250 VA (maximum)
Dimensions	310mm(W) × 504mm(D) × 548mm(H)
Weight	21kg (Excluding the attached digital camera back)

Safety standard and classification

- IEC60601-1:1988
- IEC60601-1 Amendment 1:1991
- IEC60601-1 Amendment 2:1995
 - According to the type of protection against electric shock.
< CLASS I EQUIPMENT >
 - According to the degree of protection against electric shock.
< TYPE B APPLIED PART >
 - According to the degree of protection against ingress of water as detailed in the current edition of IEC 60529.
< IPX0 >
 - According to the degree of safety of application in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide.
< Equipment not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide. >
 - According to the mode of operation.
< CONTINUOUS OPERATION >
- ISO15004:1997
- IEC60601-1-2:2001

- The relative spectral output of the instrument



- The spectrally-weighted photochemical source radiance, both phakic LB and aphakic LA
 - LB = 0.00 mW/(cm² • sr) 305nm to 700nm
 - LA = 0.00 mW/(cm² • sr) 305nm to 700nm

(informative)

Spectrally weighted photochemical radiances LB and LA give a measure of the potential that exists of a beam of light to cause photochemical hazard to the retina. LB gives the measure for eyes in which the crystalline lens is in place. LA gives this measure either for eyes in which the crystalline lens has been removed (aphakes) and has not been replaced by a UV-blocking lens or for the eyes of very young children.

The value stated for this ophthalmic instrument gives a measure of hazard potential when the instrument is operated at maximum intensity and maximum aperture. Values of LB or LA over 80mW/(cm² • sr) are considered high for beams which wholly fill a dilated pupil.

The retinal exposure dose for a photochemical hazard is a product of the radiance and the exposure time. For instance, at a radiance level of 80mW/(cm² • sr), 3 min irradiation of the dilated (8mm diameter) pupil would cause the retinal exposure dose level to attain the recommended exposure limit. If the value of radiance were reduced to 40mW/(cm² • sr), twice that time (i.e.6min) would be needed to reach the recommended limit. The recommended exposure dose is based on calculations arising from the American Conference of Governmental Industrial Hygienists (ACGIH) - Threshold Limit Values for Chemical Substances and Physical Agents (1995-1996 edition).

While no acute optical radiation hazards have been identified for ophthalmic instruments, it is recommended that the intensity of light directed into the patient's eye be limited to the minimum level which is necessary for diagnosis. Infants, aphakes and persons with diseased eyes will be at greater risk. The risk may also be increased if the person being examined has had any exposure with the same instrument or any other ophthalmic instrument using a visible light source during the previous 24 h. This will apply particularly if the eye has been exposed to retinal photography.

12 Electromagnetic Compatibility (IEC60601-1-2: 2001)

KOWA *nonmyd 7* is a medical electrical instrument. The medical electrical instrument requires special care concerning electromagnetic compatibility (EMC). This section describes its suitability in terms of electromagnetic compatibility of this instrument. When installing or using this instrument, please read carefully and observe what is described here. (This instrument was tested on electromagnetic compatibility (EMC) based on IEC60601-1-2: 2001.)

1. Carefully handle portable- or mobile-type radio frequency communication unit (RF communications equipment) since it may have an adverse effect on this instrument resulting in malfunctioning.
2. Do not directly touch the pins of the connectors specified by the right figure. Also, take preventive measures before connecting cables to these connectors.

Examples of preventive measures are as follows;

- Pay attention to the humidity of the room (do not keep the humidity too low).
- Place the instrument where conductive floor is used.
- Wear non-polyester clothes.
- Discharge your body by touching a large metal or the metal part of the instrument chassis.
- Use a wrist strap against static electricity.

Provide all who use this instrument with education and training for the meaning of the above warning mark and the preventive measures, and make sure to strictly observe them.

Refer to the following when providing education and training.

[About Static Electricity]

All materials hold positive (+) and negative (-) electrical charges. Normally, the number of positive (+) charges is equal to the number of negative (-) charges. This is called "neutral" state.

However, when electrons move by friction, contact or abrasion, the material holds more negative charges or more positive charges (this is called "electrostatically charged").

The electricity which is generated here is called "static electricity".

Static electricity is generated anytime. However, electric charges where humidity is high leak quickly as water which is a conductor is attached to the surface of the material and the electricity passes through the water film.

By contrast, the material where humidity is low holds a few thousands of volts as it tends to remain electrostatically charged.

Static electricity which is built up is discharged through the earth via other conductors. This is called "electrostatic discharge".

When an operator with static electricity touches electronic devices or parts, they discharge static electricity, which may cause malfunction or damage.

Therefore, be very careful with electrostatic discharge when touching electronic devices or parts. Specific measures are as follows;

- Pay attention to the humidity of the room (do not keep the humidity too low).
- Place the instrument where conductive floor is used.
- Wear non-polyester clothes.
- Discharge your body by touching a large metal or the metal part of the instrument chassis.
- Use a wrist strap against static electricity.

These are preventive measures to avoid discharging static electricity through electronic devices or parts.

3. This instrument was tested on electromagnetic compatibility (EMC) with optional or accessory parts being assembled into it.

Do not assemble into this instrument any optional or accessory parts other than those designated by Kowa. Otherwise, this instrument may be adversely affected by other instrument resulting in malfunctioning, or the latter itself may malfunction.

- power cable for 100V:KP300VCTF3X1.25SQKS16A
- power cable for 120V:KP320SJT18X3KS31
- power cable for 230V:KP-4819Y KS-31A
- Digital camera back:CE Marking, VCCI, FCC acquisition equipment

4. This instrument is not designed such that it can be used adjacent to other instrument or placing one on top of another. Therefore, do not apply such use. Nevertheless, if such use is inevitable, it is necessary to constantly monitor if the instrument is functioning normally after such use has been adopted.

5. Accessories and options used with this instrument are tested for EMC (electromagnetic compatibility) when combined with equipment below. When used with equipment other than specified, this instrument may malfunction due to the effect of other equipment or other equipment may malfunction. Therefore, do not use equipment other than specified below.

Option 1 : Personal computer:CE Marking, VCCI, FCC acquisition equipment

[Compliance verification and guidance]


Guidance and manufacturer's declaration - electromagnetic emissions		
The KOWA <i>nonmyd</i> 7 is intended for use in the electromagnetic environment specified below. The customer or the user of the KOWA <i>nonmyd</i> 7 should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1 Class A	The KOWA <i>nonmyd</i> 7 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. The KOWA <i>nonmyd</i> 7 is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Group 1 Class A	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration - electromagnetic immunity			
The KOWA <i>nonmyd</i> 7 is intended for use in the electromagnetic environment specified below. The customer or the user of the KOWA <i>nonmyd</i> 7 should assure that it is used in such an environment.			
Immunity test	IEC60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge(ESD) IEC61000-4-2	±6kV contact	±6kV contact	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
	±8kV air	±8kV air	
Electrical fast transient/burst IEC61000-4-4	±2kV for power supply lines ±1kV for input/output lines	±2kV for power supply lines ±1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment. RC232C signal transmission cable of 2 m in length.
Surge IEC61000-4-5	±1kV differential mode ±2kV common mode	±1kV differential mode ±2kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycle 70% U_T (30% dip in U_T) for 25 cycle <5% U_T (>95% dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the KOWA <i>nonmyd</i> 7 requires continued operation during power mains interruptions, it is recommended that the KOWA <i>nonmyd</i> 7 be powered from an uninterruptible power supply or a battery.
Power frequency (50/60Hz) magnetic field IEC61000-4-8	3 A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. mains voltage prior to application of the test level			

Guidance and manufacturer's declaration - electromagnetic immunity

The KOWA *nonmyd* 7 is intended for use in the electromagnetic environment specified below.

The customer or the user of the KOWA *nonmyd* 7 should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment– guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	Portable and mobile RF communications equipment should be used no closer to any part of the KOWA <i>nonmyd</i> 7, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter Recommended separation distance $d=1.2 \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d=1.2 \sqrt{P}$ 80 MHz to 800 MHz $d=2.3 \sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey ^a , should be less than the compliance level in each frequency range ^b . Interference may occur in the vicinity of equipment marked with the following symbol: 

NOTE 1 At 80MHz and 800MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

- a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the KOWA *nonmyd* 7 is used exceeds the applicable RF compliance level above, the KOWA *nonmyd* 7 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the KOWA *nonmyd* 7.
- b Over the frequency range 150kHz to 80MHz, field strengths should be less than 3 V/m

Recommended separation distances between portable and mobile RF communications equipment and the KOWA *nonmyd* 7

The KOWA *nonmyd* 7 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the KOWA *nonmyd* 7 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the KOWA *nonmyd* 7 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d=1.2 \sqrt{P}$	80 MHz to 800 MHz $d=1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d=2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.2	1.2	2.3
10	3.7	3.7	7.4
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 80MHz and 800MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.



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