

INSTRUCTION MANUAL
NON-MYDRIATIC RETINAL CAMERA

TRC-NW200

INTRODUCTION

Thank you for purchasing the TOPCON TRC-NW200 Non-Mydriatic Retinal Camera.

This instrument is used to observe and photograph the posterior segment of the eye.

This instrument has the following innovative features:

- High-quality digital imaging
 - Easy operation
 - All-in-one system
 - Enhanced computerized features
-

This manual outlines the TRC-NW200 Non-Mydriatic Retinal Camera, including operating procedures, troubleshooting, maintenance and cleaning.

Before using the instrument, carefully read the "DISPLAY FOR SAFE USE" and the "SAFETY CAUTIONS" to familiarize yourself with the features of the TRC-NW200 Non-Mydriatic Retinal Camera and to ensure that you operate it efficiently and safely.

Always keep this Instruction Manual at hand.

CAUTIONS FOR USE

Basic caution

When moving the chinrest up and down, be careful not to catch the patient's hand.
[The patient may be injured.]

ENVIRONMENTAL CONDITIONS FOR USE

Temperature: 10°C ~ 40°C
Humidity: 30% ~ 75% (without dew condensation)
Air pressure: 700hPa ~ 1060hPa

STORAGE, USAGE PERIOD AND OTHERS

1. Environmental conditions
Temperature: 10°C ~ 40°C
Humidity: 30% ~ 75% (without dew condensation)
Air pressure: 700hPa ~ 1060hPa
2. When storing the instrument, ensure that the following conditions are met:
 - (1) The instrument must not be splashed with water.
 - (2) Store the instrument where air pressure, temperature, humidity, ventilation, sunlight, dust, salty/sulfurous air, etc. do not give any negative side effect.
 - (3) Do not store or transport the instrument on a slope or uneven surface or in an area where it is subject to vibrations or instability.
 - (4) Do not store the instrument where chemicals are stored or gas is generated.

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTATION

Temperature: -20°C ~ 50°C
Humidity: 10% ~ 95%

CHECKPOINTS FOR MAINTENANCE

1. Periodically inspect the instrument and its parts.
2. Before using the instrument again after a long period of inactivity, make sure that it operates safely and normally.
3. Be careful not to stain the objective lens with fingerprints, dirt, etc., as this will affect the quality of pictures that the instrument takes.
4. When the instrument is not in use, cap the objective lens and apply the dust cover to the instrument.
5. If the objective lens is stained, clean it according to "Cleaning the objective lens" in this manual.

DISPLAY FOR SAFE USE

To encourage safe and proper use and to prevent danger to the operator and others or potential damage to properties, important messages are put on the instrument body and inserted in the instruction manual.

We suggest that everyone understand the meaning of the following displays, icons and text before reading the "SAFETY CAUTIONS" and observe all listed instructions.

DISPLAYS

Display	Meaning
 WARNING	Incorrect handling by ignoring this display may lead to a risk of death or serious injury.
 CAUTION	Incorrect handling by ignoring this display may lead to personal injury or physical damage.
	<ul style="list-style-type: none">• Injury refers to cuts, bruises, burns, electric shock, etc. which do not require hospitalization or extended medical treatment.• Physical damage refers to extensive damage to the building, nearby equipment and/or surrounding furniture.

ICONS

Icon	Meaning
	Prohibition. Specific content is expressed with words or a picture near the  icon.
	Mandatory Action Specific content is expressed with words or a picture near the  icon.
	Caution Specific content is expressed with words or a picture near the  icon.

SAFETY CAUTIONS

WARNINGS

Icon	Prevention item	Page
	To avoid electric shock, be sure to unplug the power cable before assembling. Also, do not plug the power cable in before assembling.	17
	To avoid fire and electric shock in case of leakage, be sure to use a power supply equipped with a 3-plug AC receptacle for proper grounding.	21
	To avoid electric shock, do not attempt disassembling, rebuilding and/or repairs on your own. Ask your dealer for repairs.	88
	Do not remove the covers from the main unit, chinrest unit or power supply unit except for the lamp house cover. You may receive an electric shock.	88
	To avoid electric shock, be sure to remove the power cable from the instrument body before removing the fuse cover. Also, do not connect the power cable to the instrument body with the fuse cover left unfixed.	96
	To avoid fire and electric shock, install the instrument in a place free of water and other liquids.	—
	To avoid fire and electric shock, do not put cups or vessels containing liquids near the instrument.	—
	To avoid electric shock, do not insert metal objects into any vents and/or slots.	—
	To avoid fire, use a properly rated fuse (T-5A,125V 100,110,120V, T-2.5A, 250V 220, 230, 240V) which matches the display provided on the fuse holder.	96
	To avoid fire in the event of an instrument malfunction, immediately turn OFF the Power switch and unplug the cable if you see smoke coming from the instrument or if you detect a burning odor.	—

SAFETY CAUTIONS

CAUTIONS

Icon	Prevention item	Page
	To avoid pain and discomfort to the patient and/or damage to the patient's eye, do not brighten the monitor lamp more than necessary.	75
	To avoid pain and discomfort to the patient and/or damage to the patient's eye, do not brighten the photography light more than necessary.	75
	To prevent the instrument from falling and to avoid injury, do not install the instrument on an uneven or unsteady surface, including a slope.	17, 20 92
	To avoid injury, do not place your fingers into the gap between the instrument body and the power supply unit.	77
	To avoid burns, do not touch the lamp immediately after it goes off.	93
	To avoid electric shock, do not handle the plugs with wet fingers.	21
	To avoid electric shock, do not touch the xenon lamp immediately after it flashes or burns out.	94

SAFETY CAUTIONS

⚠ CAUTIONS

Icon	Prevention item	Page
	Adjust the height of the chinrest while watching the patient directly.	71
	To avoid injury to the patient's eyes and nose while moving the instrument body, be attentive of the distance between the patient and the objective lens.	77
	To avoid falling and injury while moving the table with the instrument on top of it, be sure to use an approved automatic instrument table.	20
	To prevent the instrument from falling and to avoid injury during carrying, be sure to secure the instrument with the fixing knob at the bottom.	20
	To avoid injury during carrying, be sure to hold the instrument body at the bottom with two people. Carrying by one person may cause backache or injury by falling. Holding at areas other than the bottom may also cause pinched fingers and injury, as well as falling, thereby causing damage to the instrument.	17, 20
	To avoid electric shock, be sure to turn the power supply off and unplug the power cable before replacing the lamp.	93, 94
	To prevent the instrument body from falling and to avoid injury during movement, be sure to affix the power supply unit to the instrument body with the base locking knob.	—
	<p>This instrument has been tested (with 120V/230V) and found to comply with IEC60601-1-2: 2001.</p> <p>This instrument radiates radio frequency energy within standard and may affect other devices in the vicinity.</p> <p>If you have discovered that turning on/off the instrument affects other devices, we recommend you change its position, keep a proper distance from other devices, or plug it into a different outlet.</p> <p>Please consult the dealer from whom you purchased the instrument if you have any additional questions.</p>	—

USAGE AND MAINTENANCE

USAGE

Usage:

- The TRC-NW200 Non-Mydriatic Retinal Camera is an electric instrument for medical use. Use this instrument under a doctor's guidance.

USER MAINTENANCE

To ensure the safety and performance of the instrument, all maintenance work, unless specified in this manual, shall be conducted by trained service engineers.

The following maintenance tasks may be done by the user.

For details, see the relevant part of this manual.

Replacing lamps:

The illumination lamp and xenon lamp may be replaced by the user. For details, see "Replacing the illumination lamp" on page 93 and "Replacing the xenon lamp" on page 94.

Replacing fuses:

The fuses on the instrument body may be replaced by the user. For details, see "Changing the fuse" on page 96.

Cleaning the objective lens:

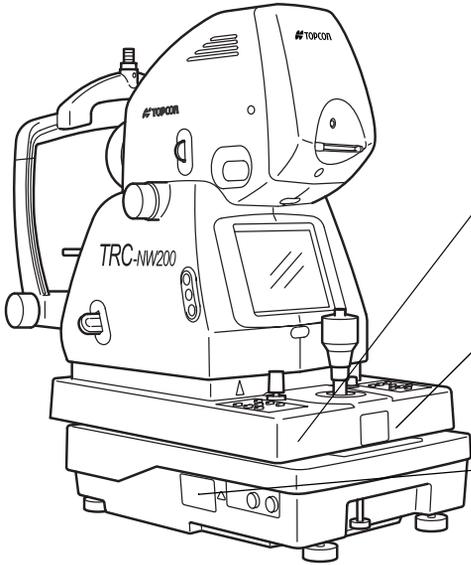
The objective lens may be cleaned by the user. For details, see "Cleaning the objective lens" on page 98.

ESCAPE CLAUSES

- TOPCON shall not take any responsibility for damage due to fire, earthquakes, actions by third persons and other accidents, or damage due to negligence and misuse by the user and any use under unusual conditions.
- TOPCON shall not take any responsibility for damage derived from inability to properly use this instrument, such as loss of business profit and suspension of business
- TOPCON shall not take any responsibility for damage caused from using this instrument in a manner other than that described in this Instruction Manual.
- Diagnoses made shall be the responsibility of pertaining doctors and TOPCON shall not take any responsibility for the results of such diagnoses.

WARNING DISPLAYS AND POSITIONS

To ensure safety, the machine provides warning displays. Use the instrument correctly by observing the display instructions. If any of the following display labels are missing, contact your TOPCON dealer at the address listed on the back cover.



CAUTION

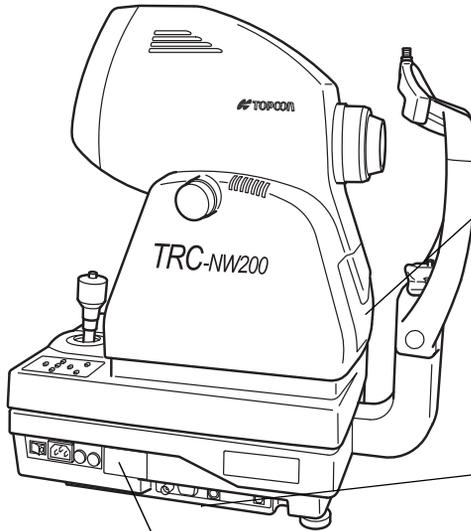

- To avoid injury to the patient's face and hands, be sure to adjust the height of the chinrest while directly watching the patient.

CAUTION


- To avoid potential injury during operation, do not touch the patient's eyes or nose with the instrument.

WARNING


- Electrical shock can cause burns or a possible fire. Turn the main power switch OFF and UNPLUG the power cord before replacing the fuses. Replace only with fuses of the correct rating.



CAUTION


- To avoid electric shock, be sure to turn the power supply off and unplug the power cable before replacing the lamp.
- To avoid burns, do not touch the lamp immediately after it goes off.

WARNING


- To prevent electrical shock, do not remove the cover. There are no user serviceable parts inside, refer servicing to qualified personnel.

WARNING


- Electrical shock can cause burns or a possible fire. Turn the main power switch OFF and UNPLUG the power cord before replacing the fuses. Replace only with fuses of the correct rating.

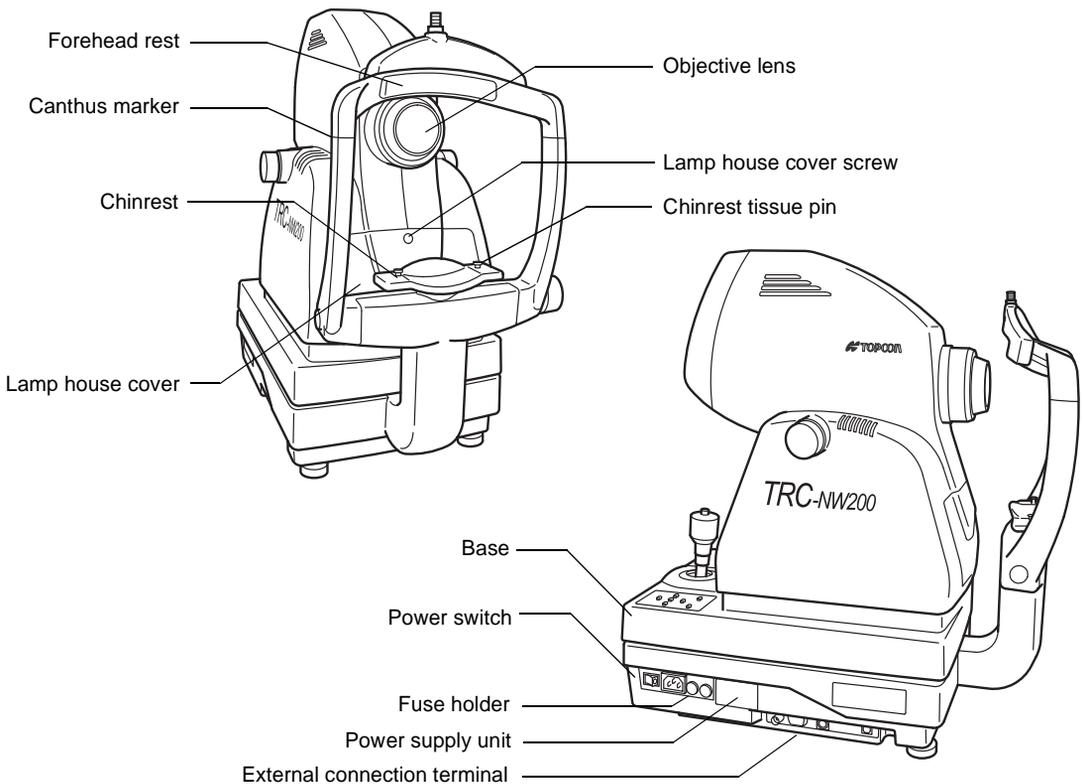
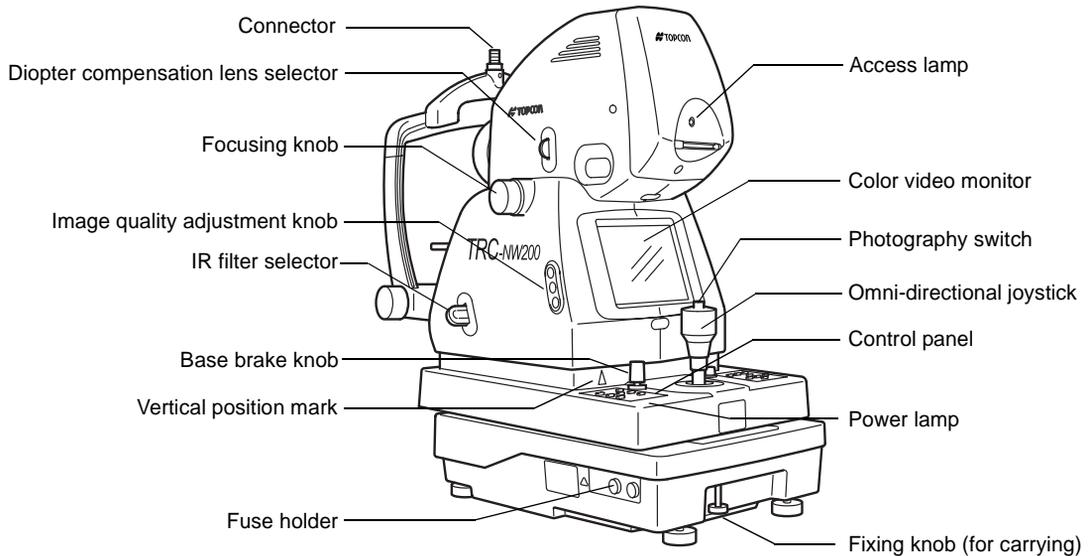
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COMPONENTS

COMPONENT NAMES

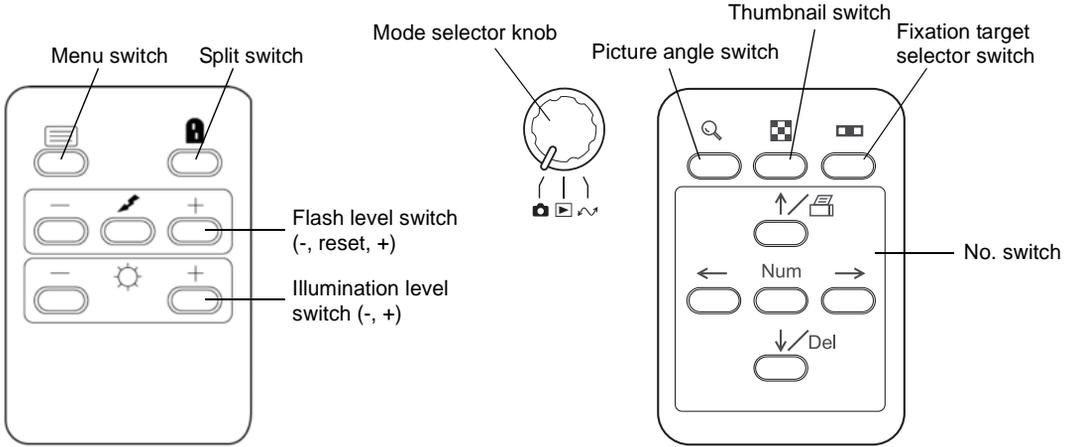


COMPOSITION OF PARTS WHICH CONTACT THE HUMAN BODY

Forehead rest: Silicone rubber

Chinrest: Acrylonitrile butadiene styrene resin

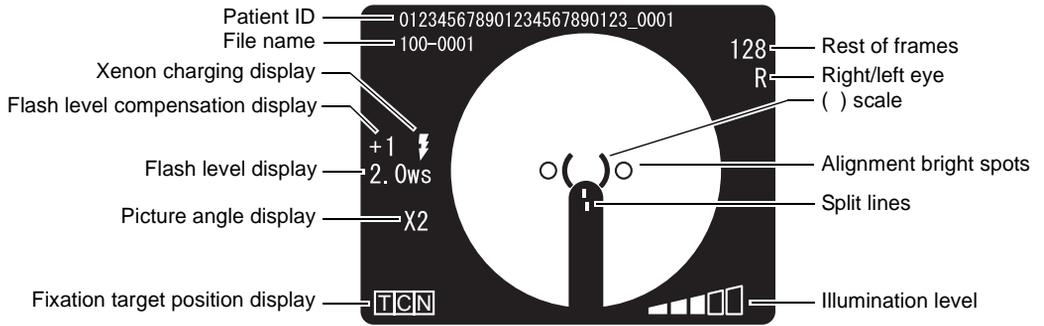
CONTROL PANEL COMPONENTS



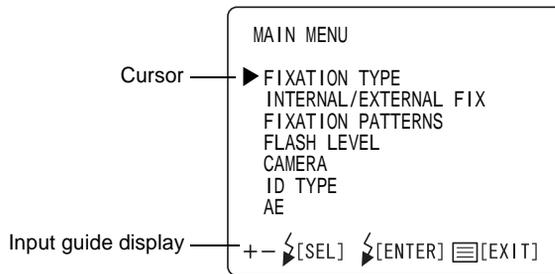
- Menu switch Displays the Menu screen.
- Split switch Turns the split lines on/off.
- Flash level switch..... Adjusts the flash level for the patient's eye condition.
- Illumination level switch Adjusts the illumination level for the patient's eye condition.
- Picture angle switch Switches the picture angle 45° and the digital zoom.
- Thumbnail switch Displays the photography images in line.
- Fixation target selector switch..... Switches the internal fixation target position, the center (the aged insurance law position) and the nose side/ear side position.
- No. switch..... Selects and deletes the optional numeral / ID number input (patient information) and the photography image.
- Mode selector knob..... Changes the modes, "photography" () , "play-back" () and "PC" () .

MONITOR SCREEN

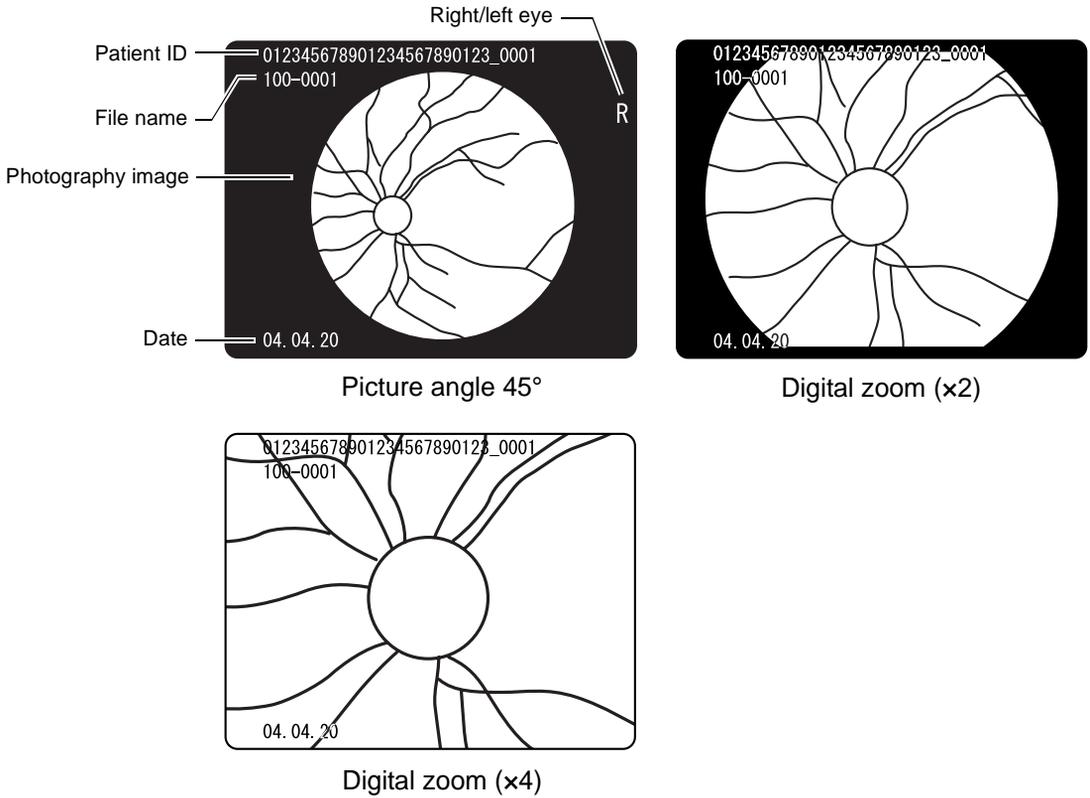
Monitor screen



Menu screen

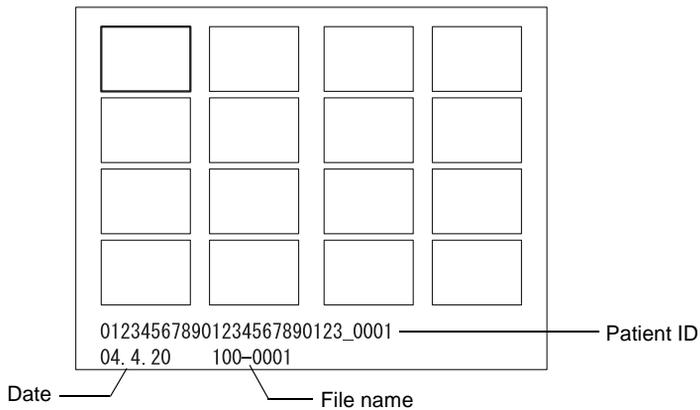


Preview display (color)



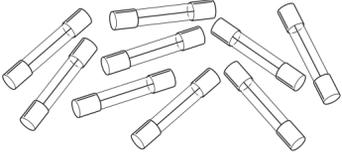
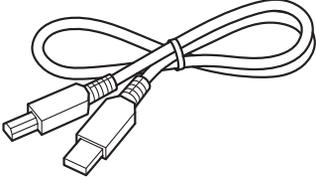
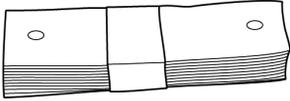
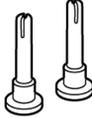
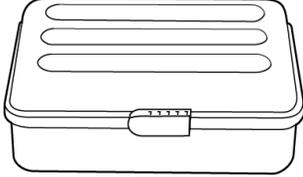
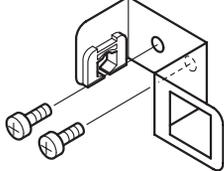
In the case of digital zoom (x2), the mask may not be indicated at the center of the review display on the monitor, and it may be partly missing. However, the recorded image is not affected by this phenomenon.

Thumbnail display



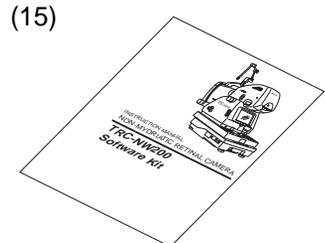
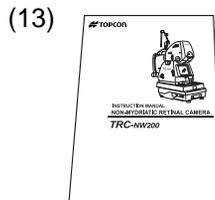
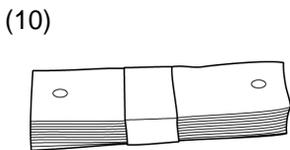
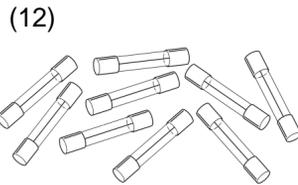
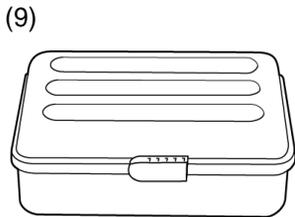
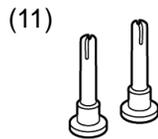
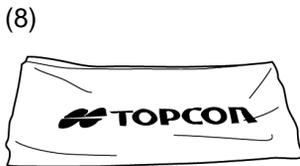
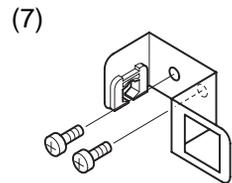
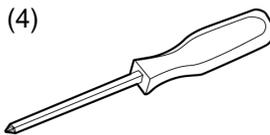
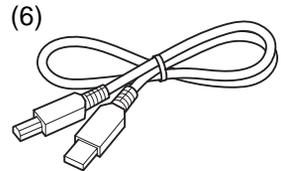
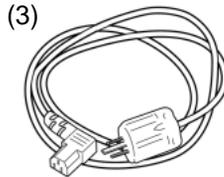
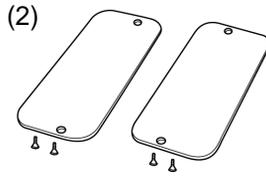
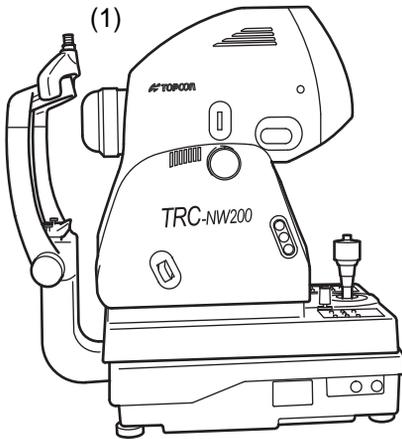
STANDARD ACCESSORIES

Upon unpacking, make sure that all the following standard accessories are included. Figures in () are the quantities

<p>Power cable (1)</p> 	<p>Fuse (9)</p> 
<p>CompactFlash® card 32MB (1)</p> 	<p>USB cable (1)</p> 
<p>Chinrest tissue paper (1)</p> 	<p>Chinrest tissue pin (2)</p> 
<p>Instruction manual (1)</p> 	<p>Spare parts case (1)</p> 
<p>Dust cover (1)</p> 	<p>Cord bracket (1)</p> 
<p>TRC-NW200 Software Kit Setup disk (1)</p> 	<p>TRC-NW200 Software Kit Instruction manual (1)</p> 

ASSEMBLY

COMPONENTS



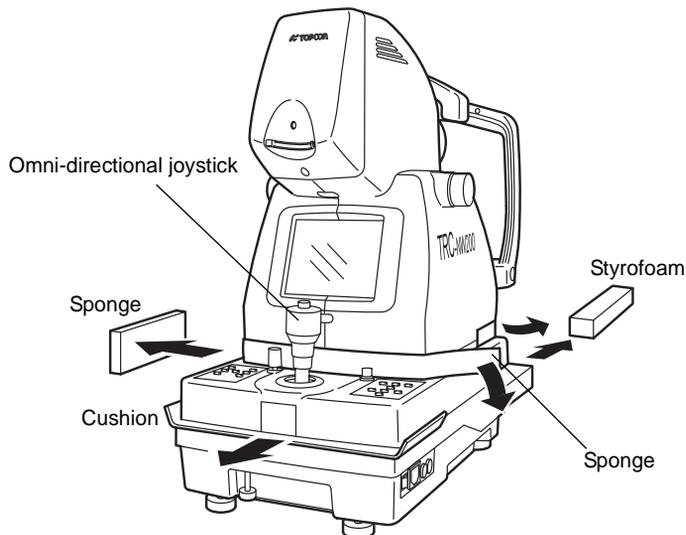
Description	Quantity	Container	Description	Quantity	Container
(1) Instrument body	1		(9) Spare parts case	1	
(2) Rail cover	2		(10) Chinrest tissue paper	1	Spare parts case
(3) Power cable	1		(11) Chinrest tissue pin (spare)	2	Spare parts case
(4) Phillips screwdriver	1		(12) Fuse (spare)	9	Spare parts case
(5) CompactFlash® card 32MB	1	Spare parts case	(13) TRC-NW200 Instruction Manual	1	
(6) USB cable	1		(14) TRC-NW200 Software Kit Setup disk	1	
(7) Cord bracket	1		(15) TRC-NW200 Software Kit Instruction manual	1	
(8) Dust cover	1				

ASSEMBLY PROCEDURE

ASSEMBLING THE INSTRUMENT BODY

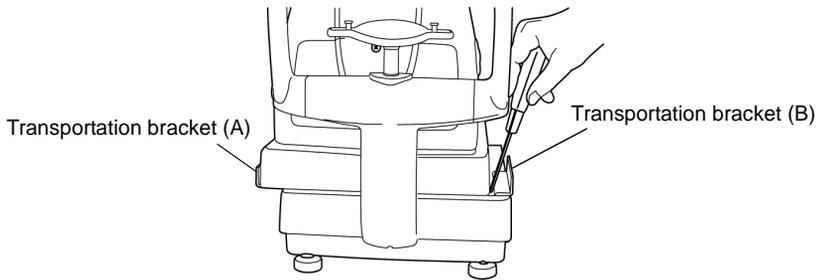
 WARNING	To avoid electric shock, be sure to unplug the power cable before assembling. Also, do not plug the power cable in before assembling.
 CAUTION	To prevent the instrument from falling and to avoid injury, do not install the instrument on an uneven or unsteady surface, including a slope.
 CAUTION	To avoid injury during carrying, be sure to hold the instrument body at the bottom with two people. Carrying by one person may cause backache or injury by falling. Holding at areas other than the bottom may also cause pinched fingers and injury, as well as falling, thereby causing damage to the instrument.
NOTE	Since the upper part and lower part of the instrument body are merely connected with the power cable, take them out together so they do not separate from each other.

- 1** Take the instrument body (1) out of the container and put it on the table.
- 2** Slightly raise the omni-directional joystick, and pull out the cushion from the lower part of the base in the arrow direction.

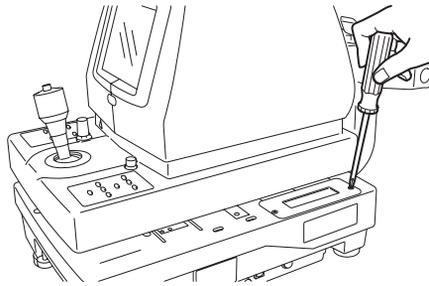


- 3** Wipe the sliding board with a cloth to remove any dirt.

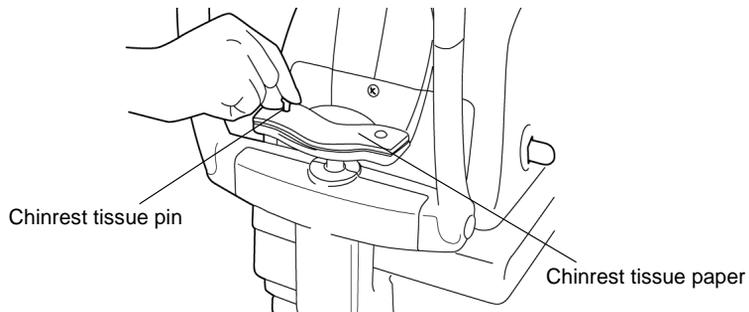
- 4** Remove the Styrofoam from the transportation bracket (A) (the one on the left-hand side as viewed from the chinrest side). Move the base to the left and unscrew the transportation bracket (B) with a screwdriver.



- 5** Slide the base to the right and unscrew the transportation bracket (A) with the screwdriver.
- 6** Fasten the rail covers (2), using the small screws that are attached.

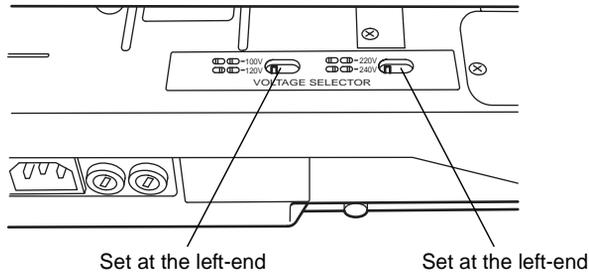


- 7** Affix the chinrest tissue paper (10) with the chinrest tissue pin.

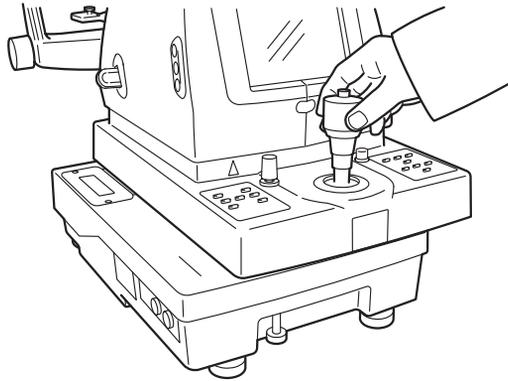


CONFIRMATION AFTER ASSEMBLY

- 1** Slide the base to the left, as viewed from the operator side, and make sure that the voltage selector is set at 100V.



- 2** Make sure that the input voltage is within the range $\pm 10\%$ of 100V. If the input voltage exceeds the range, use a constant-voltage power supply (marketed: 400VA or higher).
- 3** Loosen the base brake knob, and move the omni-directional joystick to confirm that it moves smoothly in the following directions:
 - 1) Right-left movement
 - 2) Back-forth movement
 - 3) Up-down movement



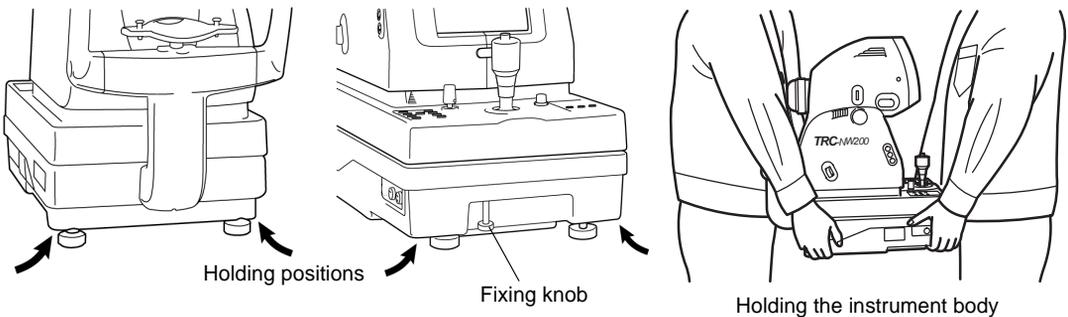
Just after being unpacked, the right-left movement may be uneven. If so, move the joystick with force to its limits in the right-left and up-down directions.

PREPARATIONS

INSTALLING THE INSTRUMENT

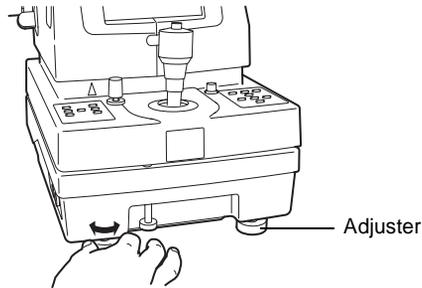
 CAUTION	To prevent the instrument from falling and to avoid injury during carrying, be sure to secure the instrument with the fixing knob at the bottom.
 CAUTION	To avoid injury during carrying, be sure to hold the instrument body at the bottom with two people. Carrying by one person may cause backache or injury by falling. Holding at areas other than the bottom may also cause pinched fingers and injury, as well as falling, thereby causing damage to the instrument.
 CAUTION	To avoid falling and injury while moving the table with the instrument on top of it, be sure to use an approved automatic instrument table.
 CAUTION	To prevent the instrument from falling and to avoid injury, do not install the instrument on an uneven or unsteady surface, including a slope.

- 1** Fasten the fixing knob.
- 2** Firmly hold the instrument body at the specified positions, and put it on the automatic instrument table.
For details about the automatic instrument table, see "OPTIONAL ACCESSORIES" on page 100.



- 3** After installing the instrument, fully loosen the fixing knob. The instrument body is freed to move.

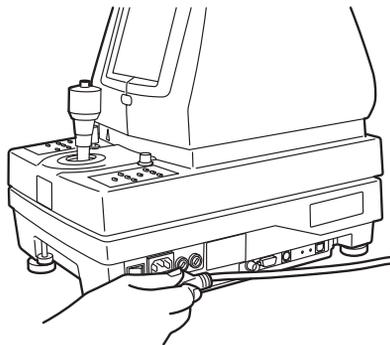
- 4** If the instrument body is slightly off level, fine-adjust the height by properly operating the four adjusters.
Do not extend the adjuster past 1 cm.



CONNECTING THE POWER CABLE

 WARNING	To avoid fire and electric shock in case of leakage, be sure to use a power supply equipped with a 3-plug AC receptacle for proper grounding.
 CAUTION	To avoid electric shock, do not handle the plugs with wet fingers.

- 1** Make sure that the main switch of the instrument body is OFF.
- 2** Attach the power cable to the instrument body.



- 3** Plug the power cable into the 3-plug AC receptacle with grounding.

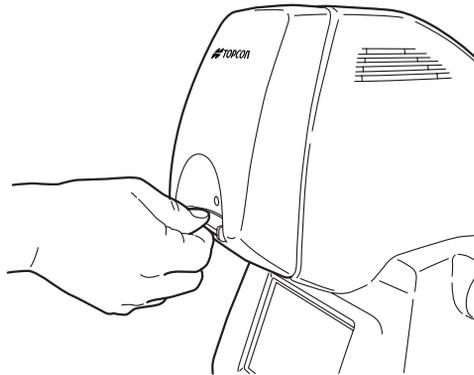


When the external fixation target (optional accessory) is used, set it on the connector of the chinrest.

INSTALLATION OF THE COMPACTFLASH® CARD

NOTE	<ul style="list-style-type: none">• Insert the CompactFlash® card in the correct direction. If it is not inserted properly, the inside of the instrument may be damaged.• Before inserting the CompactFlash® card, make sure that the switch on the instrument is in the "OFF" (O) position.
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- 1** Make sure that the switch on the instrument is in the "OFF" (O) position.
- 2** Insert the CompactFlash® card in the correct direction. As illustrated, set the CompactFlash® card with its memory capacity display at the top against the insertion port and insert it into the innermost section of the slot.



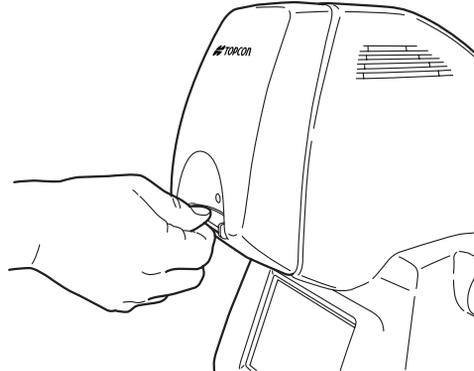
Use the CompactFlash® card specified by TOPCON. Refer to "OPTIONAL ACCESSORIES" on P.100 for the CompactFlash® card description.

If the image does not appear normally, contact your dealer for assistance.

REMOVAL OF THE COMPACTFLASH® CARD

NOTE	Before removing the CompactFlash® card, make sure that the switch on the instrument is in the "OFF" (O) position.
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- 1** Make sure that the switch on the instrument is in the "OFF" (O) position.
- 2** Pull out the CompactFlash® card from the slot.



Right after the operation of the instrument, the CompactFlash® card may be hot. Be careful when removing it.



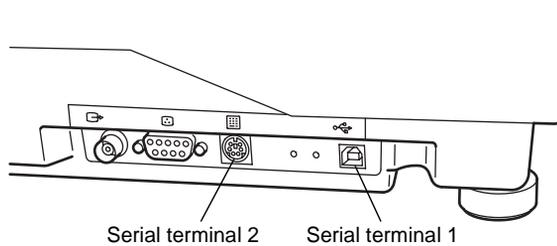
If the CompactFlash® card is inserted or removed while the access lamp is blinking (reviewing is being done or "BUSY" is being displayed), the image data stored on the CompactFlash® card may be destroyed.

CONNECTING THE EXTERNAL DEVICE

Connection to computer/ten button keypad

This instrument may be connected to the computer/ten button keypad through the external connection terminal.

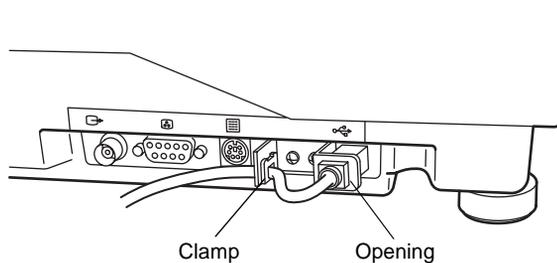
- 1** Connect the USB cable (packed together) from the computer to the serial terminal 1 of this instrument.
- 2** Connect the connector of the ten button keypad (optional) to the serial terminal 2 of this instrument.



Installation of the USB cable cord bracket

By installing this cord bracket, you can prevent the USB cable from being accidentally removed from the TRC-NW200.

- 1** Tighten the attached cord bracket onto the instrument by using the accessory screw.
- 2** Connect the connector of the USB cable to the opening of the cord bracket.
- 3** Fit the USB cable into the clamp of the cord bracket.



Use the USB cable specified by TOPCON (accessory).

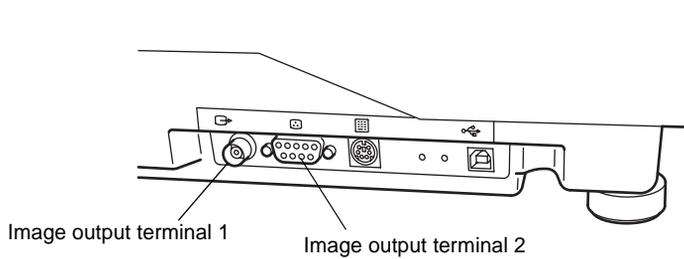


The USB cable may not connect to all PC's, so please ensure the connection is correct before attempting to fit the plug. Contact your authorized dealer for any assistance regarding the USB connection.

Image output to an external monitor and others

Through the image output port on the external connection terminal, the image displayed on the color video monitor can be displayed on an external monitor.

- 1** Connect the BNC cable (optional) to the image output terminal 1 of this instrument.
- 2** Connect the other end of the BNC cable to the input terminal of an external monitor.
- 3** The image output terminal 2 is used to output the data to a specialized printer.



Contact your dealer for any questions regarding these connections.

MENU SETTING

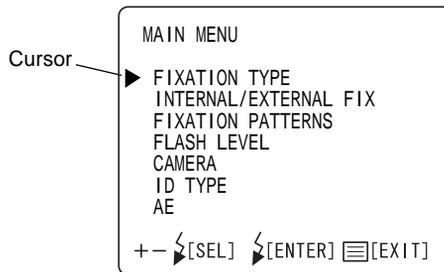
On the "MAIN MENU" display, setting of internal fixation target, switching of internal/external fixation target, flash level, setting of built-in CCD camera, setting of ID number and setting of AE can be selected.

Preparation for menu setting

- 1** Check the power cable connection.
For details about the connection, see "CONNECTING THE POWER CABLE" on page 21.
- 2** Turn the **POWER SWITCH** ON (I).

Displaying the menu screen

- 1** Check the monitor screen.
- 2** Press the **MENU SWITCH** on the control panel.
Check the "MAIN MENU" screen.



- 3** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** ; the cursor moves.

Returning to the Monitor screen

- 1** Press the **MENU SWITCH**.

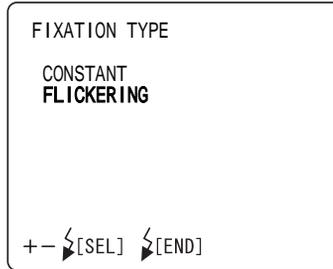
SETTING THE INTERNAL FIXATION TARGET

In setting of the internal fixation target, fixation target on/flicker status and fixation target pattern can be set.

Switching of internal fixation target on/flicker

The internal fixation target can be switched between on and flicker states. When shipped, "FLICKERING" (flicker) is set.

- 1 Move the cursor to "FIXATION TYPE" on the "MAIN MENU" screen, and press the **FLASH LEVEL SWITCH (RESET)** to call out the "FIXATION TYPE" screen.

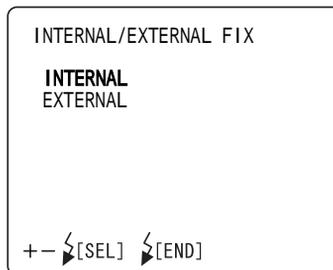


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "CONSTANT" (on) or "FLICKERING" (flicker).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MAIN MENU" screen returns.

Switching of internal/external fixation target (option)

You can change the internal/external fixation target. When shipped, "INTERNAL" (internal fixation target) is the default setting.

- 1 Move the cursor to "INTERNAL/EXTERNAL FIX" on the "MAIN MENU" screen and press the **FLASH LEVEL SWITCH (RESET)** to access the "INTERNAL/EXTERNAL FIX" screen.



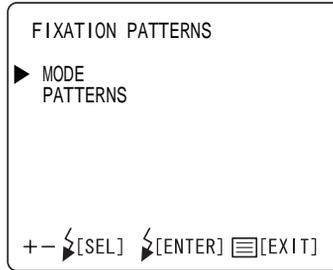
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "INTERNAL" (internal fixation target) or "EXTERNAL" (external fixation target).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MAIN MENU" screen is reset.

Internal fixation target pattern

You can select the internal fixation target pattern from two types, "ORIGINAL" (default pattern) and "CUSTOM" (pattern to be set optionally).

When shipped, "ORIGINAL" is set.

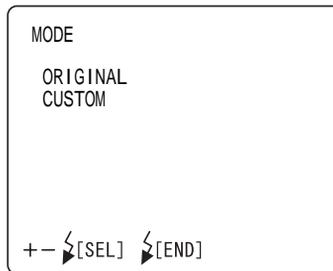
- 1 Move the cursor to "FIXATION PATTERNS" on the "FIXATION" screen and press the **FLASH LEVEL SWITCH (RESET)** to access the "FIXATION PATTERNS" screen.



- Select the "ORIGINAL" or "CUSTOM" mode in "MODE" and set the data in "PATTERNS".

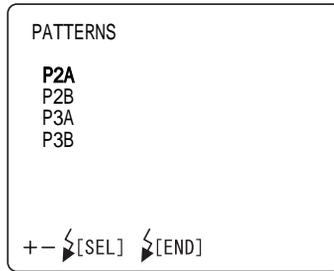
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "MODE" or "PATTERNS".

- 3 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** on the "MODE" screen and select "ORIGINAL" or "CUSTOM".



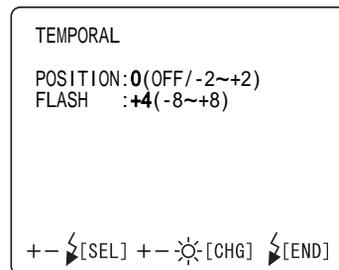
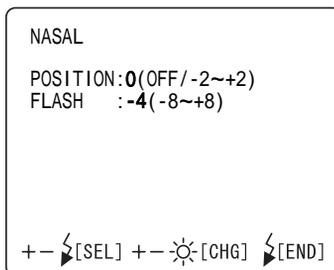
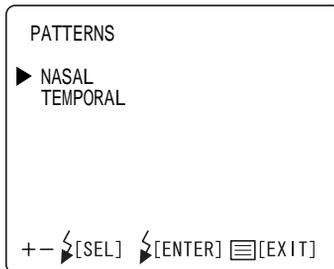
4 ① Setting of "PATTERNS" when changing "MODE" to "ORIGINAL"

When you select "ORIGINAL" on the "MODE" screen, you can select the internal fixation target patterns (P2A/P2B/P3A/P3B) of "center/nose side/ear side" on the "PATTERNS" screen. When "P2A" or "P2B" is selected, the fixation targets for "center/nose side" are indicated. When "P3A" or "P3B" is selected, those for "center/nose side/ear side" are indicated. "P2B" and "P3B" are used to take a picture of the periphery of the eye ground compared with "P2A" and "P3A".
When shipped, "P2A" is set.



4 ② Setting of "PATTERNS" when changing "MODE" to "CUSTOM"

When you select "CUSTOM" on the "MODE" screen, you can set the internal fixation target pattern optionally on the "PATTERNS" screen. You can freely set a fixation target position for the photography with optic disc or macula in focus.



5 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "FIXATION" screen is reset.

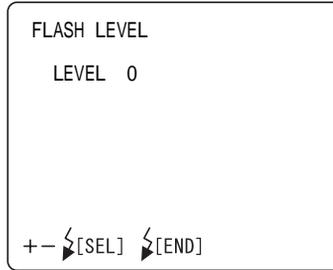
SETTING THE FLASH LEVEL

You can set the flash level.

Flash level

You can change the standard or zero value of the flash level.
When shipped, "0" (no change) is set.

- 1** Select "FLASH LEVEL" on the "MAIN MENU" screen, and press the **FLASH LEVEL SWITCH (RESET)** to call out the "FLASH LEVEL" screen.



- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change to the desirable correction step.
The value can be adjusted by 17 steps, from "+8" to "-8".
- 3** Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "MAIN MENU" screen returns.

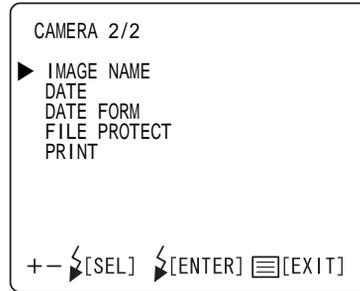
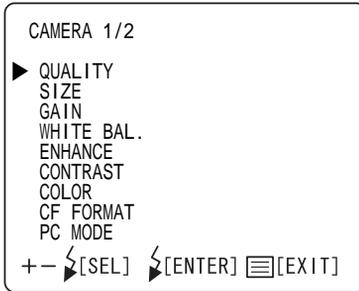


A step up/down changes the flash level reference value by about 20%.

SETTING THE BUILT-IN CCD CAMERA

In the "CAMERA" display menu, the compression ratio, record pixels, gain, white balance, image emphasis, contrast, color, CF format, PC mode, image name, date/time, date form, file protect function and print can be set.

- 1 Move the cursor to "CAMERA" on the "MAIN MENU" display and press the **FLASH LEVEL SWITCH (RESET)**.
The Monitor display changes to the "CAMERA" display.

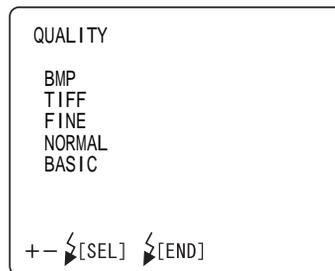


- 2 To exit from the "CAMERA" display, press the **FLASH LEVEL SWITCH (RESET)**.

File compression ratio

Set the compression ratio of the file to be stored.
When shipped, "BASIC" is set.

- 1 Select "QUALITY" on the "CAMERA" display. The "QUALITY" display appears.

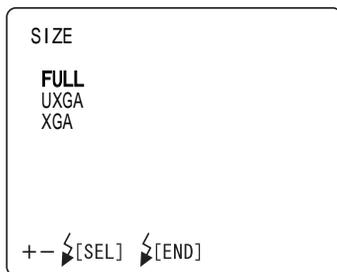


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select the desirable ratio from the following:
 - "BMP" (No compression)
 - "TIFF" (No compression)
 - "FINE" (Compression to approx. 1/4)
 - "NORMAL" (Compression to approx. 1/8)
 - "BASIC" (Compression to approx. 1/16)
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

Record pixels

Set the size of the image to be recorded.
When shipped, "FULL" is set.

- 1 Select "SIZE" on the "CAMERA" display. The "SIZE" display appears.

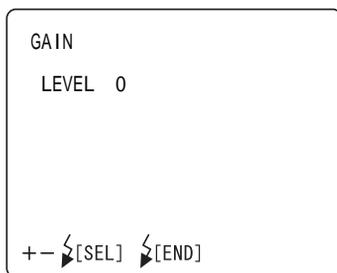


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select the desirable size from the following:
 - "FULL" (2048 × 1536 pixels)
 - "UXGA" (1600 × 1200 pixels)
 - "XGA" (1024 × 768 pixels)
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

Gain

The gain (luminance) of image can be changed.
When shipped, "0" is set.

- 1 Select "GAIN" on the "CAMERA" display. The "GAIN" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change "GAIN" (luminance) to the desirable correction step. The value can be adjusted by 25 steps, from "+12" to "-12".
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.



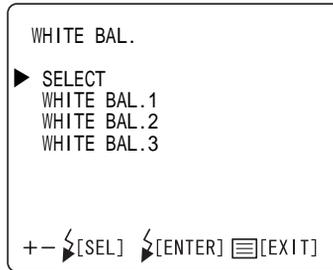
As with most commercial cameras, gain is displayed in "dB". Increase/decrease the value by 1 step (3 steps), and gain can be changed by approx. 12% (approx. 40%).

White balance

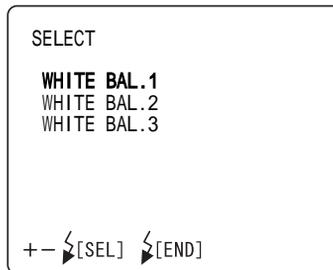
The color balance of the image can be changed.

The three types, "WHITE BAL. 1", "WHITE BAL. 2" and "WHITE BAL. 3" can be stored. When shipped, "R-GAIN 96/G-GAIN 70/B-GAIN 85" of "WHITE BAL. 1" is set.

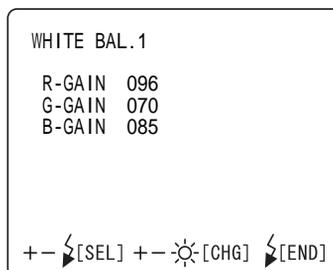
- 1 Select "WHITE BAL." on the "CAMERA" display. The "WHITE BAL." display appears.



- 2 On the "SELECT" screen, select the white balance setting ("WHITE BAL. 1 ~ 3") to be validated.



- 3 On each of "WHITE BAL. 1" to "WHITE BAL. 3", you can set data. Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change each item to the desirable numeral:
"R-GAIN" (red gain) : The value can be set in the range of "1" ~ "255".
"G-GAIN" (green gain) : The value can be set in the range of "1" ~ "255".
"B-GAIN" (blue gain) : The value can be set in the range of "1" ~ "255".

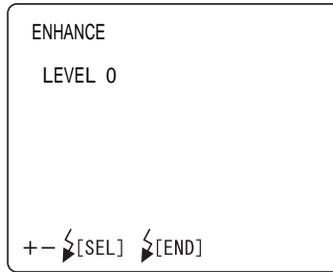


- 4 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

Image emphasis

Image emphasis allows you to change certain image characteristics.
When shipped, "0" is set.

- 1 Select "ENHANCE" on the "CAMERA" display. The "ENHANCE" display appears.

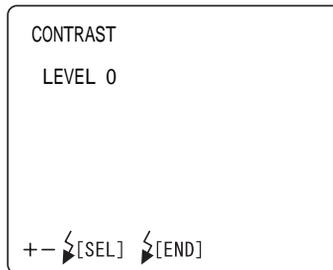


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change the level to the desirable one. You can adjust the level by 9 steps, from "-4" to "+4".
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

Contrast

The image contrast can be changed.
When shipped, "0" is set.

- 1 Select "CONTRAST" on the "CAMERA" display. The "CONTRAST" display appears.

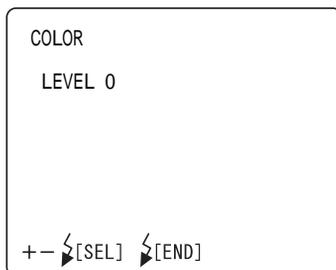


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and adjust the contrast. The contrast can be adjusted by 9 steps, from "-4" to "+4".
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

Color

The image color depth can be changed.
When shipped, "0" is set.

- 1 Select "COLOR" on the "CAMERA" display. The "COLOR" display appears.

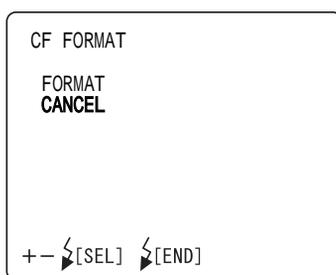


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and adjust the image color depth. The color depth can be adjusted by 9 steps, from "-4" to "+4".
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

CF format

You may use this function to format a new CompactFlash[®] card.
When shipped, "CANCEL" (format is not done) is set.

- 1 Select "CF FORMAT" on the "CAMERA" display. The "CF FORMAT" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "FORMAT" (format is done) or "CANCEL" (format is not done).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "CAMERA" display appears again.



When format is selected, all the data including the file-protect-used files are erased.

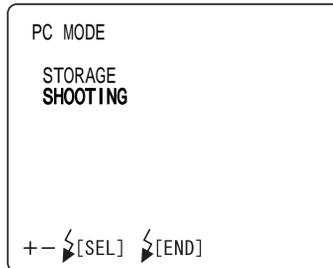


The above setting is possible only when the mode selector knob is set at "photography" () or "playback" ().

PC mode

You can select the operation mode for the PC mode of the mode selector knob. When shipped, "SHOOTING" is set.

- 1** Select "PC MODE" on the "CAMERA" display. The "PC MODE" display appears.



- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "STORAGE" or "SHOOTING".
STORAGE The CompactFlash® card is recognized as a removable disc by PC.
SHOOTING The photography image is sent to PC.
- 3** Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.



The above setting is possible only when the mode selector knob is set at "PC" (↺↻).

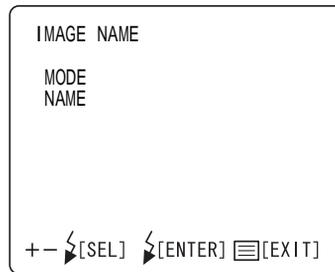


Before setting to "STORAGE", insert the CompactFlash® card to its slot. When "STORAGE" is canceled and the CompactFlash® card is removed, perform "hardware removal" through PC.

Image name

You can select the record number mode of the image file to be recorded.

- 1 Select "IMAGE NAME" on the "CAMERA" display. The "IMAGE NAME" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "MODE" or "NAME".

- ① MODE..... The record number mode of a file can be selected.

NON-CONTINUATION: Normal mode

When the CompactFlash[®] card is replaced with another or when a folder is changed, the file name begins with "100-0001".

CONTINUATION: Continuous mode

Even if the CompactFlash[®] card is replaced with another or when a folder name is changed, the file name stored in the camera is the first.

- ② NAME In the continuous mode, the record number can be set.

SET DATA: Setting is possible with optional data.

AUTO NUM: The usable lowest number is set.

- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.



The above setting is possible only when the mode selector knob is set at "photography" ().



Each time you take a picture, the final record number is updated. When this number reaches "999-1000", it is reset to "100-0000".

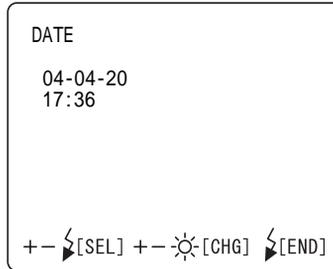


The photography possible counter is limited not only by the capacity of media but also by the blank numbers. For example, though there is a capacity enough in media, the photography possible counter is "1" if the file number "999-0999" exists.

Date/time

You can set the date and time.

- 1 Select "DATE" on the "CAMERA" display. The "DATE" display appears.

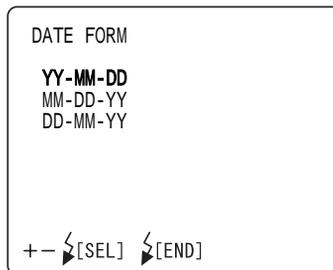


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and move the cursor to the item to be set.
Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change the numerals to the desired ones.
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; setting is done and the "CAMERA" display appears again.

Date form

You can set the display order of year, month and day.
When shipped, "year-month-day" is set.

- 1 Select "DATE FORM" on the "CAMERA" display. The "DATE FORM" display appears.

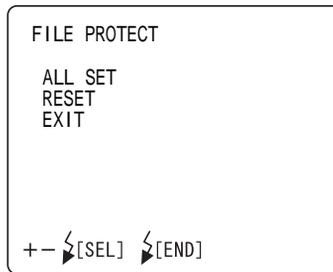


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select the desirable order from the following:
"YY-MM-DD" (year-month-day)
"MM-DD-YY" (month-day-year)
"DD-MM-YY" (day-month-year)
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; setting is done and the "CAMERA" display appears again.

File protect function

You can set the file protection setting for the camera.

- 1** Select "FILE PROTECT" on the "CAMERA" display. The "FILE PROTECT" display appears.



- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ALL SET" (exclusively for reading) or "RESET" (not exclusively for reading).
- 3** Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "CAMERA" display appears again.



When format is selected, all the data are erased even if file protect is used.

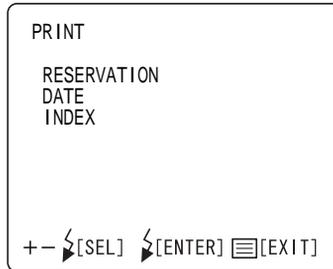


The above setting is possible only when the mode selector knob is set at "play-back" ().

Print

For the image stored in the CompactFlash[®] card, DPOF print can be reserved.

- 1 Select "PRINT" on the "CAMERA" display. The "PRINT" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "RESERVATION", "DATE" or "INDEX".

- ① RESERVATION ... : Reserves DPOF print.
ALL SET : Reserves print.
RESET : Cancels the reservation of print. (Initial data)
- ② DATE : Sets the information to be outputted in the reservation of DPOF print.
OFF : No setting (Initial data)
DATE : Sets the date.
TIME : Sets the time.
- ③ INDEX : Reserves print of INDEX with DPOF.
ALL SET : Reserves print.
RESET : Cancels the reservation of print. (Initial data)

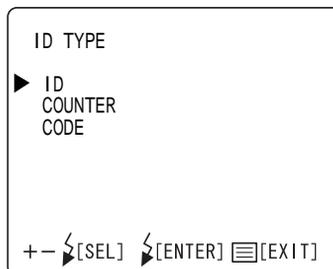
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.



Setting of print is possible only when the "playback" mode is set.

SETTING THE ID NUMBER

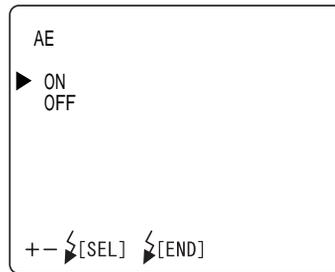
The ID number can be set.



- ① ID The digits of ID number can be selected in the range of "OFF" and 3 ~ 24 (DIGITS).
- ② COUNTER ON/OFF for the 4-digit calculation counter attached to the ID number can be selected.
- ③ CODE The establishment code can be set.

SETTING OF AE

The automatic photography brightness correction function can be selected.



- ① ON.....The flash level is corrected to control the photography brightness automatically.
- ② OFFPhotography is done with the set flash level. The photography brightness is not controlled automatically.

RESET FROM POWER SAVE STATE

This machine adopts the power save method for power saving.

When the instrument body is not operated within a set time, the power save function stops power supply to the monitor, illumination light source and photography light source.

When power save sets in, the power lamp on the control panel flickers and the monitor screen goes off.

- 1** Press the PHOTOGRAPHY SWITCH.
In a few seconds, the color video monitor is displayed and ready for photographing.



When shipped, the power save set time is 10 minutes.

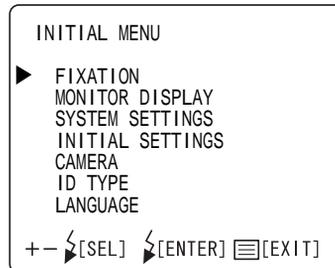
To change the set time, contact your dealer or TOPCON (see the back cover).

INITIAL SETTING

In the "INITIAL MENU" display, the record/playback, internal fixation target, image display, system settings, initial settings, built-in CCD camera settings and display language can be set.

PREPARATION FOR INITIAL SETTING

- 1** Make sure that the power cable is connected.
- 2** While pressing the **MENU SWITCH** on the control panel and the **PHOTOGRAPHY SWITCH**, turn the **POWER SWITCH ON**.
Hold the **MENU SWITCH** and the **PHOTOGRAPHY SWITCH** until the buzzer sounds.
The Title screen is displayed, and in a few seconds the Monitor screen is displayed.
- 3** Press the **MENU SWITCH** on the control panel; the "INITIAL MENU" screen is displayed.



- 4** To exit the "INITIAL MENU" screen, press the **MENU SWITCH**.



When the **POWER SWITCH** is turned OFF without exiting from the "INITIAL MENU" screen, the settings are not changed.

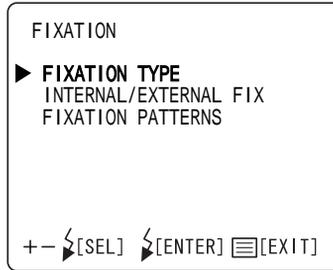


Operate the switches by referring to "COMPONENT NAMES" on P. 11 and "CONTROL PANEL COMPONENTS" on P. 12.

SETTING THE INTERNAL FIXATION TARGET

On the "FIXATION" display, fixation target on/flicker status and fixation target pattern can be set.

- 1 On the "INITIAL MENU" screen, move the cursor to "FIXATION," and press the **FLASH LEVEL SWITCH (RESET)**. The Monitor screen changes to the "FIXATION" screen.



- 2 To exit from the "FIXATION" screen, press the **MENU SWITCH**.

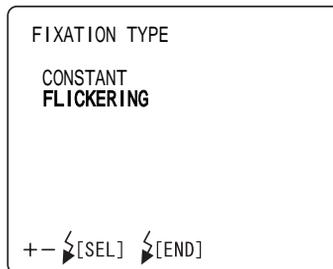


When the **POWER SWITCH** is turned OFF without exiting from the "INITIAL MENU" screen, the settings are not changed.

Switching of internal fixation target on/flicker

The internal fixation target can be switched between on and flicker states. When shipped, "FLICKERING" (flicker) is set.

- 1 Select "FIXATION TYPE" on the "FIXATION" screen and select the "FIXATION TYPE" screen.



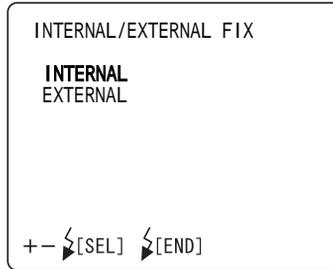
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "CONSTANT" (on) or "FLICKERING" (flicker).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "FIXATION" screen returns.

SWITCHING OF INTERNAL/EXTERNAL FIXATION TARGET (OPTION)

You can change the internal/external fixation target.

When shipped, "INTERNAL" (internal fixation target) is the default setting.

- 1 Move the cursor to "INTERNAL/EXTERNAL FIX" on the "FIXATION" screen and press the **FLASH LEVEL SWITCH (RESET)** to access the "INTERNAL/EXTERNAL FIX" screen.



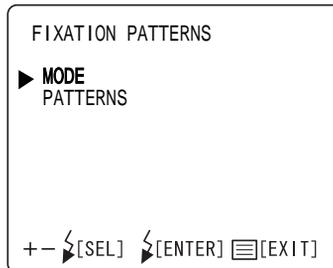
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "INTERNAL" (internal fixation target) or "EXTERNAL" (external fixation target).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "FIXATION" screen is reset.

Internal fixation target pattern

You can select the internal fixation target pattern from two types, "ORIGINAL" (default pattern) and "CUSTOM" (pattern to be set optionally).

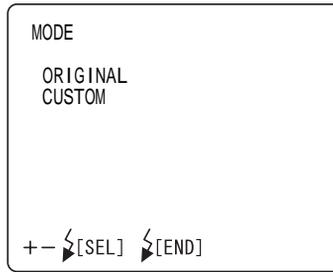
When shipped, "ORIGINAL" is set.

- 1 Move the cursor to "FIXATION PATTERNS" on the "FIXATION" screen and press the **FLASH LEVEL SWITCH (RESET)** to access the "FIXATION PATTERNS" screen.

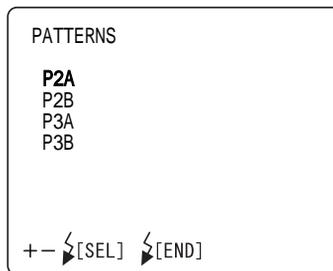


- Select the "ORIGINAL" or "CUSTOM" mode in "MODE" and set the data in "PATTERNS".
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "MODE" or "PATTERNS".

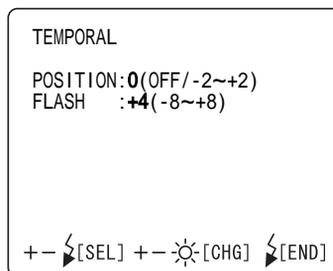
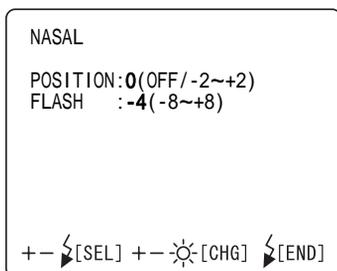
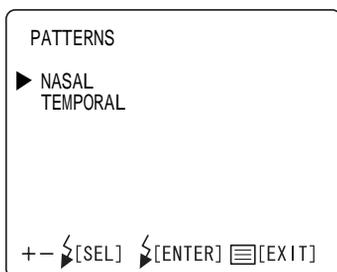
- 3** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** on the "MODE" screen and select "ORIGINAL" or "CUSTOM".



- 4** ① Setting of "PATTERNS" when changing "MODE" to "ORIGINAL"
When you select "ORIGINAL" on the "MODE" screen, you can select the internal fixation target patterns (P2A/P2B/P3A/P3B) of "center/nose side/ear side" on the "PATTERNS" screen. When "P2A" or "P2B" is selected, the fixation targets for "center/nose side" are indicated. When "P3A" or "P3B" is selected, those for "center/nose side/ear side" are indicated. "P2B" and "P3B" are used to take a picture of the periphery of the eye ground compared with "P2A" and "P3A".
When shipped, "P2A" is set.



- ② Setting of "PATTERNS" when changing "MODE" to "CUSTOM"
When you select "CUSTOM" on the "MODE" screen, you can set the internal fixation target pattern optionally on the "PATTERNS" screen. You can freely set a fixation target position for the photography with optic disc or macula in focus.

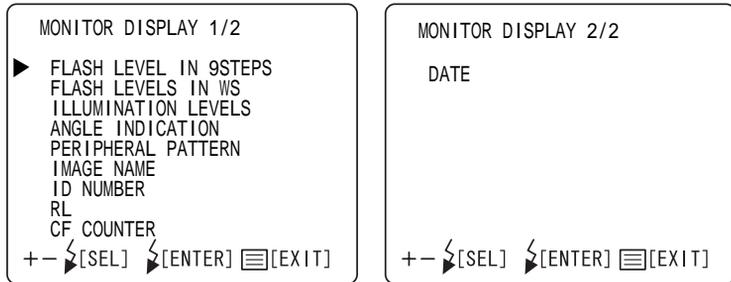


- 5** Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "FIXATION" screen is reset.

SETTING THE SCREEN DISPLAY

In the "MONITOR DISPLAY" menu, the flash level compensation display, flash level display, illumination level display, picture angle display, fixation target position and date display can be set.

- 1 Make sure that the cursor is on the "MONITOR DISPLAY" of the "INITIAL MENU" screen, and press the **FLASH LEVEL SWITCH (RESET)**. The Monitor screen changes to the "MONITOR DISPLAY" screen.



- 2 To exit from the "MONITOR DISPLAY" screen, press the **MENU SWITCH**.

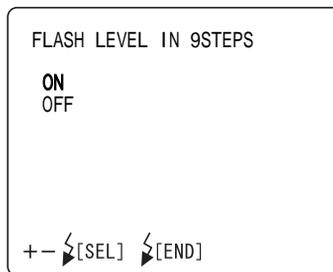


When the **POWER SWITCH** is turned OFF without exiting from the "MONITOR DISPLAY" screen, the settings are not changed.

Flash level compensation display

The flash level value may be displayed on the monitor for operator information. When shipped, "ON" (display) is set.

- 1 On the "MONITOR DISPLAY", select "FLASH LEVEL IN 9 STEPS". The "FLASH LEVEL IN 9 STEPS" display appears.

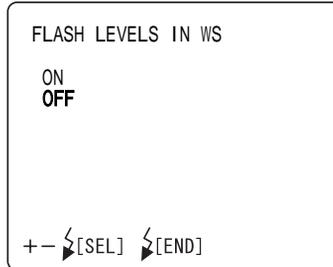


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MONITOR DISPLAY" screen returns.

Flash level display

The flash level may be displayed on the monitor. When shipped, "OFF" (no display) is set.

- 1 Select "FLASH LEVELS IN WS" on the "MONITOR DISPLAY" screen, and choose the "FLASH LEVELS IN WS" screen.

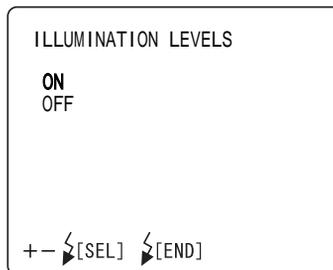


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the "MONITOR DISPLAY" screen returns.

Illumination level display

The illumination level may be displayed on the monitor for operator assistance. When shipped, "ON" (display) is set.

- 1 Select "ILLUMINATION LEVELS" on the "MONITOR DISPLAY" screen, and select the "ILLUMINATION LEVELS" screen.

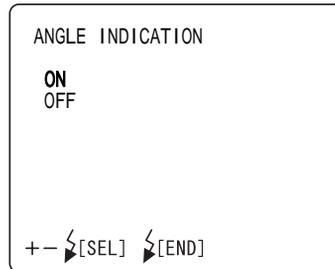


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the "MONITOR DISPLAY" screen returns.

Picture angle display

The picture angle may be displayed on the monitor. When shipped, "ON" (display) is set.

- 1 Select "ANGLE INDICATION" on the "MONITOR DISPLAY" screen, and select the "ANGLE INDICATION" screen.

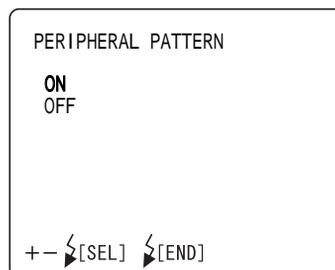


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the "MONITOR DISPLAY" screen returns.

Internal fixation target position display

You can set the internal fixation target display. When shipped, "ON" (display) is set.

- 1 Select "PERIPHERAL PATTERN" on the "MONITOR DISPLAY" screen, and call out the "PERIPHERAL PATTERN" screen.

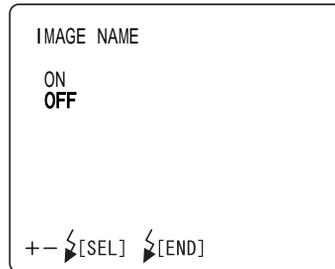


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the "MONITOR DISPLAY" screen returns.

Image name

The DCF file name may be displayed on the monitor. When shipped, "OFF" (no display) is set.

- 1 Select "IMAGE NAME" on the "MONITOR DISPLAY" screen and access the "IMAGE NAME" screen.

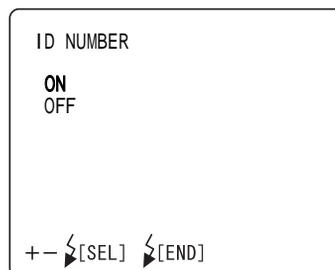


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MONITOR DISPLAY" screen is reset.

ID number

The patient ID number may be displayed on the monitor. When shipped, "ON" (display) is set.

- 1 Select "ID NUMBER" on the "MONITOR DISPLAY" screen and access the "ID NUMBER" screen.

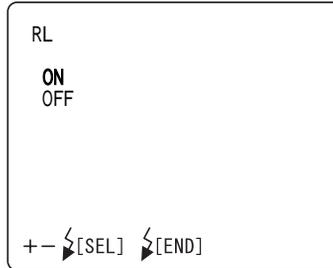


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MONITOR DISPLAY" screen is reset.

RL

The right/left eye information may be displayed on the monitor. When shipped, "ON" (display) is set.

- 1** Select "RL" on the "MONITOR DISPLAY" screen and access the "RL" display.

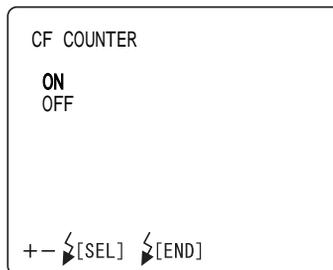


- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3** Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MONITOR DISPLAY" screen is reset.

CF counter

The remaining CF card number may be displayed on the monitor. When shipped, "ON" (display) is set.

- 1** Select "CF COUNTER" on the "MONITOR DISPLAY" screen and access the "CF COUNTER" display.

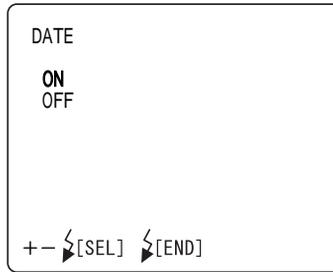


- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3** Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MONITOR DISPLAY" screen is reset.

Date display

The date may be displayed on the monitor. When shipped, "ON" (display) is set.

- 1** Select "DATE" on the "MONITOR DISPLAY" screen and access the "DATE" display.

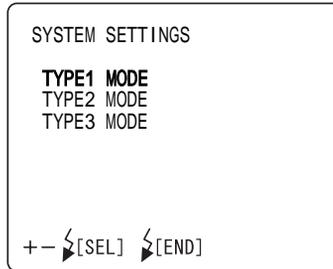


- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).
- 3** Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MONITOR DISPLAY" screen is reset.

SYSTEM SETTING

In the "SYSTEM SETTINGS" display, the recording method can be set. When shipped, "TYPE1 MODE" (When taking a picture, recording is done and reviewing is released.) is set.

- 1** Make sure that the cursor is on the "SYSTEM SETTINGS" of the "INITIAL MENU" screen, and press the **FLASH LEVEL SWITCH (RESET)**. The monitor screen changes to the "SYSTEM SETTINGS" screen.



- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select:
"TYPE1 MODE" (When taking a picture, recording is done and reviewing is released.)
"TYPE2 MODE" (When taking a picture, image stays on monitor. When reviewing is released, recording is done.)
"TYPE 3 MODE" (When taking a picture, reviewing is automatically released.)
- 3** Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "INITIAL MENU" screen is called back.



When the **POWER SWITCH** is turned OFF without exiting from the "INITIAL MENU" screen, the settings are not changed.

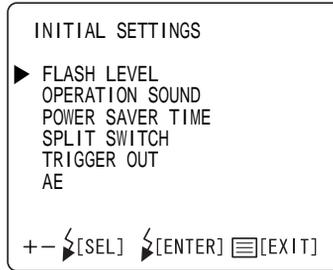


If the quality of the captured image is not good, press the **No. SWITCH (-/DEL)**. The captured image can be deleted.

SETTING THE INITIAL STATE

In the "INITIAL SETTINGS" menu, the flash level, operation sound, power saver time, split switch, trigger out and AE can be set.

- 1 Make sure that the cursor is on the "INITIAL SETTINGS" of the "INITIAL MENU" screen, and press the **FLASH LEVEL SWITCH (RESET)**. The monitor screen changes to the "INITIAL SETTINGS" screen.



- 2 To exit from the "INITIAL SETTINGS" screen, press the **MENU SWITCH**.

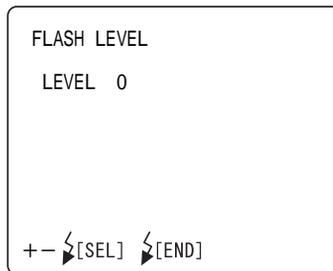


When the **POWER SWITCH** is turned OFF without exiting from the "INITIAL MENU" screen, the settings are not changed.

Flash level

You can change the reference value, or normal level of the flash. When shipped, "0" (no change) is set.

- 1 Select "FLASH LEVEL" on the "INITIAL SETTINGS" screen, and choose the "FLASH LEVEL" screen.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change the flash level to the desirable correction step. The value can be adjusted by 17 steps, from "+8" to "-8".
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "INITIAL SETTINGS" screen returns.

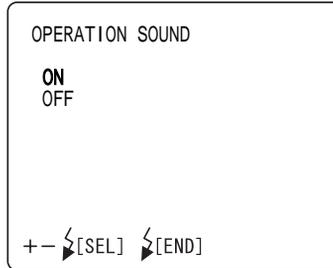


A step up/down changes the flash level by about 20%.

Operation sound

The operation sound may be turned on or off. When shipped, "ON" (operation sound) is set.

- 1 Select "OPERATION SOUND" on the "INITIAL SETTINGS" screen, and call out the "OPERATION SOUND" screen.

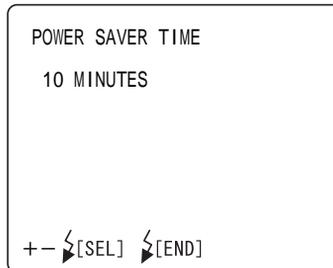


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (operation sound) or "OFF" (no operation sound).
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the "INITIAL SETTINGS" screen returns.

Power saver time

The power saver time can be set. When shipped, "10 MINUTES" (10 minutes) is set.

- 1 Select "POWER SAVER TIME" on the "INITIAL SETTINGS" screen, and call out the "POWER SAVER TIME" screen.

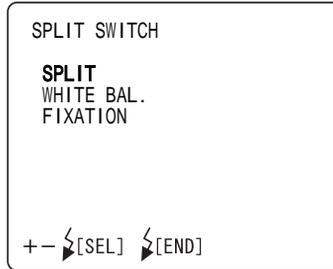


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select a value in the range from "5 MINUTES" up to "60 MINUTES" in 5-minute steps.
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the "INITIAL SETTINGS" screen returns.

Split switch function

You can select whether the split lines are ON or OFF, whether the internal fixation target is ON or OFF and whether the white balance setting pattern is changed or not. When shipped, "SPLIT" (split ON/OFF) is set.

- 1 Select "SPLIT SWITCH" on the "INITIAL SETTINGS" display. The "SPLIT SWITCH" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select one of the following:
"SPLIT" (split ON/OFF)
"WHITE BAL." (white balance setting pattern is changed)
"FIXATION" (internal fixation target ON/OFF)
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the "INITIAL SETTINGS" display appears again.

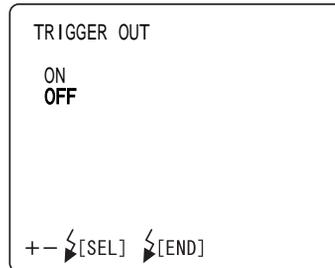


When "FIXATION" is selected and the internal fixation target is turned off by the split switch, the fixation target position display on the monitor display (at the lower left on the color video monitor screen) is turned off.

Trigger out

The trigger signal output for an external recording device can be selected. When shipped, "OFF" (no output) is set.

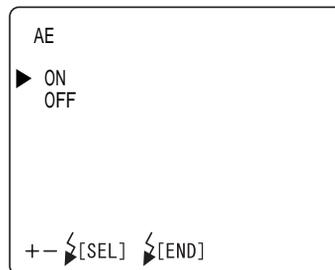
- 1 Select "TRIGGER OUT" on the "INITIAL SETTINGS" display. The "TRIGGER OUT" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (output) or "OFF" (no output).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "INITIAL SETTINGS" screen is reset.

Setting of AE

The automatic photography brightness correction function can be selected. When shipped, "OFF" is set.



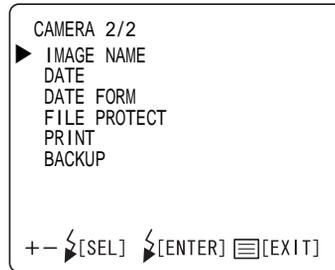
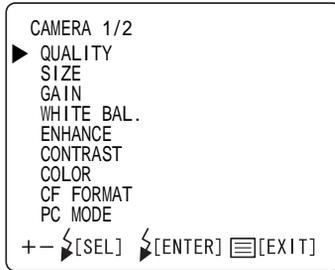
- ① ON: The flash level is corrected to control the photography brightness automatically.
- ② OFF: Photography is done with the set flash level. The photography brightness is not controlled automatically.

SETTING THE BUILT-IN CCD CAMERA

In the "CAMERA" display menu, the compression ratio, record pixels, gain, white balance, image emphasis, contrast, color, CF format, PC mode, image name, date/time, date form, file protect and print can be set.

- 1 Move the cursor to "CAMERA" on the "INITIAL MENU" display and press the **FLASH LEVEL SWITCH (RESET)**. The Monitor display changes to the "CAMERA" display.

For "CAMERA", two displays are automatically switched by moving the cursor.



- 2 To exit from the "CAMERA" display, press the **MENU SWITCH**.

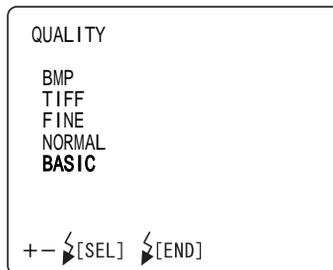


If the **POWER SWITCH** is set to "OFF" (O) without exiting from the "INITIAL MENU" display, the settings are not changed.

File compression ratio

You can set the compression ratio of the file to be stored.
When shipped, "BASIC" is set.

- 1 Select "QUALITY" on the "CAMERA" display. The "QUALITY" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select the desirable ratio from the following:

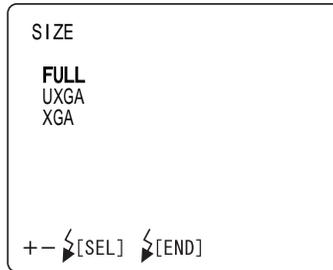
- "BMP" (No compression)
- "TIFF" (No compression)
- "FINE" (Compression to approx. 1/4)
- "NORMAL" (Compression to approx. 1/8)
- "BASIC" (Compression to approx. 1/16)

- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "CAMERA" display appears again.

Record pixels

You can set the size of the image to be recorded.
When shipped, "FULL" is set.

- 1 Select "SIZE" on the "CAMERA" display. The "SIZE" display appears.

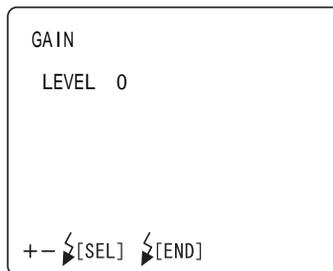


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select the desirable size from the following:
"FULL" (2048 × 1536 pixels)
"UXGA" (1600 × 1200 pixels)
"XGA" (1024 × 768 pixels)
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; setting is done and the "CAMERA" display appears again.

Gain

The gain (luminance) of image can be changed.
When shipped, "0" is set.

- 1 Select "GAIN" on the "CAMERA" display. The "GAIN" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change "GAIN" (luminance) to the desirable correction step. The value can be adjusted by 25 steps, from "+12" to "-12".
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; setting is done and the "CAMERA" display appears again.



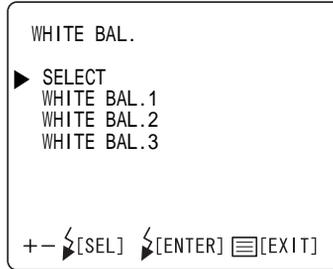
As with most commercial cameras, gain is displayed in "dB". Increase/decrease the value by 1 step (3 steps), and gain can be changed by approx. 12% (approx. 40%).

White balance

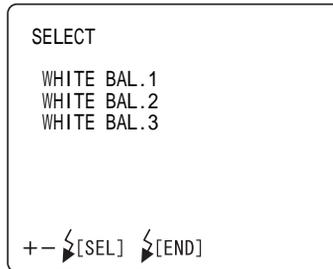
The color balance of the image can be changed.

The three types, "WHITE BAL. 1", "WHITE BAL. 2" and "WHITE BAL. 3" can be stored. When shipped, "R-GAIN 96/G-GAIN 70/B-GAIN 85" of "WHITE BAL. 1" is set.

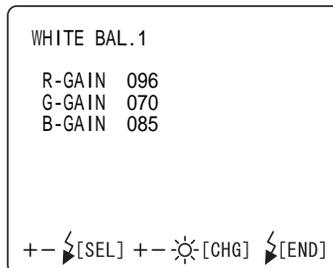
- 1 Select "WHITE BAL." on the "CAMERA" display. The "WHITE BAL." display appears.



- 2 On the "SELECT" screen, select the white balance setting ("WHITE BAL. 1 ~ 3") to be validated.



- 3 On each of "WHITE BAL. 1" to "WHITE BAL. 3", you can set data.



Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change each item to the desirable numeral:

"R-GAIN" (red gain) : The value can be set in the range of "1" ~ "255".

"G-GAIN" (green gain) : The value can be set in the range of "1" ~ "255".

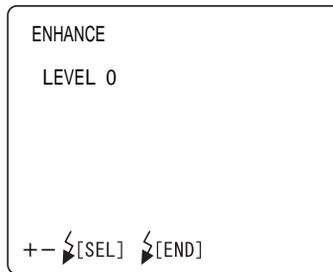
"B-GAIN" (blue gain) : The value can be set in the range of "1" ~ "255".

- 4 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

Image emphasis

Image emphasis allows you to change certain image characteristics.
When shipped, "0" is set.

- 1 Select "ENHANCE" on the "CAMERA" display. The "ENHANCE" display appears.

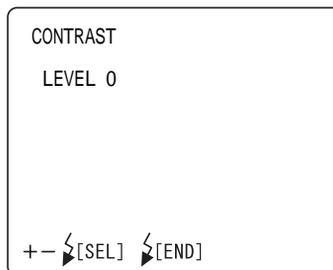


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change the level to the desirable one. You can adjust the level by 9 steps, from "-4" to "+4".
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

Contrast

The image contrast can be changed.
When shipped, "0" is set.

- 1 Select "CONTRAST" on the "CAMERA" display. The "CONTRAST" display appears.

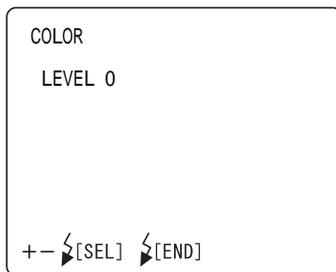


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and adjust the contrast. The contrast can be adjusted by 9 steps, from "-4" to "+4".
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

Color

The image color depth can be changed.
When shipped, "0" is set.

- 1 Select "COLOR" on the "CAMERA" display. The "COLOR" display appears.

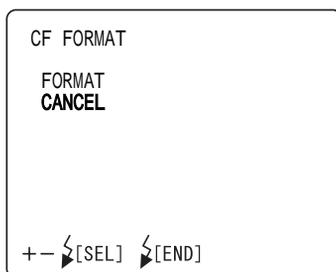


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and adjust the image color depth. The color depth can be adjusted by 9 steps, from "-4" to "+4".
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

CF format

You may use this function to format a new CompactFlash[®] card.
When shipped, "CANCEL" (format is not done) is set.

- 1 Select "CF FORMAT" on the "CAMERA" display. The "CF FORMAT" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "FORMAT" (format is done) or "CANCEL" (format is not done).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "CAMERA" display appears again.



When format is selected, all the data including the file-protect-used files are erased.

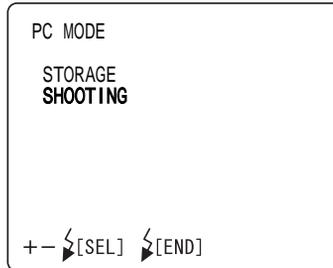


The above setting is possible only when the mode selector knob is set at "photography" () or "playback" ().

PC mode

You can select the operation mode for the PC mode of the mode selector knob. When shipped, "SHOOTING" is set.

- 1** Select "PC MODE" on the "CAMERA" display. The "PC MODE" display appears.



- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "STORAGE" or "SHOOTING".
STORAGE: The CompactFlash® card is recognized as a removable disc by PC.
SHOOTING: The photography image is sent to PC.
- 3** Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.



The above setting is possible only when the mode selector knob is set at "PC" (↺↻).

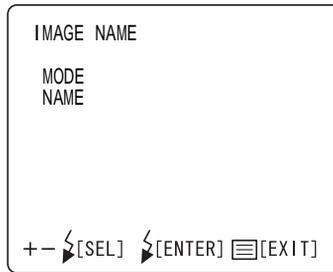


Before setting to "STORAGE", insert the CompactFlash® card to its slot. When "STORAGE" is canceled and the CompactFlash® card is removed, perform "hardware removal" through PC.

Image name

You can select the record number mode of the image file to be recorded.

- 1 Select "IMAGE NAME" on the "CAMERA" display. The "IMAGE NAME" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "MODE" or "NAME".

① MODE..... The record number mode of a file can be selected.

NON-CONTINUATION: Normal mode

When the CompactFlash[®] card is replaced with another or when a folder is changed, the file name begins with "100-0001".

CONTINUATION: Continuous mode

Even if the CompactFlash[®] card is replaced with another or when a folder name is changed, the file name stored in the camera is the first.

② NAME In the continuous mode, the record number can be set.

SET DATA : Setting is possible with optional data.

AUTO NUM : The usable lowest number is set.

- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

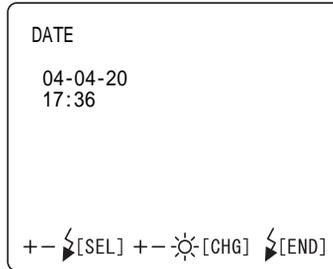


The above setting is possible only when the mode selector knob is set at "photography" ().

Date/time

You can set the date and time.

- 1 Select "DATE" on the "CAMERA" display. The "DATE" display appears.

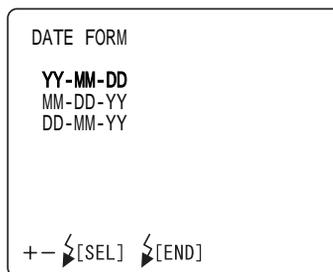


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and move the cursor to the item to be set.
Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and change the numerals to the desired ones.
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; setting is done and the "CAMERA" display appears again.

Date form

You can set the display order of year, month and day.
When shipped, "year-month-day" is set.

- 1 Select "DATE FORM" on the "CAMERA" display. The "DATE FORM" display appears.

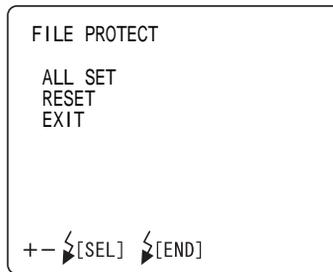


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select the desirable order from the following:
"YY-MM-DD" (year-month-day)
"MM-DD-YY" (month-day-year)
"DD-MM-YY" (day-month-year)
- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; setting is done and the "CAMERA" display appears again.

File protect function

You can set the file protection setting for the camera.

- 1 Select "FILE PROTECT" on the "CAMERA" display. The "FILE PROTECT" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ALL SET" (exclusively for reading) or "RESET" (not exclusively for reading).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "CAMERA" display appears again.



When format is selected, all the data are erased even if file protect is used.

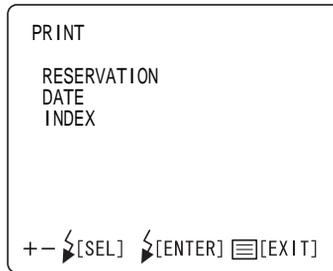


The above setting is possible only when the mode selector knob is set at "playback" (▶).

Print

For the image stored in the CompactFlash[®] card, DPOF print can be specified.

- 1 Select "PRINT" on the "CAMERA" display. The "PRINT" display appears.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "RESERVATION", "DATE" or "INDEX".

① RESERVATION ... : Reserves DPOF print.

ALL SET : Reserves print.

RESET : Cancels the reservation of print. (Initial data)

② DATE : Sets the information to be outputted in the reservation of DPOF print.

OFF : No setting (Initial data)

DATE : Sets the date.

TIME : Sets the time.

③ INDEX : Reserves print of INDEX with DPOF.

ALL SET : Reserves print.

RESET : Cancels the reservation of print. (Initial data)

- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.



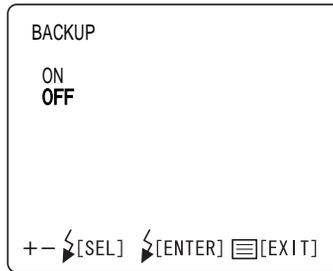
Setting of print is possible only when the "playback" mode is set.

Backup

Data are recorded in the CompactFlash[®] card and at the same time can be sent to PC through USB.

When shipped, "OFF" (data are not sent) is set.

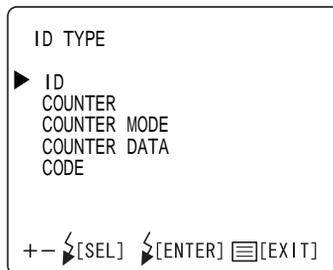
- 1 Select "BACKUP" on the "CAMERA" display. The "BACKUP" display appears.



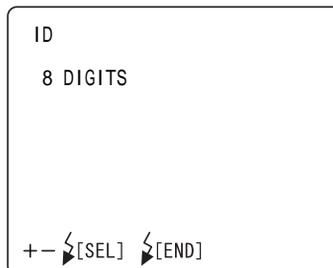
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (data are sent to PC) or "OFF" (data are not sent to PC).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "CAMERA" display appears again.

SETTING THE ID NUMBER

The ID number can be set.



- ① ID : The digits of ID number can be selected in the range of "OFF" and 3 ~ 24 (DIGITS).



- ② COUNTER : ON/OFF for the 4-digit calculation counter attached to the ID number can be selected.

COUNTER

ON
OFF

+- [SEL] [END]

- ③ COUNTER MODE : The mode of the 4-digit calculation counter attached to the ID number can be selected.

COUNTER MODE

NON-CONTINUATION
CONTINUATION

+- [SEL] [END]

- ④ COUNTER DATA : The data of the 4-digit calculation counter attached to the ID number can be set.

COUNTER DATA

DATA:0001

+- [SEL] +- [CHG] [END]



The set data is canceled by setting the POWER SWITCH at the "OFF" (O) position.

- ⑤ CODE : The establishment code can be set.

CODE

▶ **CODE**
CODE No

+- [SEL] [ENTER] [EXIT]

SETTING THE LANGUAGE

On the "LANGUAGE" screen, the language to be used on the MENU screen can be set. When shipped, "ENGLISH" is set.

- 1** Make sure that the cursor is on the "LANGUAGE" of the "INITIAL MENU" screen, and press the **FLASH LEVEL SWITCH (RESET)**. The monitor screen changes to the "LANGUAGE" screen.



- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select from the following:
"ENGLISH";
"GERMAN";
"FRENCH";
"SPANISH"; or
"ITALIAN."
- 3** Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the "INITIAL MENU" screen returns.



When the **POWER SWITCH** is turned OFF without exiting from the "INITIAL MENU" screen, the settings are not changed.

BASIC OPERATIONS

PREPARATION FOR PHOTOGRAPHY

Applying the power supply

- 1** Carefully check the power cable connection.
For details about the connection, see "CONNECTING THE POWER CABLE" on page 21.
- 2** Install the CompactFlash[®] card. For details of the installation, see "INSTALLATION OF THE COMPACTFLASH[®] CARD" on page 22.
- 3** Turn ON the POWER SWITCH of the instrument and the external recording device .
- 4** Confirm that the Title screen is displayed and then in a few seconds the Monitor screen is displayed.

Changing the mode

Turn the mode selector knob to set at "photography" ().



Setting of the patient

 CAUTION	Adjust the height of the chinrest while watching the patient directly.
NOTE	If the patient wears glasses or contact lenses, let him/her remove them first.

- 1** Make sure the main Monitor screen is on.
- 2** When using the ID number, input all patient information before seating the patient in front of the instrument.
When using the ID number:
Change the photography mode to the input mode with the No. SWITCH (Num) .
Select a digit to be inputted with the No. SWITCH () or No. SWITCH () .
Select numerals (0~9,-, A~Z) to be inputted with the No. SWITCH (↑/書) or No. SWITCH (↓/Del) .
You can input numerals with the ten button keypad (optional).
When inputting optional numerals with the ten button keypad (optional), change the photography mode to the input mode with the KEY (NumLock) or No. SWITCH (Num) .
Input numerals with the KEY (1) ~ KEY (9) , and KEY (-) .
Change the input mode to the photography mode with the KEY (Enter) .



When changing the photography mode to the input mode with the (No. SWITCH (Num)), press the (No. SWITCH (Num)) for 1 second or more. The ID numbers can be reset to the initial values (zero).

[Example of input]

12345678_0001 (Display) ⇒ 12525678-0001 (Change)

[Display and procedure] (When the No. switch is used)

12345678_0001: The newest ID number recorded on the CompactFlash® card is displayed.

12345678_0001: Press the (No. SWITCH (Num)). The numeral "1" at the leftmost end flickers.

The photography mode is changed to the input mode.

12345678_0001: Press the (No. SWITCH ()). The digit is changed and "2" flickers.

12345678_0001: Press the (No. SWITCH ()). The digit is changed and "3" flickers.

12445678_0001: Press the (No. SWITCH (↑/↵)). The flickering "3" is changed to "4".

12545678_0001: Press the (No. SWITCH (↑/↵)). The flickering "4" is changed to "5".

12545678_0001: Press the (No. SWITCH ()). The digit is changed and "4" flickers.

12535678_0001: Press the (No. SWITCH (↓/Del)). The flickering "4" is changed to "3".

12525678_0001: Press the (No. SWITCH (↓/Del)). The flickering "3" is changed to "2".

12525678_0001: Press the (No. SWITCH (Num)). The numeral does not flicker and photography is possible.

The input mode is changed to the photography mode.

[Display and procedure] (When the ten button keypad (optional) is used)

12345678_0001: The newest ID number recorded on the CompactFlash® card is displayed.

12345678_0001: Press the (KEY (NumLock)). The numeral "1" at the leftmost end flickers.

The photography mode is changed to the input mode.

12345678_0001: Press the (KEY (+)). The digit is changed and "2" flickers.

12345678_0001: Press the (KEY (+)). The digit is changed and "3" flickers.

12545678_0001: Press the (KEY (5)). The flickering "4" is changed to "5".

12545678_0001: The digit is changed and "4" flickers.

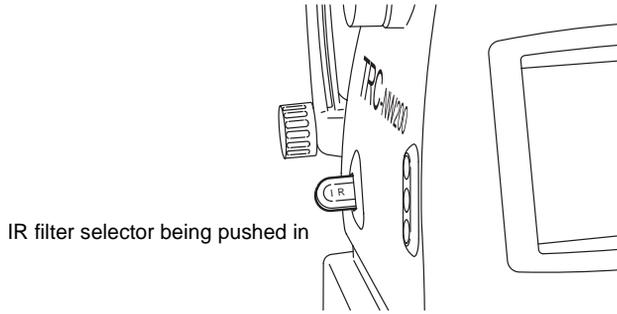
12525678_0001: Press the (KEY (2)). The flickering "4" is changed to "2".

12525678_0001: The digit is changed and "1" flickers.

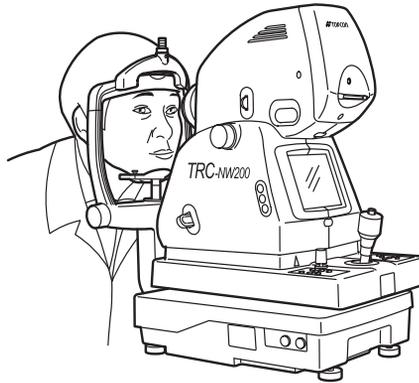
12525678_0001: Press the (KEY (Enter)). The numeral does not flicker and photography is possible.

The input mode is changed to the photography mode.

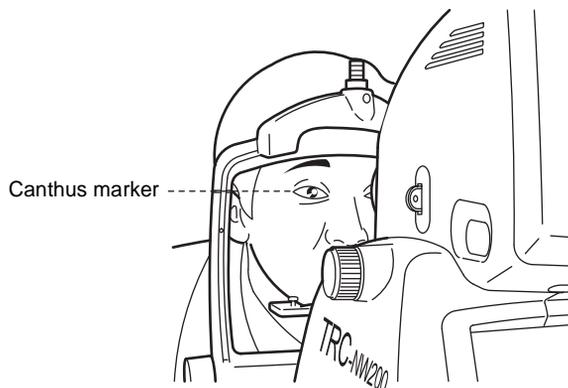
- 3** Make sure that the IR filter selector is pushed in.



- 4** Seat the patient comfortably in an exam stool or exam chair in front of the instrument.
- 5** Adjust the table height or chair height so the patient can relax with his/her chin placed centrally on the chinrest. Let the patient rest his/her chin on the chinrest.



- 6** Adjust the chinrest height by turning the chinrest handle so the outside corner of the patient's eye is level with the Canthus marker on the chinrest post. Let the patient rest his/her forehead on the forehead rest. Without the forehead up against the forehead rest sharp, in-focus images may not be possible.



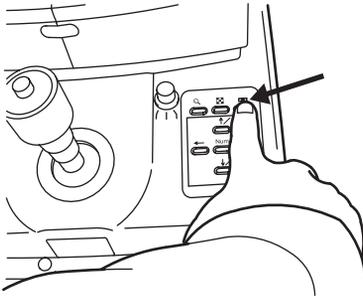
COLOR PHOTOGRAPHY (CENTER)

NOTE

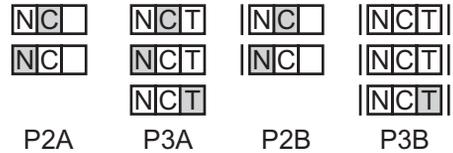
To ensure correct imaging, adjust the table height so the patient can relax with his/her chin placed centrally on the chinrest.

Setting the picture position

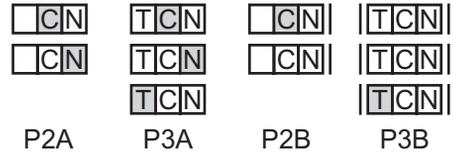
Set the photography position with the **FIXATION TARGET SELECTOR SWITCH**. Press the **FIXATION TARGET SELECTOR SWITCH**, and the target position is adjusted. Set the target position display to "C" (center). You can view the target position on the color video monitor.



Fixation position display (in the case of the right eye)



Fixation position display (in the case of the left eye)



When the power is turned on (initial condition), the photography position is set to "C" (center).
When shipped, the fixation target pattern is set to "P2A".



When the external fixation target (optional accessory) is used, operate the arm to guide the patient's fixed eye.

Setting the picture angle

Press the picture angle switch to set the picture angle to 45° or x2 (approximately x2 by digital zoom) or x4 (approximately x4 by digital zoom).



Even if the picture angle is changed, the picture angle on the color video monitor does not change. To check the current picture angle, check the picture angle display (only when x2 or x4 is set) on the color video monitor.

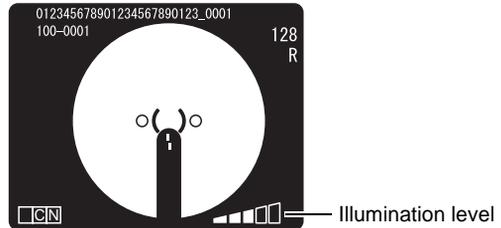
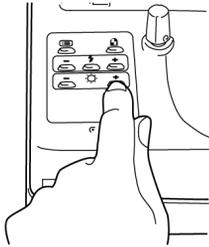
Setting the illumination level



To avoid pain and discomfort to the patient and/or damage to the patient's eye, do not brighten the monitor lamp more than necessary.

Set the illumination level using the **ILLUMINATION LEVEL SWITCH**.

You can confirm the current level using the illumination level display on the color video monitor.



Normally, the illumination level can be set by 5 steps.

When the instrument is first turned on, the illumination level is set to level 3.

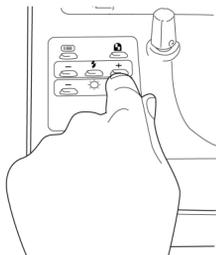
Setting the flash level



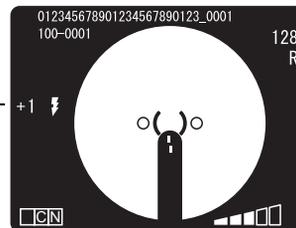
To avoid pain and discomfort to the patient and/or damage to the patient's eye, do not brighten the photography light more than necessary.

Set the flash level using the **FLASH LEVEL SWITCH**.

The compensation value can be checked by the flash level compensation display on the color video monitor.



Flash level compensation display



The flash level can be compensated in 4 steps in both the (+) and (-) directions from the reference value.

When the flash level is the reference value, no compensation value is displayed. When the instrument is first turned on, the flash level is set to the reference value.



You can adjust the reference value of the flash level by 8 steps in both (+) and (-) directions. See the "Flash level" on page 30.

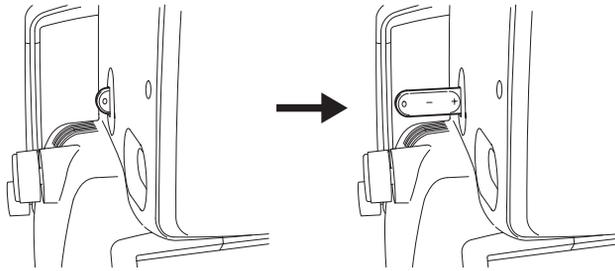


The flash level display can also display the light intensity level (unit: WS) in addition to the compensation value.

For details about the flash level setting, contact your dealer or TOPCON (see the back cover).

Changing the diopter compensation lens

Pull out the diopter compensation lens selector and change the diopter compensation lens for the patient's eye.



When the patient's eye has a strong myopia, pull out the diopter compensation lens selector by one step and set it to (-).

When the patient's eye has a strong hyperopia, pull out the diopter compensation lens selector by two steps and set it to (+).

Compensation range: 0 :-13~+12D

- :-12~-33D

+ :+9~+40D



When the diopter compensation lens is set to another value except "0", the split lines disappear.

Alignment and photography

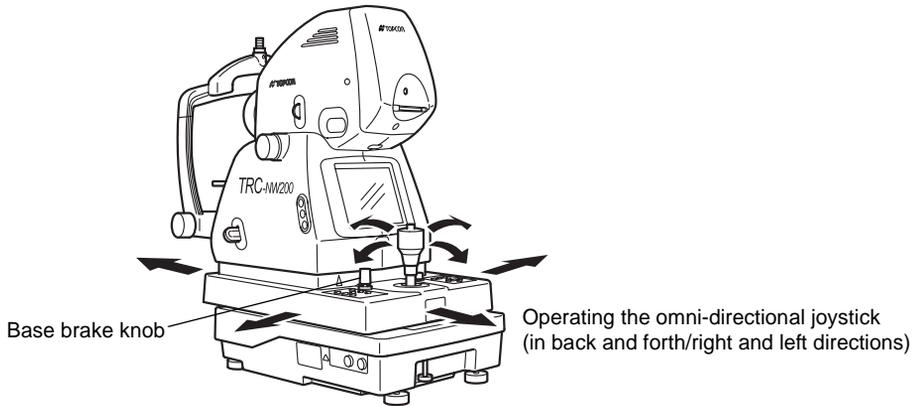
 CAUTION	To avoid injury, do not place your fingers into the gap between the instrument body and the power supply unit.
 CAUTION	To avoid injury to the patient's eyes and nose while moving the instrument body, be attentive of the distance between the patient and the objective lens.

The alignment operation is done with the omni-directional joystick.

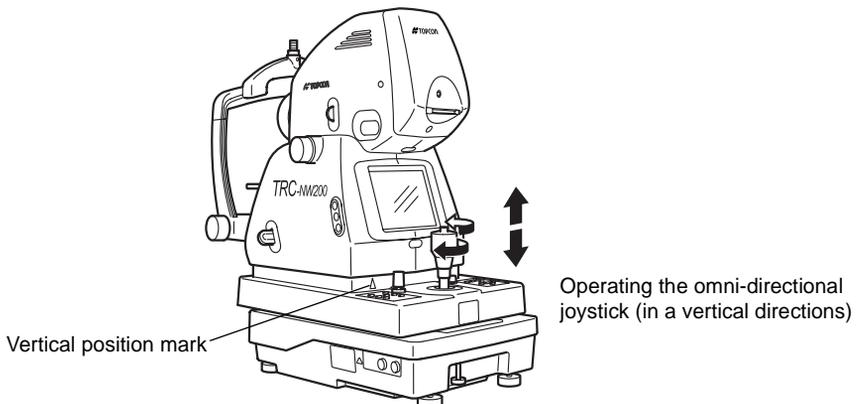


Moving the instrument body with the omni-directional joystick

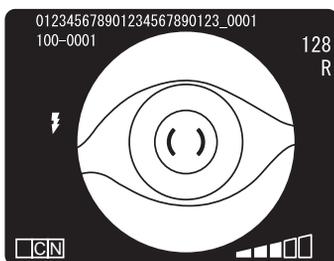
- Fine movements of the base, back and forth and right and left, are done by tilting the joystick.
Before performing this operation, free the base by turning the base brake knob to the left.
To lock the base, turn the base brake knob right.



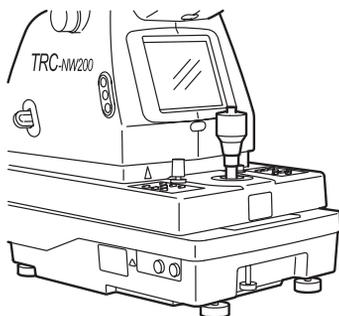
- To move the instrument body up/down, turn the omni-directional joystick right for upward movement, and left for downward movement.
The vertical position of the instrument body can be checked with the vertical position mark.



- 1** Hold the omni-directional joystick and pull the instrument backwards toward the operator. As the internal fixation target turns on, instruct the patient to look at the fixation target in the center. Observe the anterior segment image on the color video monitor.
- 2** Move the instrument body in right and left / up and down directions until you get the patient's eye in the center of the color video monitor.



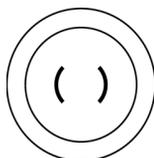
Now hold the joystick upright, which will facilitate the total alignment process.



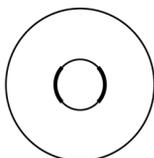
- 3** On the color video monitor, bring the () scale towards the patient's pupil, and make sure that the pupil is larger than the () scale.



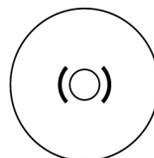
Comparison of the () scale and the eye tells you whether the pupil is large enough for retinal photography. Use this comparison to get the standard for photography.



Well dilated.

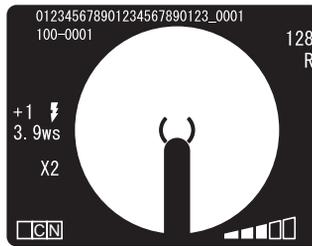


Narrowly dilated for photography.



Pupil diameter is too small: darken the room and further dilate the pupil.

- 4** While keeping the joystick upright, bring the base closer to the patient; the retina image appears on the color video monitor.



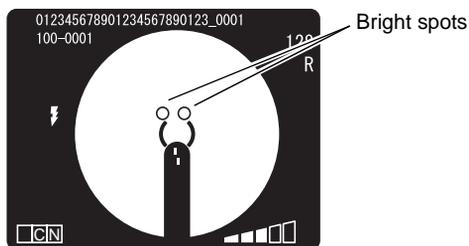
- 5** Instruct the patient to look at the green light (internal fixation target).

- 6** While watching the image on the color video monitor, adjust the brightness of the image using the **ILLUMINATION LEVEL SWITCH**.

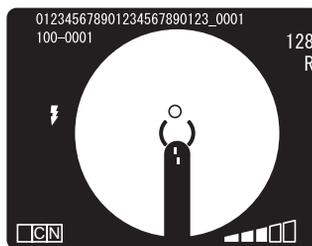


For details about the illumination level setting, see page 75. An illumination level that is too bright will make the split lines hard to see.

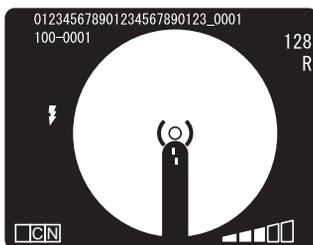
- 7** While keeping the joystick upright, bring the base closer to the patient; and two bright spots for the working distance alignment become visible.



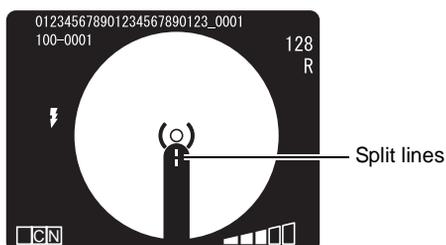
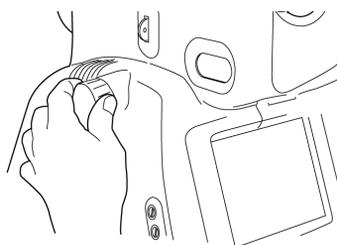
- 8** Move the joystick until the two bright spots are changed to one spot on the color video monitor.



- 9** Operate the joystick and move the instrument body to bring the bright spot on the color video monitor into the () scale.



- 10** Operate the focusing knob and align the focusing split lines into one line on the color video monitor.



If you cannot align the split lines into one line by operating the focusing knob, change the diopter compensation lens.

For details, see "Changing the diopter compensation lens" on page 76.

Since the split lines are off when the diopter compensation lens is anything other than (0), turn the focusing knob so that the eye ground image is clearly visible on the color video monitor.



If the split lines are not easily visible, lower the illumination level, or lower the brightness of the color video monitor.

For details about adjusting the brightness of the color video monitor, see "Adjusting the color video monitor" on page 97.

If one of the split lines cannot be seen, check if dilation is sufficient or if the eye is obstructed by eyelashes or the eyelid, interrupting the light.

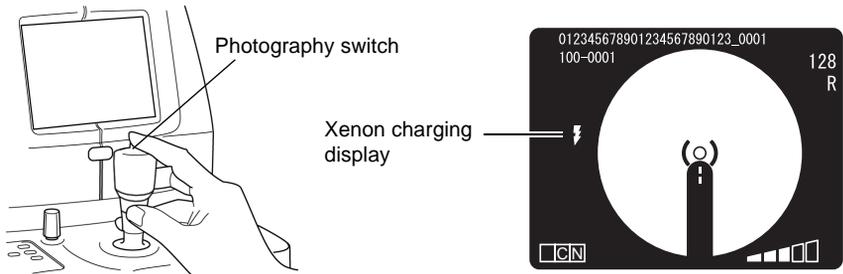


You can remove the split lines from the Monitor screen.

Pressing the **SPLIT SWITCH** to remove the split lines from the Monitor screen.

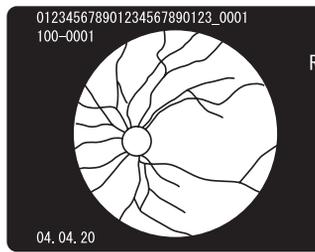
Press the **SPLIT SWITCH** again to display the split lines on the Monitor screen.

- 11** Make sure that the split line is aligned with the bright spot on the color video monitor. Press the **PHOTOGRAPHY SWITCH** when the patient does not wink.



-  When the xenon charging display flickers on the color video monitor, photography is not possible even by pressing the **PHOTOGRAPHY SWITCH**.

- 12** When the captured image is displayed on the color video monitor, it is stored on the CompactFlash® card.



-  If the light intensity of the captured image is not correct, adjust it with the **FLASH LEVEL SWITCH** and repeat the alignment and photography procedure.

- 13** To return to the Monitor screen from the photography image display on the color video monitor, press the **PHOTOGRAPHY SWITCH** again. (TYPE1 MODE)

- 14** Take a picture by repeating Procedure 1~13 if necessary.

-  When the xenon charging display flickers on the color video monitor, photography is not possible even if the **PHOTOGRAPHY SWITCH** is pressed. It takes several seconds to write data on the CompactFlash® card. Wait until writing is finished to take the next picture.

-  If the captured image is not good, it can be deleted by pressing the **No. SWITCH (↓/Del)**.

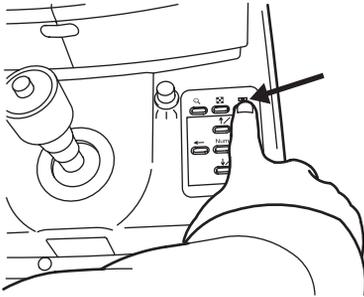
-  When the captured image is displayed on the color video monitor and the **PHOTOGRAPHY SWITCH** is pressed to return to the Monitor screen, the captured image can be stored on the CompactFlash® card. (TYPE2 MODE) The captured image can be displayed only while data is being written on the CompactFlash® card. (TYPE3 MODE).

To alter to these modes, contact your dealer or TOPCON (see the back cover).

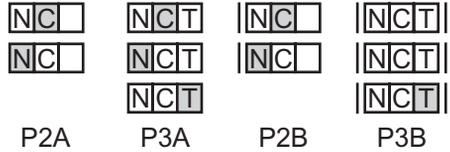
PHOTOGRAPHY OF EAR SIDE/NOSE SIDE

Setting the picture position

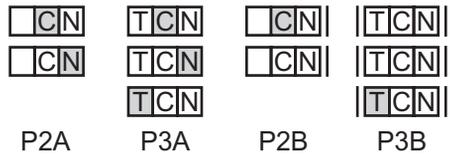
To set the ear side and nose side, press the **FIXATION TARGET SELECTOR SWITCH**. Each time it is pressed, the internal fixation target moves and the set point flickers on the color video monitor. Set to "N" for the nose side, and "T" for the ear side.



Fixation position display (in the case of the right eye)



Fixation position display (in the case of the left eye)



When shipped, the fixation target pattern is set to "P2A". When taking a picture at the ear side, set it to "P3A" or "P3B".

Other settings

For other settings, see "COLOR PHOTOGRAPHY" settings on page 74.

Alignment and photography

The alignment operation is done with the omni-directional joystick.
For details about movement/adjustment of the instrument body with the omni-directional joystick, see the "MEMO" on page 77.

- 1** Move the instrument body right and left or up and down to display the patient's eye at the center of the color video monitor.
- 2** On the color video monitor, bring the () scale toward the patient's pupil, and make sure that the pupil is larger than the () scale.



For details about dilation, see the "MEMO" on page 78.

- 3** Slowly bring the instrument closer to the patient; the eye ground image appears on the color video monitor.
- 4** In this instance, the () scale on the color video monitor moves to an alignment position matching the picture position.
- 5** By operating the ILLUMINATION LEVEL SWITCH, you can adjust the brightness of the image while watching it on the color video monitor.



For details about the illumination level setting, see the "MEMO" on page 75.

- 6** For the steps to follow, see "Alignment and photography" on page 77 for details in the case of color photography.

ANTERIOR SEGMENT PHOTOGRAPHY

Setting the picture position

Set the internal fixation target in the center by pressing the **FIXATION TARGET SELECTOR SWITCH**.

See "Setting the picture position" on page 74.

Setting the illumination level

Set the illumination level by pressing the **ILLUMINATION LEVEL SWITCH**.

See "Setting the illumination level" on page 75.

Setting the flash level

Set the flash level by pressing the **FLASH LEVEL SWITCH**.

See "Setting the flash level" on page 75.

Changing the diopter compensation lens

Push in the diopter compensation lens selector and change the diopter compensation lens to (0).

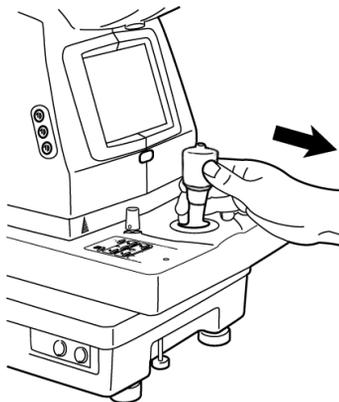
See "Changing the diopter compensation lens" on page 76.

Alignment and photography

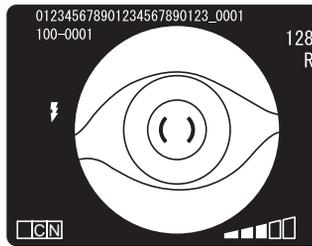
The alignment operation is done with the omni-directional joystick.

For details about movement/adjustment of the instrument body with the omni-directional joystick, see the "MEMO" on page 77.

- 1** Hold the omni-directional joystick and pull the instrument back toward the operator. Observe the anterior segment image on the color video monitor.



- 2 Move the instrument body in right and left / up and down directions until the patient's eye is in the center of the color video monitor.

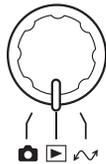


- 3 Turn the focusing knob so the anterior segment image is clearly visible on the color video monitor, and press the **PHOTOGRAPHY SWITCH**.

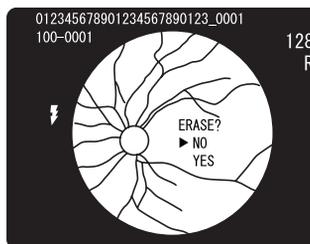
PLAYBACK AND DELETION OF RECORDED IMAGE

Playback

- 1 Access the playback mode by turning the mode selector knob.



- 2 Press the **No. SWITCH ()** or **No. SWITCH ()**.
- 3 The photographed images are displayed in order.
- 4 To delete a displayed image, press the **No. SWITCH (↓/Del)** while an image is displayed. When "ERASE?" is displayed, select "NO" or "YES" with the **No. SWITCH (↓/Del)** or the **No. SWITCH (↑/☒)**. Press the **No. SWITCH (Num)** to decide the selected data.



To delete an image through a computer, contact your dealer.



Use the CompactFlash® card specified by TOPCON.
Refer to "OPTIONAL ACCESSORIES" on P.100 for the CompactFlash® card description.

If the image does not appear normally, contact your dealer for assistance.

Playback zoom

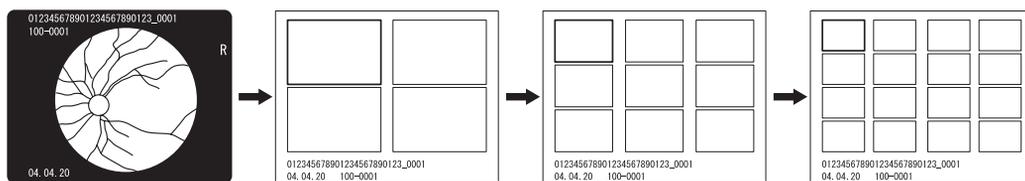
The photography image can be enlarged and displayed.

- 1 Press the **PICTURE ANGLE SWITCH (Q)** in the playback mode.
- 2 Each time the **PICTURE ANGLE SWITCH (Q)** is pressed, the magnification is changed, "1x" to "2x" to "4x".
- 3 The enlarged image can be moved by the **No. SWITCH ()**, **No. SWITCH ()**, **No. SWITCH (↓/Del)** and **No. SWITCH (↑/⏪)**.

Playback of multi-display

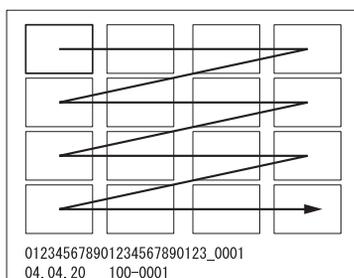
The photography images can be displayed in line.

- 1 Turn the mode selector knob to set at the playback mode (📷).
- 2 Press the **THUMBNAIL SWITCH (📷)**.
Multi-display (4-piece display playback/9-piece display playback/16-piece display playback) appears.



(1-piece display playback) (4-piece display playback) (9-piece display playback) (16-piece display playback)

- 3 Press the **No. SWITCH ()** or **No. SWITCH ()**, and the selected display moves sideways as shown below.
After the last display is selected, the next page appears.



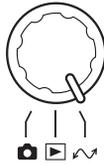
- 4 Press the **No. SWITCH (↓/Del)** or **No. SWITCH (↑/⏪)**, and the page is changed subsequently.
- 5 Press the **No. SWITCH (Num)**, and you can select a display.



While the multi-display playback is being executed, "deletion of image", "image protect" and "reservation for printing image" are impossible.

PC MODE

To transfer an image, turn the mode selector knob to set at "PC mode" ().



For the details of the PC mode operation, refer to the standard accessory, "TRC-NW200 Software Kit Instruction Manual".



When the PC mode is set, images are not recorded in the CompactFlash[®] card.

FINISHING

- 1** Turn the **POWER SWITCH** off on the instrument body and the external recording device.
- 2** While operating the omni-directional joystick, move the instrument body so that it comes just above the base.
- 3** To prevent the base from moving suddenly, turn the base brake knob to the right to lock the base.



To make the instrument body ready for the next imaging session, turn the omni-directional joystick and move the body to the center position. The vertical center position of the instrument body can be checked with the vertical position mark.



When you are not going to use the instrument for a long period of time, remove the power cables of the instrument body and external recording device from the power outlets, and remove all cables connecting the instrument to the external capture device to avoid accidental cable damage.



If the **POWER SWITCH** is turned off while the access lamp is blinking (reviewing is being done or "BUSY" is being displayed), the image data are not stored on the CompactFlash[®] card.

BEFORE REQUESTING SERVICE

TROUBLESHOOTING

Messages displayed during operation

"CHECK COVER"	The lamp house cover is off.
"CHARGE ERROR POWER OFF"	Overcharge, undercharge; or Fuse (F4) is burnt.
"CAMERA ERROR"	The CCD camera has malfunctioned.
"CHECK CF"	The CompactFlash® card has malfunctioned.
"CHECK USB"	The photographed image is not transferred to the computer.
"CHECK DATA"	The input of the optional numerals and ID data is not completed normally.
"USB NOT CONNECT"	The USB cable is not connected properly.
"CARD FULL"	The capacity of the CompactFlash® card is full.
"NO CARD"	The CompactFlash® card is not inserted.
"PC NOT READY"	The computer is not in the proper condition to enable photography.
"CHECK MODE DIAL"	The mode selector knob is changed to others except the PC mode when the STORAGE mode is in use.
"STORAGE"	The STORAGE mode is set in the PC mode.
"NO IMAGE"	There is no playback image in the playback mode.
"PROTECTED FILE"	The image to be deleted is protected.
"DPOF!"	The files beyond 999 files are specified for printing.
"INVALID FILE"	The file is invalid or damaged.

Troubleshooting

 WARNING	To avoid electric shock, do not attempt disassembling, re-building and/or repairs on your own. Ask your dealer for repairs.
 WARNING	Do not remove the covers from the main unit, chinrest unit or power supply unit except for the lamp house cover. You may receive an electric shock.

When an error is encountered, review the Check List below. If, after following the instructions below, you still cannot restore the instrument to a normal condition or if the problem does not fall into any of the categories below, contact your dealer or TOPCON (see the back cover).

Check List

Trouble	Condition	Check	Page
Color video monitor does not work.	• Power cable is off the receptacle/ instrument.	Connect power cable.	21
	• Fuse is burnt.	Change fuse.	96
	• Power save function is on (flickering power lamp).	Press Photography switch and cancel power save function.	41

Trouble	Condition	Check	Page
Color video monitor is not clear.	• Image contrast is not good.	Adjust contrast (contrast control).	97
	• Image is dark.	Adjust brightness (brightness control).	97
		Adjust light intensity (Illumination Level switch).	75
		Darken room and thoroughly dilate patient's pupil.	78
• Image color is abnormal.	Adjust hue (hue control).	97	
Periphery of captured image is dark.	• Alignment is incorrect.	Adjust alignment.	77
	• Focusing is incorrect.	Adjust focus.	80
	• Patient's pupil is not large enough.	Darken room and thoroughly dilate patient's pupil.	78
Captured image is flared all over. (The whole is covered by light.)	• Alignment is incorrect.	Adjust alignment.	77
	• Focusing is incorrect.	Adjust focus.	80
	• Opacity in patient's eye.	Flare cannot be removed.	—
Captured image is whitened.	• Patient winked the moment the photograph was taken.	Take another picture.	—
Captured image has a dim white spot.	• Objective lens is stained.	Clean lens.	98
	• Eyelashes were in the patient's eye the moment the photograph was taken. (Dim light was seen at screen bottom the moment the alignment was done.)	Let patient open eye wider and take the picture again. If not wide enough, open the eyelid (i.e., Take picture holding eyelid open).	81
Photographic image is dark all over.	• Flash level is insufficient.	Adjust flash level (Flash level switch).	75
	• Xenon set screws are loose.	Refasten screws to terminal for the xenon PCB.	94
	• Xenon lamp has served its life.	Change xenon lamp.	94
Illumination lamp does not turn on.	• Power save function is on (flickering power lamp).	Press Photography switch and cancel power save function.	41
	• Lamp terminal is loose.	Refasten lamp terminal.	93
	• Fuse is burnt.	Change fuse.	96
	• The lamp is burnt.	Change lamp.	93
Internal fixation target cannot be seen.	• Alignment is incorrect.	Adjust alignment.	77
	• Fuse is burnt.	Change fuse.	96
	• Internal fixation target is set to the nose/ear side.	Press the fixation target selector switch to move it to the center.	74
() scale is off monitor center.	• Internal fixation target is set to periphery.	Change fixation position to center (Periphery fixation switch (Reset)).	74
Split lines cannot be seen.	• Split line is set to OFF.	Turn split line ON (Split switch).	56
	• Diopter compensation lens selector is not set to (0).	Return diopter compensation lens selector to (0).	76
	• Patient's pupil is not large enough.	Darken room and thoroughly dilate patient's eye.	78
Xenon lamp does not turn on.	• Power save function is on (flickering power lamp).	Press Photography switch and cancel power save function.	41
	• Xenon lamp has served its life.	Change xenon lamp.	94
Cannot get patient's pupil center.	• Patient's face position is incorrect. (The chin and forehead are not correctly on the rests, or the patient faces sideways.)	Have patient keep their position correctly.	73
	• Patient's face height is incorrect.	Adjust face height (Chinrest handle).	73
Nothing is recorded in external recording device.	• Anomaly in external recording device.	Check power supply, settings, etc.	—
	• Cable connections are incorrect.	Check and correct cable connections.	24

SPECIFICATIONS AND PERFORMANCE

SPECIFICATIONS

Picture angle	45°, Digital zoom is possible. (x2/x4)
Working range	40.7mm
Minimum pupil diameter	φ4.0mm or more when 45° is set. 3.7mm or more when the digital zoom is set.
Diopter compensation range	No compensation lens ^{*1)} -13D ~+12D Using (-) compensation lens -12D ~-33D Using (+) compensation lens +9D ~+40D
Fixation target	Center : 4 fixed points Nose : 1 fixed point Ear : 1 fixed point Automatic detection of right-and-left movement
Base movement	Coarse: back-forth 46mm, right-left 100mm Fine: back-forth & right-left 16mm each Vertical: 30mm
Chinrest movement	Vertical: 60mm
Power supply, consumption	Power voltage General type AC100, 120, 220, 240V ±10% European type AC110, 120, 230, 240V ±10% Switch over by selector switch Power frequency: 50/60Hz Power consumption 80VA(normal), 400VA(max.)
Leak current	Ground: Normal 0.5mA max., Single failure 1mA max. Exterior: Normal 0.1mA max., Single failure 0.5mA max. Patient: Normal 0.1mA max., Single failure 0.5mA max.
Dimensions	272(W)×505(D)×530-560(H) (instrument body)
Weight	24kg (instrument body)

¹⁾ Split line working range

* The design as well as the specifications are subject to change without prior notice.

ELECTROMAGNETIC COMPATIBILITY

This product conforms to the EMC standard (IEC 60601-1-2 : 2001).

ELECTRIC RATING

Except Europe

Source voltage : AC 100,120V, 220, 240V 50/60Hz

Power input : 80VA (normal), 400VA (max)

Europe

Source voltage : AC 110, 120, 230, 240V, 50/60Hz

Power input : 80VA (normal), 400VA (max)

SYSTEM CLASSIFICATION

- Types of protection against electric shocks:
This instrument is classified as Class I equipment.
Class I equipment does not depend only on basic insulation for protection against electric shocks, but also provides a means of connection to a protective earth system of facilities so that metal parts that come into contact do not become conductive while the basic insulation is in failure.
- Grade of protection against electric shocks:
This instrument is classified as Type B equipment.
Type B equipment provides a specified grade of protection to prevent electric shocks, particularly for reliability against current leaks, measuring current and protective earth current (in case of Class I equipment).
- Degree of protection against harmful ingress of water: IPx0
TRC-NW200 has no protection against ingress of water. (The degree of protection against harmful ingress of water defined in IEC 60529 is IPx0.)
- Classification according to the method(s) of sterilization or disinfection recommended by the manufacturer: not applicable.
TRC-NW200 has no part to be sterilized or be disinfected.
- Classification according to the degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide: Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
TRC-NW200 should be used in environments where no flammable anesthetics and/or flammable gases are present.
- Classification according to the mode of operation: Continuous operation.
Continuous operation is the operation under normal load for an unlimited period, without the specified limits of temperature being exceeded.

DIMENSIONS AND WEIGHT

Dimensions : 272mm (W) × 505mm (D) × 530 ~ 560mm (H)

Weight : 24kg

PURPOSE OF USE

Used to observe and photograph the retinal oculi.

OPERATION PRINCIPLE

The infrared light is emitted from the observation illumination optical system. By using this infrared light, the eye ground of the patient is illuminated. The image received by the built-in observation CCD camera is shown on the monitor and the inspector can observe the eye ground. After adjusting the photography position and focus, a visible light is emitted from the photography illumination optical system by operating the photography switch of the instrument body. The image received by the photography CCD camera is recorded in the memory card, a commercial computer and an external recording device. When digital zoom is set, the illumination aperture is automatically changed and the photographed corneal diameter is changed. While the infrared filter is removed from the observation illumination optical system, color photography is possible.

MAINTENANCE

 CAUTION	<p>To prevent the instrument from falling and to avoid injury, do not install the instrument on an uneven or unsteady surface, including a slope.</p>
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DAILY CHECKUPS

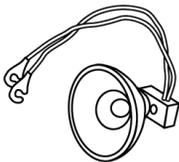
- Dust is a formidable foe to the instrument.
To ensure the production of fine images, care should be taken not to allow fingerprints and/or dirt on the objective lens.
When not in use, be sure to cap the objective lens and cover the instrument with the dust cover.
Before using the instrument, check if the objective lens is clean. If the objective lens is stained, clean it following the instructions for "Cleaning the objective lens" on page 98.
- When not in use, always turn the POWER SWITCH OFF.

Ordering consumables

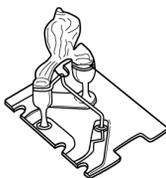
- When ordering consumables and spare parts, contact your dealer or TOPCON (see the back cover) and tell them the article name, article code and quantity.

Article name	Article code
Illumination lamp	40427 6520
Xenon lamp	40443 6570
Chinrest tissue paper	40310 4082
Dust cover	40533 9103

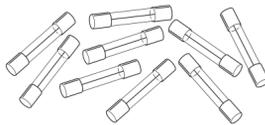
Article name	Article code
Fuse T-5A, 125V (F1, F2)	44691 5006
Fuse T-2.5A, 250V (F1, F2)	44691 5006
Fuse T-0.5A, 250V (F3)	40547 5303
Fuse T-5A, 125V (F4)	44691 5006



Illumination lamp



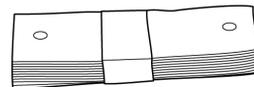
Xenon lamp



Fuse



Dust cover



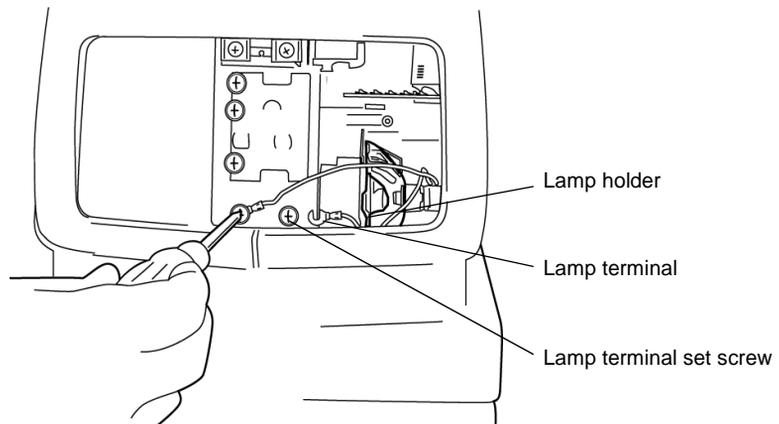
Chinrest tissue paper

Replacing the illumination lamp

 CAUTION	To avoid electric shock, be sure to turn the power supply off and unplug the power cable before replacing the lamp.
 CAUTION	To avoid burns, do not touch the lamp immediately after it goes off.
NOTE	To avoid whitening due to fingerprints, do not touch the lamp with bare fingers.
NOTE	Since the lamp is not resistible to shocks, handle it with particular care.

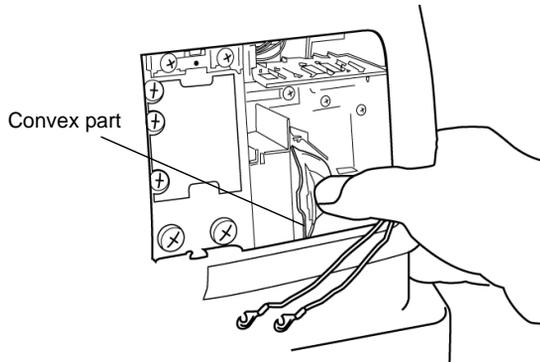
- The service life of the illumination lamp is approx. 2,000 hours. Replace the illumination lamp if it is burned or becomes whitened.

- 1** Turn the **POWER SWITCH** OFF and unplug the power cable.
- 2** Turn the omni-directional joystick and raise the instrument body to the limit.
- 3** Turn the screws with a coin, etc. and remove the lamp house cover.
- 4** Loosen the two set screws and remove the lamp terminal.



- 5** Hold the lamp at the bottom, and pull it out of the lamp holder in a straight direction.

- 6 Hold the new lamp, so the convex part faces the operator, and slide it into the lamp holder until it stops at the end. Make sure that the lamp is firmly fixed in the lamp holder.



- 7 Fasten the lamp terminal securely with the two set screws.
- 8 Attach the lamp house cover by matching the projection at the bottom part of the lamp house cover with the groove of the body cover. Turn the screws with a coin, etc. and securely fasten the lamp house cover.



To avoid electric shock, if the lamp house cover is left unfastened, an error is displayed on the monitor and operations, including photography, cannot be done.

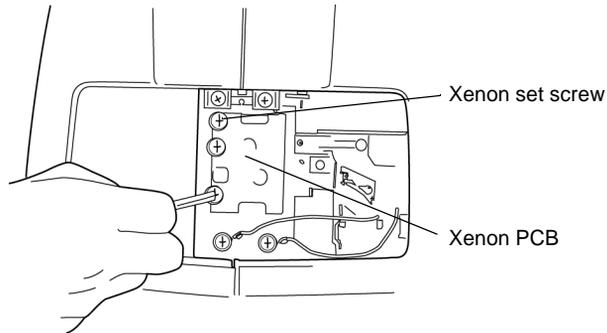
Replacing the xenon lamp

 CAUTION	To avoid electric shock, be sure to turn the power supply off and unplug the power cable before replacing the lamp.
 CAUTION	To avoid electric shock, do not touch the xenon lamp immediately after it flashes or burns out.
NOTE	To avoid whitening due to fingerprints, do not touch the lamp with bare fingers.
NOTE	Since the lamp is not resistant to shocks, handle it with particular care.

- The service life of the xenon lamp is approx. 10,000 cycles. Replace the xenon lamp if it is burned or becomes whitened.

- 1 Turn the **POWER SWITCH** OFF and unplug the power cable, then wait for more than 5 minutes for the natural electrical discharge.
- 2 Turn the screws with a coin, etc. and remove the lamp house cover.

- 3** Loosen the three xenon set screws.



- 4** Hold the xenon PCB at the top and the bottom, slightly slide it to the right and pull it out straight toward the operator side.
- 5** Insert the new xenon PCB, so the xenon lamp does not touch the surrounding metal components, and upon reaching the stopper, slightly move it to the left and slide it into the xenon set screws.
- 6** Surely fasten the three xenon set screws.
- 7** Attach the lamp house cover by matching the projection at the bottom part of the lamp house cover with the groove of the body cover. Turn the screws with a coin, etc. and securely fasten the lamp house cover.



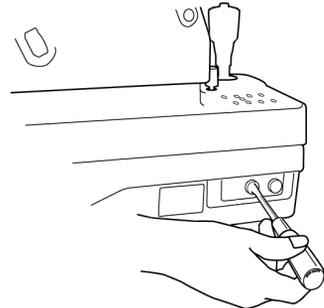
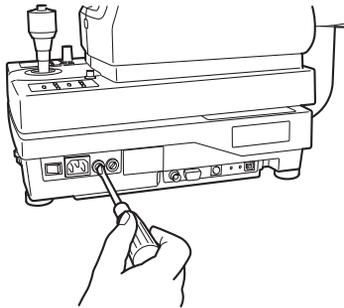
To avoid electric shock, if the lamp house cover is left unfixd, an error is displayed on the monitor and operations, including photography, cannot be done.

Changing the fuse

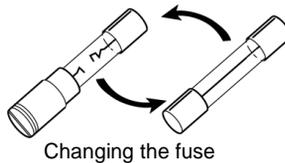
 WARNING	<p>To avoid electric shock, be sure to remove the power cable from the instrument body before removing the fuse cover. Also, do not connect the power cable to the instrument body with the fuse cover left unfixed.</p>
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 WARNING	<p>To avoid fire, use a properly rated fuse (T-5A, 125V 100, 110, 120V, T-2.5A, 250V 220, 230, 240V) which matches the display provided on the fuse holder.</p>
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- 1** Turn the POWER SWITCH OFF and unplug the power cable.
- 2** With a slotted screwdriver, press and turn the fuse holder counterclockwise and remove it.



- 3** Replace the fuse with a new fuse of the same capacity.



- 4** With a slotted screwdriver, lightly press and turn the fuse holder clockwise and fasten it.

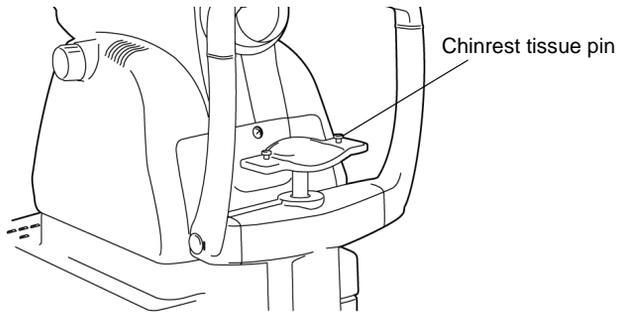


The proper usage of each fuse and the state after it is burned are shown below:

Fuse No.	Usage	State after fuse burn
F1, F2 (5A, 2.5A)	Input power supply	Entire system is off.
F3 (0.5A)	Xenon lamp lighting	Xenon lamp charging for lighting is not done. "CHARGE ERROR POWER OFF"
F4 (5A)	Control circuit	Entire system is off.

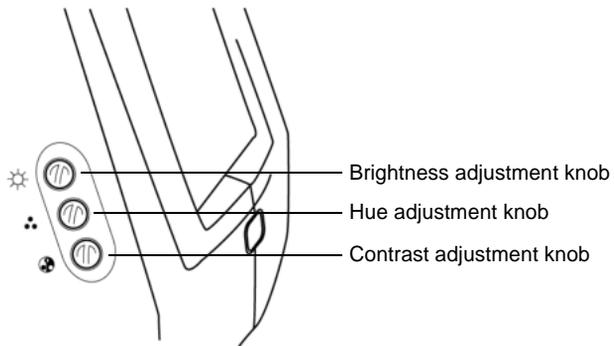
Refilling the chinrest tissue paper

- When the chinrest tissue is used up, pull out the chinrest tissue pin and refill the tissue paper.



Adjusting the color video monitor

- This machine is adjusted for the best image quality before shipment, however, readjustment may be required due to influence, including vibrations, during transportation.
 - The image quality adjustment knob is located on the left hand side of the color video monitor.
- Attain the desired image quality by operating the brightness, contrast and hue adjustment knobs.



CLEANING

Cleaning the dust cover, control panel and monitor screen

NOTE	To prevent the plastic parts of the instrument body from discoloring and deterioration, do not use volatile solvents for cleaning, including benzine, thinner, ether, gasoline, etc.
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- 1** When the dust cover, control panel and monitor screen become stained, clean them with a dry cloth.
- 2** If the dust cover is badly stained, prepare a tepid solution of neutral detergent for kitchenware. Moisten the cloth with the aforementioned solution and wring it thoroughly. Then, wipe the dust cover with the cloth.

Cleaning of the parts which contact with the patient

- Stain on forehead rest and chinrest
Mix the neutral detergent for kitchenware in tepid water. Moisten the cloth with the aforementioned solution and wring it thoroughly. Then, wipe the forehead rest and chinrest with the cloth.

Cleaning the objective lens

- To check the objective lens, set the **POWER SWITCH** to "ON" (I) and turn the illumination lamp ON.
Darken the room, pull out the IR filter selector and set it to visible fluoro-observation.
Press the **ILLUMINATION LEVEL SWITCH (+)** to maximize the light intensity.
Examine the objective lens diagonally from the front. The lens condition can be seen clearly.

How to wipe the dustproof coated objective lens

The wiping method is different from the conventional coated lens.
The resistance against wiping is very low and the lens is smooth.

- Dust and dirt adhered to the surface
Blow them off using a blower.
Be careful to prevent the blower end from touching the objective lens.
- When stain is simple such as dust, tears or saliva:
 - ① Breathe toward the objective lens and wipe it with a lens cleaning paper carefully.
 - ② If your lens cleaning paper is dirty, replace it with a clean one and repeat ①.
 - ③ Repeat ① and ② until no stain is seen on the lens.

- When stain is persistent:
 - ① Moisten a lens cleaning paper with reagent ethanol properly. Wipe the objective lens with the lens cleaning paper by rubbing lightly.
 - ② If your lens cleaning paper is dirty, replace it with a clean one and repeat ①.
 - ③ Repeat ① and ② until no stain is seen on the lens.
 - ④ Finally, wipe the objective lens with a dry lens cleaning paper which is not moistened with solvent until it is clean. It is permitted to wipe the lens after breathing toward it.



Don't use the following methods because the lens is damaged.

- Wiping the lens by grasping with fingernails
- Using a lens cleaning paper wound around a hard tool (for example, a metallic tool)



Use a soft lens cleaning paper without fiber.

- For example, BEMCOT (Asahikasei)



Don't let any strong-alkaline liquid adhere to the objective lens.
If such liquid adheres to the lens, immediately wipe it off.



If it is difficult to remove stain from the objective lens, contact your dealer or TOPCON (see the back cover).

DISPOSING THE PRODUCT

NOTE	<ul style="list-style-type: none"> • This instrument contains lithium cells, and disposal without removing these cells may pollute the environment. To dispose of the instrument, contact a waste disposer or call your dealer or TOPCON (see the back cover).
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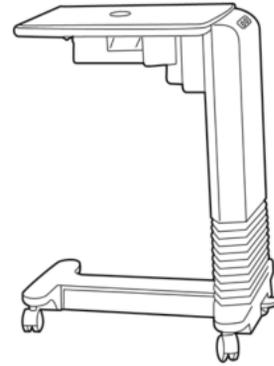
OPTIONAL ACCESSORIES

AUTOMATIC INSTRUMENT TABLE AIT-20

Because the instrument height can be changed as desired, you can take a picture more easily.

Specifications

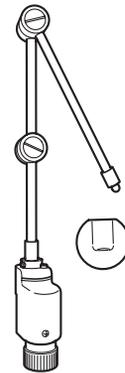
- Dimensions530(W)×540(D)×650(H)mm
- Table height.....655~845mm
- Table size450×500mm
- Weight.....Approx. 30kg
- Power consumption ..270VA (100V)



EXTERNAL FIXATION TARGET EF-2

Specifications

- Dimensions and weight
Dimensions: 53 (W)×25 (D)×328 (H) mm (when extended)
Weight: 85g (without cap)



OTHER OPTIONAL ACCESSORIES

- Automatic instrument table AIT-15
- CompactFlash® card 32MB (equivalent to the standard accessory)



Some CompactFlash® cards may not operate normally. If the image is not taken in normally, contact your dealer.

SHAPE OF PLUG

Country	Voltage/frequency	Shape of plug
Mexico	110V/50Hz	Type C&E
Argentina	220V/60Hz	Type A
Peru	220V/60Hz	Type A
Venezuela	110V/50Hz	Type C&E
Bolivia & Paraguay	220V/60Hz	Type A (Most common) Type H (Infrequently)
Chile	220V/60Hz	Type A
Colombia	110V/50Hz	Type C
Brazil	220V/60Hz 127V/60Hz	Type A Type C
Ecuador	110V/50Hz	Type C&E

SYMBOL

Symbol	IEC Publication	Description	Description (French)
	60417-5032	Alternation Current	Courant alternatif
	60348	Attention, consult accompanying documents	Attention, consulter les documents d'accompagnement
	60417-5008	Off (power: disconnection from the mains)	Éteint (courant: coupure avec le secteur)
	60417-5007	On (power: connection of the mains)	Allumé (courant: raccordement sur le secteur)
	60878-02-02	Type B applied part	Classe B

NON-MYDRIATIC RETINAL CAMERA

TRC-NW200

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