

INSTRUCTION MANUAL  
**NON-MYDRIATIC RETINAL CAMERA**

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***TRC-NW6S***

# INTRODUCTION

Thank you for purchasing the TOPCON TRC-NW6S Non-Mydriatic Retinal Camera.

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This machine has the following innovative features:

- Can observe the fundus of the eye and take images without using mydriatics.
  - The quality of pictures has improved and this instrument is easier to operate than previous models.
  - Can easily take images of the periphery using the alignment point and the external fixation target for peripheral photography.
- 

This manual outlines the TRC-NW6S Non-Mydriatic Retinal Camera, including operation procedures, troubleshooting, maintenance and cleaning.

Before using, carefully read the “DISPLAY FOR SAFE USE” and the “SAFETY CAUTIONS” to familiarize yourself with the features of the TRC-NW6S Non-Mydriatic Retinal Camera and use it efficiently and safely.

Always keep this Instruction Manual at hand.

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## PRECAUTIONS

- Since this machine is a precision instrument, be sure to install and use it in a controlled environment under normal temperature, humidity and atmospheric pressure conditions (10~40°C, 30-85%, 70~106kPa) and avoid direct exposure to sunlight.
  - Never install the machine on a slope or a place with vibrations.
  - Before using the machine, make sure that all cables are correctly connected.
  - Use a power supply within the range of  $\pm 10\%$  of the rated voltage (50/60Hz).
  - Keep the installation place always clean, and when not in use, turn off the Power switch, cap the objective lens, and install the dust cover.
  - To ensure good imaging results, handle the objective lens with particular care and keep it free of flaws, fingerprints, stains and dusts.
-

# 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
 <b>WARNING</b>	Incorrect handling by ignoring this display may lead to an impending danger of death or serious injury.
 <b>CAUTION</b>	Incorrect handling by ignoring this display may lead to personal injury or physical damage.
	<ul style="list-style-type: none"><li>• Injury refers to hurt, burns, electric shock, etc. which does not require hospitalization or extended medical treatment.</li><li>• Physical damage refers to extensive damage to the building, nearby equipment and/or surrounding furniture.</li></ul>

## 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 before assembling.	14
	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.	19
	To avoid electric shock, do not attempt disassembling, rebuilding and/or repairs. Ask your dealer for repairs.	56
	To avoid electric shock do not remove body components, covers of the TV relay lens, chinrest and power supply. – other than the lamp house cover.	56
	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.	64
	To avoid fire and electric shock, install the instrument in a place free from water and other liquids.	—
	To avoid fire and electric shock, do not put cups and vessels containing liquids near the instrument.	—
	To avoid electric shock, do not insert metals into any vents and/or slots.	—
	To avoid fire, use a properly rated fuse which matches the display provided on the fuse holder.	64
	To avoid fire in the event of instrument malfunction, including smoke, immediately turn OFF the Power switch and unplug the cable.	—

# SAFETY CAUTIONS

## CAUTIONS

Icon	Meaning	Page
	To avoid pain to the patient and damage to the patient's eye, do not brighten the monitor lamp more than necessary.	45
	To avoid pain to the patient and damage to the patient's eye, do not brighten the photography light more than	45
	To prevent the instrument from falling and to avoid injury, do not install the instrument on an unstable place, including a slope.	14 18 60
	To avoid injury, do not put fingers into the gap between the instrument body and the power supply unit.	47
	To avoid burn, do not touch the lamp immediately after it goes off.	61
	To avoid electric shock, do not handle plugs with wet fingers	19
	To avoid electric shock, do not touch the xenon lamp immediately flashes or burns out.	62

# SAFETY CAUTIONS

## CAUTIONS

Icon	Meaning	Page
	To avoid injury to the patient's face and hands, be sure to operate the chinrest for height adjustment while directly watching the patient.	41
	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.	47
	To prevent the TV relay lens and TV camera from falling and to avoid injury during adjustment and operation, make sure they are surely mounted.	16
	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.	18
	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.	18
	To avoid injury during carrying, be sure to hold the instrument body at the bottom with two persons. Carrying by one person may cause backache or injury by falling. Holding at areas other than the bottom may also cause pinching fingers and injury, as well as falling, thereby causing damage to the instrument.	14,18
	To prevent the TV camera from falling and to avoid injury, make sure that the camera mount lever is firmly tightened.	60
	To prevent the TV relay lens from falling and to avoid injury, make sure that the lens mount lever is firmly tightened.	60
	To avoid electric shock, be sure to turn the power supply off and unplug the power cable before replacing the lamp.	61,62
	To prevent the instrument body from falling and to avoid injury during movement, be sure to fix the power supply unit with the instrument body using the base locking knob.	—

## USAGE AND MAINTENANCE

### Usage:

- The TRC-NW6S 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 61 and "Replacing the xenon lamp" on page 62.

#### Replacing fuses:

Fuses of the instrument body may be replaced by the user. For details, see "Changing the fuses" on page 64.

#### Cleaning the objective lens:

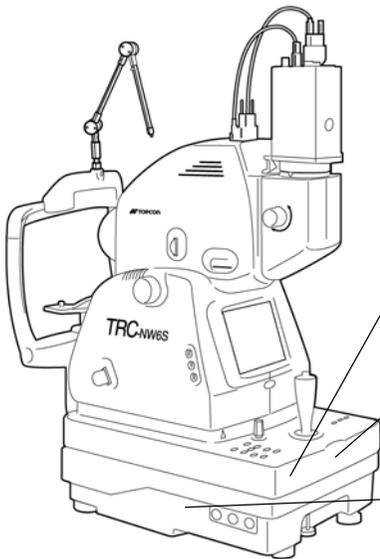
The objective lens may be cleaned by the user. For details, see "Cleaning the objective lens" on page 66.

## 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 dealer of TOPCON at the address stated on the back cover.



**CAUTION**



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

**CAUTION**

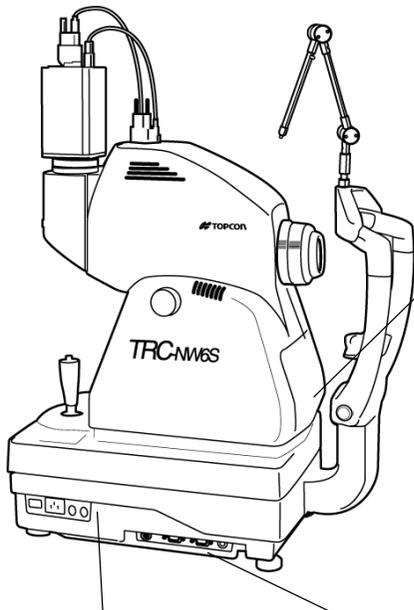


- To avoid potential injury during operation, do not touch the patient's eyes or nose with the instrument.

**WARNING**



- Electrical shock may cause burns or possible fire. Turn the main power switch OFF and UNPLUG the power cord before replacing 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 burn, do not touch the lamp immediately after it goes off.

**WARNING**



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

**WARNING**



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

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## REFERENCES

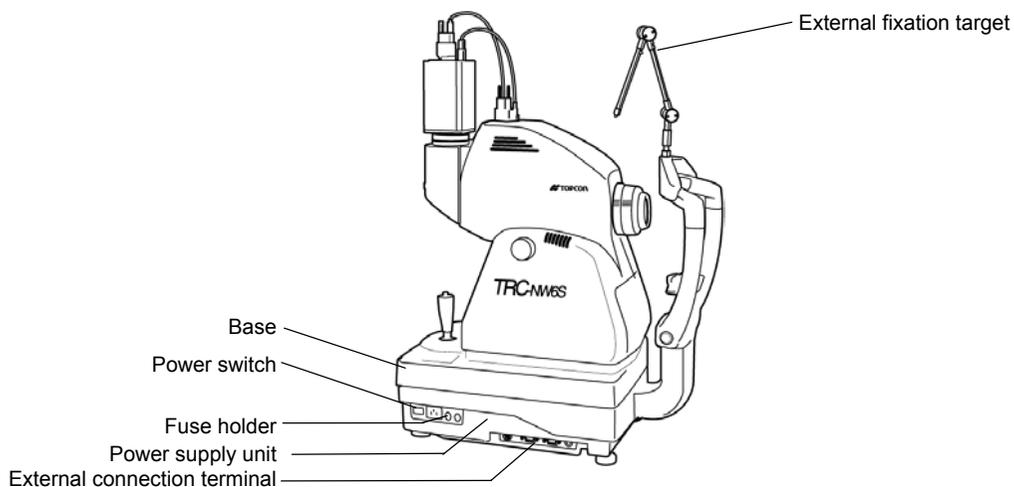
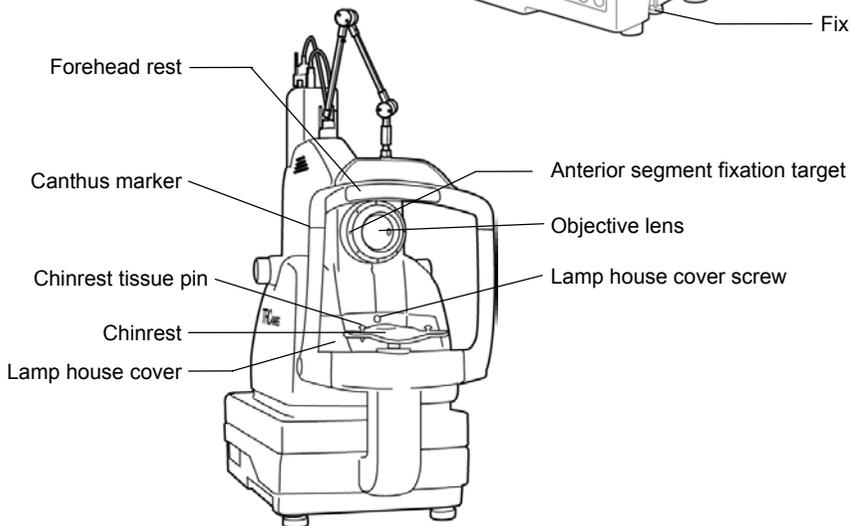
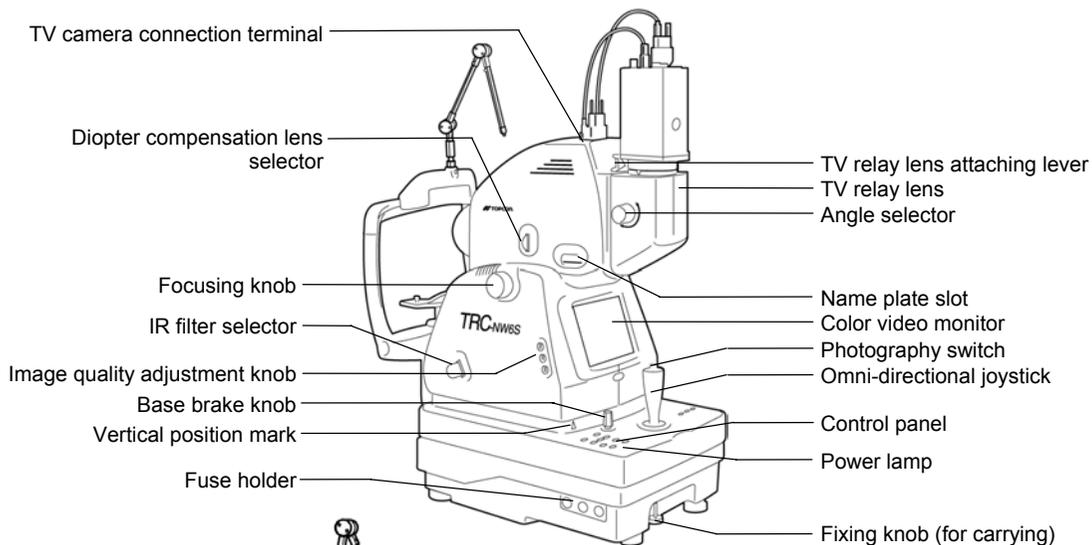
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## MAINTENANCE

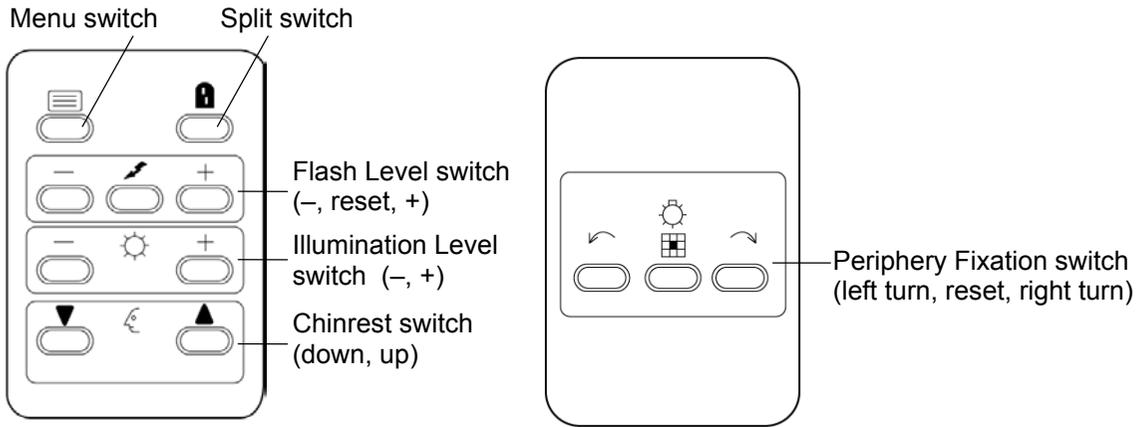
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# COMPONENTS

## COMPONENT NAMES



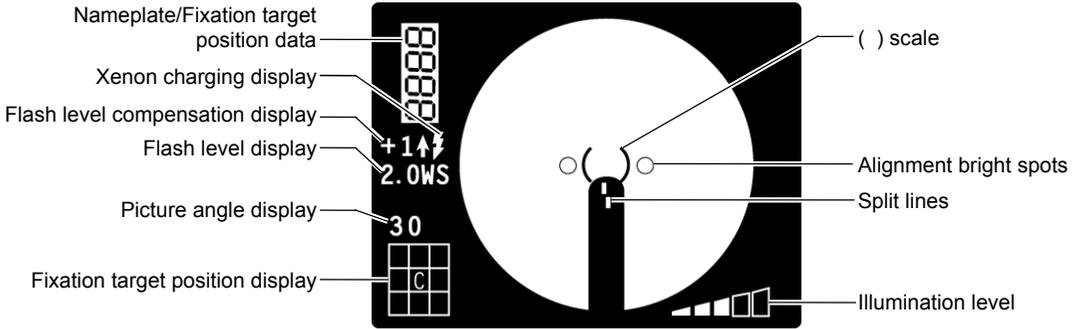
## CONTROL PANEL COMPONENTS



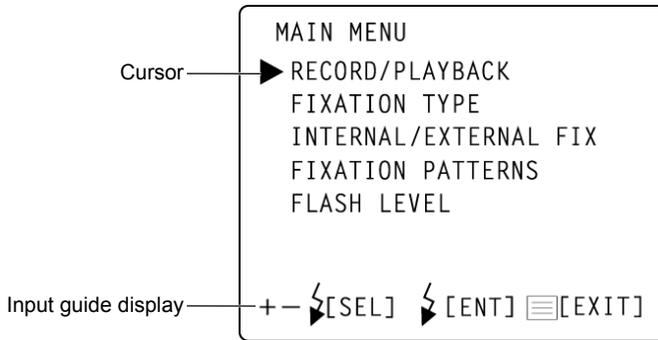
- Menu switch ..... Displays the Menu screen.
- Split switch ..... Turns split lines on/off.
- Flash Level switch ..... Adjusts the flash level for the patient's eye condition.
- Illumination Level switch ..... Adjusts the illumination level for the patient's eye condition.
- Chinrest switch ..... Positions the patient's head by electrically moving the chinrest up/down.
- Periphery Fixation switch ..... Switches the position of the internal fixation target to guide the patient's eye to the periphery fixation point.

# MONITOR SCREEN

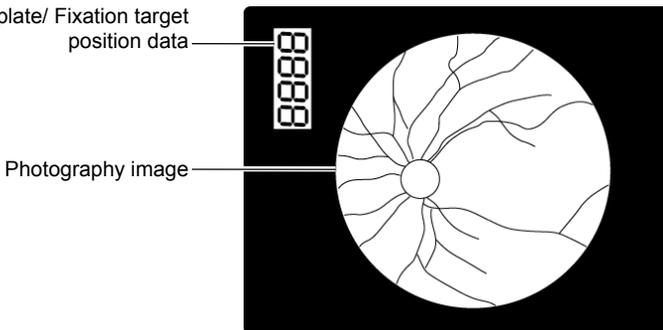
## Monitor screen



## Menu screen

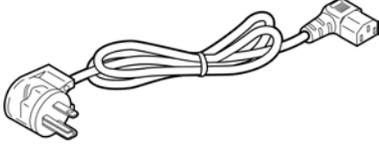
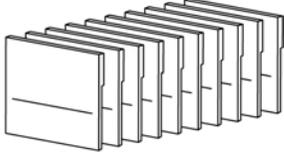
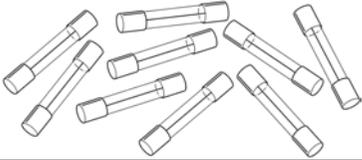
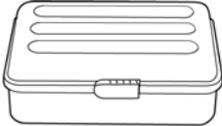
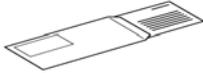
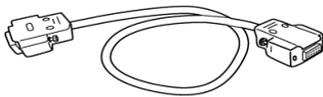


## Preview display (color)



## STANDARD ACCESSORIES

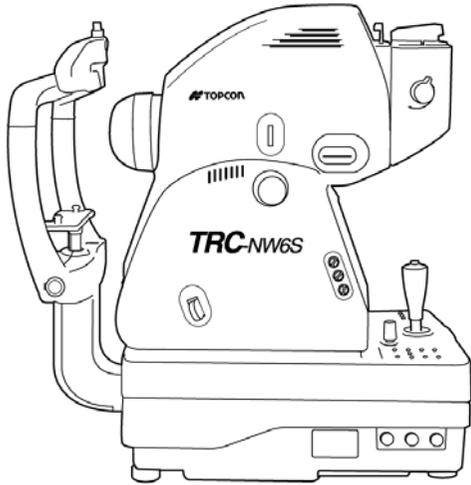
Upon unpacking, make sure that all the following standard accessories are delivered. Figures in ( ) are the quantities

<p>Power cable (1)</p> 	<p>Nameplate (10)</p> 
<p>Illumination lamp (1)</p> 	<p>Fuse (9)</p> 
<p>Chinrest tissue (1)</p> 	<p>Chinrest tissue pin (2)</p> 
<p>Emergency chinrest knob (1)</p> 	<p>Spare parts case (1)</p> 
<p>Instruction Manual</p> 	<p>Warranty (1)</p> 
<p>Dust cover (1)</p> 	<p>External fixation target (1)</p> 
<p>TV camera power cable (1)</p> 	<p>TV camera signal cable (1)</p> 

# ASSEMBLY

## COMPONENTS

(1) (2)



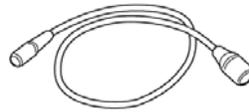
(3)



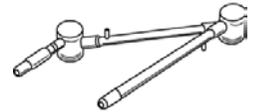
(6)



(4)



(7)



(5)



(8)



(9)



(11)



(14)



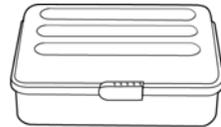
(17)



(10)



(12)



(15)



(18)



(13)



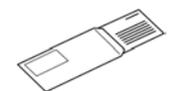
(16)



(19)



(20)



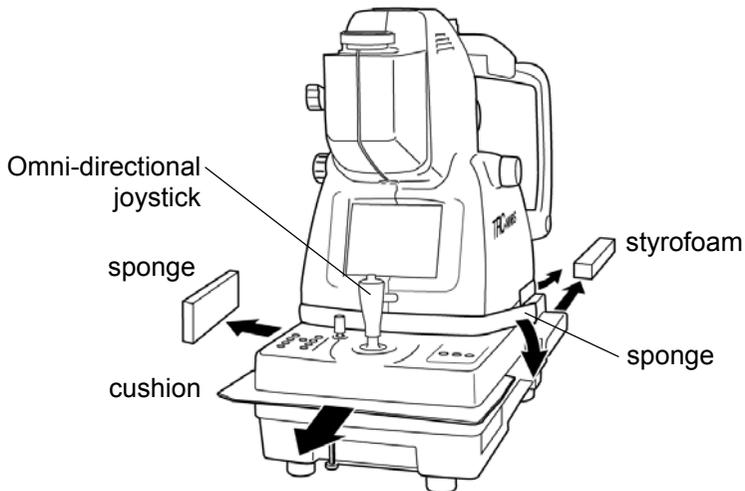
Description	Quantity	Container	Description	Quantity	Container
(1) Instrument body	1	O	(11) Dust cover	1	O
(2) TV relay lens	1	O	(12) Spare part case	1	O
(3) Rail cover	2	O	(13) Illumination lamp	1	Spare parts case
(4) TV camera power cable	1	O	(14) Nameplate	10	Spare parts case
(5) TV camera signal cable	1	O	(15) Fuse (spare)	9	Spare parts case
(6) Power cable	1	O	(16) Chinrest tissue	1	Spare parts case
(7) External fixation target	1	O	(17) Chinrest tissue pin (spare)	2	Spare parts case
(8) Star screwdriver	1	O	(18) Emergency chinrest knob	1	Spare parts case
(9) Hexagon rod spanner	1	O	(19) TRC-NW6SF Instruction Manual	1	O
(10) Focusing tool	1	Spare parts case	(20) Warranty	1	O

# ASSEMBLY PROCEDURE

## ASSEMBLING THE INSTRUMENT BODY

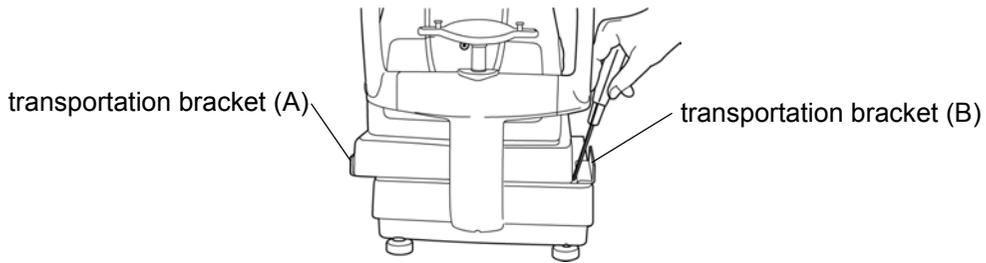
 <b>WARNING</b>	To avoid electric shock, be sure to unplug the power cable before assembling. Also, do not plug the power cable before assembling.
 <b>CAUTION</b>	To prevent the instrument from falling and to avoid injury, do not install the instrument on an unstable place, including a slope.
 <b>CAUTION</b>	To avoid injury during carrying, be sure to hold the instrument body at the bottom with two persons. Carrying by one person may cause backache or injury by falling. Holding at areas other than the bottom may also cause pinching fingers and injury, as well as falling, thereby causing damage to the instrument.
<b>NOTE</b>	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 out the instrument body (1) from 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 dirt.

- 4** Remove the styrofoam from the transportation bracket (A), the one on the left hand side viewed from the patient side, and unscrew the bracket (B).



- 5** Slide the base to the right and unscrew the transportation bracket (A).

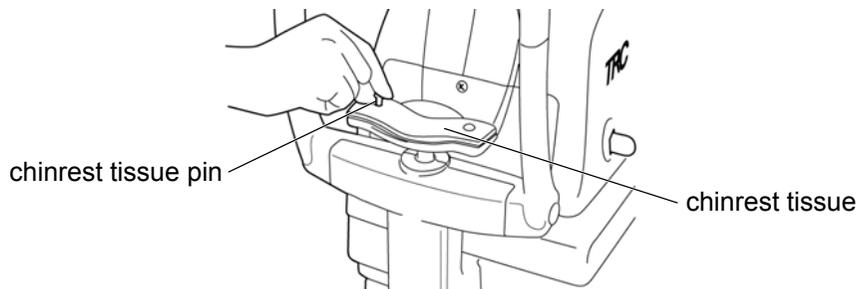
- 6** Fasten the rail covers(3), using the small screws that are attached.



- 7** Set the external fixation target (7). Match the connector groove of the external fixation target (7) with the connector of the instrument body and insert it. Secure it firmly so that it does not move.



- 8** Fix the chinrest tissue(16) with the chinrest tissue pin.



## CONNECTING THE TV RELAY LENS WITH THE INSTRUMENT BODY

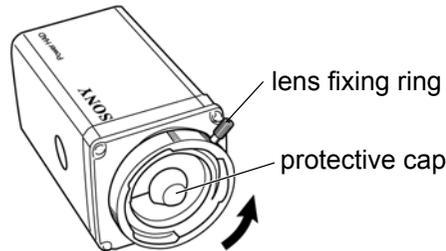


### CAUTION

To prevent the TV relay lens and TV camera from falling and to avoid injury during adjustment and operation, make sure they are surely mounted.

This machine is connected and used with an optional TV camera.  
If your TV camera is SONY DXC-970MD, the attached TV camera power cable (4) and TV camera signal cable (5) can be connected to the instrument body (1).

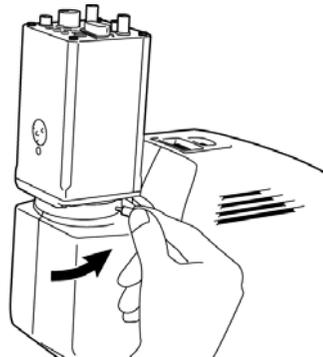
- 1 Turn the TV camera fixing ring in the arrow direction until it stops at the stopper, and remove the protective cap.



- 2 Mount the TV camera so the lens positioning hole matches the pin of the TV relay lens (2).

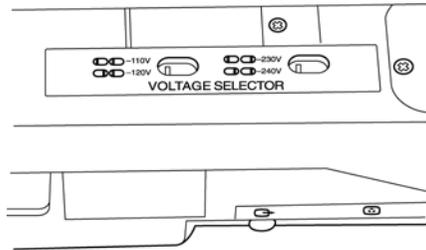


- 3 Turn the lens fixing ring in the arrow direction and fasten it.

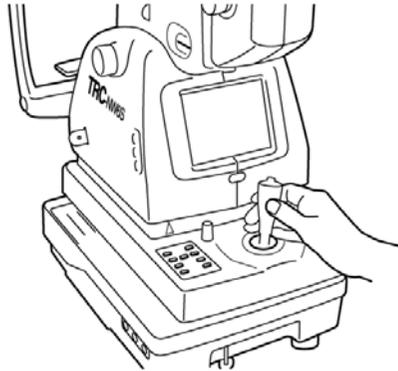


## CONFIRMATION AFTER ASSEMBLING

- 1 Slide the base to the left, as viewed from the operator side, and make sure that the primary voltage coincides with the voltage as set by voltage selector.



- 2 Make sure that the input voltage is within the range  $\pm 10\%$  of the rated voltage. If the input voltage exceeds the range, use a constant-voltage power supply (marketed: 400VA up).
- 3 Loosen the base locking knob, and move the omni-directional joystick to confirm that it moves smoothly.
  - 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 all 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 persons. Carrying by one person may cause backache or injury by falling. Holding at areas other than the bottom may also cause pinching 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.



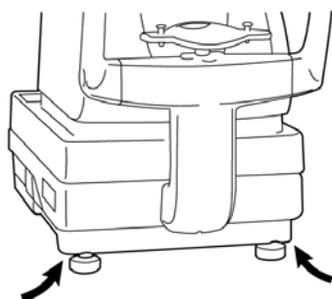
### CAUTION

To prevent the instrument from falling and to avoid injury, do not install the instrument on an unstable place, including a slope.

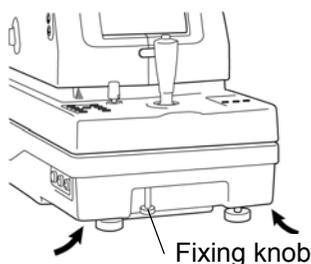
**1** Fasten the fixing knob.

**2** Firmly hold the instrument body at the specified positions, and put it on the automatic instrument table.

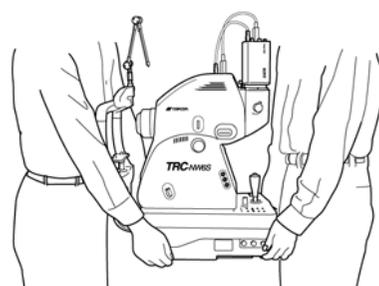
For details about the automatic instrument table, see "OPTIONAL ACCESSORIES" on page 59.



Holding positions



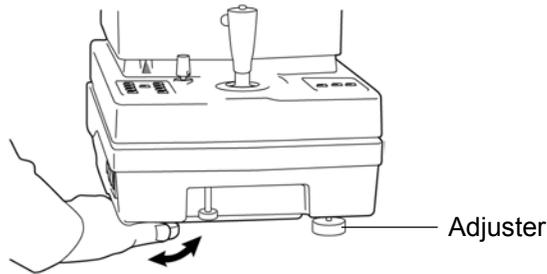
Fixing knob



Holding the instrument body

**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 1cm.



## CONNECTING THE POWER CABLE



### WARNING

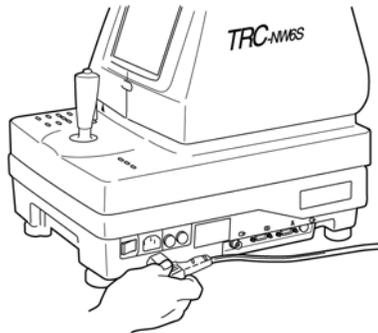
To avoid fire and electric shock in case of leakage, be sure to use a power supply equipped with a 3-plug AC receptacle for proper grounding.



### CAUTION

To avoid electric shock, do not handle plugs with wet fingers.

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



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

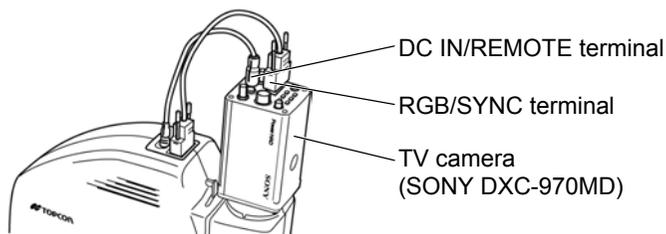
## CONNECTING THE EXTERNAL DEVICE

### Connecting the TV camera

This machine is connected and used with an optional TV camera.  
If your TV camera is SONY DXC-970MD, the attached TV camera power cable and TV camera signal cable can be connected to the instrument body.

- 1** Connect the TV camera connection terminal of the instrument body and the DC IN/REMOTE terminal of the TV camera with the TV camera power cable.

- 2 Connect the TV camera connection terminal of the instrument body and the RGB/SYNC terminal of the TV camera with the TV camera signal cable.

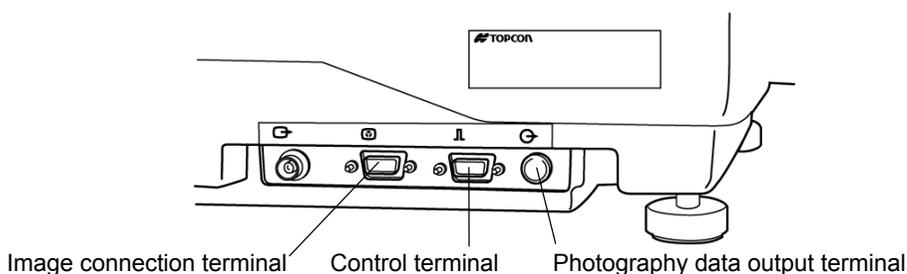


If your TV camera is not a SONY DXC-970MD, contact your dealer or TOPCON (see the back cover) for details about connection.

### Connecting the external recording device

This machine can connect an external recording device via the external connection terminal.

- 1 Connect an image cable (optional) of the external recording device to the image connection terminal of the instrument.
- 2 Connect a control cable (optional) from the external recording device to the control terminal of the instrument.
- 3 For a use with a TOPCON IMAGEnet system, connect the photography data cable (optional) to the photography data output terminal of the instrument.



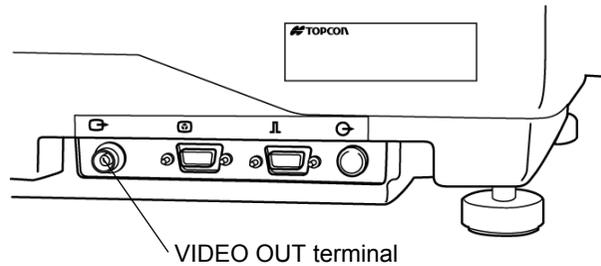
For connection with external recording devices, various types of connection cables are prepared.

For details about connecting external recording devices, contact your dealer or TOPCON (see the back cover).

## Outputting images to an external monitor

The images displayed on the color video monitor may be outputted to an external monitor via the VIDEO OUT terminal of the external connection terminal.

- 1** Connect the BNC cable (optional) to the VIDEO OUT terminal of the instrument.
- 2** Connect the other end of the BNC cable to the input terminal of the external monitor.



## VIDEO OUT terminal



For details about video output to external recording devices, contact your dealer or TOPCON (see the back cover).

## MENU SETTING

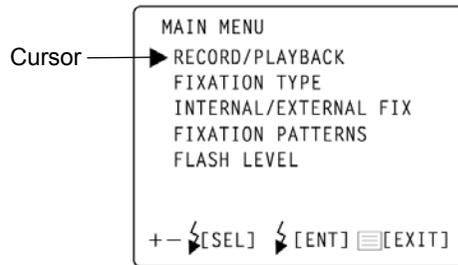
In menu setting, record/playback, fixation target on/flicker, internal/external fixation targets, fixation target patterns and flash level can be set.

### Preparation for menu setting

- 1 Check the power cable connection.  
For details about the connection, see “Connecting the power cable” on page 12.
- 2 Turn the **POWER SWITCH** ON.

### Displaying the menu screen

- 1 Check the monitor screen.
- 2 Press the **MENU SWITCH** of 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 Record/Playback mode

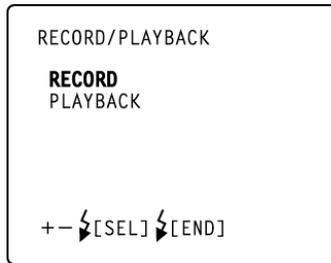
Record/Playback modes can be changed.

In the Record mode, ordinary photography is available.

The playback mode is used when displaying the recorded images of the recording device to the color video monitor.

Just after the power supply is turned on, "RECORD" (Record mode) is set.

- 1 On the "MAIN MENU" screen, make sure that the cursor is at "RECORD/PLAYBACK", and press the **FLASH LEVEL SWITCH (RESET)**. The Monitor screen changes to the "RECORD/PLAYBACK" screen.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "RECORD" (Record mode) or "PLAYBACK" (Playback mode).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MAIN MENU" screen returns.



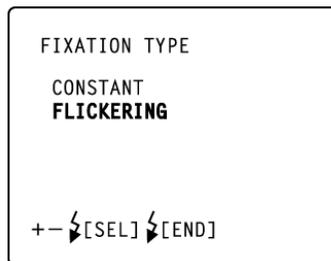
When the playback mode is on, photography is prohibited.

## Switching of fixation target on/flicker

The fixation target can be switched between on and flicker states.

When shipped, "FLICKERING" is set.

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



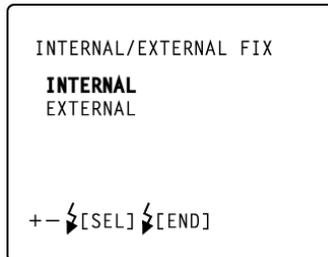
screen.

- 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 targets

Internal/external fixation targets can be switched.  
When shipped, "INTERNAL" (internal fixation) is set.

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

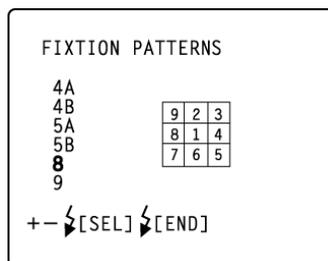


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "INTERNAL" (internal fixation) or "EXTERNAL" (external fixation).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the "MAIN MENU" screen returns.

## Fixation target pattern

You can select a fixation target pattern.  
When shipped, "8" is set.

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



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select the desired pattern from the following:
  - "4A" (vertical-horizontal 4 positions),
  - "4B" (diagonal 4 positions),
  - "5A" (vertical-horizontal 4 positions + center),
  - "5B" (diagonal 4 positions + center),
  - "8" (8 positions), or
  - "9" (8 positions + center).



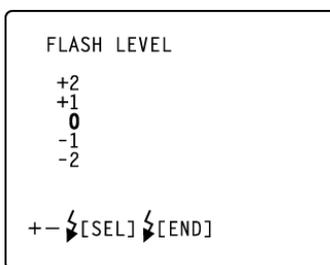
The "center" position is assigned to the optical axis center and is used for photographing around the macular segment.

- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the “MAIN MENU” screen returns.

## Flash level

You can change the reference 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 select the desired level from the following:
  - “+2” (2 steps up),
  - “+1” (1 step up),
  - “0” (no change),
  - “-1” (1 step down), or
  - “-2” (2 steps down).
- 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%.

## 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, CCD camera, illumination light source and photography light source.

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

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



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

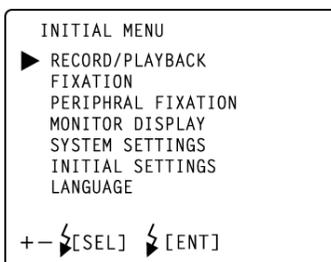
To change the set time, contact your dealer or TOPCON (see the back cover).

# INITIAL SETTING

On the "INITIAL MENU" screen, settings such as record/playback, internal/external fixation targets, peripheral photography, system setting, initial setting and language can be programmed.

## PREPARATION FOR INITIAL SETTING

- 1 Make sure that the power cable is connected.
- 2 Press the **MENU SWITCH** and **PHOTOGRAPHY SWITCH** of the control panel and turn the **POWER SWITCH** ON.  
Press the **MENU SWITCH** and **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 of the control panel; the "INITIAL MENU" screen is displayed.



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



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

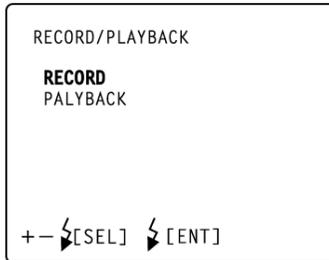
## SETTING THE RECORD/PLAYBACK MODE

The Record/Playback mode can be changed.

The playback mode is used when displaying the recorded images of the recording device to the color video monitor.

Just after turning the power supply on, "RECORD" (Record mode) is set.

- 1 Move the cursor to the "RECORD/PLAYBACK" of the "INITIAL MENU" screen, and press the **FLASH LEVEL SWITCH (RESET)** button. The Monitor screen changes to the "RECORD/PLAYBACK" screen.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select the "RECORD" or "PLAYBACK" mode.
- 3 Press the **FLASH LEVEL SWITCH (RESET)** and the "INITIAL MENU" screen is called back.



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

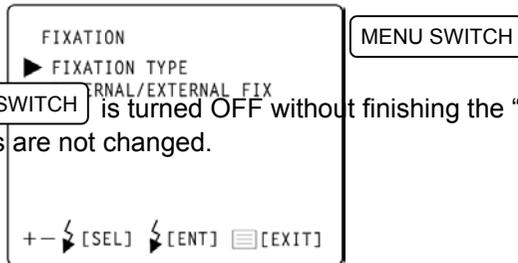
## SETTING THE FIXATION TARGET

On the “FIXATION” screen, fixation target on/flicker and internal/external fixation target switching 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.

**MEMO**

When the **POWER SWITCH** is turned OFF without finishing the “INITIAL MENU” screen, the settings are not changed.

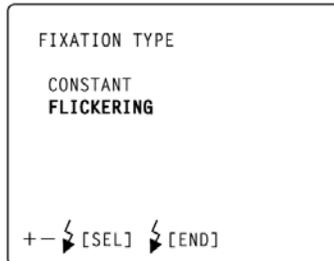


- 2 To finish the “FIXATION” screen, press the .

### Switching of fixation target on/flicker

The 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 call out the “FIXATION TYPE” screen.

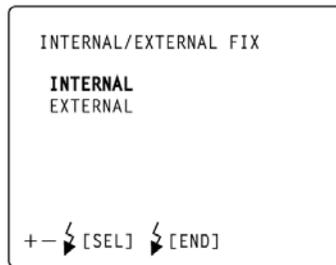


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select “CONSTANT” (on) or “FLICKERING” (flicker).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; setting is done and the “MAIN MENU” screen returns.

## Switching of internal/external fixation targets

Internal/external fixation targets can be switched. When shipped, "INTERNAL" (internal fixation) is set.

- 1 Select "INTERNAL/EXTERNAL FIX" on the "FIXATION" screen, and call out the "INTERNAL/EXTERNAL FIX" screen.



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

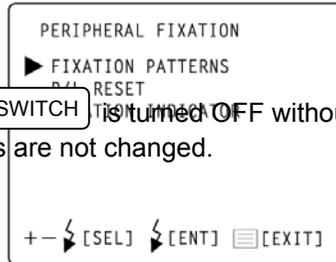
## SETTING PERIPHERAL PHOTOGRAPHY

On the “PERIPHERAL FIXATION” screen, settings such as fixation target pattern, R/L reset and display mode can be programmed.

- 1 Move the cursor to the “PERIPHERAL FIXATION” of the “INITIAL MENU” screen, and press the **FLASH LEVEL SWITCH (RESET)**. The monitor screen changes to the “PERIPHERAL FIXATION” screen.

**MEMO**

When the **POWER SWITCH** is turned OFF without finishing the “INITIAL MENU” screen, the settings are not changed.

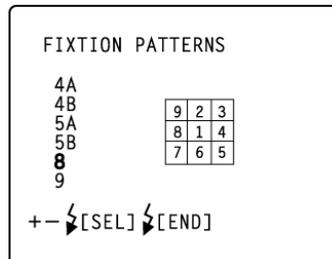


- 2 To finish the “PERIPHERAL FIXATION” screen, press the

### Fixation target pattern

You can select a fixation target pattern. When shipped, “8” is set.

- 1 Move the cursor to “FIXATION PATTERNS” on the “PERIPHERAL FIXATION” screen, and call out the “FIXATION PATTERNS” screen.



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

- “4A” (vertical-horizontal 4 positions),
- “4B” (diagonal 4 positions),
- “5A” (vertical-horizontal 4 positions + center),
- “5B” (diagonal 4 positions + center),
- “8” (8 positions), or
- “9” (8 positions + center).

- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the “PERIPHERAL FIXATION” screen returns.

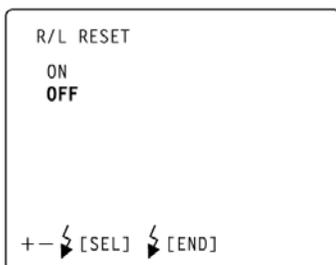
### MEMO

The “center” position is assigned to the optical axis center and is used for photographing around the macular segment.

### R/L reset

When the base is moved in the middle of a peripheral photography, right/left eye reset can be set. (When OFF is set, peripheral photography cannot be reset by right/left eye switching.) When shipped, “OFF” (no reset) is set.

- 1 Select “R/L RESET” on the “PERIPHERAL FIXATION” screen, and call out the “R/L RESET” screen.



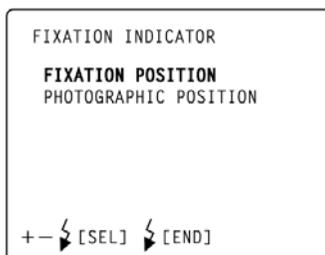
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select “ON” (reset) or “OFF” (no reset).

- 3 Press the **FLASH LEVEL SWITCH (RESET)** ; the setting is done and the “PERIPHERAL FIXATION” screen returns.

### Display mode

The display mode of peripheral fixation target can be set. When “FIXATION POSITION” (fixation position display) is set, the monitor screen display responds to the fixation target, and when “PHOTOGRAPHIC POSITION” (picture position display) is set the monitor screen display responds to the photography result. When shipped, “FIXATION POSITION” (fixation position display) is set.

- 1 Select “FIXATION INDICATOR” on the “PERIPHERAL FIXATION” screen, and call out the “FIXATION INDICATOR” screen.



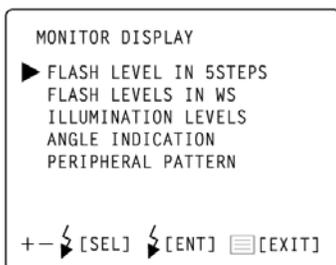
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select “FIXATION POSITION” (fixation position display) or “PHOTOGRAPHIC POSITION” (picture position display).

- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the “PERIPHERAL FIXATION” screen returns.

## SETTING THE SCREEN DISPLAY

On the “MONITOR DISPLAY” screen, display settings such as flash level compensation, flash level, illumination level, picture angle and fixation position 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 finish the “MONITOR DISPLAY” screen, press the **MENU SWITCH**.

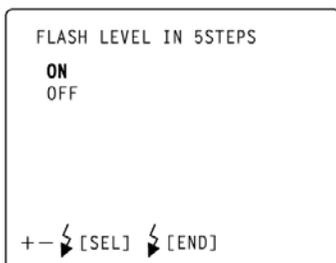


When the **POWER SWITCH** is turned OFF without finishing the “INITIAL MENU” screen, the settings are not changed.

### Flash level compensation display

The flash level compensation display can be set. When shipped, “ON” (display) is set.

- 1 Select “FLASH LEVEL IN 5STEPS” on the “MONITOR DISPLAY” screen, and call out the “FLASH LEVEL IN 5STEPS” screen.

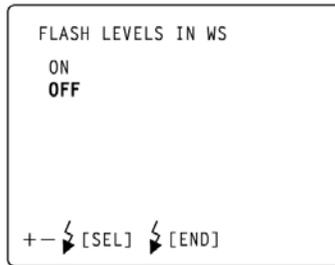


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select “ON” (display) or “OFF” (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the “MONITOR DISPLAY” screen returns.

## Flash level display

The flash level display can be set. When shipped, “OFF” (no display) is set.

- 1 Select “FLASH LEVELS IN WS” on the “MONITOR DISPLAY” screen, and call out the “FLASH LEVELS IN WS” screen.

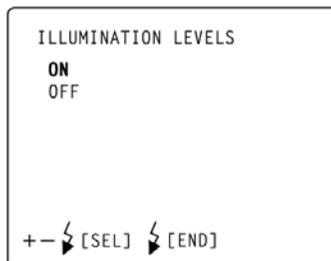


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select “ON” (display) or “OFF” (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the “MONITOR DISPLAY” screen returns.

## Illumination level display

The illumination level display can be set. When shipped, “ON” (display) is set.

- 1 Select “ILLUMINATION LEVELS” on the “MONITOR DISPLAY” screen, and call out the “ILLUMINATION LEVELS” screen.

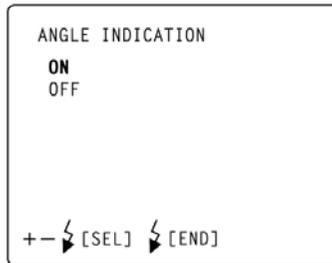


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select “ON” (display) or “OFF” (no display).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the “MONITOR DISPLAY” screen returns.

### Picture angle display

The picture angle display can be set. When shipped, "ON" (display) is set.

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



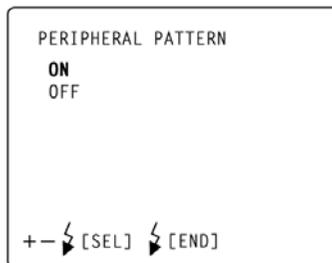
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (display) or "OFF" (no display).

- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MONITOR DISPLAY" screen returns.

### Peripheral fixation position display

The peripheral fixation position display can be set. 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).

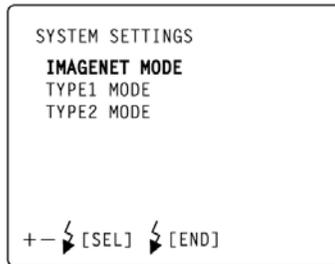
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "MONITOR DISPLAY" screen returns.

## SYSTEM SETTING

On the “SYSTEM SETTINGS” screen, settings of the connected external recording device can be programmed.

When shipped, “IMAGENET MODE” (image mode connection) 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:  
“IMAGE MODE” (IMAGEnet connection);  
“TYPE1 MODE” (single-action external device connection); or  
“TYPE2 MODE” (double-action external device connection).
- 3 Press the **FLASH LEVEL SWITCH (RESET)** and the “INITIAL MENU” screen is called back.



For details about single/double-action, refer to the instruction manual of the external recording device.

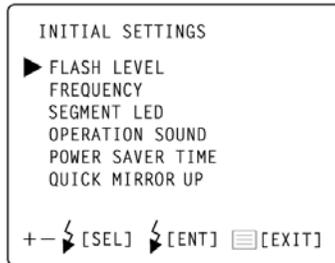


When the **POWER SWITCH** is turned OFF without finishing the “INITIAL MENU” screen, the settings are not changed.

## SETTING THE INITIAL STATE

On the “INITIAL SETTINGS” screen, settings such as flash level, commercial power supply frequency, LED display, timer sound, operation sound and quick mirror-up of power save time can be done.

- 1 Make sure that the cursor is on the “INITIAL SETTINGS” of the “INITIAL MENU” screen, and press the **FLASH LEVEL SWITCH (RESET)**.



- 2 To finish the “INITIAL SETTINGS” screen, press the **MENU SWITCH**.

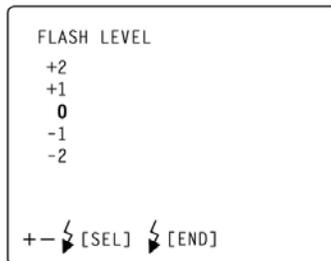
### MEMO

When the **POWER SWITCH** is turned OFF without finishing the “INITIAL MENU” screen, the settings are not changed.

### Flash level

You can change the flash level. When shipped, “0” (no change) is set.

- 1 Select “FLASH LEVEL” on the “INITIAL SETTINGS” screen, and call out the “FLASH LEVEL” screen.



- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select the desired level from the following:
  - “+2” (2 steps up),
  - “+1” (1 step up),
  - “0” (no change),
  - “-1” (1 step down), or
  - “-2” (2 steps down).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the “INITIAL SETTINGS” screen returns.

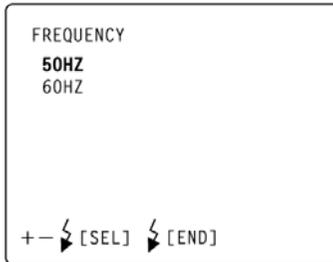


A step up/down changes the flash level reference value by about 20%.

### Commercial power supply frequency

The frequency of commercial power supply can be set. When shipped, “50HZ” (50Hz) is set.

- 1 Select “FREQUENCY” on the “INITIAL SETTINGS” screen, and call out the “FREQUENCY” screen.



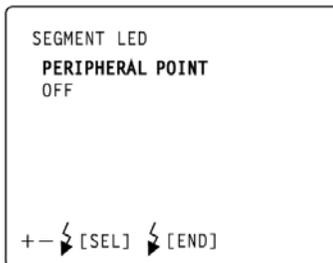
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select “50Hz” or “60Hz”.

- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the “INITIAL SETTINGS” screen returns.

### LED display

The LED display can be set. When shipped, “PERIPHERAL POINT” (fixation target position display) is set.

- 1 Select “LED DISPLAY” on the “INITIAL SETTINGS” screen, and call out the “SEGMENT LED” screen.



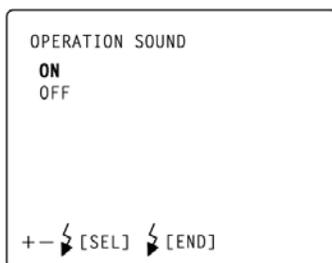
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select: “PERIPHERAL POINT” (fixation target position display); or “OFF” (no display).

- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the “INITIAL SETTINGS” screen returns.

## Operation sound

The operation sound can be set. When shipped, "ON" (operation sound) is set.

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

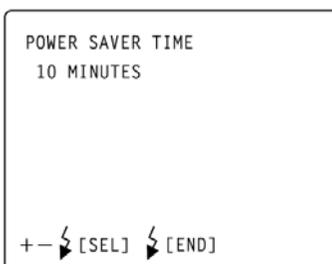


- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (operation sound) or "OFF" (no operation sound).
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "INITIAL SETTINGS" screen returns.

## Power save time

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

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



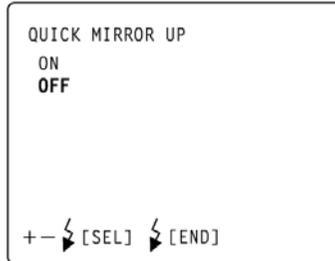
- 2 Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select between "5 MINUTES" up to "60 MINUTES" in 5 minutes steps.
- 3 Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "INITIAL SETTINGS" screen returns.

## Quick mirror up

This function is used to fix the quick mirror in the up position during assembly adjustment of the TV relay lens.

Just after the power supply is turned on, "OFF" (unfix) is set.

- 1** Select "QUICK MIRROR " on the "INITIAL SETTINGS" screen, and call out the "QUICK MIRROR UP" screen.



- 2** Press the **FLASH LEVEL SWITCH (+)** or **FLASH LEVEL SWITCH (-)** and select "ON" (fix) or "OFF" (unfix).
- 3** Press the **FLASH LEVEL SWITCH (RESET)**; the setting is done and the "INITIAL SETTINGS" screen returns.

## 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:  
"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 finishing the "INITIAL MENU" screen, the settings are not changed.

# BASIC OPERATIONS

## PREPARATION FOR PHOTOGRAPHY

### Applying the power supply

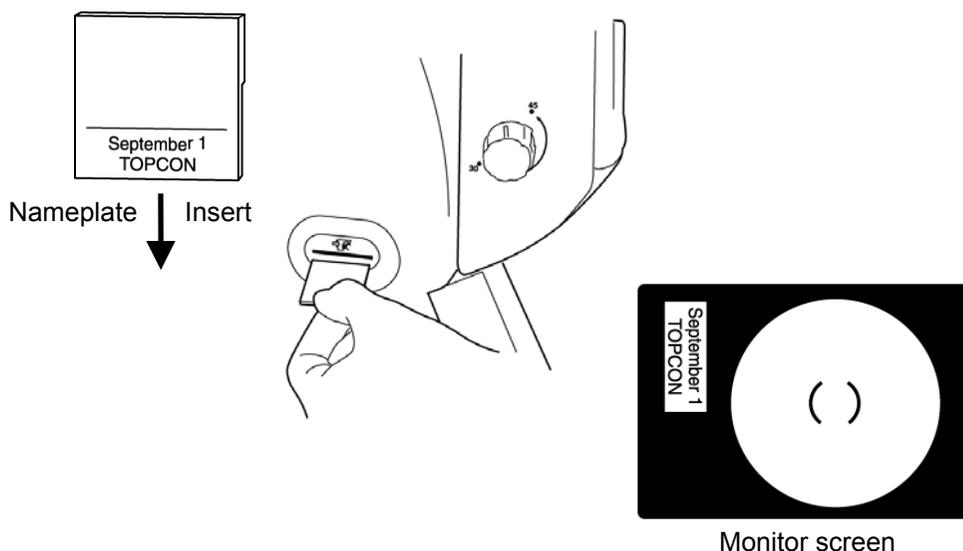
- 1** Carefully check the power cable connection.  
For details about connection, see “CONNECTING THE POWER CABLE” on page 19.
- 2** Turn ON the POWER SWITCH of the instrument and the external recording device .
- 3** Confirm that the Title screen is displayed and then in a few seconds the Monitor screen is displayed.

### Setting of the patient

 <b>CAUTION</b>	To avoid injury to the patient's face and hands, be sure to operate the chinrest for height adjustment while directly watching the patient.
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<b>NOTE</b>	If the patient wears glasses or contact lens, remove them first.
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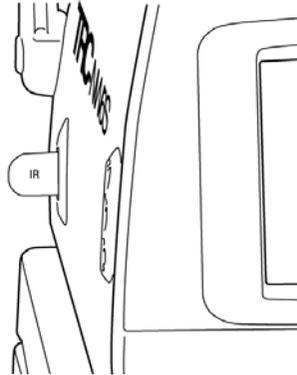
- 1** Make sure the main Monitor screen is on.
- 2** When imaging the patient's data, write the date on the nameplate and insert it into the nameplate slot.



Use a felt-tip marker to write the patient's name on the nameplate. Writings with oil felt-tips often make the nameplate unclear on the Monitor screen.

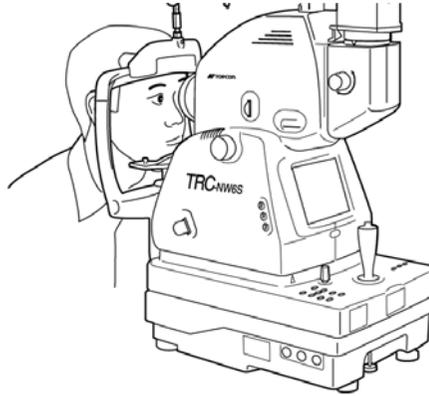
- 3** Make sure that the IR filter selector is pushed in.

IR filter selector being pushed in

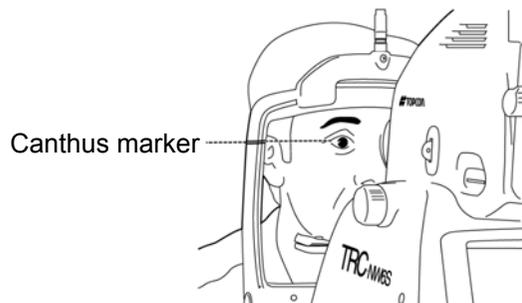


If the IR filter selector is pulled out, the IR warning display (IR) flickers on the color video monitor, informing that the visible light is on.

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



- 7** Adjust the chinrest height by the **CHINREST SWITCH** so the tail of the eye comes level with the Canthus marker of the chinrest post.



#### MEMO

The chinrest moves up/down while the **CHINREST SWITCH** is pressed. If the chinrest does not move even when the **CHINREST SWITCH** is pressed, it has failed. Turn the **POWER SWITCH** OFF and remove the power cable, and contact your dealer or TOPCON (see the back cover). In an emergency, you can manually operate the chinrest. For details about the manual operation, see "EMERGENCY CHINREST OPERATION" on page 58.

## COLOR PHOTOGRAPHY (CENTER)

### NOTE

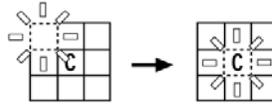
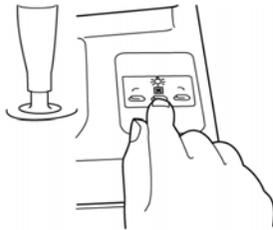
To ensure correct imaging, adjust the table height so the patient can relax with his/her chin put on the chinrest.

### Setting the picture position

Set the picture position using the **PERIPHERY FIXATION SWITCH** .

By pressing the **PERIPHERY FIXATION SWITCH (RESET)** , the fixation target is set in the center part.

The center part of the fixation position display flickers on the color video monitor, telling the operator that the fixation target is set in the center.



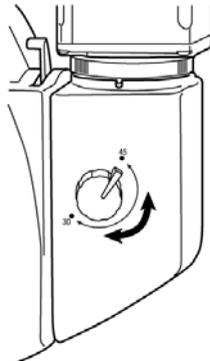
Fixation position display  
(with fixation target pattern "8")

### MEMO

When the unit is first turn on, the picture position is set in the center.

### Setting the picture angle

Set the picture angle to 45° or 30° by operating the angle selector.



### MEMO

Even when the picture angle is changed, the picture angle of the image on the color video monitor does not change.

To confirm the current picture angle, check the picture angle display on the color video monitor (displayed only when 30° is set).

## Setting illumination level

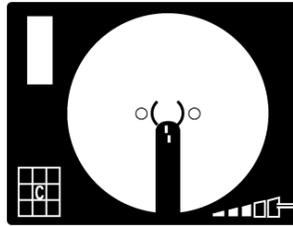


### CAUTION

To avoid pain to the patient and 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.



Illumination level

### MEMO

Normally the illumination level has five levels - during a visible fluoro-observation it has seven illumination levels to choose from.

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

## Setting the flash level

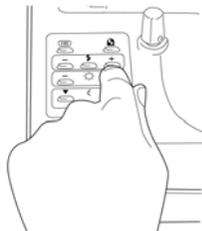


### CAUTION

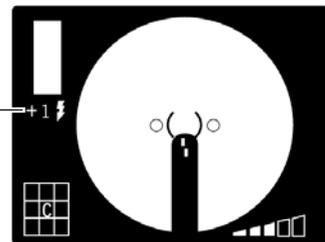
To avoid pain to the patient and damage to the patient's eye, do not brighten the photography light more than necessary.

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



### MEMO

The flash level can be compensated in two steps in both the (+) and (-) directions from the currently set position.

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.

### MEMO

You can adjust the reference value of flash level in two steps in both (+) and (-) directions. See the "Flash level" on page 25.

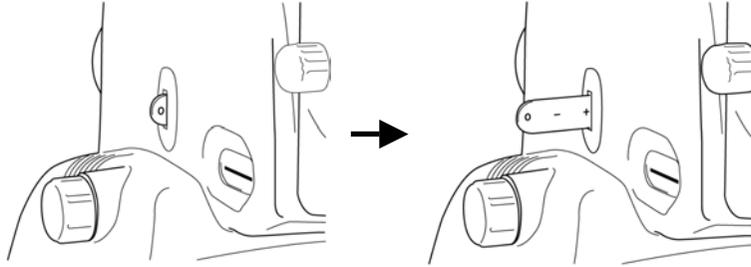
### MEMO

The flash level display can also display the light intensity level (unit: WS) besides 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.



### MEMO

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

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

Compensation range:    0    :-13~+12D  
                              -    :-12~-33D  
                              +    :+9~+40D



**CAUTION**

To avoid injury, do not put fingers into the gap between the instrument body and the power supply unit.



**CAUTION**

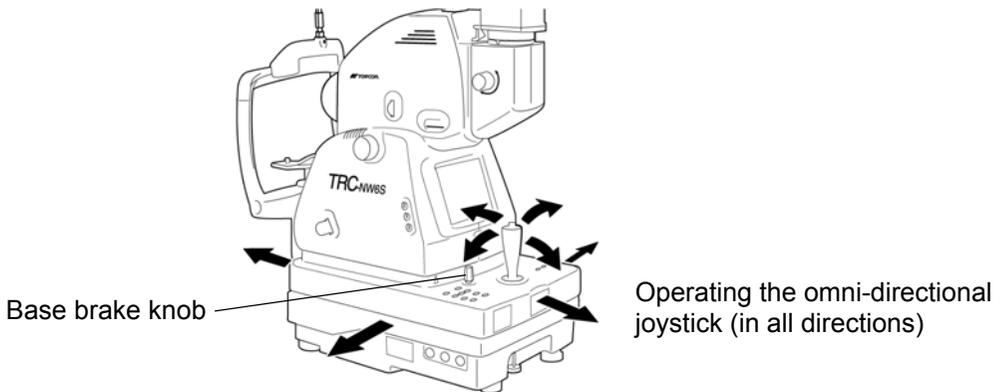
To avoid injury to the patient's eye and nose while moving the instrument body, be attentive of the distance between the patient and the objective lens.

Collimating operation is done by the omni-directional joystick.

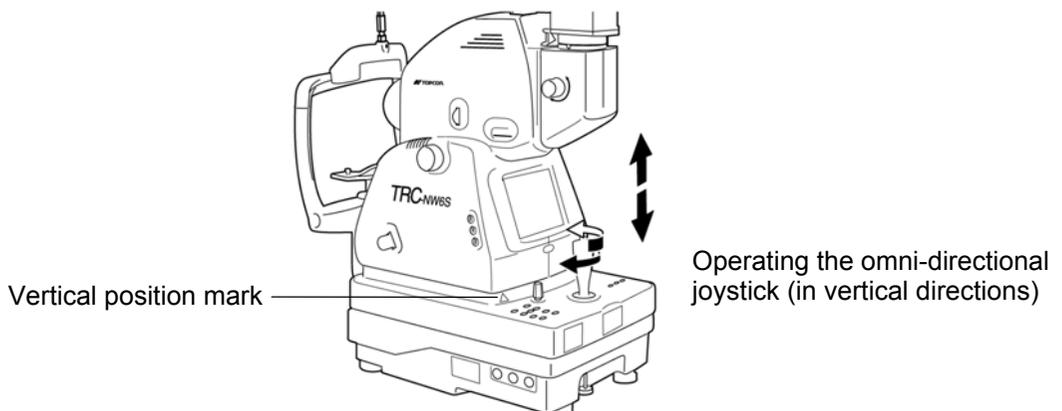
**MEMO**

Moving the instrument body by the omni-directional joystick

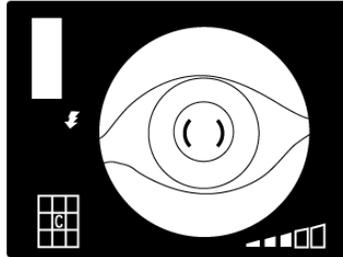
- Fine movements of the base, back and forth and right and left, are done by tilting the joystick.  
Before doing this operation, free the base by turning the base brake knob left.  
To fix the base, turn the base brake knob right.



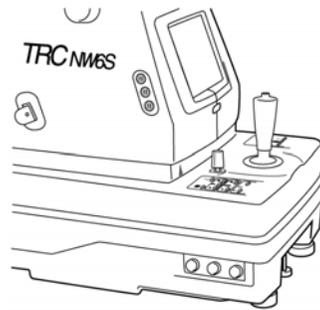
- To move the instrument body up/down, turn the omni-directional joystick right for the upward movement, and left for the downward movement.  
The vertical position of the instrument body can be checked by the vertical position mark.



- 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 all directions to get the patient's eye in the center of the color video monitor.

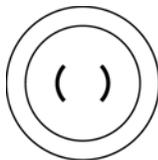


**MEMO** Now hold the joystick upright, which facilitates the eyeground collimation.

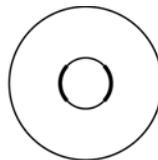


- 3** On the color video monitor, bring the ( ) scale to the patient's pupil, and make sure that the eye is larger than the ( ) scale.

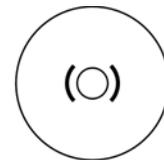
**MEMO** Comparison of the ( ) scale and the eye tells you whether the pupil is large enough for retinal photography.



Well dilated.

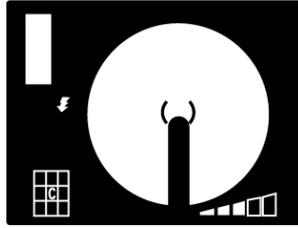


Narrowly dilated for photography.



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

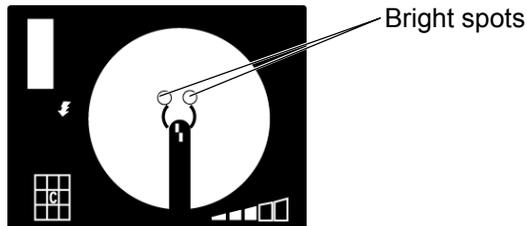
- 4** Slowly bring the instrument closer to the patient; the retina image appears on the video monitor.



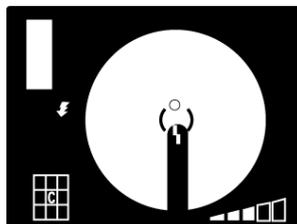
- 5** Instruct the patient to look at the green light (internal fixation target).
- 6** While watching the image on the video monitor, adjust the brightness of the image using the **ILLUMINATION LEVEL SWITCH**.

**MEMO**

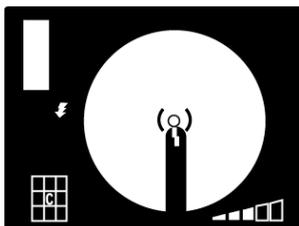
For details about illumination level setting, see page 45.  
Too bright an illumination level will make the split lines hard to see.



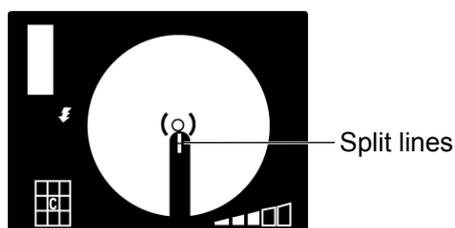
- 7** Bring the instrument still closer to the patient; and two bright spots for the working distance alignment become visible.
- 8** Operating the joystick, bring the two bright spots together on the video monitor.



- 9** Operating the joystick, move the instrument body and bring the bright spot of the video monitor into the ( ) scale.



- 10** Operating the focusing knob, align the focusing split lines into one line on the video monitor.



**MEMO**

If split lines are not aligned together by operating the focusing knob, change the diopter compensation lens.

For details, see “Changing the diopter compensation lens” on page 46.

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

**MEMO**

If 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 video monitor, see “Adjusting the color video monitor” on page 65.

If one of the split lines cannot be seen, check if dilation is insufficient or if the eye is covered with eyelashes or the eyelid, interrupting the light.

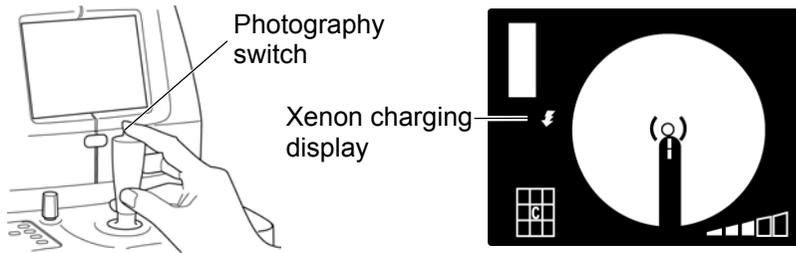
**MEMO**

You can remove split lines from the Monitor screen.

Pressing the **SPLIT SWITCH** removes the split lines from the Monitor screen.

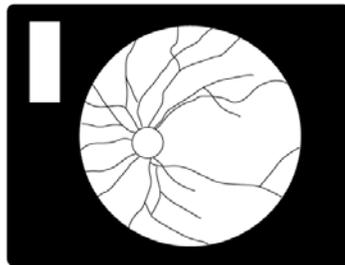
Pressing again the **SPLIT SWITCH** display the split lines on the Monitor screen.

- 11** Make sure that the split line is aligned with the bright spot on the color video monitor. Press the Photography switch.



**MEMO** When the xenon charging display flickers on the color video monitor, image capture is not possible even by pressing **PHOTOGRAPHY SWITCH**. Charging takes about 2 seconds. Wait for the next image until the xenon charging lamp turns on.

- 12** The captured image is sent to the external recording device and displayed on the color video monitor.



**MEMO** If the light intensity of image is insufficient, compensate it by pressing the **FLASH LEVEL SWITCH**, and repeating the collimation and photography procedure.

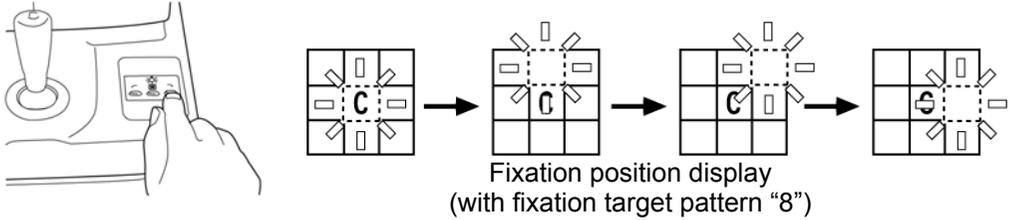
**MEMO** Depending on settings of the external recording device as well as the instrument, the captured images may not be displayed on the color video monitor.

- 13** To return to the capture screen on the color video monitor, press the **PHOTOGRAPHY SWITCH**.

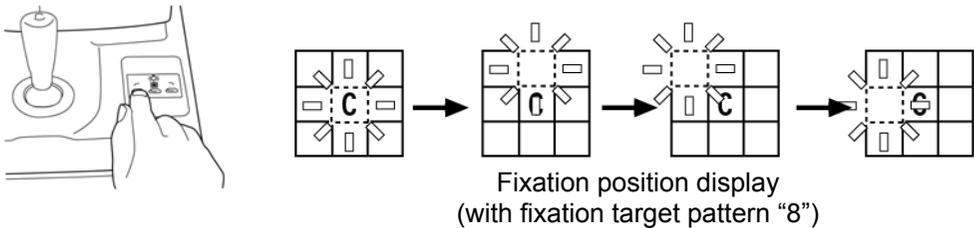
## PERIPHERAL PHOTOGRAPHY

### Setting the picture position

Each time that the **PERIPHERY FIXATION SWITCH (RIGHT)** is pressed the fixation target moves clockwise, viewed from the patient side, and the display of the set point flickers on the color video monitor.



Each time the **PERIPHERY FIXATION SWITCH (LEFT)** is pressed the fixation target moves counterclockwise, viewed from the patient side, and the display of the set point flickers on the color video monitor.



### Other settings

For other settings, see the settings of "COLOR PHOTOGRAPHY" on page 44.

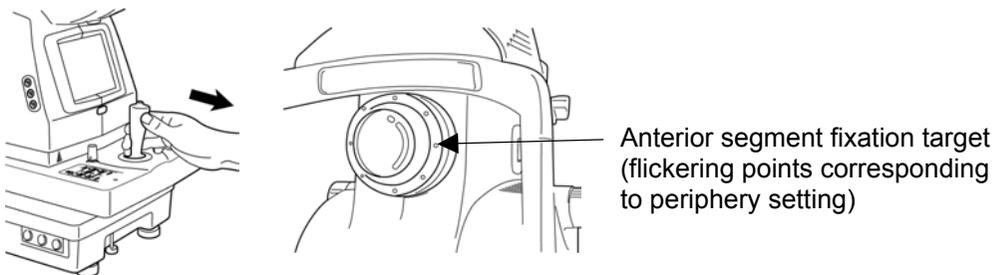
### Collimation and photography

Collimating operation is done by the omni-directional joystick.

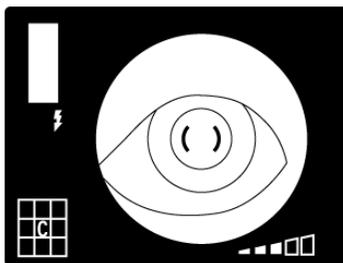
For details about movement/adjustment of the instrument body by the omni-directional joystick, see the "MEMO" on page 47.

- 1 Hold the omni-directional joystick and pull the instrument backward towards the operator. As the anterior segment fixation target turns on, instruct the patient to look at the fixation target.

Monitor the anterior segment image on the color video monitor.



- Using the omni-directional joystick, move the instrument body in all directions to get the patient's eye in the center of the color video monitor.

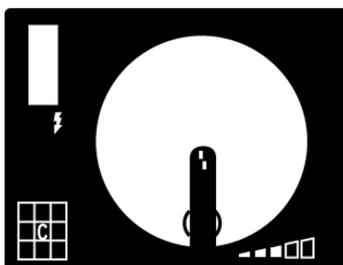


- On the color video monitor, bring the ( ) scale to the patient's pupil, and make sure that the eye is larger than the ( ) scale.



For details about dilation, see the "MEMO" on page 48.

- Slowly bring the instrument closer to the patient; the eyeground image appears on the color video monitor.
- In this instance, the ( ) scale on the color video monitor moves to an alignment position matching the picture position. At the same time the anterior segment fixation targets is changed to the internal fixation target.



- By operating the Illumination Level switch, adjust the brightness of the image while watching it on the color video monitor.



For details about illumination level setting, see the "MEMO" on page 45.

- For the steps to follow, see "Collimation and photography" on page 47 for color photography.

## ANTERIOR SEGMENT PHOTOGRAPHY

### Setting the picture position

Set the fixation target in the center by the **PERIPHERY FIXATION SWITCH**.  
See “Setting the picture position” on page 44.

### Setting the picture angle

Set the picture angle by operating the angle selector.  
See “Setting the picture angle” on page 44.

### Setting the illumination level

Set the flash level by the **ILLUMINATION LEVEL SWITCH**.  
See “Setting the illumination level” on page 45.

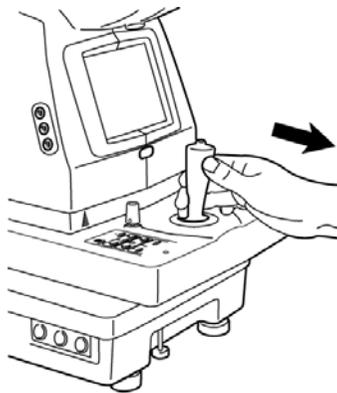
### Changing the diopter compensation lens

Push in the diopter compensation lens selector and change the diopter compensation lens (0).  
See “Changing the diopter compensation lens” on page 46.

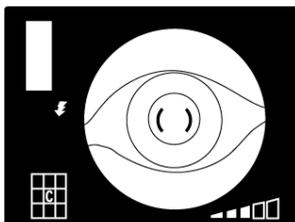
### Collimation and photography

Collimating operation is done by the omni-directional joystick.  
For details about movement/adjustment of the instrument body by the omni-directional joystick, see the “MEMO” on page 47.

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



- 2 Move the instrument body in all directions to get the patient's eye 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**.

**MEMO** In the anterior segment photography, the flash level is changed automatically to an optimal set value.

## FINISHING

---

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

**MEMO** 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 seen by the vertical position mark.

**MEMO** When not using the instrument for a long period, 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.

# BEFORE REQUESTING SERVICE

## TROUBLESHOOTING

### Messages displayed during operation

"ERR1"	Lamp cover is off.
"ERR3"	Overcharge, undercharge; or Fuse (F4) is burnt.
"ERR4"	Quick mirror mechanism malfunctions.
"ERR5"	Alignment mechanism malfunctions.
"ERR6"	Diaphragm selector position is halfway.
"ERR8"	TV relay lens is off.

### Troubleshooting

 <b>WARNING</b>	To avoid electric shock, do not attempt disassembling, re-building and/or repairs. Ask your dealer for repairs.
 <b>WARNING</b>	To avoid electric shock do not remove body components, covers of the TV relay lens, chinrest and power supply. – other than the lamp house cover.

When an error is encountered, review the following Check List below. If remedies following the instructions cannot restore the instrument to a normal condition or if the problem does not fall into any of the categories in this Check List, 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.	19
	• Fuse is burned.	Change fuse.	64
	• Power save function is on (flickering power lamp).	Cancel power save function (Photography switch).	25
Color video monitor does not show clearly.	• Image contrast is not good.	Adjust contrast (contrast control).	65
	• Image is dark.	Adjust brightness (brightness control).	65
		Adjust light intensity (Illumination Level switch).	45
		Darken room and thoroughly dilate patient's pupil.	48
Periphery of photography image is dark.	• Image color is abnormal.	Adjust hue (hue control).	65
	• Collimation is incorrect.	Adjust collimation.	49
	• Focusing is incorrect.	Adjust focus.	50
	• Patient's pupil is not large enough.	Darken room and thoroughly dilate patient's pupil.	48

Trouble	Condition	Check	Page
Photography image is flared all over.	• Collimation is incorrect.	Adjust collimation	49
	• Focusing is incorrect.	Adjust focus.	50
	• Opacity in patient's eye.	Flare cannot be removed.	—
Photography image is whitened.	• Patient winked the moment photographed.	Take another picture.	—
Photography image has dim white spot.	• Objective lens is stained.	Clean lens.	66
	• Eyelashes were in patient's eye the moment photographed. (Dim light were seen at screen bottom the moment aligned.)	Let patient open eye wider and take picture again. If wide enough, open eyelid (i.e., Take picture holding eyelid open).	48
Photography image is dark all over.	• Flash level is insufficient.	Adjust flash level (Flash level switch).	45
	• Xenon set screws are loose.	Refasten screws to terminal.	62
	• Xenon lamp has served its life.	Change xenon lamp.	62
Illumination lamp does not turn on.	• Power save function is on (flickering power lamp).	Press Photography switch and cancel power save function.	25
	• Lamp terminal is loose.	Refasten lamp terminal.	61
	• Fuse is burnt.	Change fuse.	64
	• The lamp is burnt.	Change lamp.	61
Internal fixation target cannot be seen.	• Collimation is incorrect.	Adjust collimation.	49
	• Setting is to external fixation target.	Reset to internal fixation target.	24
	• Fuse is burnt.	Change fuse.	64
( ) scale is off monitor center.	• Internal fixation target is set to periphery.	Change fixation position to center (Periphery fixation switch (Reset)).	44
Split lines cannot be seen.	• Split line is set to OFF.	Turn split line ON (Split switch).	50
	• Diopter compensation lens selector is other than (0).	Return diopter compensation lens selector to (0).	46
	• Patient's pupil is not large enough.	Darken room and thoroughly dilate patient's eye.	48
Xenon lamp does not turn on.	• Power save function is on (flickering power lamp).	Cancel power save function (Photography switch).	25
	• Xenon lamp has served its life.	Change xenon lamp.	62
	• Anomaly in external recording device.	Check power supply, settings, ink ribbon, paper, etc.	—
	• Cables connection is incorrect.	Check and correct cable connections.	19
Cannot get patient's pupil center.	• Patient's face position (incl. chin, forehead) is incorrect.	Let patient correct face position.	43
	• Patient's face height is incorrect.	Adjust face height (Chinrest switch).	43
Nothing is recorded in external recording device.	• Anomaly in external recording device.	Check power supply, settings, ink ribbon, paper, etc.	—
	• Cables connection is incorrect.	Check and correct cable connections.	20

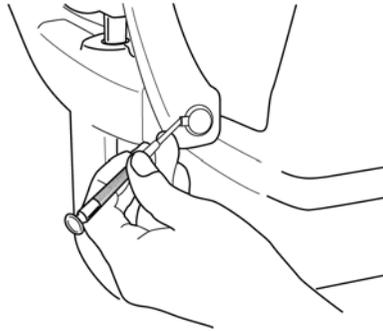
## EMERGENCY CHINREST OPERATION

If the chinrest will not move with the elevation switch, you can operate it manually using the attached emergency chinrest knob.

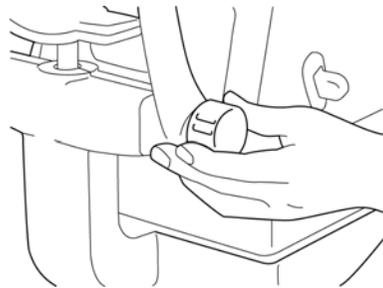
Note that the manual chinrest operation should be used only temporarily in an emergency situation.

Also, immediately contact your dealer or TOPCON (see the back cover).

- 1** Turn the **POWER SWITCH** OFF and unplug the power cable.
- 2** Using a screwdriver, remove the cover, the one on the left viewed from the operator side.



- 3** By turning the emergency chinrest knob, insert it into the hole. Make sure of the emergency chinrest knob drops securely into the hole.



- 4** Turn the emergency chinrest knob to move the chinrest up/down.

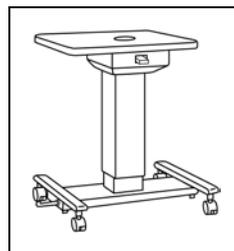
# REFERENCES

## OPTIONAL ACCESSORIES

- Automatic instrument table AIT-11  
As the instrument height can be changed as desired, measurements are easier and with more patient comfort.

### Specification

- Dimensions 554(W)×428(D)×566(H)mm
- Table height 566~766mm
- Table size 450×500mm
- Weight 21kg
- Power consumption 270VA (100V)



- Automatic instrument table AIT-20

## SPECIFICATIONS

Picture angle	45°/ (standard) / 30°/ (magnification: 1.8)
Working range	40.7mm
Minimum pupil diameter	φ4.0mm
Diopter compensation range	No compensation lens *1) -13D~+12D Using (-) compensation lens -12D~-33D Using (+) compensation lens +9D~+40D
Fixation target	Select internal or external fixation target: <ul style="list-style-type: none"> <li>• Internal fixation target Center: 4 fixed points (right-left &amp; picture angle switching, auto detection) Periphery: 8 fixed points</li> <li>• External fixation target Two joint type</li> </ul>
Data picturing	Nameplate or Fixation target position data
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 100VA(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	25.5kg (instrument body)

1) Split line working range

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

# MAINTENANCE

 <b>CAUTION</b>	To prevent the instrument from falling and to avoid injury, do not install the instrument on an unstable place, including a slope.
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## DAILY CHECKUPS

 <b>CAUTION</b>	To prevent the TV camera from falling and to avoid injury, make sure that the camera mount lever is firmly tightened.
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 <b>CAUTION</b>	To prevent the TV relay lens from falling and to avoid injury, make sure that the lens mount lever is firmly tightened.
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### Daily care

- Dust is a formidable foe to the instrument.  
To ensure 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.  
If the objective lens is stained, clean it following the instructions of "Cleaning the objective lens" on page 66.
- 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 the article name, article code and quantity.

Article name	Article code
Illumination lamp	40531 1880
Xenon lamp	40531 1810
Nameplate	40547 1132
Chinrest tissue	40310 4082
Dust cover	40488 1007

Article name	Article code
Fuse 5A/125V (F1)	44691 5006
Fuse 5A/125V (F2)	44691 5006
Fuse 6A/125V (F3)	T2400 0001A
Fuse 0.5A/250V (F4)	40547 5302
Fuse 5A/125V (F5)	44691 5006

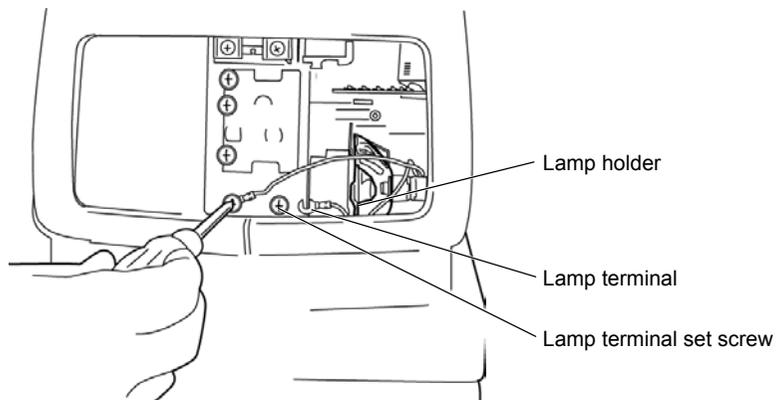


## Replacing the illumination lamp

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

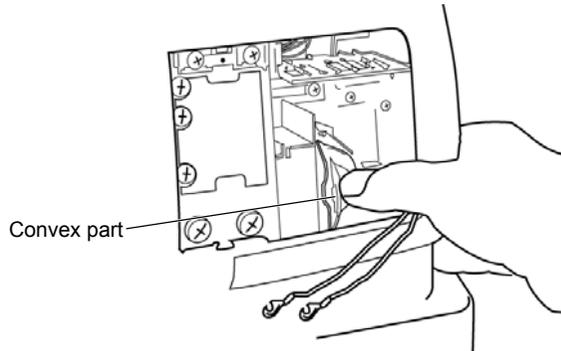
- The service life of illumination lamp is approx. 2,000 hours.  
Replacing the illumination lamp if it is burned or becomes whitened.

- 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** Unscrew the lamp house cover.
- 4** Loosen two set screws and remove the lamp terminal.



- 5** Hold the lamp at the root, and straightly pull it off the lamp holder.

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



- 7 Surely fasten the lamp terminal with two set screws.
- 8 Set the lamp house cover by matching the projection at the bottom part of the lamp house cover with the groove of the body cover. Screw and surely fix the lamp house cover.

**MEMO**

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

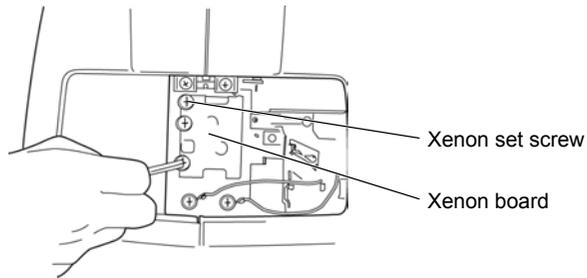
Replacing the xenon lamp

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

- The service life of xenon lamp is approx. 10,000 cycles.  
Replacing 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 natural electrical discharge.
- 2 Unscrew the lamp house cover.

- 3** Loosen three xenon set screws.



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

**MEMO**

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

## Changing the fuse



### WARNING

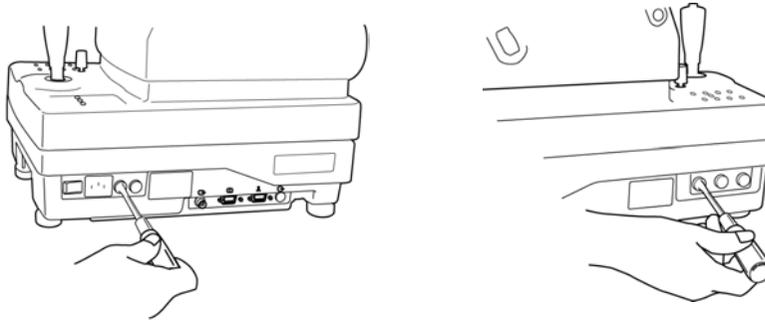
To avoid electric shock, be sure to remove the power cable from the instrument body before removing the fuse cover. Also, do not connect the power cable to the instrument body with the fuse cover left unfixed.



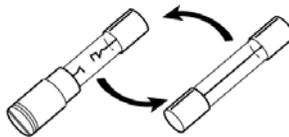
### WARNING

To avoid fire, use a properly rated fuse which matches the display provided on the fuse holder.

- 1** Turn the POWER SWITCH OFF and unplug the power cable.
- 2** With a screwdriver, press and turn the fuse holder counterclockwise and remove.



- 3** Change the fuse with the new fuse having the same capacity.



Changing the fuse

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

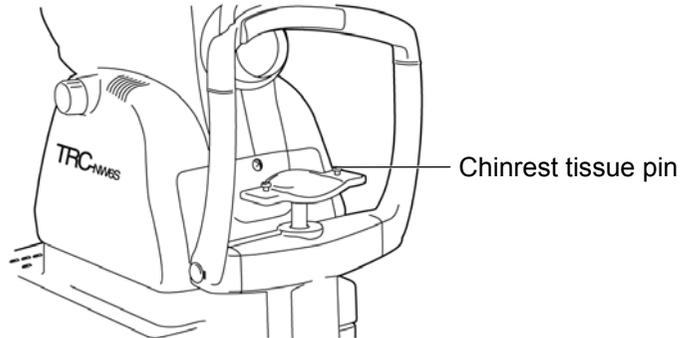


The usage of each fuse and the state after it is burned are shown below:

Fuse No.	Usage	State after fuse burn
F1, F2 (5A)	Input power supply	Entire system is off.
F3 (6A)	Illumination light	Illumination lamp is off.
F4 (0.5A)	Xenon lamp	ERR3: Xenon lamp charging is not done.
F5 (5A)	Control circuit	Entire system is off.

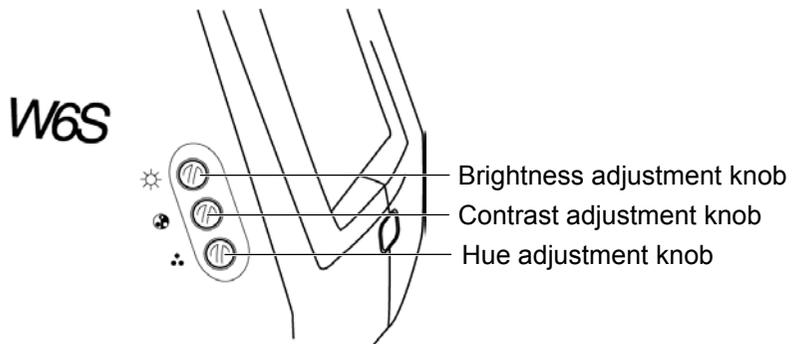
### Supplying the chinrest tissue

- When the chinrest tissue is used up, pull off the chinrest tissue pin and supply the tissue.



### 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.
- Please note that the ideal monitor settings for fundus viewing may be different than those for anterior segment viewing.
- 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 instrument body from discoloring and deterioration, do not use volatile solvents for cleaning, including benzine, thinner, ether, gasoline, etc.

- 1** When the dust cover, control panel and Monitor screen become stained, clean them with dry cloth.
- 2** If the dust cover is badly stained, prepare a tepid solution of neutral detergent for kitchenware. Moisten the cloth with the solution and rinse it thoroughly.

### Cleaning the objective lens

- To check the objective lens, 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 (+)** four times and make the light intensity maximum.

Examine the objective lens diagonally from the forward. The lens condition can be seen clearly.

- Dust and dirt adhered to the surface  
Blow them off using a blower.
- Fingerprints and oil spots on the surface

- 1** Blow large particles off.
- 2** Prepare a mix of ethanol (2) and ether (8).
- 3** Moisten a clean, dried gauze with the mix, and lightly wipe the lens spirally from the center outward. Do this till stains are completely removed. To prevent the objective lens from being scratched, be sure to always use a clean gauze face and not to wipe the lens surface hard.

#### MEMO

If stains are persistent and can not easily be removed, contact your dealer or TOPCON (see the back cover).  
Use the ethanol-ether mix at temperatures (10~40°C) and moisture (30~85%) under normal living environment.

## NON-MYDRIATIC RETINAL CAMERA

# TRC-NW6S

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