

USER MANUAL
NON-MYDRIATIC RETINAL CAMERA

TRC-NW300

INTRODUCTION

Thank you for purchasing the TOPCON TRC-NW300 NON-MYDRIATIC RETINAL CAMERA.

INTENDED USE / INDICATIONS FOR USE

The Topcon Model TRC-NW300 Non-Mydriatic Camera is intended for use in capturing images of the retina and the anterior segment of the eye and presenting the data to the eyecare professional, without the use of a mydriatic.

FEATURES

This instrument has the following features:

- Photographs can be taken through pupils $\phi 4.0\text{mm}$ or larger. ($\phi 3.3\text{mm}$ or larger if small pupil diaphragm is on)
- Auto focus function

PURPOSE OF THIS MANUAL

Before using the instrument, carefully read the "DISPLAY FOR SAFE USE" and the "SAFETY CAUTIONS" to familiarize yourself with the features of the TRC-NW300 NON-MYDRIATIC RETINAL CAMERA and use it efficiently and safely.

Always keep this User Manual at hand.

INTENDED PATIENT POPULATION

Patients undergoing examination with this instrument must be able to follow instructions including:

- Being able to position their face appropriately in the chinrest and forehead rest.
- Keep the eye open as instructed by the examiner.

CAUTION : Federal laws restricts this device to the sale by or on the order of a physician.
--



DISPOSAL

When disposing of TRC-NW300 parts, follow the local regulations for disposal and recycling.



This symbol is applicable for EU member countries only.
To avoid potential damage to the environment and possibly human health, this instrument should be disposed of (i) for EU member countries - in accordance with WEEE (Directive on Waste Electrical and Electronic Equipment), or (ii) for all other countries, in accordance with local disposal and recycling laws.

This Product Contains Mercury in the backlighting of the LCD display. Prior to disposal remove or otherwise ensure that this is disposed of in accordance with Local, State and Federal Laws. This information is applicable in U.S.A only.

This product contains a CRL Lithium Battery which contains Perchlorate Material-special handling may apply.

See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate/>

Note; This is applicable to California, U.S.A. only

ENVIRONMENTAL CONDITIONS FOR USE

Temperature : 10°C - 40°C

Humidity : 30% - 90% (without dew condensation)

Air pressure : 700hPa - 1060hPa

STORAGE, USAGE PERIOD

1. Environmental conditions (without package)

*Temperature : 10°C - 40°C

Humidity : 10% - 95% (without dew condensation)

Air pressure : 700hPa - 1060hPa

* THIS INSTRUMENT DOES NOT MEET THE TEMPERATURE REQUIREMENTS OF ISO 15004-1 FOR STORAGE. DO NOT STORE THIS INSTRUMENT IN CONDITIONS WHERE THE TEMPERATURE MAY RISE ABOVE 40°C OR FALL BELOW 10°C.

2. When storing the instrument, ensure that the following conditions are met:

(1) The instrument must not be splashed with water.

(2) Store the instrument away from environments where air pressure, temperature, humidity, ventilation, sunlight, dust, salty/sulfurous air, etc. could cause damage.

(3) Do not store or transport the instrument on a slanted or uneven surface or in an area where it is subject to vibrations or instability.

(4) Do not store the instrument where chemicals are stored or gas is generated.

3. Normal life span of the instrument:

8 years from delivery providing regular maintenance is performed [TOPCON data]

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN STORAGE

Temperature : -20°C - 50°C

Humidity : 10% - 95%

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTATION

Temperature : -40°C - 70°C

Humidity : 10% - 95%

CHECKPOINTS FOR MAINTENANCE




1. Periodically inspect the instrument and its parts.
2. Before using the instrument after a long period of inactivity, make sure that it operates safely and normally.
3. Be careful not to stain the objective lens with fingerprints, dirt, etc., as this will affect picture quality.
4. When the instrument is not in use, cap the objective lens and cover the instrument with the dust cover.
5. If the objective lens is soiled, clean it according to "Cleaning the objective lens" on page 78 of this manual.

DISPLAY FOR SAFE USE

To encourage safe and proper use and to prevent danger to the operator and others or potential damage to properties, warnings and cautions are placed on the instrument body and inserted in the user manual.

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

DISPLAYS

Display	Meaning
 CONTRAINDICATIONS	Situations in which the device should not be used because the risk of use clearly outweighs any possible benefit.
 WARNING	Incorrect handling by ignoring this display may lead to an impending danger of death or serious injury.
 CAUTION	Incorrect handling by ignoring this display may lead to personal injury or physical damage.
<ul style="list-style-type: none">• Injury refers to hurt, cuts, bruises, electric shock, etc. which do not require hospitalization or extended medical treatment.• Physical damage refers to extensive damage to the building, nearby equipment and/or surrounding furniture.	

GENERAL SAFETY INFORMATION



CONTRAINDICATIONS

This instrument must not be used for the following patients.

- Patients who are hypersensitive to light
- Patients who recently underwent photodynamic therapy (PDT)
- Patients taking medication that causes photosensitivity.



WARNINGS

Ensuring the Safety of Patients and Operators

Use this instrument carefully on the following patients.

- Patients who have epidemic keratitis, conjunctivitis or any other infectious disease
- Patients who are taking medications that cause light hypersensitivity.

Be careful not to hit the patient's eyes or nose with the instrument during operation.
[The patient may be injured.]

Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause birth defects or other reproductive harm. Wash hands after handling.

Preventing Electric Shocks and Fires.

To avoid fire and electric shock, install the instrument in a dry place free of water and other liquids.

To avoid fire and electric shock, do not put cups or other containers with liquids near the instrument.

To avoid electric shock, do not insert metal objects into any vents and/or slots.

To avoid fire in the event of an instrument malfunction, immediately turn OFF the power switch "○" and disconnect the power cord from the instrument if you see smoke coming from the instrument, etc.

Don't install the instrument where it is difficult to disconnect the power cord from the instrument. Ask your dealer for service.



CAUTIONS

Ensuring the Safety of Patients and Operators

Be careful not to let the patient touch this instrument. The patient's hand may be pinched by the movable part.

Do not touch the focusing knob while in auto focus mode. You may be injured.

When operating the chinrest switch, be careful not to pinch the patient's hand. The patient may be injured.

Always place and transport the instrument on a suitable instrument table.

Preventing Electric Shocks and burn.

Electric shock may cause burns or a possible fire. Turn the power switch OFF and unplug the power cord before replacing the fuses.
Replace only with fuses of the correct rating.

To avoid burns, allow lamp to cool before replacing.

To avoid injury caused by electric shock, do not open the cover. Ask your dealer for service.

To avoid electric shock, turn off the power switch and unplug the power cord and then replace the lamp with a rated one.

Electromagnetic Compatibility (EMC)

This instrument has been tested (with 100/120/230V) and found to comply with IEC60601-1-2: Ed.3.0: 2007.

This instrument radiates radio frequency energy within standard and may affect other devices in the vicinity.

If you have discovered that turning on/off the instrument affects other devices, we recommend you change its position, keep a proper distance from other devices, or plug it into a different outlet.

Please consult your authorized dealer if you have any additional questions.

USAGE AND MAINTENANCE

Usage:

- The TRC-NW300 NON-MYDRIATIC RETINAL CAMERA is an electric instrument for medical use. Use it accordingly.

USER MAINTENANCE

To ensure the safety and performance of the instrument, all maintenance work, unless specified in this manual, shall only 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 71 and "Replacing the xenon lamp" on page 72.

Replacing fuses:

Fuses of the instrument body may be replaced by the user. For details, see "Changing the fuse" on page 74.

Cleaning the objective lens:

The objective lens may be cleaned by the user. For details, see "Cleaning the objective lens" on page 78.

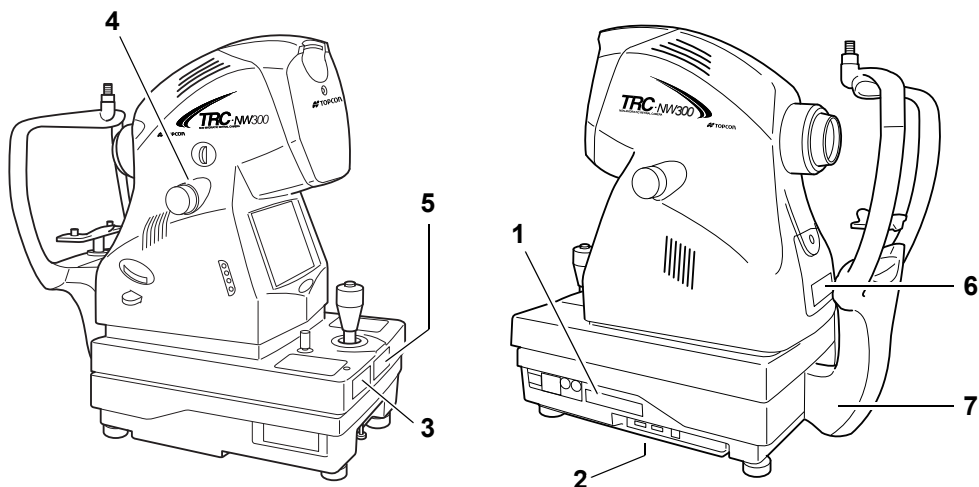
ESCAPE CLAUSES

- 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 User Manual.
- Diagnoses made shall be the responsibility of the user and TOPCON shall not take any responsibility for the results of such diagnoses.

WARNING DISPLAYS AND POSITIONS

To ensure safety, this machine provides warning displays.

Use the instrument correctly by observing the display instructions. If any of the following display labels are missing, contact your TOPCON dealer at the address listed on the back cover.



No.	Label	Meaning
1		WARNING Electric shock may cause burns or a possible fire. Turn the power switch OFF and unplug the power cord before replacing the fuses. Replace only with fuses of the correct rating.
2		WARNING To avoid injury caused by electric shock, do not open the cover. Ask your dealer for service.
3		CAUTION When operating the chinrest up/down switch, be careful not to pinch the patient's hand. The patient may be injured.
4		CAUTION Do not touch the focusing knob while in auto focus mode. You may be injured.
5		CAUTION Be careful not to hit the patient's eyes or nose with the instrument during operation.
6		CAUTION <ul style="list-style-type: none"> To avoid electric shock, turn off the power switch when replacing the lamp. To avoid burns, do not replace the lamp with a new one immediately after it goes off because it is still very hot and can cause burns.
7		Degree of protection against electric shock : TYPE B APPLIED PART

CONTENTS

INTRODUCTION	1
DISPOSAL	2
ENVIRONMENTAL CONDITIONS FOR USE	2
STORAGE, USAGE PERIOD	2
ENVIRONMENTAL CONDITIONS FOR PACKAGING IN STORAGE	3
ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTATION	3
CHECKPOINTS FOR MAINTENANCE	3
DISPLAY FOR SAFE USE	4
GENERAL SAFETY INFORMATION	5
USAGE AND MAINTENANCE	7
ESCAPE CLAUSES	7
WARNING DISPLAYS AND POSITIONS	8

SYSTEM DIAGRAM

COMPONENT NAMES	11
COMPOSITION OF PARTS THAT COME IN CONTACT WITH THE PATIENT	11
CONTROL PANEL COMPONENTS	12
COMPONENTS OF COLOR LCD MONITOR SCREEN	14
STANDARD ACCESSORIES	16

PREPARATIONS

ASSEMBLY PROCEDURE OF THE INSTRUMENT BODY	17
INSTALLATION/REMOVAL OF COMPACTFLASH CARD	19
CONNECTING THE USB MEMORY	20
CONFIRMATION AFTER ASSEMBLY	21
CONNECTING THE POWER CORD	22
CONNECTING THE EXTERNAL DEVICE	23
MENU SETTING	24
RESET FROM POWER SAVE STATE	35

BASIC OPERATIONS

FLOW OF OPERATION	36
OTHER TYPES OF PHOTOGRAPHY	36
PREPARATION FOR PHOTOGRAPHY	37
COLOR PHOTOGRAPHY (CENTER)	39
EXITING	47

OBJECTIVE OPERATIONS

PHOTOGRAPHY OF OTHERS EXCEPT "CENTER"	48
SMALL PUPIL PHOTOGRAPHY	49
ANTERIOR SEGMENT PHOTOGRAPHY	52
IMAGE PLAYBACK MODE	54

BEFORE REQUESTING SERVICE

TROUBLESHOOTING	58
-----------------------	----

SPECIFICATIONS & PERFORMANCE

SPECIFICATIONS	62
ELECTROMAGNETIC COMPATIBILITY	63

REQUIREMENTS FOR THE EXTERNAL DEVICE	66
PATIENT'S ENVIRONMENT	67
ELECTRIC RATING	67
SYSTEM CLASSIFICATION	67
DIMENSIONS AND WEIGHT	68
OPERATION PRINCIPLE	68

MAINTENANCE

DAILY CHECKUPS	69
CLEANING	78

OPTIONAL ACCESSORIES

EXTERNAL FIXATION TARGET EF-2	80
OTHER OPTIONAL ACCESSORY	80

REFERENCE MATERIAL

SHAPE OF PLUG	81
SYMBOL	81
USABLE AUTOMATIC INSTRUMENT TABLE	82

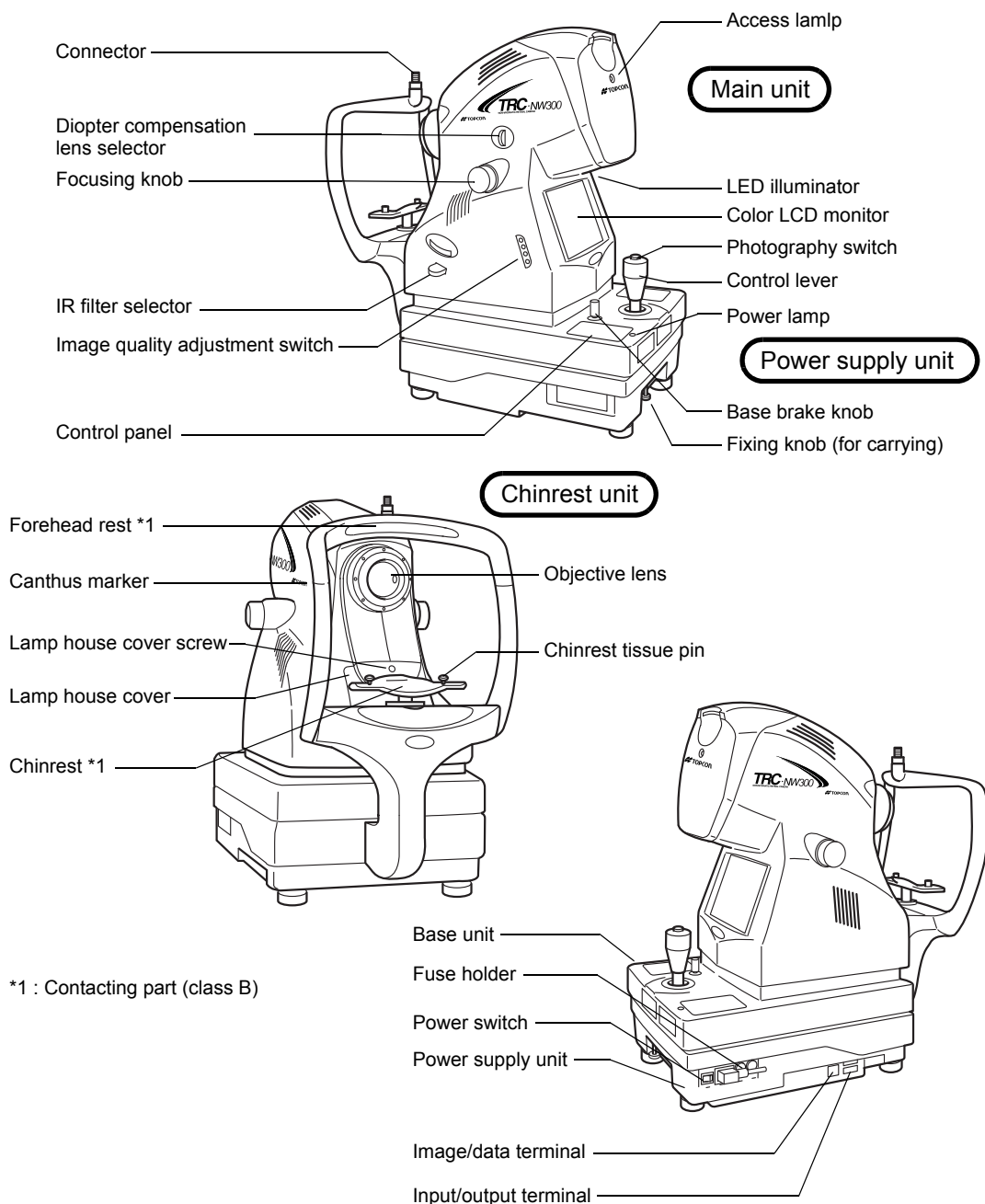
RELATION BETWEEN SETTING OF ILLUMINATION/

FLASH LEVEL AND MAXIMUM RADIANCE	83
--	----

END USER LICENSE AGREEMENT	84
----------------------------------	----

SYSTEM DIAGRAM

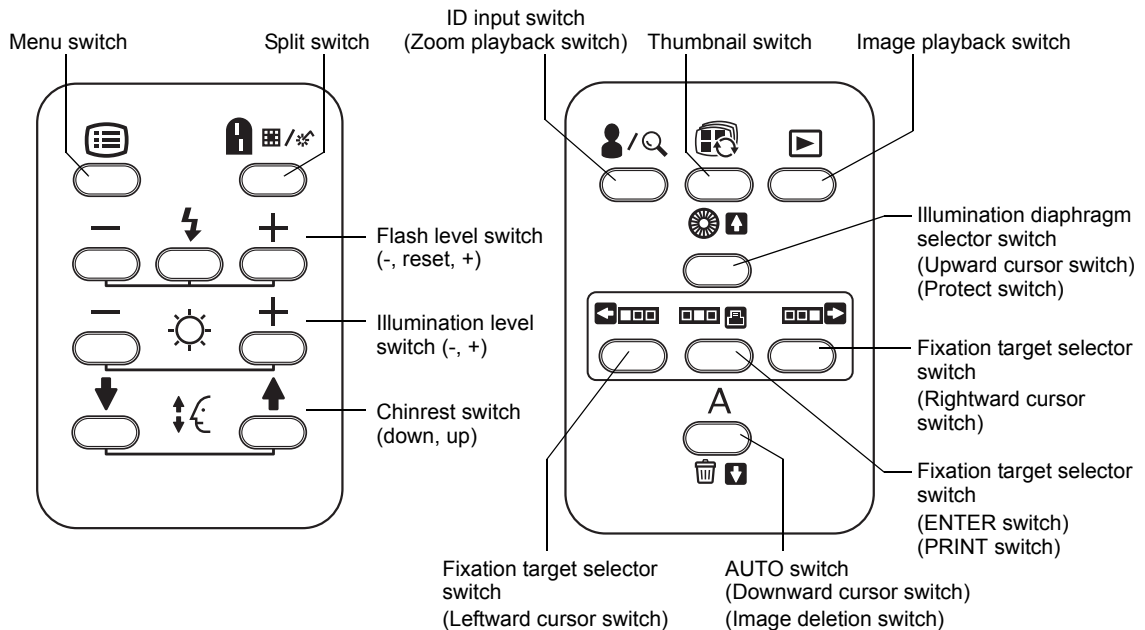
COMPONENT NAMES



COMPOSITION OF PARTS THAT COME IN CONTACT WITH THE PATIENT

Forehead rest	: Silicone rubber
Chinrest	: Acrylonitrile butadiene styrene resin
Chinrest tissue pin	: Polyamide resin

CONTROL PANEL COMPONENTS



Menu switch: P.24
Displays "MENU".

Split switch: P.45
Turns on/off the split line.

* (The function of the split switch can be changed by setting. For example, this switch can be set in order to turn on/off the internal fixation target.)

Flash level switch: P.40
Adjusts the flash level according to the patient's eye condition.

Illumination level switch: P.39
Adjusts the illumination level according to the patient's eye condition.

Chinrest switch: P.38
Adjusts the chinrest up/down movement.

ID input switch: P.37
(Zoom switch)
Moves to the ID input screen.
(Magnifies the image by "2×" and "4×" during the image playback mode.)

Image playback switch: P.54
Reproduces the image stored in the set record media.
(This switch function is invalidated by the setting on the external recording device and the instrument.)

Illumination diaphragm selector switch: P.49

(Upward cursor switch): P.24, P.37

(Protect switch): P.57

Used in small pupil photography. IN/OUT of the illumination diaphragm for small pupil (hereinafter, small pupil diaphragm) is done.

(You can move the selection cursor upward when entering the menu and ID.)

(You can protect images to prevent important images from being deleted.)

AUTO switch: P.45

(Downward cursor switch): P.24, P.37

(Image deletion switch): P.57

Turns ON/OFF the auto shoot/auto focus/auto small pupil functions. (ON/OFF of each function can be set by "MENU".)

(You can move the selection cursor downward when entering the menu and ID. Turns ON/OFF to delete the reviewed photographic image.)

Fixation target selector switch: P.48

(Leftward cursor switch): P.37

Switches the position of the internal fixation target to guide the patient's eye to the fixation point at the temporal/nasal side.

(You can move the selection cursor leftward when entering the menu and ID.)

Fixation target selector switch: P.48

(Rightward cursor switch): P.37

Switches the position of the internal fixation target to guide the patient's eye to the fixation point at the temporal/nasal side.

(You can move the selection cursor rightward when entering the menu and ID.)

Fixation target selector switch: P.48

(ENTER switch): P.24, P.37

(PRINT switch): P. 57

Switches the position of the internal fixation target to guide the patient's eye to the fixation point at the temporal/nasal side.

(You can decide the selected item in the menu. Turn ON this switch to print the reviewed image.)

Thumbnail switch: P.54

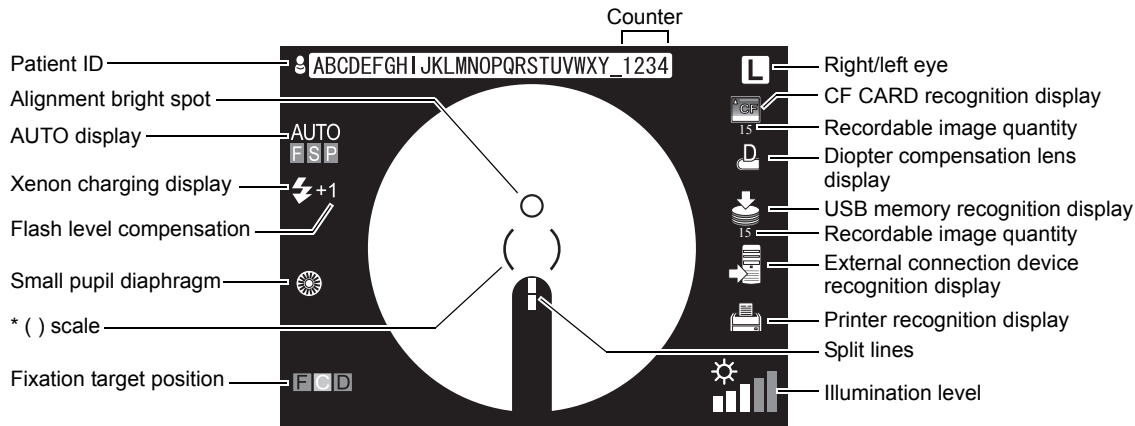
Displays the photographed image in the thumbnail status.




* For details, contact your dealer or TOPCON (see the back cover).

COMPONENTS OF COLOR LCD MONITOR SCREEN

Monitor screen




* When the () scale blinks in red, pull the base toward you (the operator) to the limit. For moving the instrument, refer to page 42.

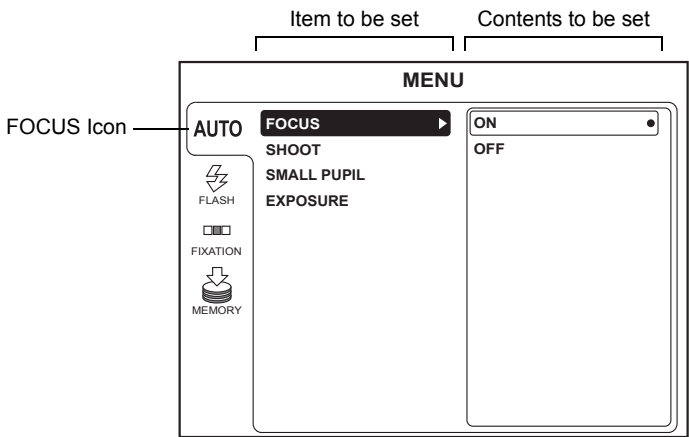
 The AUTO display shows the auto function that is ON. For setting the auto functions, refer to "MENU SETTING" on page 24.

AUTO "F" is lit: The auto focus function is ON. (Set it to "OFF", and "F" is darkened.)
F S P "S" is lit: The auto shoot function is ON. (Set it to "OFF", and "S" is darkened.)
"P" is lit: The auto small pupil function is ON. (Set it to "OFF", and "P" is darkened.)

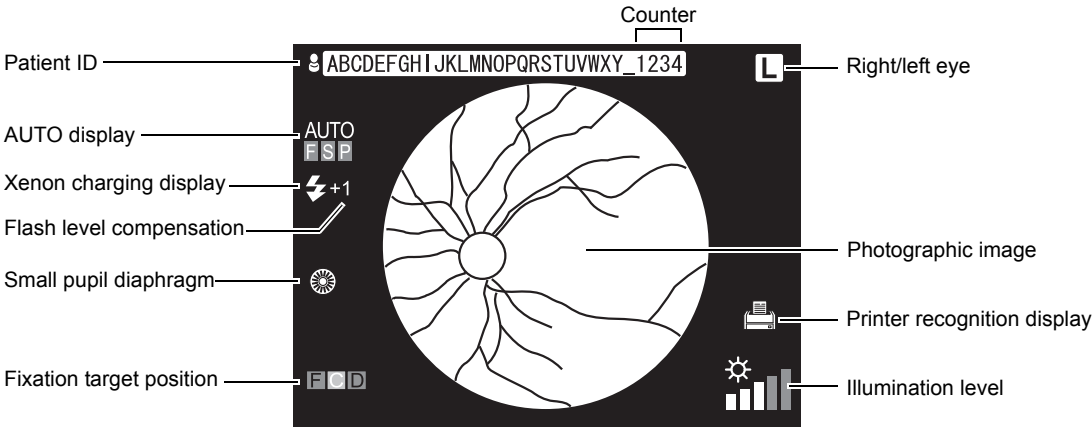
AUTO When the auto function, which has been set to "ON", is invalidated, a red oblique line is displayed.
F S P The left figure shows that the auto small pupil function is invalidated.

 The upper limit of the displayed recordable image quantity is "999".

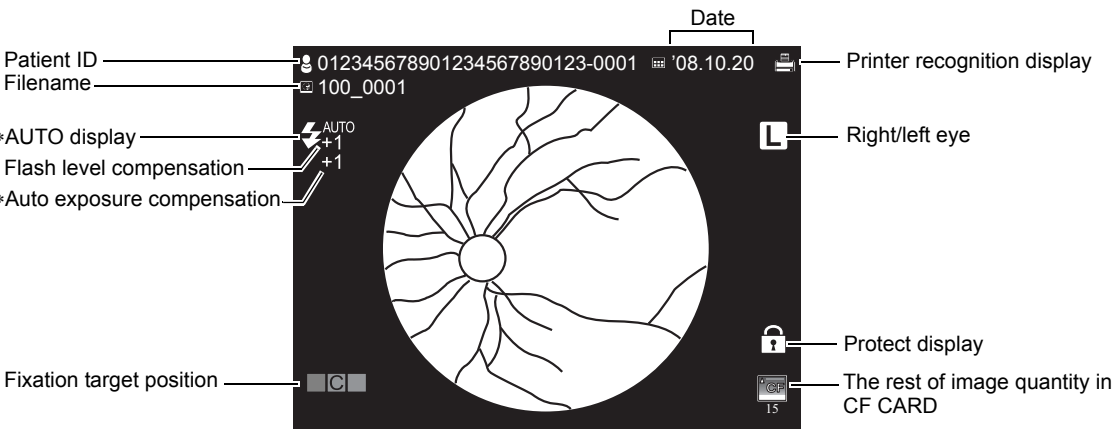
MENU screen




Preview screen (right after photographing)



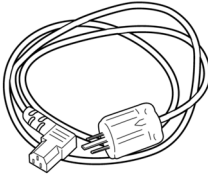
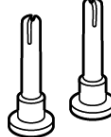
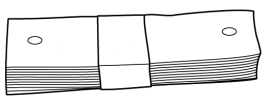
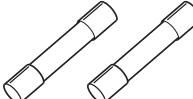


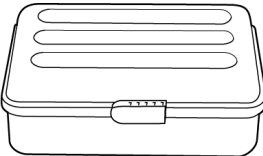
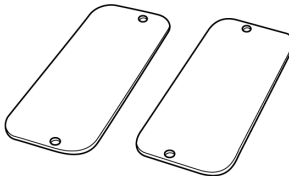
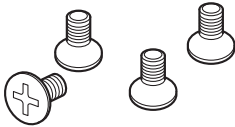
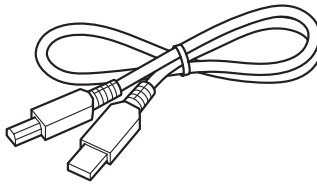
Preview screen (in the image playback mode)



*  Displayed only when the flash level is compensated by the auto exposure function.





STANDARD ACCESSORIES

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

Power cord (1) 	Chinrest tissue pin (2) 
Chinrest tissue paper (1) 	Fuse (spare) (2) 
User manual (1), Instruction manual (1) 	Dust cover (1) 
Spare parts case (1) 	Rail cover (2) 
Screw (4) 	USB cable (1) 

PREPARATIONS

ASSEMBLY PROCEDURE OF THE INSTRUMENT BODY

 CAUTION	Before transporting this instrument, secure the fixing knob on the bottom to prevent movement.
 CAUTION	This instrument should be carried by two persons. Carrying by one person may cause backache or injury. Holding at areas other than the bottom may also cause injury, as well as falling, thereby damaging the instrument.
 CAUTION	To prevent damage and injuries, install the instrument on a level surface.
 CAUTION	To avoid electric shock, unplug the power cord from the outlet before assembling. Do not plug the power cord into the outlet before assembling the instrument.
NOTE	Since the upper part and lower part of the instrument body are connected to each other with the power cable, take them out together so they do not separate from each other.
NOTE	Always place the instrument in the center of the instrument table.

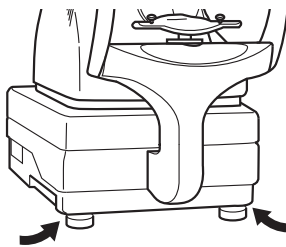
1 Take out the instrument body from the cardboard box and put it on the table.



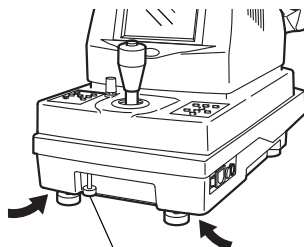
Before transporting, ensure that the fixing knob has been adjusted to prevent back-and-forth and right-and-left movement of the base. If the base moves, turn the fixing knob to stop it.



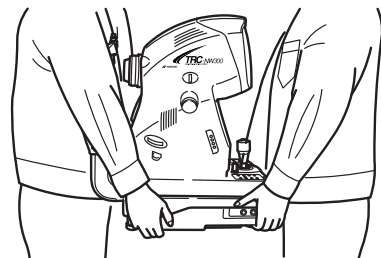
When carrying the instrument body, firmly hold it at the following specified positions.



Holding positions



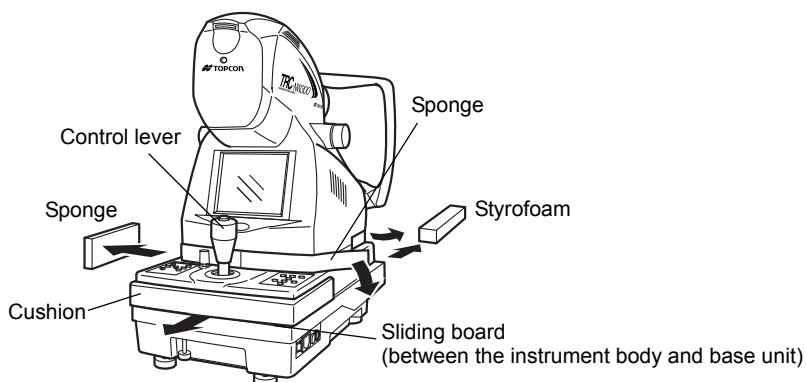
Fixing knob



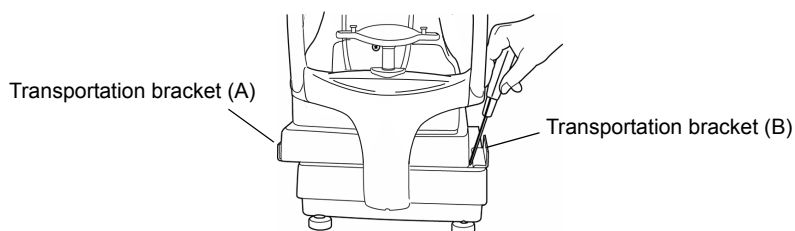
Holding the instrument body

2 Loosen the fixing knob.

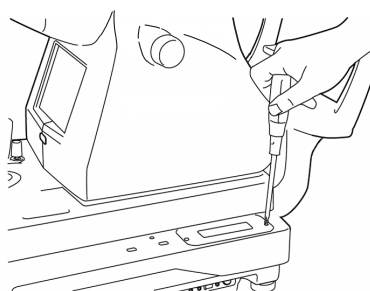
- 3** Slightly raise the control lever and remove the packing material from the underneath the base in the direction of the arrow.



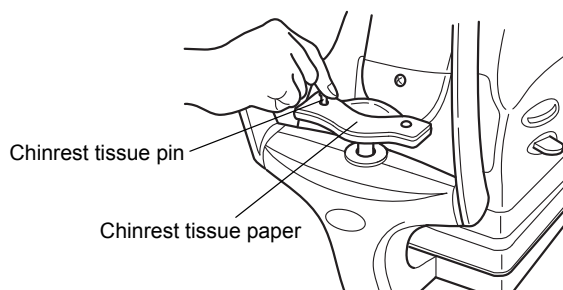
- 4** Wipe the sliding board with a cloth, etc. to remove dust.
- 5** Remove the styrofoam from the transportation bracket (A) (the one on the left hand side as viewed from the chinrest side.), slide the base to the left and unscrew the transportation bracket (B).



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



- 8** Affix the chinrest tissue paper with the chinrest tissue pin.



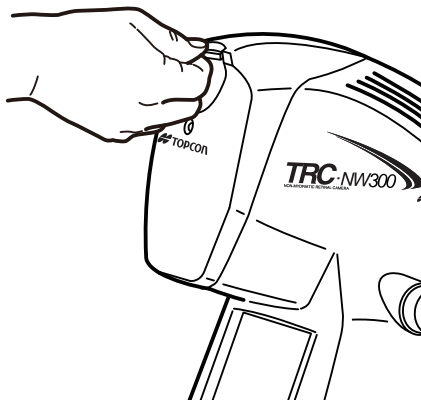
INSTALLATION/REMOVAL OF COMPACTFLASH™ CARD

When using the CompactFlash™ card (hereafter, CF CARD), insert it into the instrument correctly according to the following procedure.

NOTE	Insert the CF CARD in the correct direction. If it is not inserted properly, the inside of the instrument may be damaged.
NOTE	Before inserting or removing the CF CARD, make sure that the POWER SWITCH on the instrument is in the "OFF" (○) position.

Installation of CF CARD

- 1** Make sure that the **POWER SWITCH** on the instrument is in the "OFF" (○) position.
- 2** Insert the CF CARD in the correct direction. As illustrated, place the CF CARD with its memory capacity display on top and push it all the way into the slot.



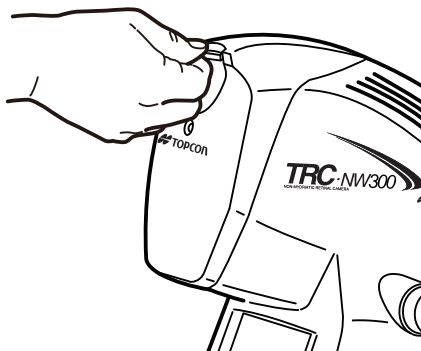
Use the CF CARD specified by TOPCON. For the CF CARD, refer to "OPTIONAL ACCESSORIES" on page 80.



If problems are encountered by using any other CF CARD except the specified one, TOPCON will not guarantee the instrument. Please understand this.

Removal of CF CARD

- 1 Make sure that the **POWER SWITCH** on the instrument is in the "OFF" (○) position.
- 2 Pull out the CF CARD from the slot.



Right after operation of the instrument, the CF CARD may be hot. Be careful when removing it.

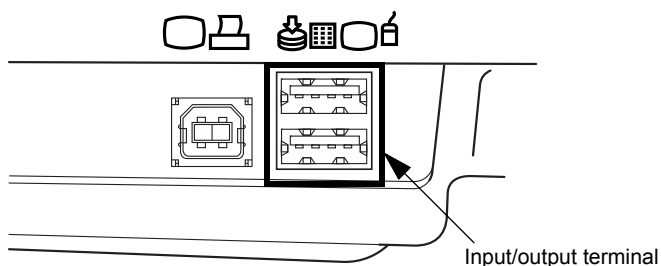



If the CF CARD is inserted or removed while the access lamp is blinking (e.g. the pre-view screen is being displayed), the image data stored on the CF CARD may be destroyed.


CONNECTING THE USB MEMORY

When using the USB memory, connect it to the instrument according to the following procedure. The USB memory can be connected even when the power of the instrument is ON.

- 1 Connect the USB memory to the input/output terminal in the correct direction.



Before photographing, check if the USB memory recognition icon "  " is displayed on the Monitor screen. Unless this icon is displayed, the USB memory is not connected to the instrument. So, the photographed image is not stored.

Right after the USB memory is connected, it is not recognized at once. Please wait until the USB memory recognition icon "  " is displayed.



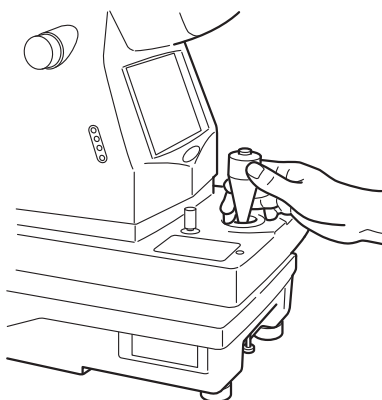
If you wait for a while but the USB memory recognition icon is not displayed, disconnect and connect the USB memory.



When you want to remove the USB memory, the operation on the menu is necessary. Refer to P.33.

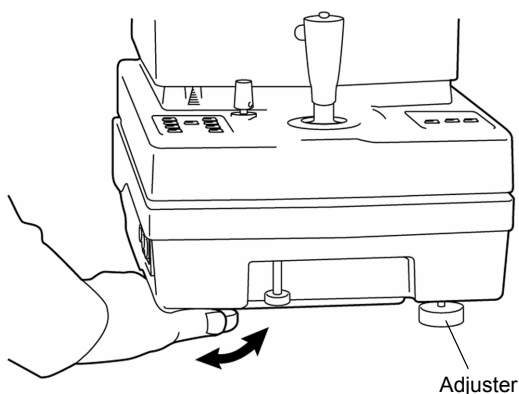
CONFIRMATION AFTER ASSEMBLY

- 1** Make sure that the input voltage is within $\pm 10\%$ of the rated voltage for the instrument.
If the input voltage exceeds this range, use a constant-voltage power supply (marketed: 400VA or more).
- 2** Loosen the base brake knob, and move the control lever to verify 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 control lever with force to its limits in all directions.

- 3** If the instrument body is slightly off level, finely adjust the height by properly turning the four adjusters.
Do not extend the adjusters past 1cm.



CONNECTING THE POWER CORD



WARNING

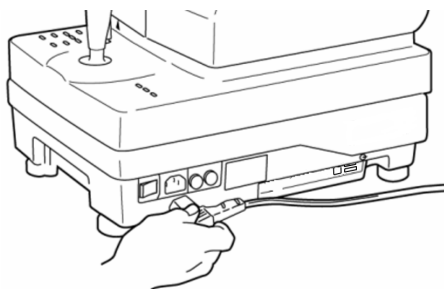
To avoid fire and electric shock in case of leakage, be sure to use a grounded outlet. Do not connect to outlets that are not grounded.



CAUTION

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

- 1** Make sure that the **POWER SWITCH** of the instrument body is OFF (○).




- 2** Attach the power cord to the instrument body.
- 3** Plug the power cord into a proper outlet with grounding.

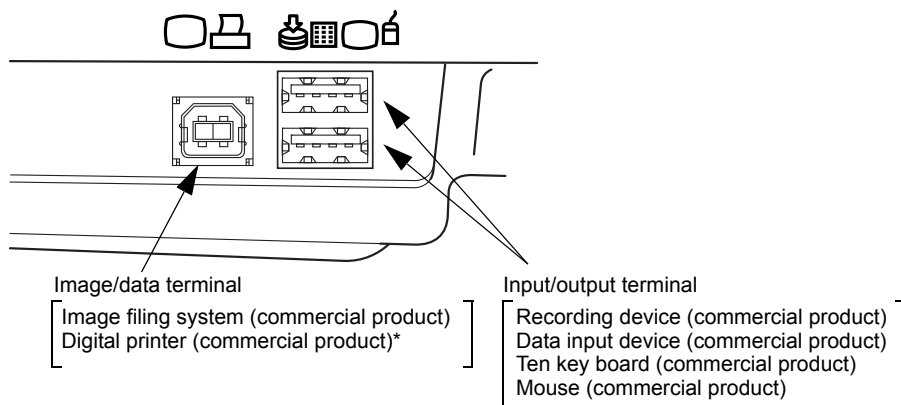


Refrain from using UPS (Uninterruptible Power Supply). It is possible that use of a UPS may cause problems.

CONNECTING THE EXTERNAL DEVICE


 CAUTION	<p>To avoid electric shock, do not touch the external connection terminal and the patient at the same time.</p>
NOTE	<p>Use only external devices that comply with IEC 60950/IEC 60950-1 or UL60950/UL60950-1. For details about connecting external devices, contact your dealer or TOPCON (see the back cover).</p>

This instrument can be connected to an image filing system (commercial product).



* By connecting the digital printer applicable to Pict Bridge, direct print is done.

Connecting to an image filing system (commercial product).

- 1** Connect one USB cable (commercial product) to the image/data terminal .
- 2** Connect the other end of the USB cable to an image filing system.




Use the external device complying with IEC60950/IEC60950-1 or UL60950/UL60950-1.





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



When connecting the external device, do not take a picture before the recognition displays shown below appear on the color LCD monitor.

CF card: 

Personal computer: 

USB memory: 

Printer: 



When you want to change the date stored in the recording device, contact your dealer or TOPCON office (see the back cover).



Before using the USB memory, make sure that it is not infected with the computer virus. Then, connect it.



For the use of an image filing system, refer to the instruction manual of each system.



For a list of usable printer, check it by contacting your dealer or TOPCON office (see the back cover).

MENU SETTING

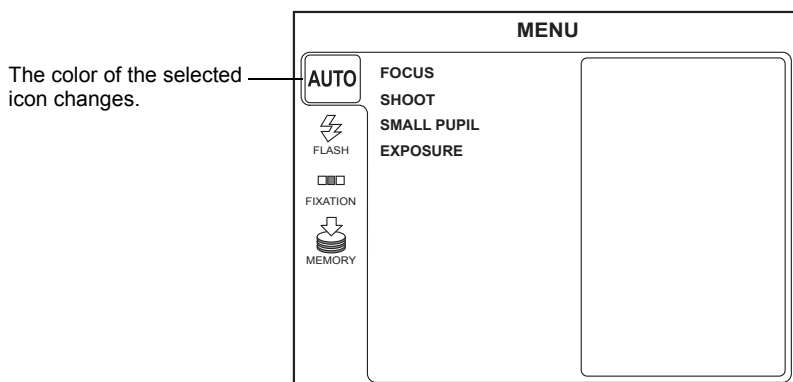
In menu setting, ON/OFF of the auto functions, the flash level and the fixation target can be set.

Preparations for menu setting

- 1** Check the power cord connections.
For details about the connection, see "CONNECTING THE POWER CORD" on page 22.
- 2** Turn the **POWER SWITCH** ON (I).

Displaying the menu screen

- 1** Make sure that the Monitor screen is displayed.
- 2** Press the **MENU SWITCH** on the control panel.
Make sure that "MENU" is displayed.



- 3** Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH**; the selected item is changed.
- 4** Press the **ENTER SWITCH**, and the selected item is chosen.

Returning to the Monitor screen

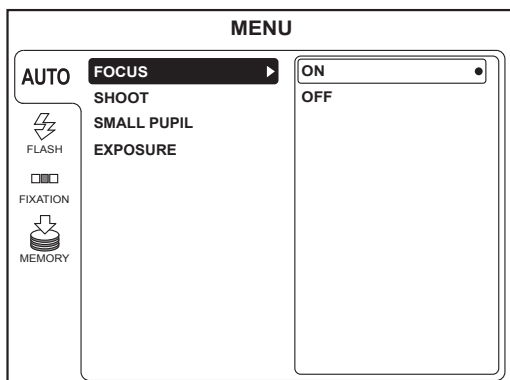
- 1** Press the **MENU SWITCH**.

Setting of auto focus

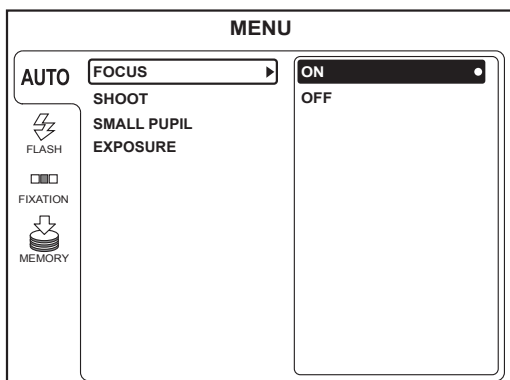
Set the auto focus function ON/OFF. (Factory default is "ON".)

When auto focus is set to ON, focusing is automatically performed when taking a picture.

- 1** On the "MENU" screen, select "AUTO" and press the **ENTER SWITCH**.
- 2** Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** to select "FOCUS" and then press the **ENTER SWITCH**.



- 3** Select "ON" or "OFF" with the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** and then press the **ENTER SWITCH**. The selected data is set.

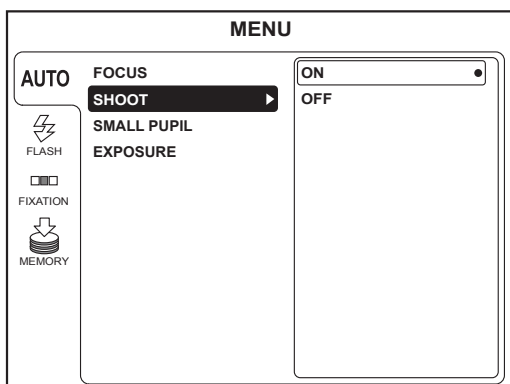


Setting of auto shoot

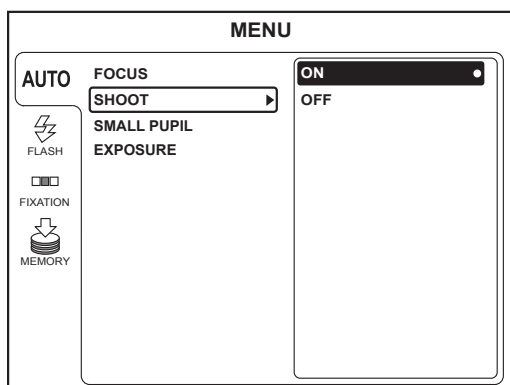
Set the auto shoot function ON/OFF. (Factory default is "ON".)

The auto shoot mechanism works as follows: when the fitted alignment bright spot is put into () in the focalized status, the instrument takes a picture automatically without pressing the photography switch.

- 1 On the "MENU" screen, select "AUTO" and press the **ENTER SWITCH**.
- 2 Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** to select "SHOOT" and then press the **ENTER SWITCH**.



- 3 Select "ON" or "OFF" with the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** and then press the **ENTER SWITCH**. The selected data is set.

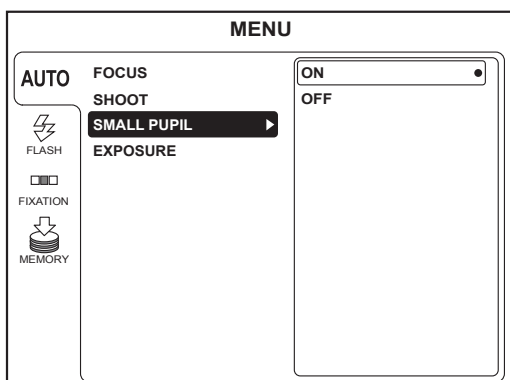


Setting of auto small pupil

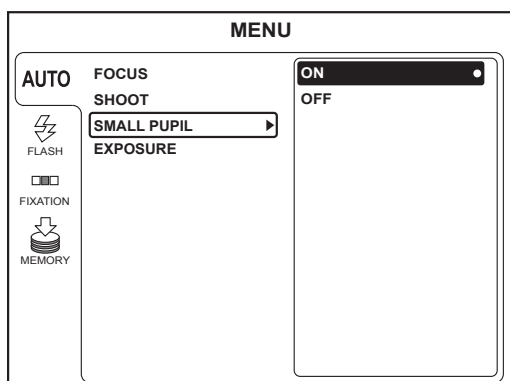
Set the auto small pupil function ON/OFF. (Factory default is "ON".)

The auto small pupil mechanism works as follows: when the pupil diameter of the patient is too small to take a picture, the instrument automatically changes to the small pupil diaphragm.

- 1** On the "MENU" screen, select "AUTO" and press the **ENTER SWITCH**.
- 2** Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** to select "SMALL PUPIL" and then press the **ENTER SWITCH**.



- 3** Select "ON" or "OFF" with the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** and then press the **ENTER SWITCH**. The selected data is set.

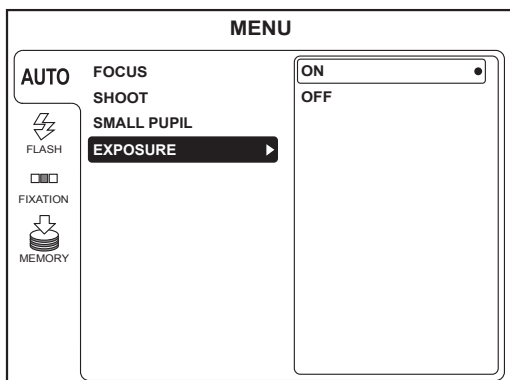


Setting of auto exposure

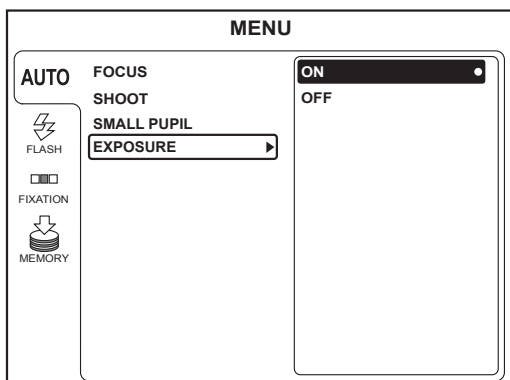
Set the auto exposure to ON/OFF. (Factory default is "ON".)

The auto exposure works to compensate the flash level according to the brightness of fundus.

- 1** On the "MENU" screen, select "AUTO" and press the **ENTER SWITCH**.
- 2** Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** to select "EXPOSURE" and then press the **ENTER SWITCH**.



- 3** Select "ON" or "OFF" with the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** and then press the **ENTER SWITCH**. The selected data is set.

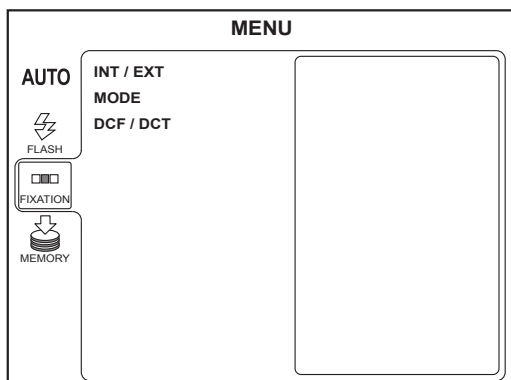


Switching of internal/external fixation targets (The external fixation target is an optional accessory.)

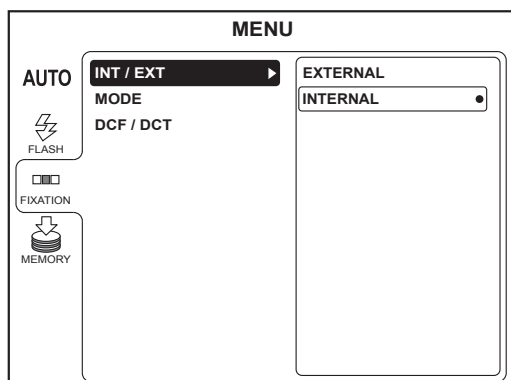
You can change the internal/external fixation targets.

When shipped, "INTERNAL" (internal fixation target) is set.

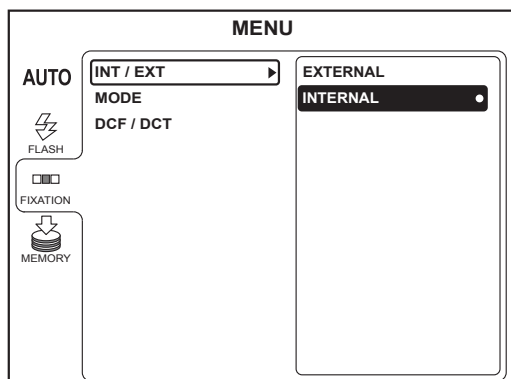
- 1 Select "FIXATION" on the "MENU" screen and press the **ENTER SWITCH**.



- 2 Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** to select "INT/EXT" and then press the **ENTER SWITCH**.



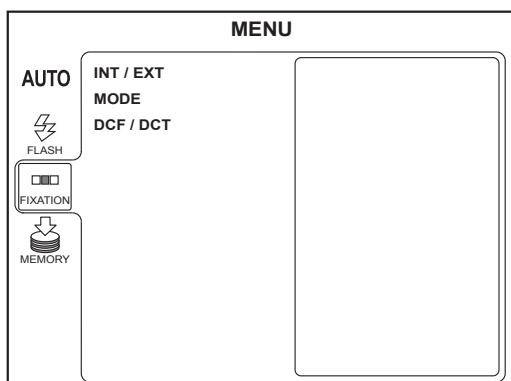
- 3 Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** to select "INTERNAL" (internal fixation target) or "EXTERNAL" (external fixation target). Then, press the **ENTER SWITCH**.



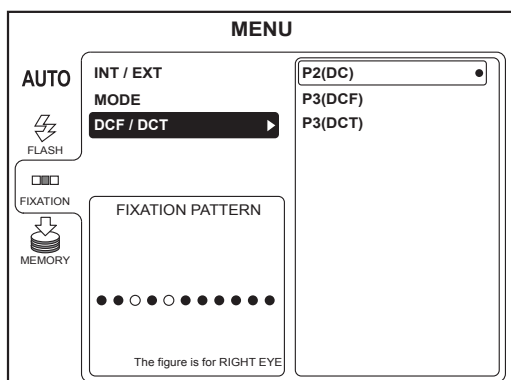
Fixation target pattern

You can select the fixation target pattern.
When shipped, "P2 (DC)" is set.

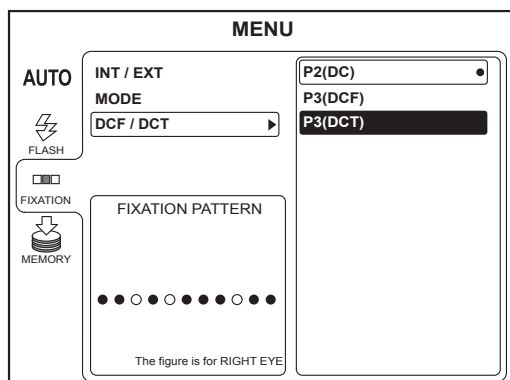
- 1 On the "MENU" screen, select "FIXATION" and press the **ENTER SWITCH**.



- 2 Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** to select "DCF/DCT" and then press the **ENTER SWITCH**.



- 3 Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** and select the desired pattern from the following:
"P2 (DC)" (center and center of optic disc),
"P3 (DCF)" (center, center of optic disc and center of macula), or "P3 (DCT)" (center, center of optic disc and temporal side).
Press the **ENTER SWITCH**.

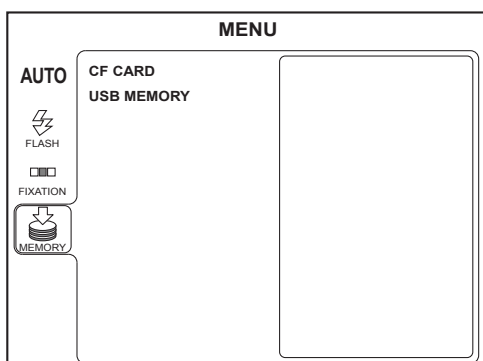


For setting and lighting the internal fixation target, refer to "MEMO" on page 48.

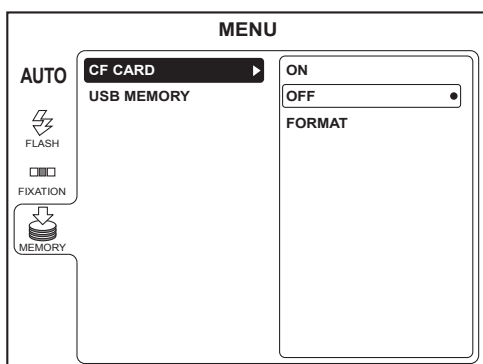
Setting of CF CARD

Set ON/OFF for storing data into the CF CARD. For installing/removing the CF CARD, refer to page 19.

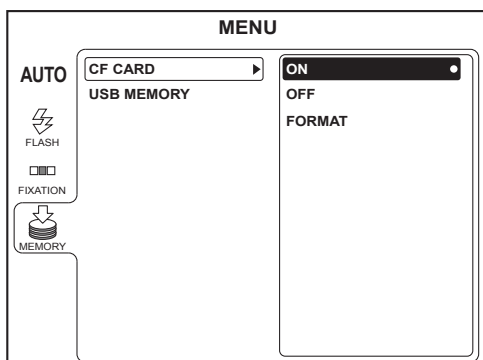
- 1 On the "MENU" screen, select "MEMORY" and press the **ENTER SWITCH**.



- 2 Press the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH** to select "CF CARD" and then press the **ENTER SWITCH**.



- 3 Select "ON" (to store data in CF CARD) or "OFF" (not to store data in CF CARD) by pressing the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH** and then press the **ENTER SWITCH**.

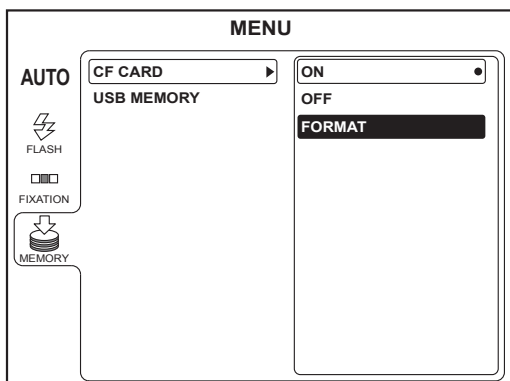


As more and more data is recorded on CF CARD, it takes a longer time to display the Monitor screen since the power of the instrument was ON.

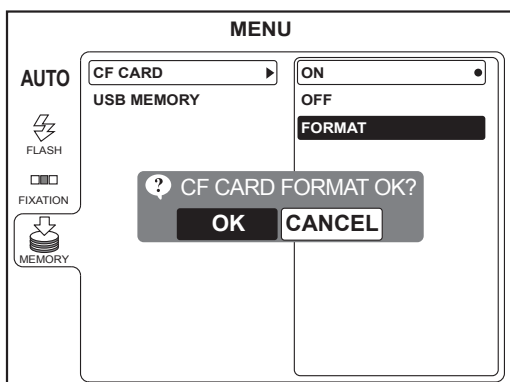
Formatting CF CARD

Format CF CARD according to the following procedure.

- 1** On the "MENU" screen, select "MEMORY" and press the **ENTER SWITCH**.
- 2** Press the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH** to select "CF CARD" and then press the **ENTER SWITCH**.
- 3** Press the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH** to select "FORMAT" and then press the **ENTER SWITCH**.



- 4** The following check screen appears. Press the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH** to select "OK" and then press the **ENTER SWITCH**.



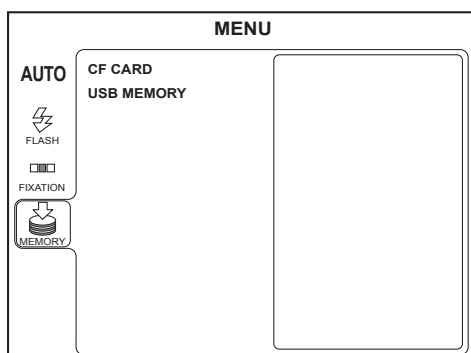
To stop formatting of CF CARD, select "CANCEL".



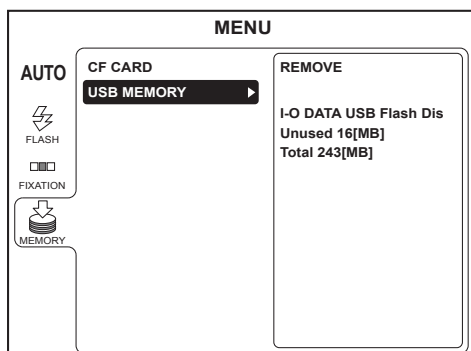
When formatting CF CARD is finished, "THE CF CARD CAN BE FORMAT" is displayed.

Removal of the USB memory

- 1 On the "MENU" screen, select "MEMORY" and press the **ENTER SWITCH**.

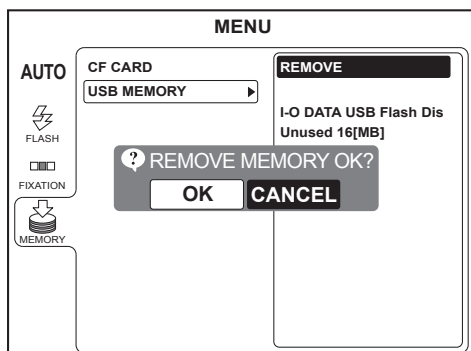


- 2 Press the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH** to select "USB MEMORY" and then press the **ENTER SWITCH**.



- 3 Select "REMOVE" and then press the **ENTER SWITCH**.

- 4 The following check screen appears. Select "OK" and then press the **ENTER SWITCH**.



- 5 When the message "THE MEMORY CAN BE REMOVED." is displayed on the color LCD monitor, remove the USB memory from the input/output terminal.



When the message "THE MEMORY CAN NOT BE STOPPED. PLEASE TRY AGAIN." is displayed, wait for a while and repeat the procedure from Step 1.



Before using the USB memory, it is recommended to format it with a personal computer.

Menu functions list

You can also change the set data for other items in the same way as setting of the auto functions. The settable menus are shown below.

Setting of the AUTO functions (AUTO)

Item	Options	Initial setting	Explanation
FOCUS	ON/OFF	ON	Select ON/OFF of auto focus.
SHOOT	ON/OFF	ON	Select ON/OFF of auto shoot.
SMALL PUPIL	ON/OFF	ON	Select ON/OFF of auto small pupil.
EXPOSURE	ON/OFF	OFF	Select ON/OFF of auto exposure function. When the auto exposure function is set to "ON", the set flash level is compensated to control the dispersion in the brightness of the photographed image.

Setting of the flash level (FLASH)

Item	Options	Initial setting	Explanation
BASE LVL	-4 to +4	0	Set the reference value of flash level. When you set "0", the reference value of flash level is 9.4W·s.

Setting of the internal fixation target (FIXATION)

Item	Options	Initial setting	Explanation
INT/EXT	INTERNAL EXTERNAL	INTERNAL	Select the internal or external fixation target.
* MODE	DEFAULT CUSTOM	DEFAULT	Select "CUSTOM", and the fixation position is optionally set. Select "DEFAULT", and the data is set as when shipped.
DCF/DCT	P2 (DC) P3 (DCF) P3 (DCT)	P3	Select the internal fixation target pattern. P2 (DC): Set this when you want to photograph "Center" (C) and "Center of optic disc" (D). P3 (DCF): Set this when you want to photograph "Center" (C), "Center of optic disc" (D) and "Center of macula" (F). P3 (DCT): Set this when you want to photograph "Center" (C), "Center of optic disc" (D) and "Temporal side" (T).

* When shipped, the same fixation target position is set for both "CUSTOM" and "DEFAULT". When you want to light an optional point in the "CUSTOM" status, contact your dealer or TOP-CON office (see the back cover).

Setting of the recording medium to save image (MEMORY)

Item	Options	Initial setting	Explanation
CF CARD	ON OFF FORMAT	OFF	Select "ON" to save the photographed image on CF CARD. Select "OFF" not to save the photographed image on it. When you select "FORMAT", the CF CARD is initialized.
USB MEMORY	REMOVE	—	Select "REMOVE" to remove the USB memory from the instrument.

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 on the control panel flickers and the monitor screen goes off.

1 Press the PHOTOGRAPHY SWITCH.

The color LCD monitor is displayed and ready for photography.



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

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

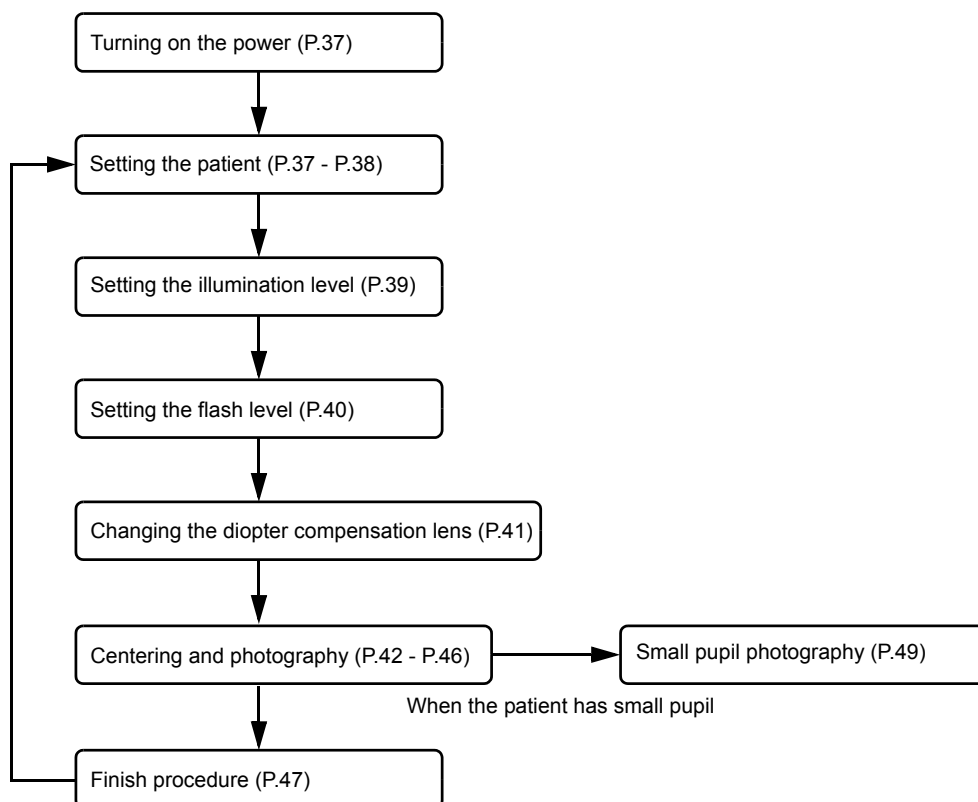


Sometimes the instrument is not set in the power save state due to the focusing condition.

BASIC OPERATIONS

FLOW OF OPERATION

Photography procedure explained in "COLOR PHOTOGRAPHY (CENTER)"




OTHER TYPES OF PHOTOGRAPHY



- Photography of others except "center" (P.48)
- Anterior segment photography (P.52 - P.53)

PREPARATION FOR PHOTOGRAPHY

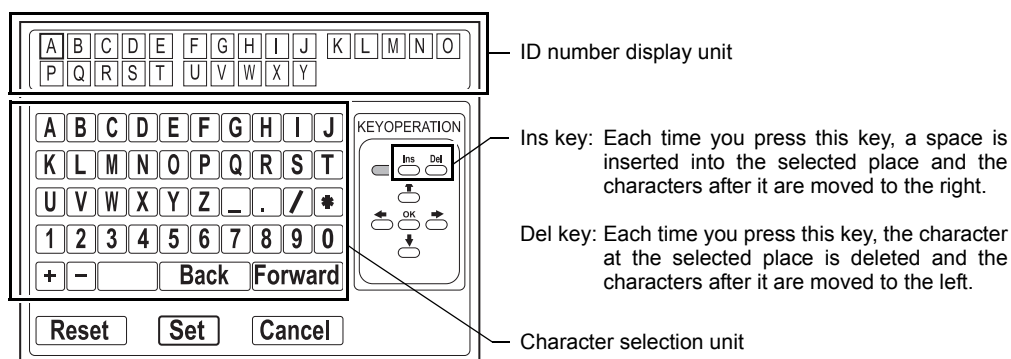
Applying the power supply

- 1 Carefully check the power cord connection.
For details about the connection, see "CONNECTING THE POWER CORD" on page 22.
 - 2 Turn on any external connection device.
 - 3 Turn ON (|) the **POWER SWITCH** of the instrument.
 - 4 Make sure that the title screen and the Monitor screen are displayed.
-  Right after the power is turned on, nothing is displayed for a few moments. This delay is normal. Wait until the title screen appears.


Patient setting

 CAUTION	To avoid electric shock, do not touch the external connection terminal and the patient at the same time.
 CAUTION	To avoid injury to the patient's face and hands, be sure to operate the chinrest for height adjustment while observing the patient.
NOTE	If the patient wears glasses or contact lenses, remove them first.
NOTE	To ensure correct imaging, adjust the table height so the patient has his/her chin placed centrally on the chinrest.

- 1 Make sure the main Monitor screen is on.
- 2 Press the **ID INPUT SWITCH**, and the ID number input screen appears.



- 3 Move to the character to be inputted with the cursor switches of the instrument.
- 4 Press the **ENTER SWITCH** of the instrument to select the character.

 The cursor character in the ID number display unit is changed to the selected character. Then, the cursor moves to the right. To move the cursor in the ID number display unit to the left, select "Back" in the character selection unit. To move it rightward, select "Forward".

5 Repeat Step **3** - **4** to input all the digits.



Connect the mouse to the input/output terminal, and the mouse pointer is displayed only when inputting ID. Move the mouse pointer to a desired character and click the left button of the mouse. The cursor character in the ID number display unit is changed to the selected character. Then, the cursor moves to the right.

6 Select "Set". The inputted ID is validated and the system exits from the input screen.



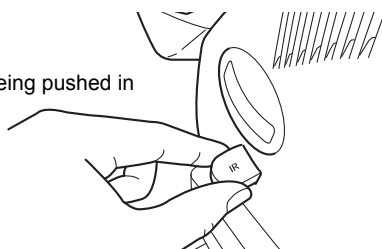
If you press the **ID INPUT SWITCH** again, the inputted ID is canceled.



It is possible to take a picture even if the ID is not inputted.

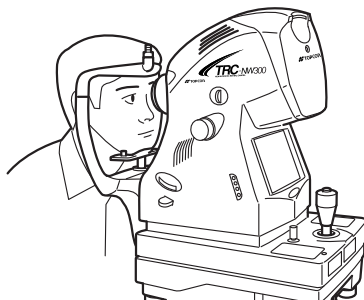
7 Make sure that the IR filter selector is on.

IR filter selector being pushed in

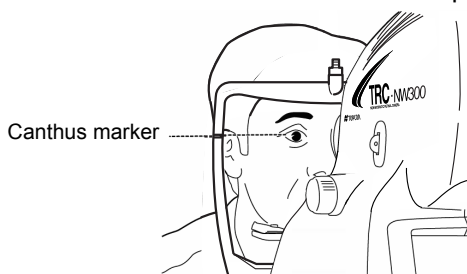


8 Seat the patient comfortably.

9 Adjust the table height or chair height so the patient has his/her chin placed centrally on the chinrest.



10 Adjust the chinrest height with the **CHINREST SWITCH** so the outside corner of the patient's eye is level with the Canthus marker on the chinrest post.



The chinrest moves up/down while the **CHINREST SWITCH** is pressed. If the chinrest does not move when you press the **CHINREST SWITCH**, it malfunctions. Set the **POWER SWITCH** to the OFF (○) side and unplug the power cord from the outlet. Then, contact your dealer or TOPCON (see the back cover).

COLOR PHOTOGRAPHY (CENTER)

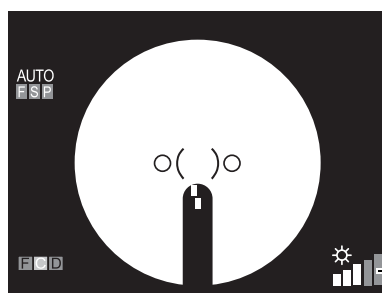
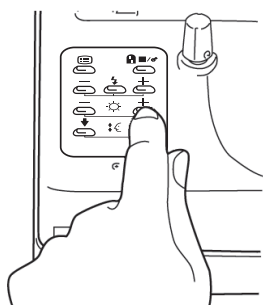
Setting the illumination level



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

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

You can verify the current level using the illumination level display on the color LCD monitor.



Illumination level



Normally the illumination level has five steps.

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

Setting the flash level

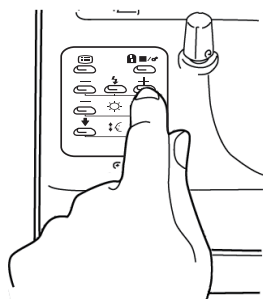


CAUTION

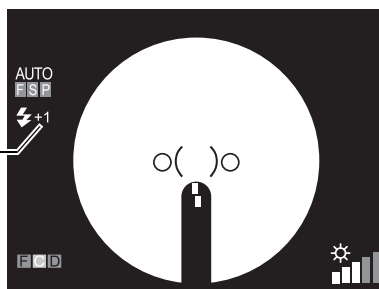
To avoid pain and discomfort to the patient and damage to the patient's eye, do not brighten the photography light more than necessary.

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

The compensation value can be checked with the flash level compensation display on the color LCD monitor.



Flash level
compensation
display



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

When the flash level is the reference value, no compensation value is displayed.

When the instrument is first turned on, the flash level is set to the reference value.



You can adjust the reference value of the flash level in four steps in both (+) and (-) directions.



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

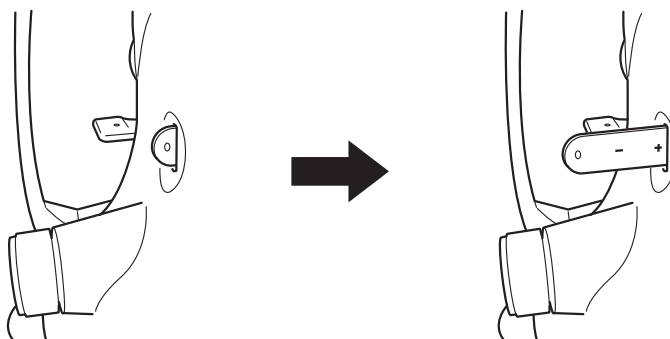
For details about the flash level setting, contact your dealer or TOPCON (see the back cover).



When the flash level compensation display is changed to the higher level by one step, the flash level is increased by approx. 20%.

Changing the diopter compensation lens

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



On a highly myopic patient, pull out the diopter compensation lens selector by one step and set it to (-) myopia.

On a highly hyperopic patient, pull out the diopter compensation lens selector by two steps and set it to (+) hyperopia.

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





When the diopter compensation lens is set to any other value except "0", the split lines will not be displayed.



When the diopter compensation lens is inserted, its indication blinks at the upper right corner on the Monitor screen.

At this time, the auto focus, auto shoot and auto small pupil functions do not work.

Centering and photography

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

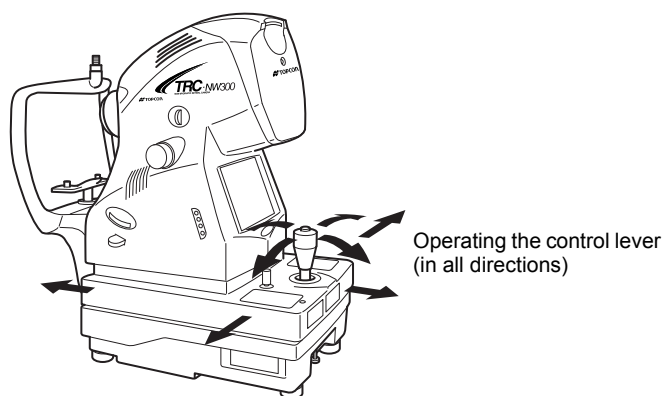
The centering operation is done with the control lever.



Centering the instrument body with the control lever

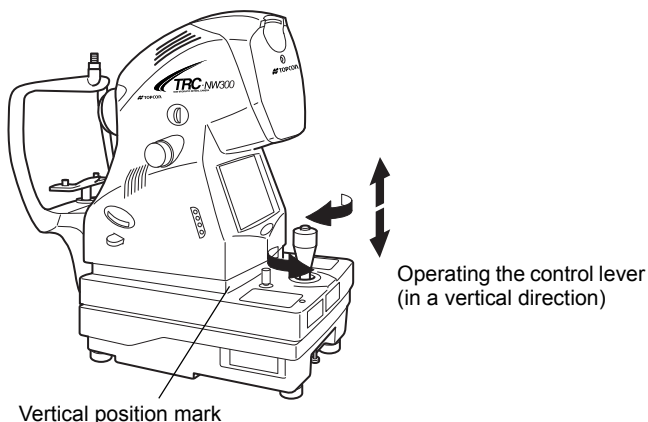
- Fine movements of the base, back and forth and right and left, are done by tilting the control lever.

Before performing this operation, free the base by turning the base brake knob to the left. To lock the base, turn the base brake knob right.

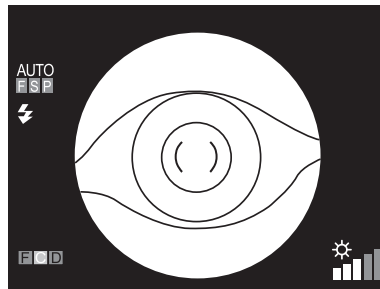


- To move the instrument body up/down, turn the control lever right for upward movement, and left for downward movement.

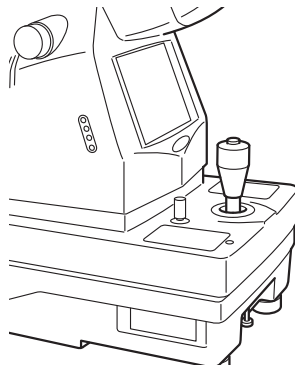
The vertical position of the instrument body can be checked with the vertical position mark.



- 1** Hold the control lever and pull the instrument toward the operator. As the internal fixation target flickers, instruct the patient to look at the fixation target in the center. Observe the anterior segment image on the color LCD monitor.
- 2** Move the instrument body using the control lever until you get the patient's eye centered in the color LCD monitor.



Hold the control lever perpendicularly, which facilitates centering on the fundus.

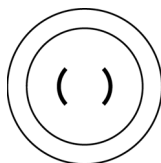


- 3** On the color LCD monitor, bring the () scale towards the patient's pupil, and make sure that the pupil is larger than the () scale.

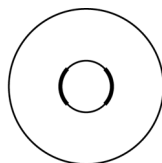


Comparison of the () scale and the pupil tells you whether the pupil is large enough for retinal photography.

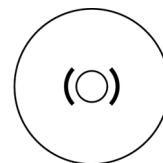
The following pictures are provided as a reference.



Well dilated.

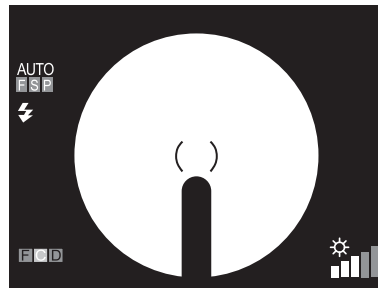


Narrowly dilated for photography.



Pupil diameter is too small: darken the room and further dilate the pupil. If the pupil diameter is still smaller than the () scale, use the small pupil mode (P.49).

- 4** Slowly bring the instrument closer to the patient; the retina image will appear on the color LCD monitor.

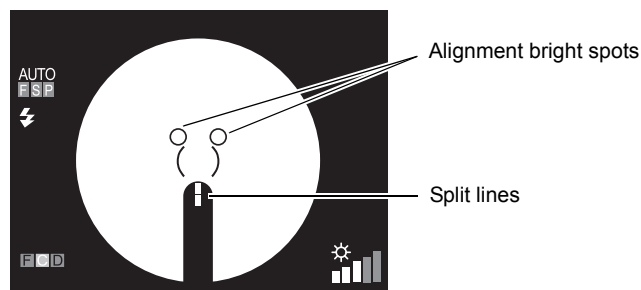


- 5** Instruct the patient to look at the green light (internal fixation target).
- 6** While watching the image on the color LCD monitor, adjust the brightness of the image using the **ILLUMINATION LEVEL SWITCH**.



For details about the illumination level setting, see page 39.

- 7** Bring the instrument even closer to the patient; and two bright spots for the working distance alignment become visible.



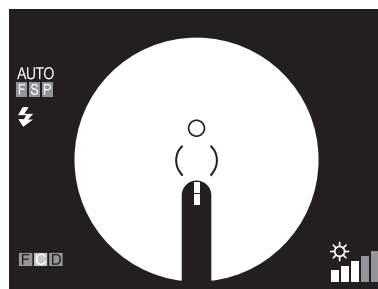
When the auto focus function is ON, the instrument changes the split lines into one line. At this time, the fundus is almost in focus.

The auto focus mechanism may not work for ocular pathology (e.g. strong cataract), myopia and hyperopia (beyond -13 and more than +12D), etc.



When the auto focus function is OFF, operate the focusing knob to change the split lines into one line on the color LCD monitor.

- 8** Operate the control lever until the two alignment bright spots are changed to one spot.





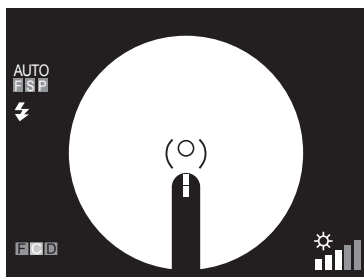
When the patient's eye is beyond -13 or more than +12D, the instruction to insert the diopter compensation lens appears on the color LCD monitor screen. At this time, change the diopter compensation lens. Refer to "Changing the diopter compensation lens" on page 41.

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

At the same time all the automatic functions are disabled.

9

Operate the control lever and move the instrument body to bring the bright spot of the color LCD monitor into the () scale.



10

When the relationship between the instrument body and the patient's eye is correct for photography, the instrument automatically takes a picture.



When the auto shoot function is OFF, the instrument does not take a picture automatically. Check the bright spot on the color LCD monitor and press the **[PHOTOGRAPHY SWITCH]** to take a picture.



Use the **[AUTO SWITCH]** to turn ON/OFF all the auto functions, which have been set to "ON" in "MENU", at the same time. Press the **[AUTO SWITCH]** to turn OFF the auto functions, and the AUTO display disappears on the color LCD monitor.



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



You can remove the split lines from the Monitor screen if they are not necessary.

Press the **[SPLIT SWITCH]** to remove the split lines from the Monitor screen.

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

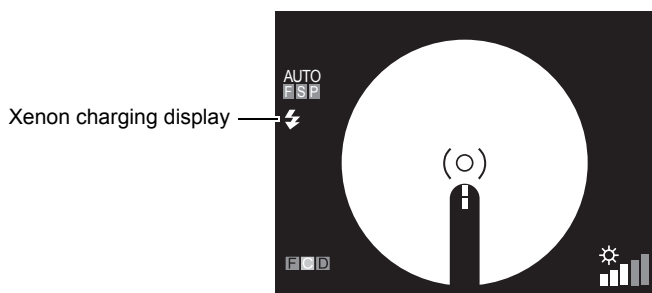
When the split lines are erased on the Monitor screen, the auto focus and auto shoot functions do not work.



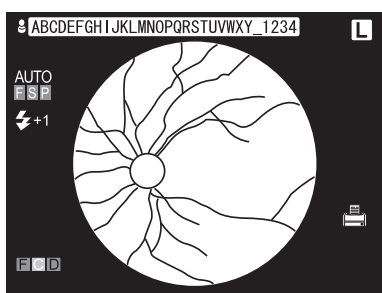
If the patient blinks when taking a picture, the blink detection function works to stop photography.



When the xenon charging display flickers on the color LCD monitor, photography is not possible even by pressing the **PHOTOGRAPHY SWITCH**. Wait until the xenon charging display turns on before you attempt to take the next image.



- 11** The captured image is stored in the external recording device and displayed on the color LCD monitor.



If the light intensity of the image is insufficient, compensate for it by pressing the **FLASH LEVEL SWITCH**, and repeat the centering and photography procedure.

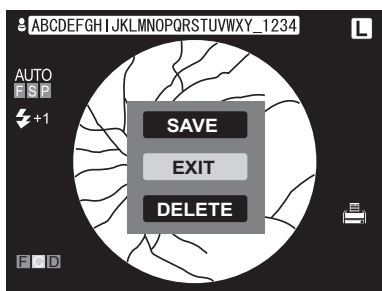
- 12** To return to the Monitor screen from the photographed image on the color LCD monitor, press the **PHOTOGRAPHY SWITCH** again.



When using the CF CARD or USB memory, the image is stored at this time. When a digital printer is connected to the instrument, the image is printed at this time.



When you do not want to print the image, press the **IMAGE DELETION SWITCH**. The following screen appears. Select "SAVE" to store the image. Select "DELETE" not to store the image. Select "CANCEL" to return to the Preview screen.



EXITING

- 1** Turn OFF(○) the POWER SWITCH on the instrument body and the external recording device.
- 2** While operating the control lever, move the instrument body so that it comes just above the base.
- 3** To prevent the base from moving suddenly, turn the base brake knob to the right to lock the base.



For the next capture, turn the control lever and move the body to the center position. The vertical center position of the instrument can be checked with the vertical position mark.



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



This instrument adopts the power save method (P.35). If you are going to use the instrument after a short pause period, it is recommended to use it without turning off the POWER SWITCH.

OBJECTIVE OPERATIONS

PHOTOGRAPHY OF OTHERS EXCEPT "CENTER"

Setting the picture position

To set the fixation target position, use the **FIXATION TARGET SELECTOR SWITCH**. Each time you press the **FIXATION TARGET SELECTOR SWITCH**, the setting changes from "D" (center of optic disc) to "C" (center) alternately.

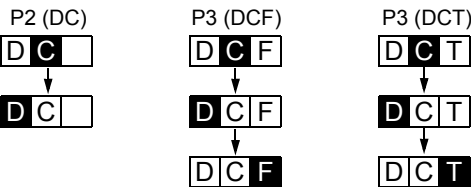


The above explains the case in which "P2 (DC)" is set for "PERIPHERAL". In addition to "P2 (DC)", it is possible to set "P3 (DCF)" (D: center of optic disc, C: center, F: center of macula) and "P3 (DCT)" (D: center of optic disc, C: center, T: temporal side). To set it, select "FIXATION" on the "MENU" screen and next "DCF". Then, select "P3 (DCT)" or "P3 (DCF)".

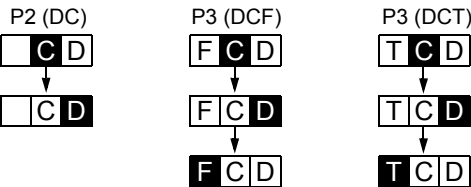
When "P3 (DCF)" is set, the setting changes in the following order: "C" (center) → "D" (center of optic disc) → "F" (center of macula). When "P3 (DCT)" is set, the setting changes in the following order: "C" (center) → "D" (center of optic disc) → "T" (temporal side).



Fixation target position display (at right eye)



Fixation target position display (at left eye)



SMALL PUPIL PHOTOGRAPHY

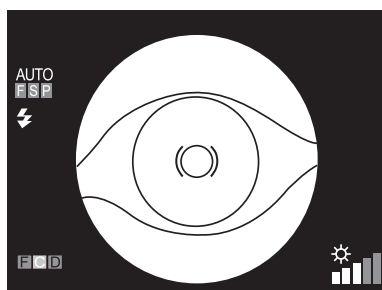
When the patient's pupil diameter is small, perform the small pupil photography. When the auto small pupil function is set to "ON", the small pupil diaphragm is automatically set. Take a picture in the same way as the procedure of "COLOR PHOTOGRAPHY (CENTER)" on page 39 and after. When the auto small pupil function is set to "OFF", take a picture by the following procedure. Even when the auto small pupil function is set to "ON", you can also take a picture by the following procedure.



For the patient's pupil condition, refer to "MEMO" on page 43. When you have judged before photographing that the pupil diameter is small or when the small pupil diaphragm mark blinks, it is recommended to take a picture using the following procedure.

1

Using the control lever, move the instrument body in all directions to get the patient's eye in the center of the color LCD monitor.



2

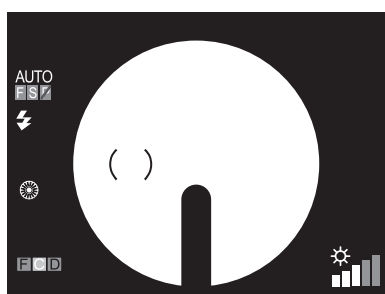
On the color LCD monitor, bring the () scale to the patient's pupil. If the patient's pupil is smaller than the () scale, press the **ILLUMINATION DIAPHRAGM SELECTOR SWITCH**.



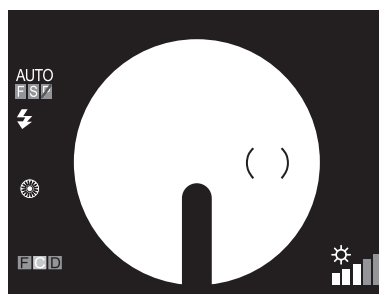
On the color LCD monitor, the small pupil diaphragm mark is displayed.

3

Slowly bring the base unit closer to the patient; the fundus image appears on the color LCD monitor.



Right eye



Left eye



When the fixation target is in the center, the () scale is displayed at the right side for right eye, and at the left side for left eye.

4

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

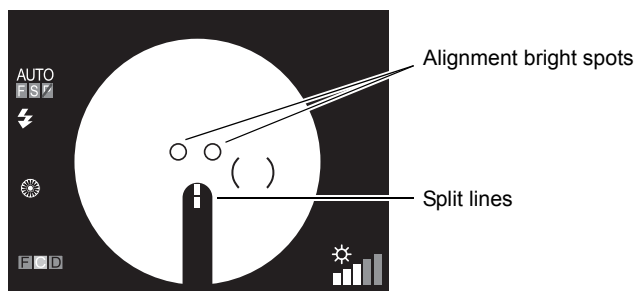
5

By operating the **ILLUMINATION LEVEL SWITCH**, adjust the brightness of the image while watching it on the color LCD monitor.



For details about the illumination level setting, see "Setting the illumination level" on page 39.

- 6** Bring the instrument even closer to the patient, and two bright spots for the working distance alignment become visible.



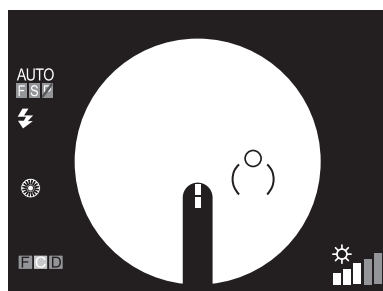
When the auto focus function is ON, the instrument changes the split lines into one line. At this time, the fundus is almost in focus.

The auto focus mechanism will not work for ocular pathology (e.g. strong cataract), myopia and hyperopia (beyond -13 and greater than +12D), etc.

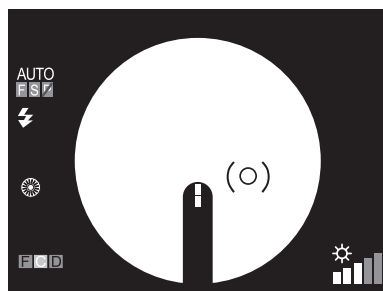


When the auto focus function is OFF, operate the focusing knob to change the split lines into one line on the color LCD monitor.

- 7** Operate the control lever until the two alignment bright spots are changed to one spot.



- 8** Operate the control lever and move the instrument body to bring the bright spot into the () scale on the color LCD monitor.



9 When the relationship between the instrument body and the patient's eye is correct for photography, the instrument automatically takes a picture.



When flares appear in the peripheral section, the instrument does not take a picture automatically even if the auto shoot function is ON.

Check the bright spot on the color LCD monitor and press the photography switch to take a picture.



When the auto shoot function is OFF, the instrument does not take a picture automatically.

Check the bright spot on the color LCD monitor and press the photography switch to take a picture.



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

For details, see "Changing the diopter compensation lens" on page 41.

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



If the split lines cannot be seen, check if the eye is obstructed by eyelashes or the eyelid.



Upon condition that the digital magnification mode is set, when the auto small pupil function is ON and small pupil is detected or when you take a picture by pressing the switch, the image is stored with the digital magnification 30° in an image filing system. When the image is printed in this setting status, it is printed with the digital magnification 30°. When shipped, the digital magnification mode is not set. For details, contact your dealer or TOPCON (see the back cover).

ANTERIOR SEGMENT PHOTOGRAPHY

Setting the picture position

Set the fixation target in the center with the **FIXATION TARGET SELECTOR SWITCH**.

Setting the illumination level

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

See "Setting the illumination level" on page 39.

Setting the flash level

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

See "Setting the flash level" on page 40.

Changing the diopter compensation lens

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

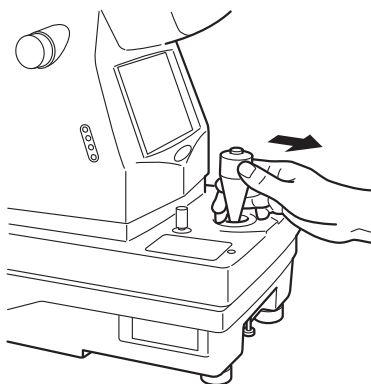
See "Changing the diopter compensation lens" on page 41.

Centering and photography

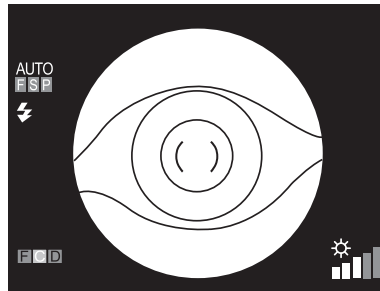
The centering operation is done with the control lever.

For details about movement/adjustment of the instrument body with the control lever, see the "MEMO" on page 42.

- 1** Hold the control lever and pull the instrument back toward the operator. Observe the anterior segment image on the color LCD monitor.



- 2** Move the instrument body in all directions by the control lever until the patient's eye is in the center of the color LCD monitor.



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

IMAGE PLAYBACK MODE

Reading the image

- 1 Press the **IMAGE PLAYBACK SWITCH** on the Monitor screen. The screen to select the recording medium whose image should be read appears on the color LCD monitor.
- 2 Press the **DOWNWARD CURSOR SWITCH** or **UPWARD CURSOR SWITCH** to select "CF CARD" or "USB MEMORY".



This operation is necessary only when both CF CARD and USB memory are used.

- 3 Press the **ENTER SWITCH** to decide the selected item. The image is read from the selected recording medium.



In this condition, press the **LEFTWARD CURSOR SWITCH**, and the preceding photographed image is displayed. Press the **RIGHTWARD CURSOR SWITCH**, and the next photographed image is displayed.

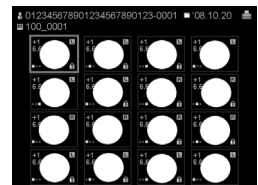
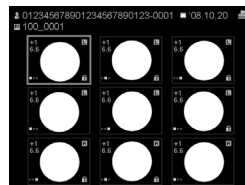
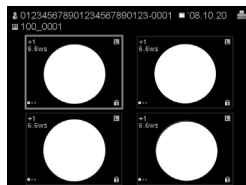
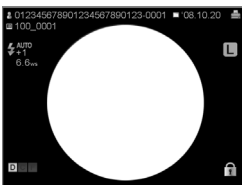
- 4 To exit from the image playback mode, press the **IMAGE PLAYBACK SWITCH**.

Zooming the playback image

- 1 Press the **ZOOM SWITCH** in the playback mode.
- 2 Each time you press the **ZOOM SWITCH**, the image magnification is changed by "1×", "2×" and "4×".
- 3 You can move the enlarged image position with the **UPWARD CURSOR SWITCH**, **DOWNWARD CURSOR SWITCH**, **LEFTWARD CURSOR SWITCH** and **RIGHTWARD CURSOR SWITCH**.

Thumbnail display

- 1 Press the **THUMBNAIL SWITCH** in the playback mode.
- 2 Each time you press the **THUMBNAIL SWITCH**, the image is changed to "4", "9" and "16" in the thumbnail status.



(1 image is reproduced.) → (4 images are reproduced.) → (9 images are reproduced.) → (16 images are reproduced.)

- 3 Press the **LEFTWARD CURSOR SWITCH**, **RIGHTWARD CURSOR SWITCH**, **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH**, and the selected image is moved in each direction. After the image at the end is selected, the page is changed to the next.




The image encircled with the orange frame is the selected one.

- 4 Press the **ENTER SWITCH**, and the selected image is decided.

Printing the image

When a digital printer appropriate to Pict Bridge is connected to the instrument, direct print can be performed.

- 1 Display the image to be printed on the color LCD monitor.
- 2 Make sure that the printer recognition icon [] appears on the color LCD monitor and press the **PRINT SWITCH**.
- 3 The message "PRINT CURRENT OK?" and the screen to select "YES" or "NO" appear. Select "YES" to execute printing, and "NO" to suspend printing with the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH**. Then, press the **ENTER SWITCH**.



When the preview screen appears right after taking a picture, the image is also printed by pressing the **PRINT SWITCH**.



You can also print images through the menu in the image playback mode. (Refer to P.56.)

Deleting the image

- 1 Display the image to be deleted and press the **IMAGE DELETION SWITCH**.
- 2 The message "DELETE?" and the screen to select "ALL", "CURRENT" or "CLOSE" appear. Press the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH** to select "CURRENT". Then, press the **ENTER SWITCH**.



When selecting "CLOSE", the playback screen appears again without deleting the image. When selecting "ALL", all the images in the record media are deleted.



You can also delete images through the menu in the image playback mode. (Refer to P.56.)

Protecting the image

You can apply "Protect" to the important image. The protected image cannot be deleted.

- 1 Display the image to be protected.
- 2 Press the **PROTECT SWITCH**. "Protect" is applied to the displayed image.



When "Protect" is applied, the "Protect" icon [] is displayed at the lower right corner on the screen.

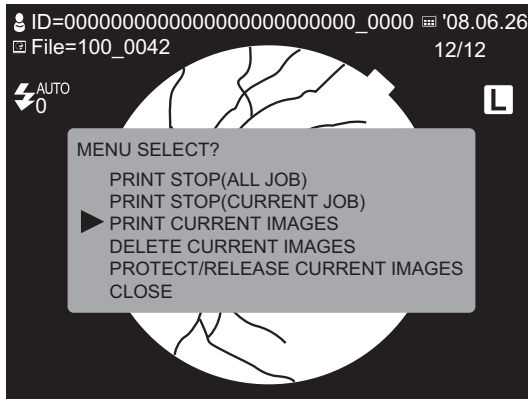


You can also protect images through the menu in the image playback mode. (Refer to P.56.)

Menu in the image playback mode

You can execute and stop printing, and delete and protect images according to the following procedure.

- 1 Press the **MENU SWITCH** in the image playback mode, and the following menu is displayed.



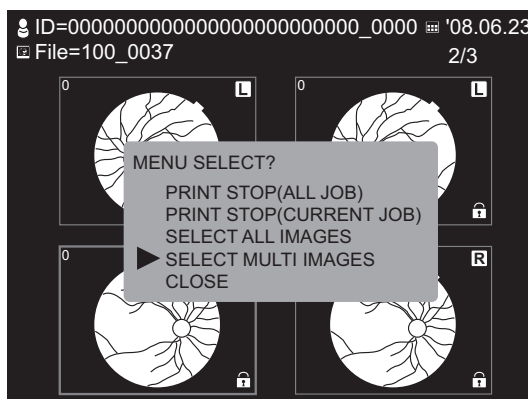
- PRINT STOP (ALL JOB)
Stops printing for all of the reserved images.
- PRINT STOP (CURRENT JOB)
Stops printing for only the images being printed.
- PRINT CURRENT IMAGES
Prints the images displayed on the screen.
- DELETE CURRENT IMAGES
Deletes the images displayed on the screen.
- PROTECT/RELEASE CURRENT IMAGES
Applies "Protect" to the images displayed on the screen.
When "Protect" has already been applied to the images, "Protect" is canceled.
- CLOSE
Exists from this menu.

- 2 Press the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH** to select a desired item.

- 3 Press the **ENTER SWITCH**, and the selected item is executed.



While the images are displayed in the thumbnail status, the following menu appears. The operations are the same as above.



- PRINT STOP (ALL JOB)
Stops printing for all of the reserved images.
- PRINT STOP (CURRENT JOB)
Stops printing for only the images being printed.
- SELECT ALL IMAGES
Selects all the images at a time.
- SELECT MULTI IMAGES
Shifts to the multi-selection screen.
- CLOSE
Exits from this menu.

Multi-selection

When selecting "SELECT MULTI IMAGES" in the menu while the images are displayed in the thumbnail status, the multi-selection screen appears. On the multi-selection screen, two or more images can be selected at the same time. The background is green on the multi-selection screen. The operations are the same as those in the normal thumbnail status.

1 Select "SELECT MULTI IMAGES" in the menu while the images are displayed in the thumbnail status.

2 Press the **LEFTWARD CURSOR SWITCH**, **RIGHTWARD CURSOR SWITCH**, **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH**, and the selected image is moved in each direction. After the image at the end is selected, the page is changed to the next.



The image encircled with the orange frame is the selected one.

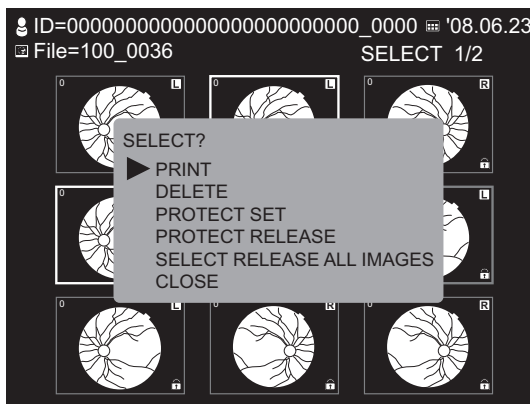
3 Press the **ENTER SWITCH**, and the selected image is decided.



When the selected image is decided, the image frame is changed to yellow.

4 When you want to select more images, repeat Step **2** to Step **3**.

5 After selecting the images, press the **MENU SWITCH**. The following menu is displayed.



- **PRINT**
Prints the selected image.
- **DELETE**
Deletes the selected image.
- **PROTECT SET**
Applies "Protect" to the selected image.
- **PROTECT RELEASE**
Cancels "Protect" of the selected image.
- **SELECT RELEASE ALL IMAGES**
Cancels the whole selection of images.
- **CLOSE**
Exits from the menu.

6 Press the **UPWARD CURSOR SWITCH** or **DOWNWARD CURSOR SWITCH** to select the item to be executed. Then, press the **ENTER SWITCH**.

BEFORE REQUESTING SERVICE

TROUBLESHOOTING

Messages displayed during operation

Error message	Explanation	How to cancel
NO CFCARD!!	The CF card is not inserted.	Press the PHOTOGRAPHY SWITCH to cancel the error message. Insert the CF CARD or set "OFF" for the CF CARD.
CF FULL!!	The CF CARD does not have sufficient capacity.	Press the PHOTOGRAPHY SWITCH to cancel the error message. Then, delete the images in the CF CARD or connect a new CF CARD.
USB MEMORY FULL!!	The USB memory does not have sufficient capacity.	Press the PHOTOGRAPHY SWITCH to cancel the error message. Then, delete the images in the USB memory or connect a new USB memory.
PC NOT READY!!	<ul style="list-style-type: none">• The external device is not connected to the instrument with the USB cable.• The photography software (image filing system, etc.) of the external device does not start.• The photography software (image filing system, etc.) of the external device is not in the photography possible condition.	<ul style="list-style-type: none">• Check if the external device is correctly connected to the instrument.• Check if the photography software (image filing system, etc.) of the external device starts.• Check if the photography software (image filing system, etc.) of the external device is in the photography possible condition.
INTERLOCK ERROR!!	The cover is open.	Close the cover.
CF CARD HARDWARE ERROR!!	There is an error caused by hardware in the CF CARD.	Replace the CF CARD.
CF CARD FORMAT ERROR!!	The CF CARD cannot be formatted.	Replace the CF CARD.
TRANSFER IMAGE TIME OUT!!	While the photographed image is being transferred to the photography software (image filing system, etc.) of the external device, the time-out error has occurred.	Check the condition of the photography software (image filing system, etc.) of the external device.
BATTERY EMPTY	The battery is run down.	Contact your dealer or TOPCON (see the back cover).

Warning message

Warning message	Explanation
DIGIT NUMBER OF ID IS OVER!!	The digits of the ID, which was sent from the photography software (image filing system, etc.) of the external device, are beyond the specified number.



If one of the following errors has occurred, turn off the power switch and contact your dealer or TOPCON (see the back cover).

Error message	Explanation
COM OPEN ERROR!!	The port to be used for internal communication cannot be opened in the instrument.
CHECK CAMERA!!	An error has occurred in the connection with the photography camera.
LIVE CAPTURE ERROR!!	An error has occurred in the "LIVE" display for observation.
COM CONNECT ERROR!!	A connection error has occurred during the internal communication in the instrument.
GPIO OPEN ERROR!!	The I/O port to be used in the inside of the instrument cannot be opened.
PCB INITIALIZE ERROR!!	An error has occurred during the firmware initialization.
AF INITIALIZE ERROR!!	The initialization of the auto-focus motor has failed.
CHARGE ERROR!!	An error has occurred while charging is done for the xenon lamp to be used for flash.
SAVE IMAGE ERROR - CF CARD!!	The photographed image cannot be saved in the CF card.
SAVE IMAGE ERROR - USB MEMORY!!	The photographed image cannot be saved in the USB memory.

Troubleshooting



WARNING

To avoid electric shock, do not attempt disassembling, rebuilding and/ or repairs on your own. Ask your dealer for repairs.



WARNING

Do not remove the covers from the main unit, chinrest unit or power supply unit except for the lamp house cover. You may receive an electric shock.

When an error is encountered, review the Check List below.

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

Check List

Problem	Condition	Check	Page
Color LCD monitor does not work.	• Power cable not connected.	Connect power cable.	22
	• Fuse has blown.	Change fuse.	74
	• Power save function is on (flickering power lamp).	Press Photography switch and cancel power save function.	35
Periphery of photographic image is dark.	• Centering is incorrect.	Adjust centering.	42
	• Focusing is incorrect.	Adjust focus.	44
	• Patient's pupil is not large enough.	Darken room and thoroughly dilate patient's pupil.	43
Photographic image is flared all over. (The whole is covered with light.)	• Centering is incorrect.	Adjust centering.	42
	• Focusing is incorrect.	Adjust focus.	44
	• Opacity in patient's eye.	Flare cannot be removed.	—
Photographic image has a dim white spot.	• Objective lens is soiled.	Clean lens.	78
	• Eyelashes were in the way the moment the photograph was taken. (Dim light was seen at the screen bottom the moment the camera was aligned.)	Let patient open eye wider and take picture again. If not wide enough, open eyelid (i.e., Take picture holding eyelid open).	45
Photographic image is dark all over.	• Flash level is insufficient.	Adjust flash level (Flash level switch).	40
	• Xenon set screws are loose.	Refasten the xenon PCB.	73
	• Xenon lamp has served its life.	Change xenon lamp.	72
The "AUTO" function does not work.	• The diopter compensation lens is not inserted.	Set the diopter compensation lens selector to "0".	41
	• The external fixation target is set.	Set the internal fixation target.	29
Illumination lamp does not turn on.	• Power save function is on (flickering power lamp).	Press Photography switch and cancel power save function.	35
	• Lamp terminal is loose.	Refasten lamp terminal.	72
	• Fuse has blown.	Change fuse.	74
	• The lamp has burned out.	Change lamp.	71
Internal fixation target cannot be seen.	• Centering is incorrect.	Adjust centering.	42
	• Setting is to external fixation target.	Reset to internal fixation target.	29
	• Fuse has blown	Change fuse.	74
() scale is off monitor center.	• Internal fixation target is set to periphery.	Press fixation target selector switch to set the fixation target in the center.	48

Problem	Condition	Check	Page
Split lines cannot be seen.	• Split line is set to OFF.	Turn split line ON (Split switch).	12
	• Diopter compensation lens selector is not set to (0).	Return diopter compensation lens selector to (0).	41
	• Patient's pupil is not large enough.	Darken room and thoroughly dilate patient's eye.	43
Xenon lamp does not turn on.	• Power save function is on (flickering power lamp).	Press Photography switch and cancel power save function.	35
	• Xenon lamp has served its life.	Change xenon lamp.	72
	• Anomaly in external recording device.	Check power supply, settings, paper, etc.	—
Cannot get patient's pupil center.	• Is the patient's chin and forehead positioned correctly on the forehead rest and chinrest? Is the patient facing sideways?	Have patient correct their position.	38
	• Patient's face height is incorrect.	Adjust the face height with the chinrest switch.	38
Nothing is recorded in external recording device.	• Anomaly in external recording device.	Check power supply, settings, paper, etc.	—
	• Cable connections are incorrect.	Check and correct cable connections.	23
A black shadow appears at the center of the photographed image.	• Does the patient have myopia of -10D or more?	This shadow always appears because of the optical principle of the product. It does not indicate any trouble.	—
	• Is the reflection from fundus very strong in the patient's eye?		

* A part of pixels might keep ON or OFF due to the characteristics of the color LCD monitor, but it is not a trouble. Please use the instrument as it is. This phenomenon does not affect the image data.

SPECIFICATIONS & PERFORMANCE

SPECIFICATIONS

Picture angle	45°
Working distance	40.7mm
Photographable area of pupil	φ4.0mm or more (φ3.3mm or more when the small pupil diaphragm is used)
Focus range to correct the refractive errors of the patient's eye	0 : -13D to +12D *1) - : -33D to -12D + : +9D to +40D
Internal fixation target	Center : Fixed 4 points Temporal side : Fixed 1 point Nasal side : Fixed 1 point Right/left eye automatic detection
Auto focus function	Used only in the split line working range. (This can be turned ON/OFF.)
Base movement	Back-forth : 46mm Right-left : 100mm Up-down : 30mm
Chinrest movement	67mm

*1) Split line working range

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

Essential performance
• Photographing must be performed correctly.

ELECTROMAGNETIC COMPATIBILITY


This product conforms to the EMC Standard (IEC 60601-1-2 Ed.3.0: 2007).

- a) MEDICAL ELECTRICAL EQUIPMENT needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the ACCOMPANYING DOCUMENTS.
- b) Portable and mobile RF communications equipment can affect MEDICAL ELECTRICAL EQUIPMENT.
- c) The use of ACCESSORIES, transducers and cables other than those specified, with the exception of transducers and cables sold by the manufacturer of the EQUIPMENT or SYSTEM as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of the EQUIPMENT or SYSTEM.
- d) The EQUIPMENT or SYSTEM should not be used adjacent to or stacked with other equipment. IF adjacent or stacked use is necessary, the EQUIPMENT or SYSTEM should be observed to verify normal operation in the configuration in which it will be used.
- e) The use of the ACCESSORY, transducer or cable with EQUIPMENT and SYSTEMS other than those specified may result in increased EMISSION or decreased IMMUNITY of the EQUIPMENT or SYSTEM.

Item	Parts code	Length (m)
AC power cord	44804 7002	1.5
USB cable	40422 74100	2.0
USB cable (for USB keyboard)	—	2.0
USB cable (for USB mouse)	—	1.5

Guidance and manufacturer's declaration - electromagnetic emissions		
The TRC-NW300 is intended for use in the electromagnetic environment specified below. The customer or the user of the TRC-NW300 should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The TRC-NW300 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	
Harmonic emissions IEC61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC61000-3-3	Complies	

Guidance and manufacturer's declaration - electromagnetic immunity			
The TRC-NW300 is intended for use in the electromagnetic environment specified below. The customer or the user of the TRC-NW300 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV line(s) to line(s) ±2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_t (>95% dip in U_t) for 0.5 cycle 40% U_t (60% dip in U_t) for 5 cycles 70% U_t (30% dip in U_t) for 25 cycles <5% U_t (>95% dip in U_t) for 5 sec	<5% U_t (>95% dip in U_t) for 0.5 cycle 40% U_t (60% dip in U_t) for 5 cycles 70% U_t (30% dip in U_t) for 25 cycles <5% U_t (>95% dip in U_t) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user or the TRC-NW300 requires continued operation during power mains interruptions, it is recommended that the TRC-NW300 be powered from an uninterruptible power supply or battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_t is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic immunity			
The TRC-NW300 is intended for use in the electromagnetic environment specified below. The customer or the user of the TRC-NW300 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150kHz to 80MHz</p> <p>3 V/m 80MHz to 2.5GHz</p>	<p>3 V</p> <p>3 V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the TRC-NW300, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance</p> $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P} \quad 80\text{MHz to } 800\text{MHz}$ $d = 2.3\sqrt{P} \quad 80\text{MHz to } 2.5\text{GHz}$ <p>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,^a should be less than the compliance level in each frequency range.^b</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p>NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p>^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the TRC-NW300 is used exceeds the applicable RF compliance level above, the TRC-NW300 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the TRC-NW300.</p>			
<p>^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

Recommended separation distance between portable and mobile RF communications equipment and the TRC-NW300			
The TRC-NW300 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the TRC-NW300 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the TRC-NW300 as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150kHz to 80MHz $d = 1.2\sqrt{P}$	80MHz to 800MHz $d = 1.2\sqrt{P}$	800MHz to 2.5GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

REQUIREMENTS FOR THE EXTERNAL DEVICE

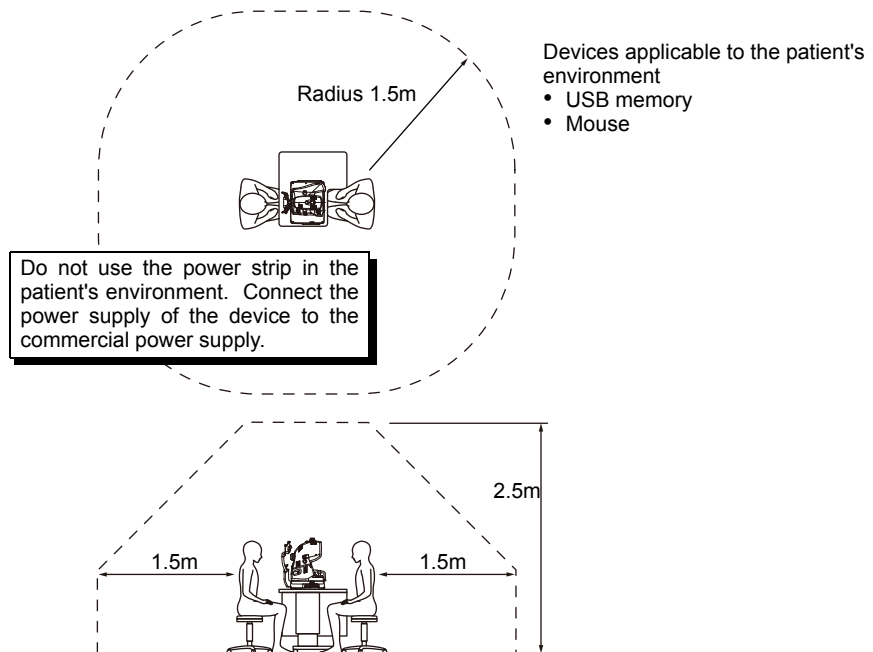
The external device connected to the analog and digital interfaces must comply with the respective IEC or ISO standards (e.g. IEC 60950 for data processing equipment and IEC 60601-1 for medical equipment).

Anybody connecting additional equipment to medical electrical equipment configures a medical system and is therefore responsible that the system complies with the requirements for medical electrical systems. Attention is drawn to the fact that local laws take priority over the above mentioned requirements. If in doubt, contact your dealer or TOPCON(see the back cover).

PATIENT'S ENVIRONMENT

When the patient or inspector may touch the devices (including the connecting devices) or when the patient or inspector may touch the person that comes into contact with the devices (including the connecting devices), the patient's environment is shown below.

In the patient's environment, use the device conforming to IEC60601-1. If you are compelled to use any device not conforming to IEC60601-1, use an insulation transformer or the common protective earth system.



ELECTRIC RATING

Source voltage : AC100-240V

Frequency : 50-60Hz

Power input : NORMAL 100VA MAXIMUM 400VA

SYSTEM CLASSIFICATION

Types of protection against electric shocks: This instrument is classified as Class I equipment.

Class I equipment does not depend only on basic insulation for protection against electric shocks, but also provides a means of connection to a protective earth system of facilities so that metal parts that come into contact do not become conductive while the basic insulation is in failure.

Degree of protection against electric shocks: Type B applied part

Type B applied part is the applied part complying with the specified requirements of the Standard IEC 60601-1 to provide protection against electric shock, particularly regarding allowable LEAKAGE CURRENT.

Degree of protection against harmful ingress of water: IPX0

The TRC-NW300 has no protection against ingress of water. (The degree of protection against harmful ingress of water defined in IEC 60529 is IPX0.)

Classification according to the method(s) of sterilization or disinfection recommended by the manufacturer: not applicable.

The TRC-NW300 has no part to be sterilized or to be disinfected.

Classification according to the degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide: Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

The TRC-NW300 should be used in environments where no flammable anesthetics and/or flammable gases are present.

Classification according to the mode of operation: Continuous operation.

Continuous operation is the operation under normal load for an unlimited period, without the specified limits of temperature being exceeded.

DIMENSIONS AND WEIGHT

Dimensions : 274mm (W) × 508mm (D) × 528 - 558mm (H)

Weight : 22.7kg

OPERATION PRINCIPLE

The fundus of the patient's eye is illuminated by the infrared light emitted by the illumination optical system. The observation CCD camera built into the instrument receives the image and the image is indicated on the color LCD monitor allowing the operator to observe the fundus. After adjusting the photography position and focus, the visible light is emitted from the illumination optical system provided for photography by operating the photography switch of the instrument. The image is formed by the observation and photography optical systems. The built-in digital photography unit takes a picture of the image and the image is recorded in the memory card set in the instrument and/or the connected image filing system or external recording device, which is a commercial product.

The fundus of the patient's eye can also be illuminated, observed and photographed by the visible light after removing the IR filter from the illumination optical system.

MAINTENANCE

DAILY CHECKUPS



CAUTION

To prevent damage and injuries, install the instrument on a level surface.

Daily care

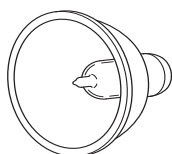
- Dust is a formidable foe to the instrument.
To ensure the production of fine images, care should be taken not to allow fingerprints and/or dirt on the objective lens.
When not in use, be sure to cap the objective lens and cover the instrument with the dust cover.
If the objective lens is stained, clean it following the instructions for "Cleaning the objective lens" on page 78.
- When not in use, always turn the **POWER SWITCH** OFF (○).

Ordering consumables

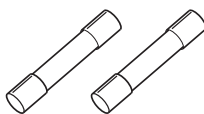
- When ordering consumables and spare parts, contact your dealer or TOPCON (see the back cover) and tell them the article name, article code and quantity.

Article name	Article code
Illumination lamp	40531 1817
Xenon lamp	40443 65701
Chinrest tissue paper	40310 4082
Dust cover	40488 1007

Article name	Article code
Fuse T 4AH 250V	T2400 0176A



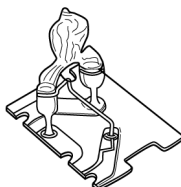
Illumination lamp



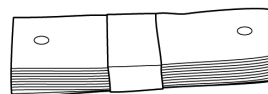
Fuse



Dust cover



Xenon lamp



Chinrest tissue paper



User maintenance items

Item	Inspection time	Contents
Inspection	Before using	<ul style="list-style-type: none">• The instrument must operate correctly.• The objective lens must be free of dirt or flaws, etc.
Cleaning	When the part is stained	<ul style="list-style-type: none">• Objective lens• External cover, control panel, etc.
Replacement	As required	<ul style="list-style-type: none">• Illumination lamp• Xenon lamp• Fuse

Manufacturer maintenance items

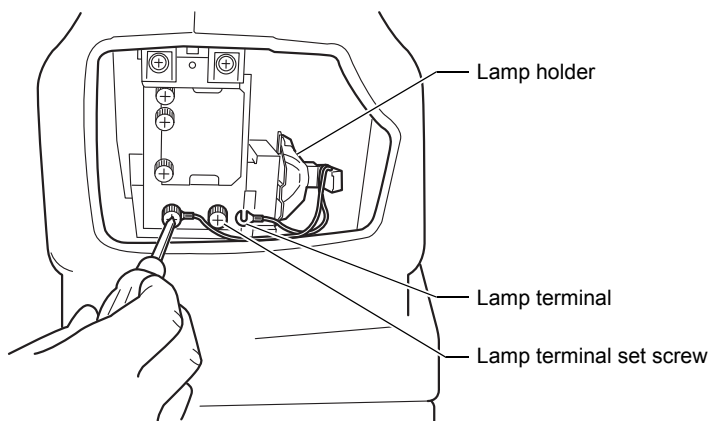
Item	Inspection time	Contents
Cleaning each unit	At least every 12 months	<ul style="list-style-type: none">• Cleaning the external parts• Cleaning the optical system• Cleaning the base unit
Operation check	At least every 12 months	<ul style="list-style-type: none">• Operation of the instrument• Operation of switches
Photography check	At least every 12 months	<ul style="list-style-type: none">• Focus, flare, central ghost and dust• Check the flash level.• Check the illumination level.

Replacing the illumination lamp

 CAUTION	To avoid electric shock, be sure to turn the power switch off and unplug the power cord before replacing the lamp.
 CAUTION	To avoid burns, allow lamp to cool before touching.
NOTE	To avoid whitening due to fingerprints, do not touch the lamp with bare fingers.
NOTE	Since the lamp is not shock resistant, handle it with particular care.

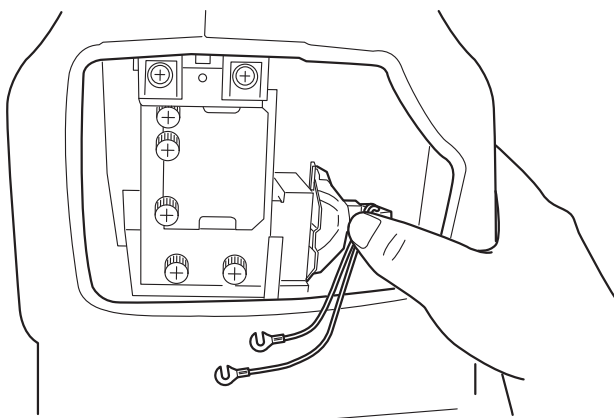
- The service life of the illumination lamp is approx. 2,000 hours.
Replace the illumination lamp if it becomes discolored.

- 1** Turn the **POWER SWITCH** OFF (○) and unplug the power cord.
- 2** Turn the control lever and raise the instrument body to it's limit.
- 3** Unscrew the lamp house cover with a coin, etc. to remove it.
- 4** Loosen the two set screws and remove the lamp terminal.



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

- 6** Hold the new lamp and slide it into the lamp holder until it stops at the end. Make sure that the lamp is firmly fixed in the lamp holder.



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



To avoid electric shock, if the lamp house cover is not correctly attached, an error is displayed on the color LCD monitor and operations, including photography, cannot be done.

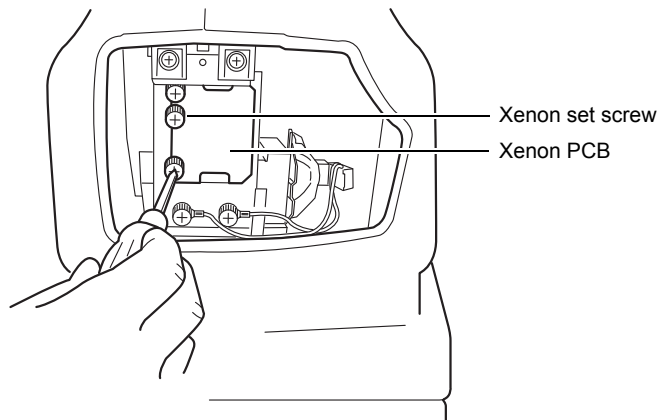
Replacing the xenon lamp

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

- The service life of the 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 wait for more than 5 minutes for the natural electrical discharge. Then, unplug the power cord.

- 2** Unscrew the lamp house cover with a coin, etc. to remove it.
- 3** Loosen the three xenon set screws.



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



To avoid electric shock, if the lamp house cover is not correctly attached, an error is displayed on the color LCD monitor and operations, including photography, cannot be done.

Changing the fuse



WARNING

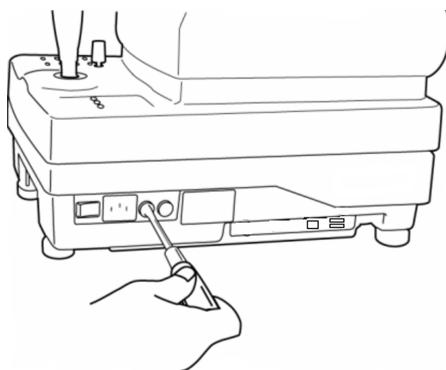
To avoid electric shock, unplug the power cord from the grounded outlet before removing the fuse cover. Do not connect the power cord to the grounded outlet with the fuse cover not correctly attached.



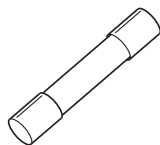
WARNING

To avoid fire in the event of an instrument malfunction, use only fuses that are fitted to the marked label at the side of the fuse holder.

- 1 Turn the **POWER SWITCH** OFF (○) and unplug the power cord.
- 2 With a slotted screwdriver, press and turn the fuse holder counterclockwise and remove it.



- 3 Replace the fuse with one of the same capacity.



Changing the fuse

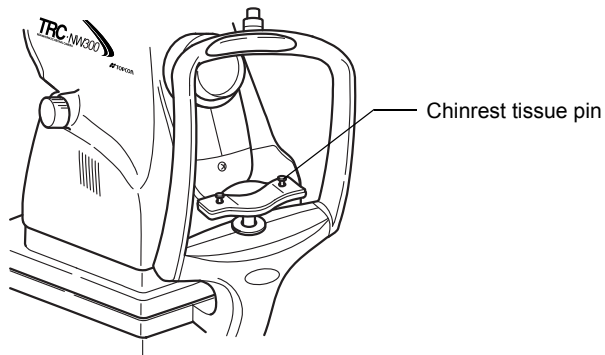
- 4 With a slotted screwdriver, lightly press and turn the fuse holder clockwise and fasten it.



When the fuse has blown, the entire instrument will not operate. Replace the fuse.

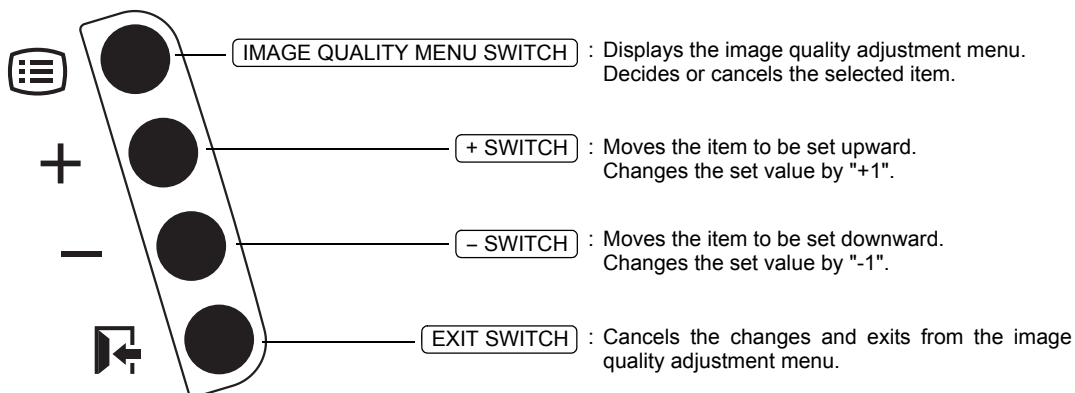
Supplying the chinrest tissue paper

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



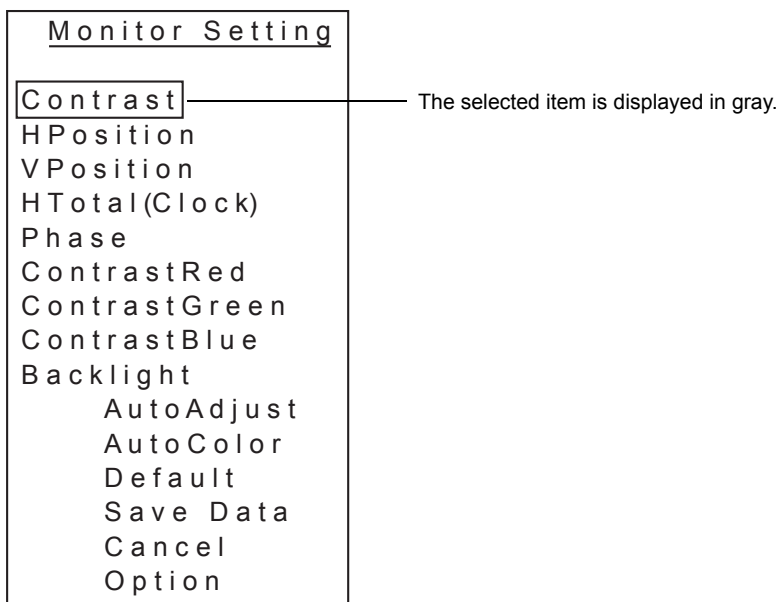
Adjusting the color LCD monitor

- This instrument is adjusted for the best image quality before shipment, however, readjustment may be required due to vibrations, etc., during transportation.
- The image quality adjustment switch is on the left side of the color LCD monitor. Contact your dealer for further adjustment of the image quality.
- Names of switches



- Image quality adjustment procedure of the color LCD monitor

- 1** Press the **IMAGE QUALITY MENU SWITCH**, and the image quality adjustment menu appears on the color LCD monitor.



- 2** Press the **+ SWITCH** or **- SWITCH** to move to a desirable item.
- 3** Press the **IMAGE QUALITY MENU SWITCH**. The selected item color is changed to yellow and you can change the set value.
- 4** Change the set value of the selected item with the **+ SWITCH** or **- SWITCH**.
- 5** Press the **IMAGE QUALITY MENU SWITCH**. The set value is decided and the selected item color is changed to gray.

6 If you want to change other items, repeat Step **2** to **5**.

7 Select "Save Data" and press the IMAGE QUALITY MENU SWITCH. The set value is saved and the image quality adjustment menu disappears.



When the switches are not operated for 10 seconds or more during setting, the setting procedure is finished, the set value is saved and the image quality adjustment menu disappears.

- Items and contents for image quality adjustment

Page 1

Set item	Contents
Contrast	Adjusts the contrast for all RGB colors.
HPosition	Adjusts the horizontal position.
VPosition	Adjusts the vertical position.
Htotal (clock)	Sets the horizontal total number.
Phase	Sets the phase. (Glimmer adjustment)
Contrast Red	Adjusts the red contrast. (Digital setting)
Contrast Green	Adjusts the green contrast. (Digital setting)
Contrast Blue	Adjusts the blue contrast. (Digital setting)
Backlight	Adjusts the brightness.
Auto Adjust	Adjusts the position automatically.
Auto Color	Adjusts the color automatically.
Default	Returns the set data to the condition when shipped.
Save Data	Saves the set data.
Cancel	Cancels the data and erases the image quality adjustment menu.
Option	Displays page 2.

Page 2

Set item	Contents
Red Gain	Adjusts the red ADC gain. (Analog setting)
Green Gain	Adjusts the green ADC gain. (Analog setting)
Blue Gain	Adjusts the blue ADC gain. (Analog setting)
Red Offset	Adjusts the red ADC offset. (Analog setting)
Green Offset	Adjusts the green ADC offset. (Analog setting)
Blue Offset	Adjusts the blue ADC offset. (Analog setting)
Filter	Sets the space filter.
Gamma	Sets the gamma value.
OSD HPosition	Adjusts the horizontal position of the image quality adjustment menu screen.
OSD VPosition	Adjusts the vertical position of the image quality adjustment menu screen.
OSD Effect	Sets the transparent effect of the image quality adjustment menu screen.
OSD Time Out	Sets the "OFF" time of the image quality adjustment menu screen.
Default	Returns the set data to the condition when shipped.
Save Data	Saves the set data.
Cancel	Displays page 1.

CLEANING

Cleaning the external cover, control panel and color LCD monitor screen

NOTE	To prevent the plastic parts of the instrument body from discoloring and deteriorating, do not use volatile solvents for cleaning, including benzine, thinner, ether, gasoline, etc.
-------------	--

- 1** When the external cover, control panel and color LCD monitor screen become stained, clean them with a dry cloth.
- 2** If the external cover is badly stained, prepare a tepid solution of neutral detergent for kitchenware. Moisten the cloth with the aforementioned solution and wring it thoroughly. Then wipe the cover with the cloth.

Cleaning the parts which come into contact with the patient

Before and after using the instrument, clean the parts with a clean gauze pad moistened with sterilizing alcohol.

Cleaning the objective lens

When the objective lens is soiled, clean it according to the following procedure. The dustproof coated objective lens is used in this instrument. The wiping method is different from a conventional coated lens.

- To check the objective lens, set the **POWER SWITCH** to "ON" (|) and turn the illumination lamp ON.
Darken the room. Pull out the IR filter selector and set the visible light for the observation illumination.
Press the **ILLUMINATION LEVEL SWITCH (+)** four times to set the maximum light intensity.
Examine the objective lens diagonally from the front. The lens condition can be seen clearly.
- Dust and dirt adhered to the surface
Blow them off using a blower.
Be careful to prevent the blower end from touching the objective lens.
- When the stain is simple such as dust, tears or saliva:
 - 1** Breathe toward the objective lens and wipe it with a lens cleaning paper carefully.
 - 2** If your lens cleaning paper is dirty, replace it with a clean one and repeat step **1**.
 - 3** Repeat steps **1** and **2** until no stain is seen on the lens.

- When the stain is persistent:

- 1** Moisten a lens cleaning paper with reagent ethanol. Wipe the objective lens with the lens cleaning paper by rubbing lightly.
- 2** If your lens cleaning paper is dirty, replace it with clean one and repeat step **1**.
- 3** Repeat steps **1** and **2** until no stain is seen on the lens.
- 4** Finally, wipe the objective lens with a dry lens cleaning paper. It is o.k. to wipe the lens after breathing on it.



Don't use the following methods because the lens can be damaged.

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



Use a soft lens cleaning paper without fiber.

- For example, BEMCOT (Asahikasei)



Don't let any strong-alkaline liquid adhere to the objective lens.

If such liquid adheres to the lens, immediately wipe it off.

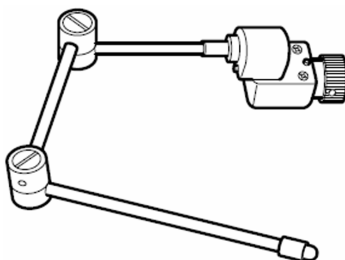


If it is difficult to remove a stain from the objective lens, contact your dealer or TOPCON (see the back cover).

OPTIONAL ACCESSORIES

EXTERNAL FIXATION TARGET EF-2

This is used to guide the patient's fixed sight.



OTHER OPTIONAL ACCESSORY

- CompactFlash™ card (TS1GCFX8192SI made by Transcend Information Inc.)











Use the CompactFlash™ card specified by TOPCON. If not, TOPCON will not guarantee the operation of the instrument.

REFERENCE MATERIAL

SHAPE OF PLUG

Country	Voltage/frequency	Shape of plug
Mexico	110V/50Hz	Type C&E
Argentina	220V/60Hz	Type A
Peru	220V/60Hz	Type A
Venezuela	110V/50Hz	Type C&E
Bolivia & Paraguay	220V/60Hz	Type A (Most common) Type H (Infrequently)
Chile	220V/60Hz	Type A
Colombia	110V/50Hz	Type C
Brazil	220V/60Hz 127V/60Hz	Type A Type C
Ecuador	110V/50Hz	Type C&E
USA	120V/60Hz	Type A (Hospital Grade)
Canada	120V/60Hz	Type A (Hospital Grade)

SYMBOL

Symbol	IEC/ISO Publication	Description	Description (French)
	IEC 60417-5032	Alternating Current	Courant alternatif
	IEC 60417-5008	Off (power: disconnection from the main power supply)	Éteint (courant: coupure avec le secteur)
	IEC 60417-5007	On (power: connection to the main power supply)	Allumé (courant: raccordement sur le secteur)
	IEC 60878-02-02	Type B applied part	Partie appliquée du Type B
	ISO 7010-W001	General warning sign	Symbole d'avertissement général
	ISO 7010-M002	Refer to instruction manual/booklet	Voir le manuel/la brochure
	ISO 7000-2497	Date of manufacture	Date de fabrication
	ISO 7000-2498	Serial number	Numéro de série

USABLE AUTOMATIC INSTRUMENT TABLE

Automatic instrument table AIT-16

Because the instrument height is adjustable, you can take a picture more easily.

Specifications

- Dimensions 525 (W) × 490 (D) mm
- Table height..... 660 - 880mm
- Table size 490 × 500mm
- Weight..... Approx. 23kg (only the instrument body)
- Power consumption 220VA
- Maximum load..... 50kg

RELATION BETWEEN SETTING OF ILLUMINATION/ FLASH LEVEL AND MAXIMUM RADIANCE

When the maximum radiance is "1", the ratio of radiance is shown below in setting of illumination/flash level.

Illumination level

Indicated set value	Level ratio
1	0.210
2	0.312
3	0.451
4	0.636
5	1.000

Flash level

Indicated set value	Level ratio
0.7	0.022
0.8	0.025
1.0	0.027
1.2	0.033
1.4	0.036
1.7	0.041
2.0	0.047
2.3	0.054
2.8	0.063
3.3	0.070
3.9	0.081
4.7	0.100
5.6	0.114
6.6	0.131
7.9	0.154
9.4	0.177
11	0.203
13	0.233
16	0.268
19	0.291
22	0.334
27	0.411
32	0.507
38	0.616
45	0.707
53	0.812
63	1.000

END USER LICENSE AGREEMENT

- You have acquired a device (DEVICE) that includes software licensed by TOPCON CORPORATION (TOPCON) from Microsoft Licensing Inc. or its affiliates (MS). Those installed software products of MS origin, as well as associated media, printed materials, and "online" or electronic documentation (SOFTWARE) are protected by international intellectual property laws and treaties. The SOFTWARE is licensed, not sold. All rights reserved.
- IF YOU DO NOT AGREE TO THIS END USER LICENSE AGREEMENT (EULA), DO NOT USE THE DEVICE OR COPY THE SOFTWARE. INSTEAD, PROMPTLY CONTACT TOPCON FOR INSTRUCTIONS ON RETURN OF THE UNUSED DEVICE(S) FOR A REFUND. **ANY USE OF THE SOFTWARE, INCLUDING BUT NOT LIMITED TO USE ON THE DEVICE, WILL CONSTITUTE YOUR AGREEMENT TO THIS EULA (OR RATIFICATION OF ANY PREVIOUS CONSENT).**

GRANT OF SOFTWARE LICENSE. This EULA grants you the following license:

- You may use the SOFTWARE only on the DEVICE.
- **NOT FAULT TOLERANT.** THE SOFTWARE IS NOT FAULT TOLERANT. TOPCON HAS INDEPENDENTLY DETERMINED HOW TO USE THE SOFTWARE IN THE DEVICE, AND MS HAS RELIED UPON TOPCON TO CONDUCT SUFFICIENT TESTING TO DETERMINE THAT THE SOFTWARE IS SUITABLE FOR SUCH USE.
- **NO WARRANTIES FOR THE SOFTWARE.** THE SOFTWARE is provided "AS IS" and with all faults. THE ENTIRE RISK AS TO SATISFACTORY QUALITY, PERFORMANCE, ACCURACY, AND EFFORT (INCLUDING LACK OF NEGLIGENCE) IS WITH YOU. ALSO, THERE IS NO WARRANTY AGAINST INTERFERENCE WITH YOUR ENJOYMENT OF THE SOFTWARE OR AGAINST INFRINGEMENT. **IF YOU HAVE RECEIVED ANY WARRANTIES REGARDING THE DEVICE OR THE SOFTWARE, THOSE WARRANTIES DO NOT ORIGINATE FROM, AND ARE NOT BINDING ON, MS.**
- No Liability for Certain Damages. **EXCEPT AS PROHIBITED BY LAW, MS SHALL HAVE NO LIABILITY FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING FROM OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THE SOFTWARE. THIS LIMITATION SHALL APPLY EVEN IF ANY REMEDY FAILS OF ITS ESSENTIAL PURPOSE. IN NO EVENT SHALL MS BE LIABLE FOR ANY AMOUNT IN EXCESS OF U.S. TWO HUNDRED FIFTY DOLLARS (U.S. \$250.00).**
- **Limitations on Reverse Engineering, Decompilation, and Disassembly.** You may not reverse engineer, decompile, or disassemble the SOFTWARE, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation.
- **SOFTWARE as a Component of the DEVICE - Transfer.** This license may not be shared, transferred to or used concurrently on different computers. The SOFTWARE is licensed with the DEVICE as a single integrated product and may only be used with the DEVICE. If the SOFTWARE is not accompanied by a DEVICE, you may not use the SOFTWARE. You may permanently transfer all of your rights under this EULA only as part of a permanent sale or transfer of the DEVICE, provided you retain no copies of the SOFTWARE. If the SOFTWARE is an upgrade, any transfer must also include all prior versions of the SOFTWARE. This transfer must also include the Certificate of Authenticity label. The transfer may not be an indirect transfer, such as a consignment. Prior to the transfer, the end user receiving the SOFTWARE must agree to all the EULA terms.

- **EXPORT RESTRICTIONS.** You acknowledge that SOFTWARE is subject to U.S. and European Union export jurisdiction. You agree to comply with all applicable international and national laws that apply to the SOFTWARE, including the U.S. Export Administration Regulations, as well as end-user, end-use and destination restrictions issued by U.S. and other governments. For additional information see <http://www.microsoft.com/exporting/>.

PRODUCT SPECIFIC TERMS:

- **RESTRICTED FUNCTIONALITY.** You are licensed to use the SOFTWARE to provide only the limited functionality (specific tasks or processes) for which the DEVICE has been designed and marketed by TOPCON. This license specifically prohibits any other use of the SOFTWARE programs or functions, or inclusion of additional software programs or functions that do not directly support the limited functionality on the DEVICE.

(a) Notwithstanding the foregoing, you may install or enable on the DEVICE systems utilities, resource management or similar software (including without limitation anti-virus software) (collectively, "Support Software") solely for the purpose of administration, performance enhancement and/or preventive maintenance of the DEVICE. You acknowledge and agree that with respect to any Support Software: (i) the Support Software may not be compatible with the SOFTWARE installed on your DEVICE; (ii) no warranty is provided by MS, Microsoft Corporation or their affiliates for any Support Software that you may install on your DEVICE; and (iii) neither MS, Microsoft Corporation nor their affiliates is responsible for technical support of any Support Software you may install on your DEVICE. Please contact TOPCON if you have any questions regarding any Support Software that you are considering installing on your DEVICE.

(b) The DEVICE may use terminal services protocols (such as Remote Desktop Protocol, Remote Assistance or Independent Computer Architecture) to connect or access Applications (as defined below) running on a server; however, these Applications may not run locally on the DEVICE. For purposes of this provision, "Applications" mean software that provides any of the following functionality: consumer or business tasks or processes performed by a computer or computing device, including email, word processing, spreadsheets, database, scheduling, or personal finance.

- **DEVICE CONNECTIONS.** The SOFTWARE may not be used by more than two (2) processors at any one time on the DEVICE. You may permit a maximum of ten (10) computers or other electronic devices to connect via Server Message Block (SMB) to the DEVICE to utilize one or more of the following services of the SOFTWARE: (a) file services, print services, (b) Internet information services and/or (c) remote access (including connection sharing). The ten connection maximum includes any indirect connections made through "multiplexing" or other software or hardware which pools or aggregates connections. This ten connection maximum does not apply to other uses of the SOFTWARE. Unlimited simultaneous inbound connections are permitted via TCP/IP.
- **CLIENT ACCESS LICENSES.** If you use the DEVICE to access or utilize the services or functionality of Microsoft Windows Server products (such as Microsoft Windows Server 2003), or use the DEVICE to permit workstation or computing devices to access or utilize the services or functionality of Microsoft Windows Server products, you may be required to obtain a Client Access License for the DEVICE and/or each such workstation or computing device. Please refer to the end user license agreement for your Microsoft Windows Server product for additional information.
- **REMOTE DESKTOP FEATURES/NETMEETING/REMOTE ASSISTANCE.** The SOFTWARE may contain Net-Meeting, Remote Assistance, and Remote Desktop technologies that enable the SOFTWARE or other applications

installed on the DEVICE to be used remotely between two or more computing devices, even if the SOFTWARE or application is installed on only one DEVICE. You may use NetMeeting, Remote Assistance, and Remote Desktop with all Microsoft products; provided however, use of these technologies with certain Microsoft products may require an additional license. For both Microsoft products and non-Microsoft products, you should consult the license agreement accompanying the applicable product or contact the applicable licensor to determine whether use of NetMeeting, Remote Assistance, or Remote Desktop is permitted without an additional license.

- **REMOTE BOOT FEATURE.** Your DEVICE may be enabled with a Remote Boot feature which includes Remote Boot Installation Services tool. You may use the Remote Boot Installation Services tool only to deploy the SOFTWARE to one or more DEVICES on which you are licensed to run the SOFTWARE (i.e. DEVICES to which the appropriate Certificate of Authenticity is affixed). Please refer to the DEVICE documentation, if provided with your DEVICE, or contact TOPCON for additional information.
- **AUTOMATIC INTERNET-BASED SERVICES.** The SOFTWARE features described below are enabled by default to connect via the Internet to Microsoft computer systems automatically, without separate notice to you. You consent to the operation of these features, unless you choose to switch them off or not use them. Microsoft does not use these features to collect any information that will be used to identify you or contact you. For more information about these features, please see the privacy statement at <http://go.microsoft.com/fwlink/?LinkId=25243>
 - **Web Content Features.** Under the SOFTWARE's default configuration, if you are connected to the Internet, several features of the SOFTWARE are enabled by default to retrieve content from Microsoft computer systems and display it to you. When you activate such a feature, it uses standard Internet protocols, which transmit the type of operating system, browser and language code of your DEVICE to the Microsoft computer system so that the content can be viewed properly from your DEVICE. These features only operate when you activate them, and you may choose to switch them off or not use them. Examples of these features include Windows Catalog, Search Assistant, and the Headlines and Search features of Help and Support Center.
 - **Digital Certificates.** The SOFTWARE uses digital certificates based on the x.509 standard. These digital certificates confirm the identity of Internet users sending x.509 standard encrypted information. The SOFTWARE retrieves certificates and updates certificate revocation lists. These security features operate only when you use the Internet.
 - **Auto Root Update.** The Auto Root Update feature updates the list of trusted certificate authorities. You can switch off the Auto Root Update feature.
 - **Windows Media Player.** Some features of Windows Media Player automatically contact Microsoft computer systems if you use Windows Media Player or specific features of it: features that (A) check for new codecs if your DEVICE does not have the correct ones for content you attempt to play (this feature may be switched off), and (B) check for new versions of Windows Media Player (this feature will operate only when you are using Windows Media Player).
 - **Windows Media Digital Rights Management.** Content providers are using the digital rights management technology for Windows Media contained in this SOFTWARE ("WM-DRM") to protect the integrity of their content ("Secure Content") so that their intellectual property, including copyright, in such content is not misappropriated. Portions of this SOFTWARE and third party applications such as media players use WM-DRM to play Secure Content ("WM-DRM Software"). If the WM-DRM Software's security has been compromised,

owners of Secure Content ("Secure Content Owners") may request that Microsoft revoke the WM-DRM Software's right to copy, display and/or play Secure Content. Revocation does not alter the WM-DRM Software's ability to play unprotected content. A list of revoked WM-DRM Software is sent to your DEVICE whenever you download a license for Secure Content from the Internet. Microsoft may, in conjunction with such license, also download revocation lists onto your DEVICE on behalf of Secure Content Owners. Secure Content Owners may also require you to upgrade some of the WM-DRM components in this SOFTWARE ("WM-DRM Upgrades") before accessing their content. When you attempt to play such content, WM-DRM Software built by Microsoft will notify you that a WM-DRM Upgrade is required and then ask for your consent before the WM-DRM Upgrade is downloaded. WM-DRM Software built by third parties may do the same. If you decline the upgrade, you will not be able to access content that requires the WM-DRM Upgrade; however, you will still be able to access unprotected content and Secure Content that does not require the upgrade. WM-DRM features that access the Internet, such as acquiring new licenses and/or performing a required WM-DRM Upgrade, can be switched off. When these features are switched off, you will still be able to play Secure Content if you have a valid license for such content already stored on your DEVICE.

- **WINDOWS UPDATE AGENT (ALSO KNOWN AS SOFTWARE UPDATE SERVICES).** If the SOFTWARE includes Windows Update Agent ("WUA") (also known as Software Update Services) functionality that may enable your DEVICE to connect to and access updates ("Windows Updates") from a server installed with the required server component then the following conditions apply:
 - Without limiting any other disclaimer in this EULA, or any EULA accompanying a Windows Update, you acknowledge and agree that no warranty is provided by MS, Microsoft Corporation or their affiliates with respect to any Windows Update that you install or attempt to install on your DEVICE;
 - In addition, you acknowledge and accept that (i) Windows Updates may not be necessary or suitable for installation on or use with your DEVICE or the SOFTWARE, and (ii) if installed or attempted to be installed on your DEVICE, Windows Updates may not function on the DEVICE or may malfunction and/or cause harm to the DEVICE, to operators of the DEVICE or to other persons or property. If you connect to a server that installs a Windows Update, you agree that you assume all risk and liability with regard to any Windows Update that you install or attempt to install on your DEVICE using functionality provided by SOFTWARE. You further agree that neither MS, Microsoft Corporation nor their affiliates have any liability to you with respect to any Windows Update that you install or attempt to install on your DEVICE; and
 - TOPCON is solely responsible for providing technical support, if any, to you in connection with your installation of Windows Updates installed on your DEVICE using WUA functionality provided by the SOFTWARE. Please contact TOPCON if you have any questions regarding any Windows Update that you are considering installing on your DEVICE or otherwise regarding the WUA functionality.
- **NOTICES REGARDING THE MPEG-4 VISUAL STANDARD.** The SOFTWARE may include MPEG-4 visual decoding technology. This technology is a format for data compression of video information. For this technology, MPEG LA, L.L.C. requires this notice:

"USE OF THIS PRODUCT IN ANY MANNER THAT COMPLIES WITH THE MPEG 4 VISUAL STANDARD IS PROHIBITED, EXCEPT FOR USE DIRECTLY RELATED TO (A) DATA OR INFORMATION (i) GENERATED BY AND OBTAINED WITHOUT CHARGE FROM A CONSUMER NOT THEREBY ENGAGED IN A BUSINESS ENTERPRISE, AND (ii) FOR PERSONAL USE ONLY; AND (B) OTHER USES SPECIFICALLY AND SEPARATELY LICENSED BY MPEG LA, L.L.C.

If you have questions regarding this notice, please contact MPEG LA, L.L.C., 250 Steele Street, Suite 300, Denver, Colorado 80206; Telephone 303 331.1880; FAX 303 331.1879; www.mpegla.com."

GENERAL TERMS:

- **PRODUCT SUPPORT.** Product support for the SOFTWARE is not provided by MS, Microsoft Corporation or their affiliates. For product support, please refer to TOPCON support number provided in the documentation for the DEVICE. Should you have any questions concerning this EULA, or if you desire to contact TOPCON for any other reason, please refer to the address provided in the documentation for the DEVICE.
- **END USER PROOF OF LICENSE.** If you acquired the SOFTWARE installed on the DEVICE, or on a compact disc or other media, a genuine Microsoft "Proof of License"/Certificate of Authenticity label with a genuine copy of the SOFTWARE identifies a licensed copy of the SOFTWARE. To be valid, the label must be affixed to the DEVICE, or appear on TOPCON's software packaging. If you receive the label separately other than from the TOPCON it is invalid. You should keep the label on the DEVICE or packaging to prove that you are licensed to use the SOFTWARE. This End User License Agreement ("EULA") is valid and grants the end-user rights ONLY if the SOFTWARE is genuine and a genuine Certificate of Authenticity for the SOFTWARE is included. For more information on identifying whether your SOFTWARE is genuine, please see <http://www.microsoft.com/piracy/howtotell>.
- **BACKUP COPY.** You may make one (1) backup copy of the SOFTWARE. You may use this backup copy solely for your archival purposes and to reinstall the SOFTWARE on the DEVICE. Except as expressly provided in this EULA or by local law, you may not otherwise make copies of the SOFTWARE, including the printed materials accompanying the SOFTWARE. You may not loan, rent, lend or otherwise transfer the backup copy to another user.
- **RESTRICTED USE.** The SOFTWARE is not designed or intended for use or resale in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, or other devices or systems in which a malfunction of the SOFTWARE would result in foreseeable risk of injury or death to the operator of the device or system, or to others.
- **NO RENTAL/COMMERCIAL HOSTING.** You may not rent, lease, lend or provide commercial hosting services with the SOFTWARE to others.
- **SEPARATION OF COMPONENTS.** The SOFTWARE is licensed as a single product. Its component parts may not be separated for use on more than one device computer.
- **CONSENT TO USE OF DATA.** You agree that MS, Microsoft Corporation and their affiliates may collect and use technical information gathered in any manner as part of product support services related to the SOFTWARE. MS, Microsoft Corporation and their affiliates may use this information solely to improve their products or to provide customized services or technologies to you. MS, Microsoft Corporation and their affiliates may disclose this information to others, but not in a form that personally identifies you.
- **INTERNET GAMING/UPDATE FEATURES.** If the SOFTWARE provides, and you choose to utilize, the Internet gaming or update features within the SOFTWARE, it is necessary to use certain computer system, hardware, and software information to implement the features. By using these features, you explicitly authorize MS, Microsoft Corporation, their affiliates and/or their designated agent to use this information solely to improve their products or to provide customized services or technologies to you. MS, Microsoft Corporation or their affiliates may disclose this information to others, but not in a form that personally identifies you.

- **TRADEMARKS.** This EULA does not grant you any rights in connection with any trademarks or service marks of COMPANY, MS Microsoft Corporation or their affiliates and suppliers.
- **LINKS TO THIRD PARTY SITES.** You may link to third party sites through the use of the SOFTWARE. The third party sites are not under the control of MS, Microsoft Corporation or their affiliates. Neither MS, Microsoft Corporation nor their affiliates is responsible for contents of any third party sites, any links contained in third party sites, or any changes or updates to third party sites, or any changes or updates to third party sites. Neither MS, Microsoft Corporation nor their affiliates is responsible for webcasting or any other form of transmission received from any third party sites. MS, Microsoft Corporation or their affiliates are providing these links to third party sites to you only as a convenience, and the inclusion of any link does not imply an endorsement by MS, Microsoft Corporation or their affiliates of the third party site.
- **ADDITIONAL SOFTWARE/SERVICES.** This EULA applies to updates, supplements, add on components, product support services, or Internet-based services components ("Supplemental Components"), of the SOFTWARE that you may obtain from TOPCON, MS, Microsoft Corporation or their affiliates after the date you obtain your initial copy of the SOFTWARE, unless you accept updated terms or another agreement governs. If other terms are not provided along with such Supplemental Components and the Supplemental Components are provided to you by MS, Microsoft Corporation or their affiliates then you will be licensed by such entity under the same terms and conditions of this EULA, except that (i) MS, Microsoft Corporation or their affiliates providing the Supplemental Components will be the licensor with respect to such Supplemental Components in lieu of the "COMPANY" for the purposes of the EULA, and (ii) TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THE SUPPLEMENTAL COMPONENTS AND ANY (IF ANY) SUPPORT SERVICES RELATED TO THE SUPPLEMENTAL COMPONENTS ARE PROVIDED AS IS AND WITH ALL FAULTS. ALL OTHER DISCLAIMERS, LIMITATION OF DAMAGES, AND SPECIAL PROVISIONS PROVIDED HEREIN AND/OR OTHERWISE WITH THE SOFTWARE SHALL APPLY TO SUCH SUPPLEMENTAL COMPONENTS. MS, Microsoft Corporation or their affiliates reserve the right to discontinue any Internet-based services provided to you or made available to you through the use of the SOFTWARE.
- **RECOVERY MEDIA.** If SOFTWARE is provided by TOPCON on separate media and labeled "Recovery Media" you may use the Recovery Media solely to restore or reinstall the SOFTWARE originally installed on the DEVICE.
- **TERMINATION.** Without prejudice to any other rights, TOPCON or MS may terminate this EULA if you fail to comply with the terms and conditions of this EULA. In such event, you must destroy all copies of the SOFTWARE and all of its component parts.
- **NOTICE REGARDING SECURITY.** To help protect against breaches of security and malicious software, periodically back up your data and system information, use security features such as firewalls, and install and use security updates.

When calling please give us the following information about your unit:

- Model name: TRC-NW300
- Serial No.: Shown on the rating plate on the right side of the power unit
- Period of use: Please inform us of the date of purchase.
- Instrument's condition: Please provide us with as much detail as possible on the problem.

NON-MYDRIATIC RETINAL CAMERA (TRC-NW300)

USER MANUAL

2012 version (2012.04-100TH ⑦)

Date of issue: Apr. 6, 2012

Published by TOPCON CORPORATION

75-1 Hasunuma-cho, Itabashi-ku, Tokyo, 174-8580 Japan.

NON-MYDRIATIC RETINAL CAMERA

TRC-NW300

TOPCON MEDICAL SYSTEMS, INC.

111 Bauer Drive, Oakland, NJ 07436, USA Phone:+1-201-599-5100 Fax:+1-201-599-5250 www.topconmedical.com

TOPCON CANADA INC.

110 Provencher Avenue, Boisbriand, QC J7G 1N1 CANADA Phone:+1-450-430-7771 Fax:+1-450-430-6457 www.topcon.ca

TOPCON EUROPE MEDICAL B.V.

(European Representative)(European Sole Sales Company)

Essebaan 11; 2908 LJ Capelle a/d IJssel; P.O.Box145; 2900 AC Capelle a/d IJssel; THE NETHERLANDS
Phone:+31 -(0)10-4585077 Fax:+31 -(0)10-4585045 E-mail: medical@topcon.nl; www.topcon.eu

ITALY OFFICE

:Viale dell' Industria 60; 20037 Paderno Dugnano; (Milano), ITALY Phone:+39-02-9186671 Fax:+39-02-91081091 E-mail: topconitaly@tiscali.it; www.topcon.it

DANMARK OFFICE

:Praestemarksvej 25; 4000 Roskilde, DANMARK Phone:+45-46-327500 Fax:+45-46-327555 E-mail: topcon@topcondanmark.dk www.topcondanmark.dk

IRELAND OFFICE

:Unit 276, Blanchardstown; Corporate Park 2 Ballycoolin Dublin 15, IRELAND Phone:+353-18975900 Fax:+353-18293915 E-mail: medical@topcon.ie; www.topcon.ie

TOPCON DEUTSCHLAND G.m.b.H.

Hanns-Martin-Schleyer Strasse 41; D-47877 Willich, GERMANY Phone:+49-(0)2154-8850 Fax:+49-(0)2154-885177 E-mail: med@topcon.de; www.topcon.de

TOPCON ESPAÑA S.A.

HEAD OFFICE:Frederic Mompou 4 Esc. A Bajos 3, 08960 Sant Just Desvern Barcelona, Spain Phone:+34-93-4734057 Fax:+34-93-4733932 E-mail: medica@topcon.es; www.topcon.es

PORTUGAL OFFICE:Rua da Forte,6-6A,L-0.22,2790-072 Carnaxide, PORTUGAL Phone:+351-210-994626 Fax:+351-210-938786 www.topcon.pt

TOPCON S.A.R.L.

BAT A1 3 route de la révolte 93206 SAINT DENIS CEDEX, FRANCE Phone:+33 1 49 21 23 23 Fax:+33 1 49 21 23 24 E-mail:topcon@topcon.fr; www.topcon.fr

TOPCON SCANDINAVIA A.B.

Neogatan 2; P.O.Box 25; 43151 Mölndal, SWEDEN Phone:+46-(0)31-7109200 Fax:+46-(0)31-7109249 E-mail:medical@topcon.se; www.topcon.se

TOPCON (GREAT BRITAIN) LTD.

Topcon House,Kennet Side,Bone Lane,Newbury,Berkshire RG14 5PX United Kingdom

Phone:+44-(0)1635-551120 Fax:+44-(0)1635-551170 E-mail: info@topcon.co.uk; www.topcon.co.uk

TOPCON POLSKA Sp. z o. o.

ul. Warszawska 23; 42-470 Siewierz, POLAND Phone:+48-(0)32-6705045 Fax:+48-(0)32-6713405 www.topcon-polska.pl

TOPCON SINGAPORE MEDICAL PTE. LTD.

60 Alexandra Terrace, #08-27 The Comtech, SINGAPORE 118502 Phone:+65-68720606 Fax:+65-67736150 www.topcon.com.sg

TOPCON INSTRUMENTS (MALAYSIA) SDN.BHD.

No. D1, (Ground Floor), Jalan Excella 2, Off Jalan Ampang Putra, Taman Ampang Hilir, 55100 Kuala Lumpur, MALAYSIA Phone:+60-(0)3-42709866 Fax:+60-(0)3-42709766

TOPCON INSTRUMENTS (THAILAND) CO.,LTD.

77/162 Sinnsathorn Tower, 37th Floor, Krungthoburi Rd., Klongtongsai, Klongsarn, Bangkok 10600, THAILAND Phone:+66(0)2-440-1152~7 Fax:+66-(0)2-440-1158

TOPCON CORPORATION BEIJING OFFICE

Block No.9, Kangding Street, Beijing Economic-Technological Development Area, Beijing,100176, CHINA Phone:+86-(0)10-6780-2799 Fax:+86-(0)10-6780-2790

TOPCON CORPORATION SHANGHAI OFFICE

14L Huamin Empire Plaza, No.726, Yan-an Xi Road, Shanghai, 200050, CHINA Phone:+86-(0)21-5238-7722 Fax:+86-(0)21-5237-0761

TOPCON CORPORATION BEIRUT OFFICE

P.O.Box 70-1002 Antelias,Beirut, LEBANON Phone:+961-4-523525/523526 Fax:+961-4-521119

TOPCON CORPORATION DUBAI OFFICE

P.O.Box 293705, Dubai Airport Free Zone L.I.U J-12, Dubai, U.A.E. Phone:+971-4-299-5900 Fax:+971-4-299-5901

TOPCON CORPORATION

75-1 Hasunuma-cho,Itabashi-ku,Tokyo,174-8580 Japan.

Phone:3-3558-2520 Fax:3-3960-4214 www.topcon.co.jp

40502 91017

Printed in Japan 1204-100TH⑦