

USER MANUAL
COMPUTERIZED TONOMETER

CT-800A

INTRODUCTION

Thank you for purchasing the COMPUTERIZED TONOMETER CT-800A.

INTENDED USE / INDICATIONS FOR USE

Measured through the cornea based on the tension of the eye pressure within the eye ball, to provide information for diagnosis.

FEATURES

This instrument features the following:

- By spraying air, intraocular pressure can be measured in non-contact.
- Using Z alignment mark helps adjustment of distance with a patient's eye.

PURPOSE OF THIS MANUAL

This User Manual provides an overview of the basic operation, troubleshooting, checking and cleaning of the TOPCON COMPUTERIZED TONOMETER CT-800A.

To get the safety use of the instrument, read GENERAL SAFETY INFORMATION and DISPLAYS AND SYMBOLS FOR SAFE USE.

Keep this Manual at hand for future reference.

[CAUTION] Federal law restricts this device to sale by or on the order of a physician.



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- 2. The contents of this manual are correct to the best of our knowledge. Please inform us of any ambiguous or erroneous descriptions, missing information, etc.
- 3. This manual is original instructions.

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DISPLAYS AND SYMBOLS FOR SAFE USE

In order to encourage the safe use of the instrument and to avoid danger to the operator and others as well as damage to properties, warnings are described in the User Manual and marked on the instrument body. We suggest you thoroughly understand the meaning of the following displays/icons and Safety Cautions, as well as read the Manual, and strictly observe the instructions.

DISPLAY

DISPLAY	MEANING
CONTRAINDICATION	Indicates a serious risk is more than the profits obtained by use of the instrument. A patient who should not be used according to a condition, a primary disease, complications, an anamnesis, family history and a predisposition is shown.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTE	Useful functions to know. Paying attention to these will prevent the noted problems.

SYMBOL

Symbol	Description	Description (French)
\sim	Alternating Current	Courant alternatif
	Off (power: disconnection from the main power supply)	Éteint (courant: coupure avec le secteur)
	On (power: connection to the main power supply)	Allumé (courant: raccordement sur le secteur)
*	Type B applied part	Partie appliquée du Type B
<u> </u>	General warning sign	Symbole d'avertissement général
	Refer to instruction manual/booklet	Voir le manuel/la brochure
سا	Date of manufacture	Date de fabrication
SN	Serial number	Numéro de série
⇒O	Brake ON (Base fixed)	Freiner (Base fixée)
40	Brake OFF (Base fixation releasing)	Desserrer le frein (Désengagement de la fixation de la base)
4	Safety stopper setting position	Position de réglage de l'arrêt de sécurité
	Manufacturer	Fabricant

Ī	EC REP	Authorised Representative in the European	Représentant autorité pour l'Union euro-
	EC REP	Community	péenne
		requirements of the Council Directive 93/42/	Indique que le produit est conforme aux exigences de la directive 93/42/CEE du Conseil et des autres législations applicables de l'Union.

GENERAL SAFETY INFORMATION

⚠ CONTRAINDICATION

Ensuring the Safety of Patients and Operators

To prevent corneal damage, do not measure a patient with corneal disease or one who's had corneal surgery.

To prevent corneal damage, do not measure a patient wearing a contact lens. Tell the patient to remove the contact lens.



Ensuring the Safety of Patients and Operators

When operating the instrument, do not touch the patient's eye or nose.

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 fire in the event of an instrument malfunction, immediately turn OFF the power switch "O" and disconnect the power plug from the outlet if you see smoke coming from the instrument, etc. Don't install the instrument where it is difficult to disconnect the power plug from the outlet. Ask your dealer for service.

Be sure to connect the power plug to an AC 3-pin receptacle equipped with grounding. Connection with receptacle without grounding may cause fire and electric shock in case of shortcircuiting.



Important caution

The following patients need extra attention.

Patients with infectious disease such as Keratoconjunctivitis Epidemica

Ensuring the Safety of Patients and Operators

Be sure to perform setting of safety stopper, to avoid injury caused by the instrument hitting the patient's eye or nose.

To avoid injury when operating the up/down button for chinrest, be careful not to catch the patient's fingers.

To avoid injury when operating the measuring head up or down, be careful not to catch the patient's/operator's fingers.

When operating the instrument use much care so that operator's finger or hand is not pinched between the fore-head rest and the main body. Or the operator may be injured.

- When moving the instrument, two people should lift from the bottom of the device. One person lifting the device may cause harm to his back or injury by falling parts.
- · When holding the bottom of the instrument, avoid touching a projection of screws to prevent injuries.
- To prevent damage and injuries, do not hold the part of anything but bottom like the Terminal cover. If you hold, it may cause to catch the finger or to damage the instrument by falling.
- To prevent damage and injuries, do not install the instrument on an uneven, unsteady or sloped surface.
- When setting an instrument on an instrument table, pay attention not to injury the fingers between the instrument and the table.
- When setting a printer paper, keep a patient's face away from the instrument. Some part of the instrument may touch the patient's lip or nose if the printer button is pressed.
- To avoid potential injury in case of malfunction, including a paper jam, be sure to shut off the power before attempting to repair it.
- To avoid potential injury, do not touch the printer body including metal parts or the paper cutter, while the printer is in operation or when replacing the printer paper.

Before measuring, check if there is any foreign matter on and around the measuring nozzle. If there is any, it may enter and damage the patient's eye during the measurement.

- To avoid injury, do not insert fingers under the chinrest. To avoid injury when moving the chinrest down, be careful not to catch the patient's finger. Tell this to the patient, too.
- To avoid injury when operating the machine, be careful about the cover not to catch fingers of the patient. Tell this to the patient, too.
- To avoid injury by raising, falling or dropping the instrument, do not apply the strong power downward on the chinrest.
- Before measuring, be sure to set the safety stop. If not, it may cause injury by touching the measuring window glass to patient's eye. Set it respectively for the right and left eyes.
- Set the safety stop from the side of the instrument. Setting operation from other positions, where checking of the eye position or intraocular pressure window position is not easy, may cause injury by touching intraocular pressure window to the patient's eye.

When operating the instrument (for measurement and control panel operation), be careful that the instrument does not touch the patient's lip or nose. If touched, clean the instrument as specified in "HOW TO CLEAN THIS INSTRUMENT" on page 60.

To avoid injury when operating the machine (for measurement and control panel operation), be careful not to approach the finger to space of movable part.

- Do not use or apply any aerosol-type cleaner near the instrument. If a drop of cleaner remains inside the measuring nozzle, the patient's eye may be injured during measurement.
- · Do not use tweezers or gauze, as these may scratch the lens and glass surfaces.

To clean the measuring window, measuring nozzle and the glass inside the measuring nozzle, use ethanol. Using other chemicals may cause damage to the patient's eye during measurement.

- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- Do not remove the enclosures. LED high-power is radiated.

Preventing Electric Shocks

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

To avoid electric shocks, do not insert metal objects into the instrument body through the vent holes or gaps.

- To avoid electric shocks, do not handle the power plug with wet fingers.
- The power cord in standard accessories for this instrument cannot use besides this instrument.

To avoid electric shock, do not touch the external connection terminal and the patient at the same time.

- Don't connect an additional power strip or an extension cord to the system.
- Don't connect the device which is not recognized as one component of the system.

Modification of this instrument is not permitted.

Ensuring Security

- When connecting this instrument to an external device through LAN, apply the security update to the external device, make use of anti-virus software and take other countermeasures against computer virus properly.
- Do not connect any USB storage device that is not checked with the anti-virus software to the USB port of this instrument.
- When connecting this instrument to an external device through LAN, set the ID and password of the user to the external device.
- When outputting data to the shared folder on an external device from this instrument, set a proper user ID and password to the shared folder.

Electromagnetic Compatibility (EMC)

This instrument has been tested (with 100/120/230V) and found to comply with IEC 60601-1-2:2014+AMD1: 2020 (Ed.4.1). 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.

HOW TO USE THIS MANUAL

- Read the instructions on pages 1 to 12 before using the machine.
- Regarding connection to various devices, see "CONNECTING EXTERNAL I/O TERMINALS" on page 23.
- If you would like an overview of the system, begin by reading "BASIC OPERATIONS" (page 26).
- For setting various functions, see "SETTING FUNCTIONS ON SETUP SCREEN" on page 51.

GENERAL MAINTENANCE INFORMATION

USER MAINTENANCE

To maintain the safety and performance of the equipment, never attempt to repair or perform maintenance. These tasks should be performed by an authorized service representative.

Maintenance tasks that can be performed by the user are as follows; for details, follow the manual's instructions.

CLEANING OF THE MEASURING WINDOW

For details, See "CLEANING THE MEASURING WINDOW" on page 61.

CLEANING THE MEASURING NOZZLE AND WINDOW GLASS INSIDE THE NOZZLE

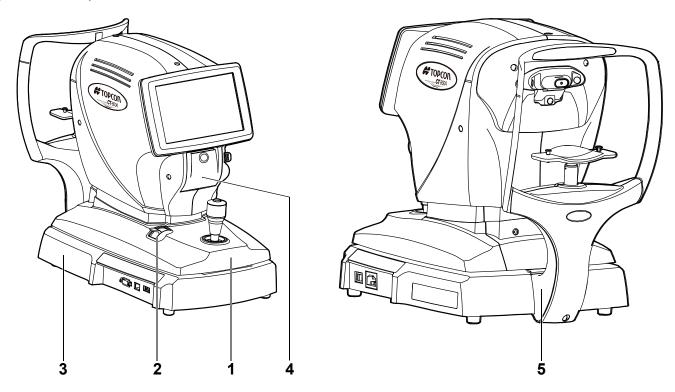
Regarding the measuring nozzle and the glass surface inside the measuring nozzle, cleaning is allowed. For details, see "CLEANING THE MEASURING NOZZLE AND THE GLASS INSIDE THE MEASURING NOZZLE" on page 62.

DISCLAIMERS

- TOPCON is not responsible for damage due to fire, earthquakes, actions or inactions of third persons or other accidents, or damage due to negligence and misuse by the user and any use under unusual conditions.
- TOPCON is not responsible for damage derived from inability to properly use this equipment, such as loss of business profits and suspension of business.
- TOPCON is not responsible for damage caused by operations other than those described in this User Manual.
- TOPCON is not responsible for any damage caused by unauthorized access from outside, malware or viruses.
- The device does not provide a diagnosis of any condition or lack thereof or any recommendations for appropriate treatment. The relevant healthcare provider is fully responsible for all diagnosis and treatment decisions and recommendations.

POSITIONS OF WARNING AND CAUTION INDICATIONS

To secure safety, this equipment provides warnings. Correctly use the equipment following these warning instructions. If any of the following marking labels are missing, please contact your dealer or TOPCON at the address stated on the back cover.



No.	Label	Meaning	Signification	
1	nose with the instrument during operation.		MISE EN GARDE Prendre garde de ne pas frapper les yeux ou le nez du patient avec l'instrument pen- dant l'opération.	
2	cause injury by touching the instrument to patient's eye or nose.		PRÉCAUTION Veillez à configurer l'arrêt de sécurité. Si non, cela peut provoquer des blessures en heurtant l'œil ou le nez du patient avec l'instrument.	
3		CAUTION To avoid injury caused by electric shock, do not open the cover. Ask your dealer for service.	PRÉCAUTION Ne pas ouvrir le couvercle pour éviter les blessures causées par un choc électrique. Demander au revendeur d'effectuer le service.	
4	A	CAUTION To avoid potential injury, do not touch the printer body including metal parts or the paper cutter, while the printer is in operation or when replacing the printer paper.	PRÉCAUTION Pour éviter tout risque de blessure, ne touchez pas le corps de l'imprimante, y compris les parties métalliques ou le coupepapier, lorsque l'imprimante est en fonctionnement ou lorsque vous remplacez le papier de l'imprimante.	
5	†	Degree of protection against electric shock: TYPE B APPLIED PART	Degré de protection contre les chocs électriques: TYPE B PARTIE D'APPLICATION	

STANDARD ACCESSORIES

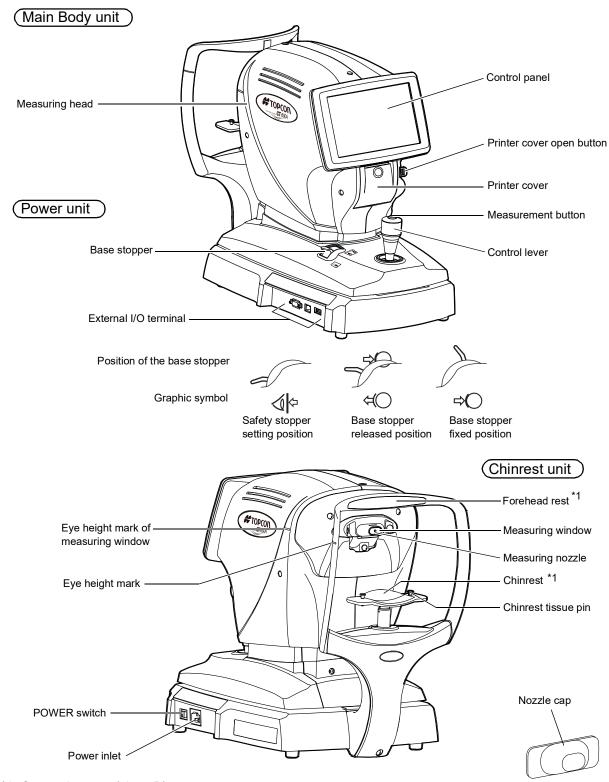
The following are standard accessories. Make sure that all these items are included (quantity).

The following are standard accessories. Make	
Power cord (1)* ¹	Chinrest tissue pin (2)
Printer paper (2)	Monitor cleaner (1)
Chinrest tissue (1)	Dust cover (1)
	# TOPCON
Accessory case (1)	User Manual, Instruction Manual* ² , Unpacking and Assembling, Cleaning Procedure (1 each)
Nozzle cap (1)	Blower (1)
Applicator (1)	

- *1 More than one power cord can be included on certain occasions.
- *2 Depending on the destination, this is not attached.

COMPONENTS

COMPONENT NAMES



*1: Contacting part (class B)

COMPOSITION OF PARTS WHICH CONTACT THE HUMAN BODY

Forehead rest: Silicone rubber

Chinrest : Acrylonitrile butadiene styrene resin

OPERATION METHOD OF CONTROL PANEL



- The control panel is a touch panel. Do not use any sharp tools; e.g. ball point pen.
- Do not touch two points on a control panel simultaneously.

Tap → Touch the control panel softly with a finger.



CONTROL PANEL COMPONENTS

The control panel is designed as a touch panel for performing various operations and settings. It displays images and shows information, including set conditions and measurement results.



(ID	ID button	Input the patient ID (up to 13 characters) and operator ID (up to 13 characters). However, if no patient ID is input, the patient No. is allocated automatically.
$\left(R\right)$	R display/L display	Shows the measured eye is R (Right eye) or L (Left eye). The measured eye is framed in orange.
	Air check button	Checks that the measurement system of the instrument operates properly.
	Reset button	Returns the measurement head (the side and the depth direction) to an initial position.

AS M	Alignment mode buttonSwitches	alignment	(measurement	position	adjustment)
	mode.				

"A" semi-auto mode: If approaching the automatic measuring range, fine alignment and measurement are performed automatically.

"AS" auto shoot mode: If reaching the measurable range, the measurement starts automatically.

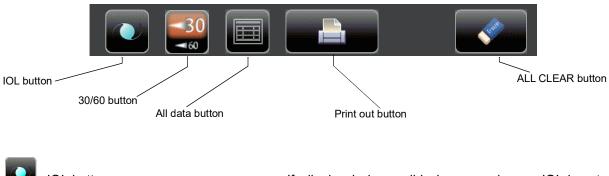
"M" manual mode: All processes are performed manually from alignment to measurement.

Settings button	Displays the Settings screen.



Up/down button for chinrestMoves the chinrest up/down.

FUNCTION BUTTON



	IOL button	If aligning is impossible in measuring an IOL-inserted eye, tapping this button may allow the measurement. When the button is selected, "IOL" is displayed on the control panel and the selected button is framed in orange.
−30	30/60 button	Switches between 1-30 range and 1-60 range.

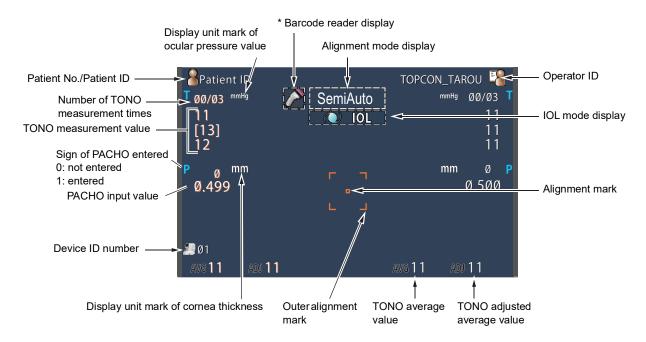
All data button
All data button

Print out button	Displays on measurement stand-by and prints measurement
	results. Tap the button when no measurement data is present
	to feed the paper.

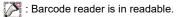
ALL CLEAR buttonClears all measurement dat	a.
--	----

MONITOR SCREEN

MEASUREMENT SCREEN

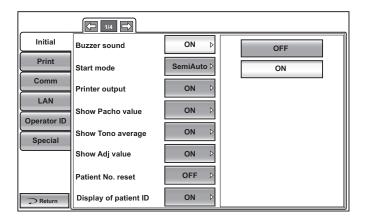


^{*} Displayed when the barcode reader is connected.

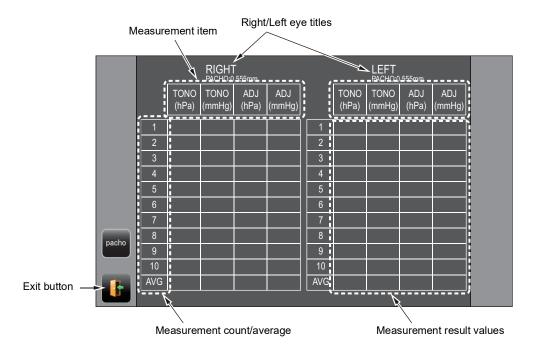


: Barcode reader is inhibited to read. (During measurement, printing, data output)

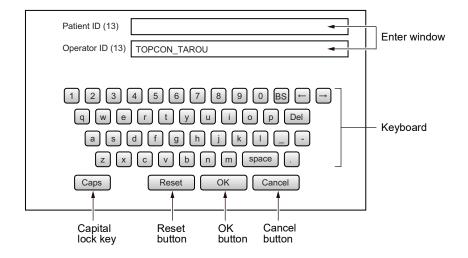
SETUP SCREEN



ALL DATA SCREEN

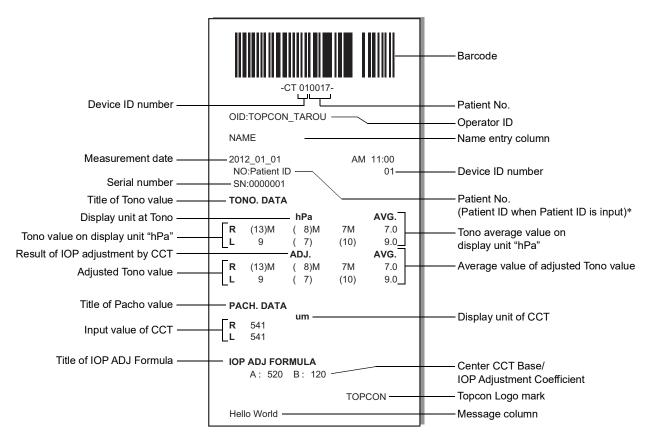


PATIENT ID INPUT SCREEN



PRINTER OUTPUT

Printed example when "Printer Layout" of "Print" is set to "SIMPLE"



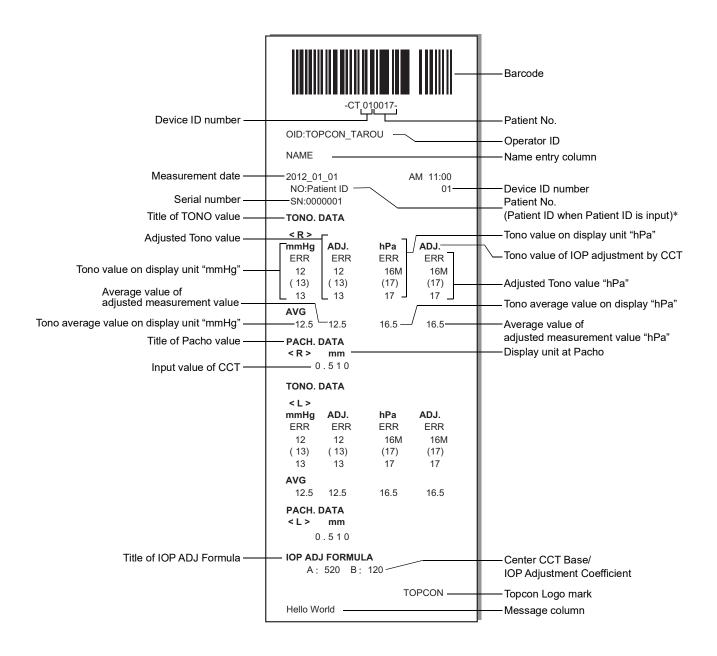
* As for the patient No., the result of the printing will differ depending on whether the patient ID is inputted or not inputted.

Input: Patient ID is printed.

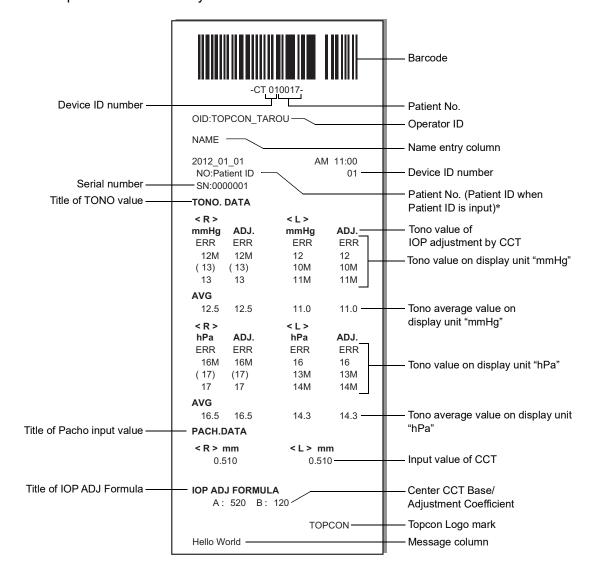
Not input : Patient No. (starts from 0001, automatically added +1 upon completion of measurement) is printed.



- The "M" mark is printed on the value measured by using the Measurement button. (In the error of ERR, OVER, etc., the "M" mark is not printed.)
- The value with low reliability is outputted with the parenthesis notation.



Printed example when "Printer Layout" of "Print" is set to "DATA"

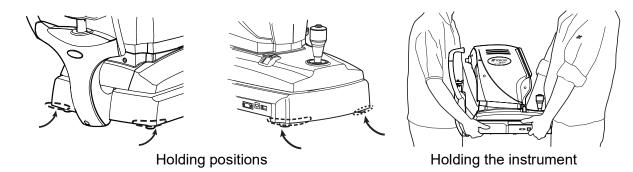


PREPARATIONS

INSTALLATION



- When moving the instrument, two people should lift from the bottom of the device.
 - One person lifting the device may cause harm to his back or injury by falling parts.
- When holding the bottom of the instrument, avoid touching a projection of screws to prevent injuries.
- To prevent damage and injuries, do not hold the part of anything but bottom like the Terminal cover. If you hold, it may cause to catch the finger or to damage the instrument by falling.
- To prevent damage and injuries, do not install the instrument on an uneven, unsteady or sloped surface.
- When setting an instrument on an instrument table, pay attention not to injury the fingers between the instrument and the table.
- **1** Firmly hold the instrument at the position shown below and place it on the automatic instrument table.



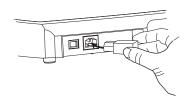
CONNECTING POWER CORD



Be sure to connect the power plug to an AC 3-pin receptacle equipped with grounding. Connection with receptacle without grounding may cause fire and electric shock in case of short-circuiting.



- To avoid electric shocks, do not handle the power plug with wet fingers.
- The power cord in standard accessories for this instrument cannot use besides this instrument
- **1** Make sure the POWER switch of the instrument is OFF.
- **2** Connect the power cord to the power inlet at the right side of the instrument.
- **3** Insert the power cord plug into the 3-pin AC grounding receptacle.



CONNECTING EXTERNAL I/O TERMINALS



To avoid electric shock, do not touch the external connection terminal and the patient at the same time.

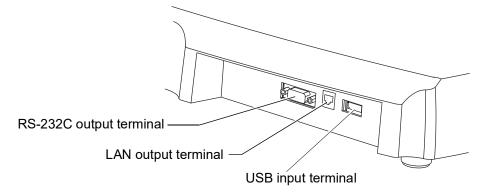


When connecting this product with a commercial personal computer, use one conforming to IEC 62368-1, with a separation unit.

DATA OUTPUT

This product can be connected to a personal computer (PC) and other external devices via the RS-232C or LAN.

- **1** Connect the connection cable to the output terminal of the instrument
- **2** Connect the other end of the connection cable to the PC, etc.



DATA INPUT



- Do not operate a touch panel during barcode data entering by barcode reader. If you enter data when tapping the button on the touch panel, the barcode may not be read normally.
- Do not align, measure, or output data during barcode data entering by barcode reader. If you enter data during these operations, the barcode may not be read normally.
- Take care not to enter the wrong patient information. It may be mistaken for information from another patient.

This product can be connected to a bar-code reader and other external devices via USB.

- 1 Connect the connection cable to the USB input terminal of the instrument.
- **2** Connect the other end of the connection cable to the external device.



For questions about connections, contact your TOPCON dealer.

PRINTER PAPER SETTING



- When setting a printer paper, keep a patient's face away from the instrument. Some part of the instrument may touch the patient's lip or nose if the printer button is pressed.
- To avoid potential injury in case of malfunction, including a paper jam, be sure to shut off the power before attempting to repair it.
- To avoid potential injury, do not touch the printer body including metal parts or the paper cutter, while the printer is in operation or when replacing the printer paper.



- Be sure to use the specified printer paper. If you use the paper other than the specified, the printer may be broken or the instrument may not be able to use.
- If you insert the printer paper backwards, printing will not start.
- Please push the printer cover OPEN button using your right thumb while placing your index and middle fingers on the projecting part which is in reverse side below the button. Unexpected movement is avoided when the printer cover OPEN button is pressed.
- For printing paper, use the following paper specified by TOPCON.

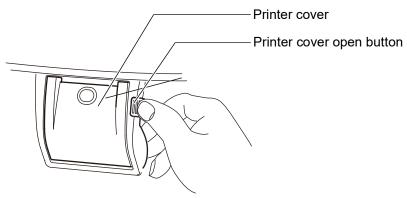
Item Name	Item Code
Printing Paper	448004001

Product No.: TP-50K-J-R (manufactured by Nippon Paper Industries Co., Ltd.)

(Paper Width: 58mm, Roll Outer Diameter: \$\phi48mm or less)

When ordering any consumable, contact our agent where you purchased the product, or our particular department as indicated in this Instruction Manual with the Item Name, Item Code and Quantity.

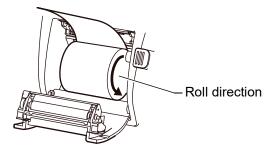
1 Press the printer cover open button to open the printer cover.



2 Open the printer cover to the limit.



Insert the printer paper in the direction shown below and pull out the paper end to your side by 7 to 8cm.



4 Bring the paper into the center, then close the printer cover.





- Please close the printer cover using your right thumb while placing your index and middle fingers on the projecting part which is in reverse side below the printer cover OPEN switch. Unexpected movement is avoided when closing the printer cover.
- In case the printer cover is not firmly closed, printing will not start, and "CLOSE PRT COVER" will be displayed on the monitor screen.

RECOVERY FROM POWER SAVE STATUS

This instrument adopts the power save system for saving electric power. When the machine is not operated for a set time, the control panel becomes a screensaver.

1 Tap the control panel, operate the control lever or move the base to the left or the right. In a few seconds, the measurement screen is displayed and measurement is enabled.

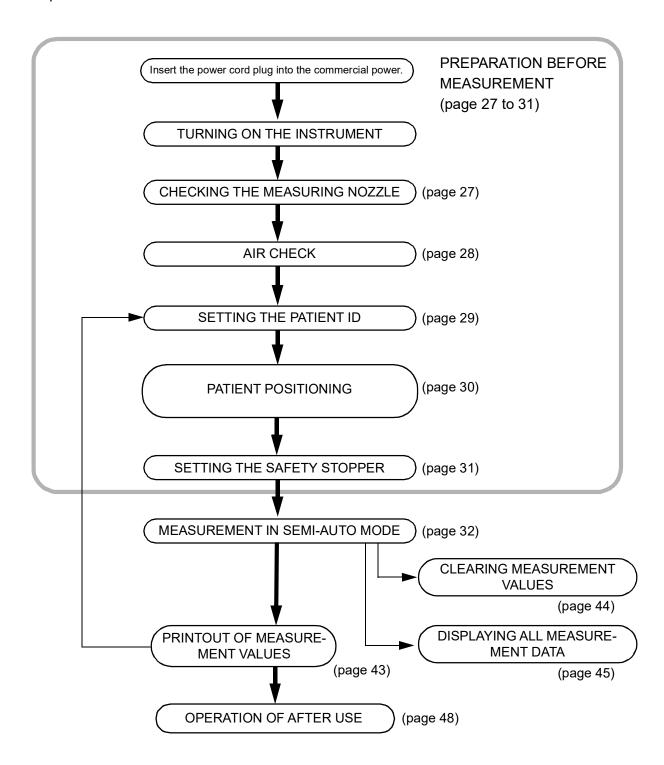


The time to start the power save status can be changed in the initial setting "Start time of sleep mode" (see page 55).

BASIC OPERATIONS

OPERATION FLOW CHART

Basic operation of this instrument is as follows:



PREPARATION BEFORE MEASUREMENT

TURNING ON THE INSTRUMENT

- Insert the power cord plug into the commercial power (the 3-pin AC grounding receptacle.)
 For the details of connection, refer to "CONNECTING POWER CORD" on page 22.
- Press on the POWER switch.
- 3 Make sure that the title screen is displayed and then the MEASUREMENT screen is displayed in a few seconds.
- **4** Release the base stopper.

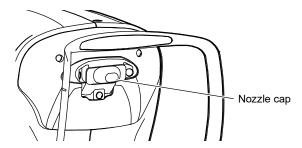
CHECKING THE MEASURING NOZZLE



Before measuring, check if there is any foreign matter on and around the measuring nozzle.

If there is any, it may enter and damage the patient's eye during the measurement.

1 Remove the nozzle cap.



Check if there is any foreign matter on and around the measuring nozzle. If there is any, turn OFF the POWER switch, clean it off and then turn ON the POWER switch. For cleaning, see "CLEANING THE MEASURING NOZZLE AND THE GLASS INSIDE THE MEASURING NOZZLE" on page 62.

AIR CHECK

This instrument is equipped with a function for checking correct operations of the measurement system inside the instrument.

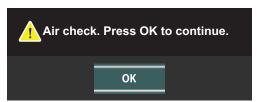
1 Tap the Air check button.



Then, the confirming message of Air check/End operation is displayed.



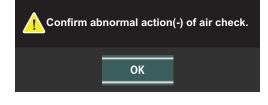
- Press the CHECK button. Then, air is out from the measuring nozzle automatically.
- 3 Make sure the message box of "Air check. Press OK to continue." is displayed on the control panel.



4 Press the OK button, return to Measurement screen.



If abnormal action(+) or abnormal action(-) is displayed, the condition is not normal. Check if there is any object before the measuring nozzle. If there is any, remove it, press the OK button and do the check again. If there is no object, a failure is suspected. Turn the POWER switch to OFF, unplug the power cord, and call your dealer or TOPCON at the address printed on the back cover of this manual.

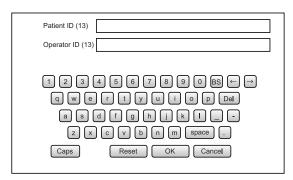


SETTING THE PATIENT ID

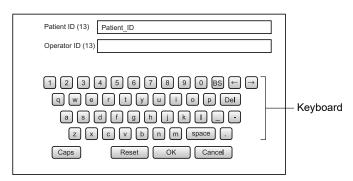
Tap the D button on the control panel.



2 The Patient ID Input screen is called up.



3 Enter the patient ID using the keyboard on the screen.



4 Return to the Measurement screen, and confirm that the patient ID is updated.





- If "Display of patient ID" is set to "OFF" in the initial setting, the patient No./patient ID is not displayed on the measurement screen.
- An enter window of Operator ID is displayed when the "Use Operator ID" of "Operator ID" is set to "ON" in the SETUP screen.

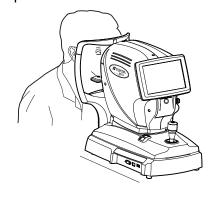
PATIENT POSITIONING



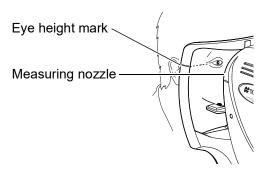
- To avoid electric shock, do not touch the external connection terminal and the patient at the same time.
- To avoid injury, do not insert fingers under the chinrest.
 To avoid injury when moving the chinrest down, be careful not to catch the patient's finger. Tell this to the patient, too.
- To avoid injury when operating the machine, be careful about the cover not to catch fingers of the patient. Tell this to the patient, too.
- To avoid injury by raising, falling or dropping the instrument, do not apply the strong power downward on the chinrest.
- When operating the instrument, be careful that the instrument does not touch the patient's lip or nose. If touched, clean the instrument following "CLEANING THE COMPONENTS THAT COME INTO CONTACT WITH THE PATIENT" on page 60.

NOTE

- Adjust the height of the adjustable instrument table so that the patient can sit on the chair comfortably. Otherwise, correct measurement values may not be obtained.
- Before starting measurement, explain the functioning so patients are not surprised by the air puff.
- When operating the instrument, be careful that the instrument does not touch the patient's nose. If touched, clean the instrument following "CLEANING THE MEASURING WINDOW" on 61.
- If no patient ID is registered, a "patient No." is assigned automatically in order of examination.
- Check the measurement screen.
- **2** Take off a chinrest tissue on the chinrest. If the tissue has run out, please supply new chinrest tissues. (see page 63)
- Wipe the dirt form forehead rest.
- 4 Have the patient sit in front of the instrument.
- Adjust the adjustable instrument table or the chair height for the patient to put his/her chin on the chinrest comfortably.
- Hold the control lever, pull the main body towards operator side fully, place the patient's chin on the chinrest and touch patient's forehead to the forehead rest.



Adjust the chinrest height by up/down button for chinrest until the eye height mark of the chinrest reaches the same height as the patient's eye. At this moment, confirm that the measuring nozzle is at the height of the patient's visual line.

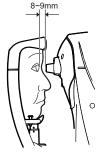


SETTING THE SAFETY STOPPER

A safety stop is set up by using a base stopper.



- Before measuring, be sure to set the safety stop.
 If not, it may cause injury by touching the measuring window glass to patient's eye. Set it respectively for the right and left eyes.
- Set the safety stop from the side of the instrument.
 Setting operation from other positions, where checking of the eye position or intraocular pressure window position is not easy, may cause injury by touching intraocular pressure window to the patient's eye.
- Hold the control lever and pull the machine body towards the operator fully.
- Turn the control lever and adjust the height of the measuring nozzle to the center of the patient's cornea.
- Keep depressing the base stopper, hold the control lever and push out the machine body slowly. "LOCKED" appears in the control panel.
- Look at patient's eyes from the side during depressing the base stopper. When the measuring nozzle reaches a position 8-9mm from the cornea, release the base stopper.



- Holding the control lever, try to slightly pull to front the machine body. Then push out slowly the machine body towards the patient's eye again while confirming that "LOCKED" does not disappear in the control panel to make sure the stopper is working. If the machine body does not move forward any further, the setting is completed.
- Pull the machine body towards the operator fully.

 "LOCKED" disappears in the control panel, so measuring is possible.

MEASUREMENT IN SEMI-AUTO MODE



When operating the instrument (for measurement and control panel operation), be careful that the instrument does not touch the patient's lip or nose. If touched, clean the instrument as specified in "HOW TO CLEAN THIS INSTRUMENT" on page 60.

NOTE

- Semi-auto mode measurement may not be possible, in case the eyelid and the eyelashes cover the pupil.
 - If this occurs, the operator should tell the patient to open their eyes as wide as possible, or lift the eyelid to allow for measurement.
 - Semi-auto mode measurement may not be possible due to frequent blinks or existing abnormalities in the corneal surface caused corneal disease etc. In this case, measure in manual mode.
- The ocular pressure varies due to heart beats and tears. So, if it is not possible to obtain exact measurement values by measuring only once or twice, it is recommended to perform ocular pressure measurements several times.
- If the machine is moved before the measurement values are displayed, it might cause an incorrect measurement.

This instrument has 3 types of alignment (measuring position adjustment) mode.

"A" Semi-auto mode: If approaching the automatic measuring range, fine alignment and measurement are performed automatically.

"AS" Auto shoot mode: Alignment is performed manually, and the measurement starts automatically if reaching the measurable range.

"M" manual mode: All processes are performed manually from alignment to measurement. Before shipment the default setting is Semi-auto mode (A).

SETTING THE SEMI-AUTO MODE

If the large sign "A" is displayed in the Alignment mode button with orange background, it is in Semi-Auto mode.

If the large sign "A" is not displayed in the Alignment

mode button with orange background, it is in other mode. Tap the button to change to Semi-auto mode.



SETTING THE MEASURING RANGE

In this instrument, the measuring range can be switched in 2 steps between "1-30" and "1-60." Normally, "1-30" is used, but if the patient's ocular pressure is high, switch it to "1-60." The default setting is "1-30" upon power on.

Tap the 30/60 button of the measurement screen and set the measuring range.

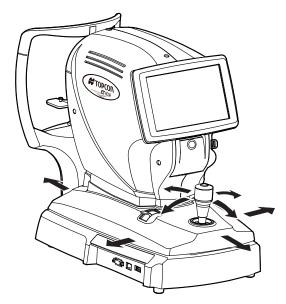


MEASUREMENT IN SEMI-AUTO MODE

To avoid injury when operating the machine (for measurement and control panel operation), be careful not to approach the finger to

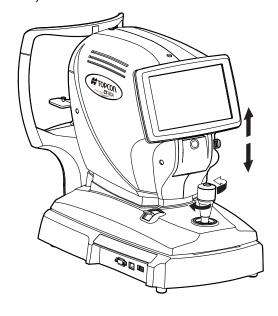
Alignment operations are done with the control lever.

· The main body position can be fine-adjusted longitudinally and laterally by inclining the control level to each direction.



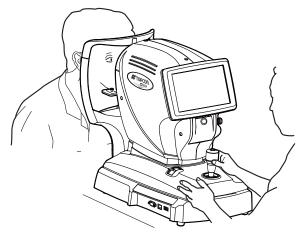
Operating the control lever (for front, back, right and left adjustment)

• The main body position can be fine-adjusted vertically by turning the control level right (up) and left (down).



Operating the control lever (for up/down adjustment)

Hold the control lever and move the main body to the operator side.



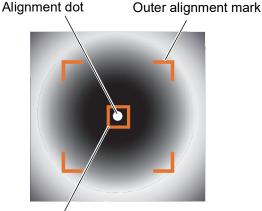
2 Operate the control lever laterally and vertically to obtain the target eye in the center of control panel screen. Then tell the patient to look at green luminous dot.



While moving the main body toward the patient, focus the target eye.

A vague, reflected alignment dot appears on the cornea.





Alignment mark



Note: Under following conditions, the outer alignment mark does not appear.

- · During safety stopper setting.
- · During an air charge
- When the base is pulled to the limit at the front (operator side)

Fine-adjust the main body position in all directions so that the alignment dot point comes within the alignment mark.

Example 2 Keeping the alignment dot within the alignment mark, slowly move the main body toward the patient. When the main body approaches the target eye, Z alignment arrows appear to the control panel screen.





- Do not allow the eyelash and eyelid to cover outer alignment mark to ensure stable measurement.
- If the machine is too close to the patient's eye in comparison with the optimal alignment position, outward Z alignment arrows appear in magenta (red purple) color, or it is too far the inward arrows appear in cyan (blue) color.
- Move the measuring head to the direction of the arrows indicated by operating the control lever. The number of the Z alignment arrows is reduced and the arrows are shortened as the measuring position comes. The alignment and measurement are performed automatically.



- If you keep pushing the measurement button, only alignment is performed. If you release the measurement button, measurement is performed. When the measurement in optional timing is required under semi-auto mode, please use this function.
- Automatic operation may not be possible, select Manual mode.

When the measuring head has reached the limit of movement (vertical/lateral directions), a yellow-colored limit mark appears on the control panel corner, showing it is the movement limit in that direction and the message of "MOVE *** TO AVOID LIMIT." displayed.

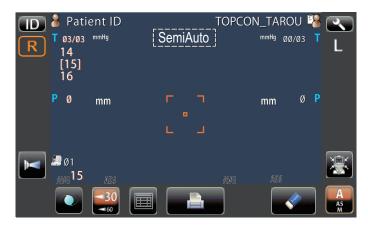
Move the measuring head or the chinrest to a position that aligning is possible.





In the limit of depth direction, only the message "MOVE FORWARD (BACKWARD) TO AVOID THE LIMIT." is displayed.

The measurement value is displayed on the control panel. For displaying measurement values, refer to "DISPLAYING MEASUREMENT VALUES" on page 37.



- Hold the control lever and pull the main body to the operator side, then switch R or L and repeat the same procedure from "SETTING THE SAFETY STOPPER" on page 31 to previous item for the next eye measurement.
- **9** Tell the patient a measuring is end and leave from the instrument.



- Semi-auto mode measurement may not work depending on the cornea condition.
- If the machine is moved before measurement values are displayed, it might cause an incorrect measurement.

DISPLAYING MEASUREMENT VALUES

With regard to TONO measurement values, data of the latest three measurements are displayed on the control panel.

Figures only: Measurement was done correctly.

[] figures: When the reliability of measurement is low. ERROR: Measurement was not done correctly.

OVER: When the measurement range is exceeded.



 In TONO average value display, low-reliability numerical data with [] are not added to the average value calculation.

However, if all measurement data are numerical data with [], the average value calculation is done using these data.

- For explanation of the messages on the control panel screen, refer to "MESSAGE LIST" on page 64.
- When data is printed out by pushing the measurement button, the "M" mark is printed at side of the value.



MEASUREMENT IN AUTO SHOOT MODE



- Adjust the height of the instrument table so that the patient can sit comfortably. Otherwise, correct measurement values may not be obtained.
- Do not perform measurement if the patient stops breathing or is nervous. Otherwise, correct measurement values may not be obtained.
- If the machine is moved before measurement values are displayed, it may cause incorrect measurement results.

In Auto shoot mode the process to fine alignment is performed manually, and the measurement starts automatically if reaching the measurable range.

SETTING THE AUTO SHOOT MODE

- **1** If the large sign "AS" is displayed in the Alignment mode button with orange background, it is in Auto shoot mode.
- **2** If the large sign "AS" is not displayed in the <u>Alignment mode</u> button with orange background, it is in other mode. Tap the button to change to Auto shoot mode.



SETTING THE MEASURING RANGE

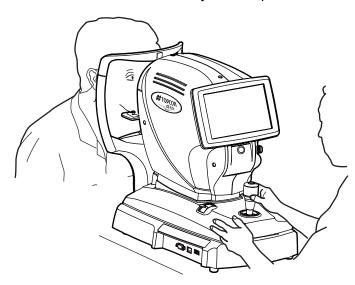
1 Tap the (30/60) button to select the measuring range if the change is required.

ALIGNMENT AND MEASUREMENT

Alignment is operated on the control panel.

For the adjustment of main body using the control lever, refer to page 33.

- **1** Use the base stopper to release the main body.
- **2** Hold the control lever and move the main body to the operator side.



3 Operate the control lever laterally and vertically to obtain the target eye in the center of control panel.



Depending on the alignment condition, the alignment mark is displayed differently:

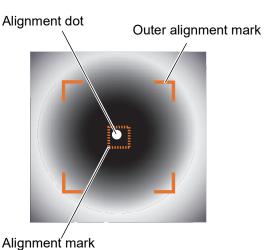
: When alignment is insufficient/out of the measuring range

When alignment is within the measuring range in all directions (front/rear, right/left, top/bottom)

4 While moving the main body toward the patient, focus the target eye.

A vague, reflected alignment dot appears on the cornea.



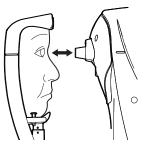


5 When the main body is brought closer to the patient's eye, Z alignment arrows appear on the control panel screen.





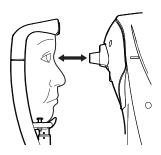
- Do not allow the eyelash and eyelid to cover the outer alignment mark to ensure stable measurement.
- If the machine is too close to the patient's eye in comparison with the optimal alignment position, outward magenta-colored (red purple) Z alignment arrows appear, or if it is too far the arrows are changed to inward cyan (blue) color, and if the machine is completely off the alignment range, Z alignment arrows does not appear. The number of arrows is reduced accordingly as the optimal alignment reference position comes closer. If the alignment reaches the measuring range, the alignment mark is displayed in green color.
- **6** Move the measuring head little by little to the direction of the arrows indicated by operating the control lever. The number of arrows is reduced accordingly as the measuring range comes closer.



Too close



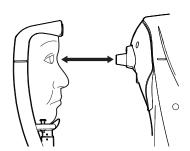
Outward Z alignment arrows (purple)



Too far



Inward Z alignment arrows (Green)



Positioning is incorrect at all.



Z alignment arrows are not appeared.

- **7** Align to make the cyan (blue) or magenta (red purple) Z alignment arrows short. When the Z alignment arrows reach minimum, the measurement is carried out automatically at the position which the alignment mark turns green. The measurement value is displayed on the control panel.
- **8** Hold the control lever and pull the main body to the operator side, then switch R or L and repeat the same procedure from "SETTING THE SAFETY STOPPER" on page 31 to previous item for the next eye measurement.





- If Auto Shoot mode measurement does not work, push the measurement button when the alignment dot becomes minimum within the alignment mark. Auto Shoot mode measurement may not work depending on the cornea condition.
- If the machine is moved before measurement values are displayed, it might cause an incorrect measurement.

DISPLAYING MEASUREMENT VALUES

With regard to TONO measurement values, data of the latest three measurements are displayed on the control panel.

Figures only: Measurement was done correctly.

[] figures: When the reliability of measurement is low.

ERROR: Measurement was not done correctly.

OVER: When the measurement range is exceeded.



- In TONO average value display, low-reliability numerical data with [] are not added to the average value calculation. However, if all measurement data are numerical data with [], the average value calculation is done using these data.
- When data is printed out, the "M" mark is printed on the value measured in auto shoot mode off.
- For explanation of the messages on the control panel screen, refer to "MESSAGE LIST" on page 64.



MEASUREMENT IN MANUAL MODE

In manual mode all processes are performed manually from alignment to measurement.

SETTING THE MANUAL MODE

- 1 If the large sign "M" is displayed in the Alignment mode button with orange background, it is in Manual mode.
- **2** If the large sign "M" is not displayed in the <u>Alignment mode</u> button with orange background, it is in other mode. Tap the button to change to Manual mode.



SETTING THE MEASURING RANGE

1 Tap the 30/60 button to select the measuring range if the change is required.

ALIGNMENT AND MEASUREMENT

In Manual mode the procedure for alignment is same as auto shoot mode (refer to page 39).

For measurement, align to make the cyan (blue) or magenta (red purple) Z alignment arrows short as same manner of the Item **7** at "Alignment" in auto shoot mode (refer to page 41). When "ALIGN-MENT OK" is displayed, push the Measurement button on the control lever at the position, which Z alignment arrows disappear and the alignment mark turns green.



- Even if the alignment is not correct, measurement can be performed by pushing the measurement button. To ensure correct measurement with high accuracy, try to get correct alignment.
- Even if you seem to get correct alignment, the alignment mark does not become green. In this case, please carry out a measurement after confirming surely that the alignment is performed correctly.
- The alignment mark may not become green according to patient's cornea condition.

PRINTOUT OF MEASUREMENT VALUES



- To avoid a paper jam in the printer, do not feed the paper if it is partly cut or wrinkled.
- To avoid discoloring of the printer paper (particularly the recording area) during storage, use a polypropylene bag and not one containing plasticizer (PVC, etc.).
- To avoid discoloring of the printer paper (particularly the recording area) after pasting, use water-soluble glue and not one containing solvent.
- Since the printer paper is thermosensitive, it is not suitable for keeping records for a long period. If necessary, prepare copies separately.

This instrument can print out measurement values with a printer.

1

Tap the PRINT button on the control panel.

Measurement values on the control panel are printed out.

When measurement values are printed out, the displayed values disappear on the control
panel. At this moment, the internal measurement data still remains. The data is cleared by
tapping the <u>ALL CLEAR</u> button.





- When a red line is printed at the edge of the printer paper, replace it with a new one. For details about the replacement of the printer paper, see "PRINTER PAPER SETTING" on page 24. 58mm wide printer paper (example: TP-50KJ-R, Nippon Paper) is recommended.
- "Close printer cover." indicates that the printer cover is left opened, ensure that the printer cover is completely closed.
- If the print button is tapped again after printing of measurement value is carried out and all measurement value is cleared, the last measurement data is printed out.

If printing out of the measurement values is not required, be sure to clear the measurement values for a next patient. (Refer to "CLEARING MEASUREMENT VALUES" on page 44.)

CLEARING MEASUREMENT VALUES

If printing out of the measurement values is not required, be sure to clear the measurement values for a next patient.



Tap the ALL CLEAR button on the control panel.

All measurement values of both eyes are cleared.



DISPLAYING ALL MEASUREMENT DATA

Normally the latest measurement is displayed, but it is possible to display and confirm all measurement data.

1,

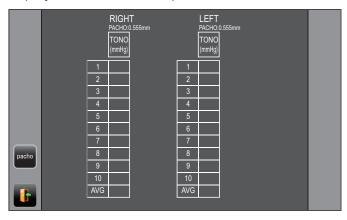
Tap the ALL DATA DISPLAY button.



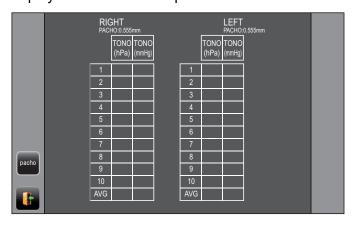
2 The Data Display screen is displayed.

The display unit is varied according to the Settings of setup.

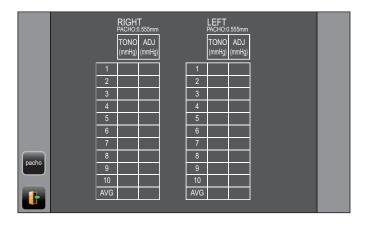
Setup item: Display unit in intraocular pressure measurement "mmHg"



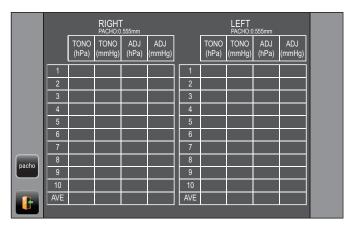
Setup item: Display unit in intraocular pressure measurement "hPa"



Setup setting: Display unit in intraocular pressure measurement "mmHg," IOP adjustment "ON"



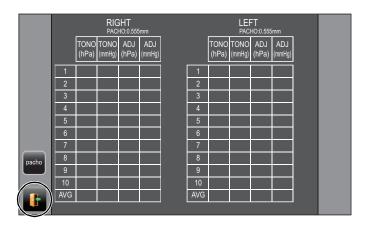
Setup setting: Display unit in intraocular pressure measurement "hPa," intraocular pressure adjustment "ON"





For the value measured by manual mode and the value measured by using the measurement button in auto shoot mode, the color of a character turns to yellow.

To exit the data display and return to the Measurement screen, tap the EXIT button.



WHEN CORNEA THICKNESS IS REFLECTED ON MEASUREMENT DATA

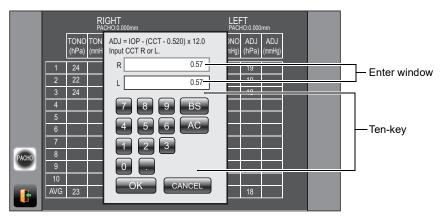
Measurement data calculated including cornea thickness can be displayed by inputting a PACHO (cornea thickness) data.

When carrying out this setup, it is required to select ON at "Show Adj value" of "Initial".

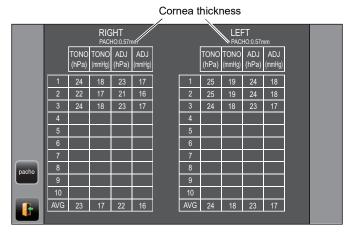
Tap the (PACHO) button on the Data Display screen.

			RIG PACE	HT HO:0.000	mm			LEF PACI	-T HO:0.000)mm	
		TONO (hPa)	TONO (mmHg)	ADJ (hPa)	ADJ (mmHg)			TONO (mmHg)		ADJ (mmHg)	
	1	24	ERR	18	ERR	1	25	ERR	19	ERR	
	2	22	ERR	17	ERR	2	25	ERR	19	ERR	
	3	24	ERR	18	ERR	3	24	ERR	18	ERR	
	4					4					
	5					5					
	6					6					
	7					7					
pacho	8					8					
	9					9					
	10					10					
	AVG	23		17		AVG	24		18		

The PACHO data input screen appears. Select enter window of "R" (right eye) or "L" (left eye) by tapping, and enter the cornea thickness value using ten key.



Tap the OK button and fix the input value. The entered cornea thickness value is displayed on the Data display screen and is reflected to the measurement data.



OPERATION OF AFTER USE

1 Use the base stopper to fix the main body.

2 Turn the (POWER) switch to off.



When external devices are connected to external I/O terminals, turn off the power of these devices too.

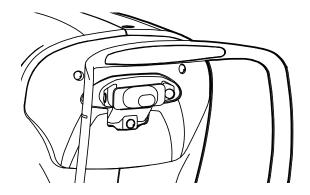
(If power switch is provided.)

3 Unplug the power cord from a 3-pin AC inlet with grounding.



When the instrument is not used for a long period, unplug the power supply cable, and detach the cable connected to the external I/O terminal.

4 Fit the nozzle cap to the measuring nozzle.



OPTIONAL OPERATIONS

DISPLAYING THE PATIENT ID (PATIENT No.) OR OPERATOR ID

A patient ID or operator ID of up to 13 characters can be input and displayed on the control panel and printout.

However, if no patient ID is input, the patient No. is allocated automatically by the device.

1 Tap (ID) button.

2 Tap keyboard on the screen and enter characters. Tap (OK) button and fix the input value.



- Patient ID is reset when measurement values are printed or if the ALL CLEAR button is tapped.
- Patient No. reset condition can be selected such that the patient No. is reset upon power on or not, in the initial setting of setup screen.
- Be sure to verify the input ID to agree with data of a patient or an operator.

OUTPUT USING RS-232C

This instrument can output data to a PC, etc. via the RS-232C interface.

- **1** Connect the interface cable to RS-232C OUT.

 Refer to "CONNECTING EXTERNAL I/O TERMINALS" on page 23.
- **2** Set up of data communication settings. For details, refer to "DATA COMMUNICATION (COMM)" on page 58.
- **3** Perform measurements.
- **4** Tap the PRINT OUT button of the control panel.
 When output is completed, "RS-232C SUCCESS" is displayed on the screen.

INPUT USING USB



- If you enter barcode data and output the data while the barcode reader is prohibited from reading, a message asking you to enter the barcode data again is displayed.
- For the message to be displayed, refer to "MESSAGE LIST" on page 64.
- If the message is displayed, enter the barcode data again.

This instrument can input ID numbers from a bar code reader, etc. via the USB.

- 1 Check the connection of USB IN.
 For connection, refer to "CONNECTING EXTERNAL I/O TERMINALS" on page 23.
- 2 Input ID numbers from the external device.

 The inputted ID numbers are displayed on the screen.

OUTPUT USING LAN

This instrument can output data to a PC, etc. via the LAN interface.

- **1** Connect the network cable to LAN OUT. For connection, refer to "CONNECTING EXTERNAL I/O TERMINALS" on page 23.
- **2** Set up of LAN connection settings. For details, refer to "LAN CONNECTION (LAN)" on page 58.
- **3** Perform measurements.
- **4** Tap the PRINT OUT button of the control panel. Output is completed.



For explanation of messages during communication refer to the "MESSAGE LIST" on page 64.

SETTING FUNCTIONS ON SETUP SCREEN

OPERATING THE SETUP SCREEN

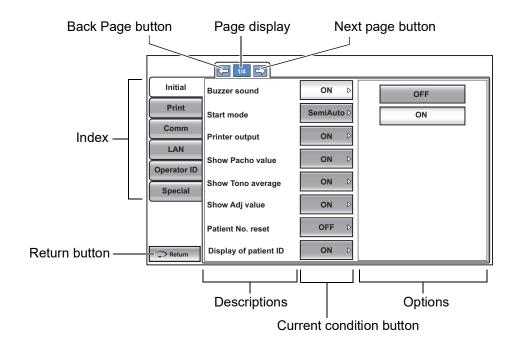
Various functions can be set on the SETUP screen.

PREPARATONS FOR SETTING

- Make sure that the power cord is connected.
 For connection, refer to "CONNECTING POWER CORD" on page 22.
- **2** Turn ON the POWER switch.
- **3** Tap the <u>SETTINGS</u> button on the control panel.

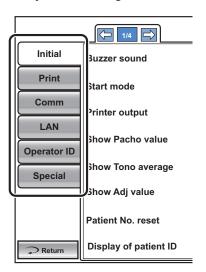


The SETUP screen is displayed.

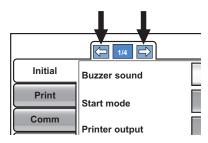


OUTLINE OF SETUP SCREEN OPERATIONS

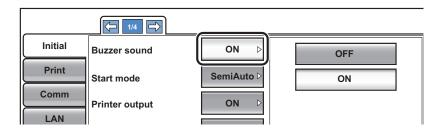
1 Tap INDEX and select the subject of setting.



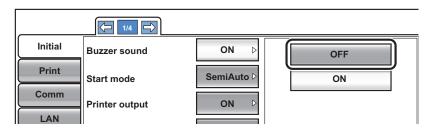
2 Operate the <u>NEXT PAGE</u> button or <u>BACK PAGE</u> button, as necessary, and display the page to confirm/change.



3 Tap the (CURRENT CONDITION) button of the item to be changed and find the (OPTIONS) button.



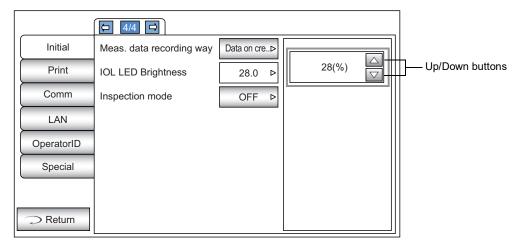
4 Tap the OPTIONS button and change the setting.



• Instead of the OPTIONS button, up/down buttons and ten-key would be displayed.

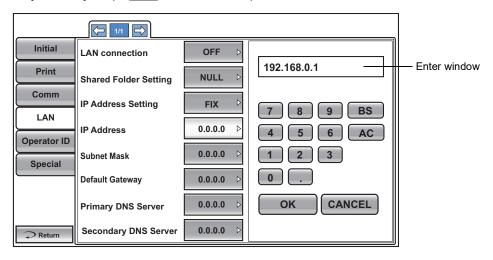
UP/DOWN BUTTON:

Tap the up or down button on the screen to change the setting.



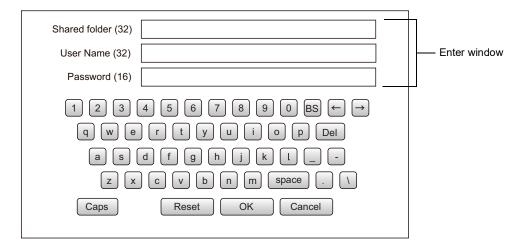
TEN-KEY:

Tap ten-key on the screen and enter the figure. If there are several windows to enter, tap the window to enter the figure by ten-key. Tap OK and fix the input value.



KEYBOARD:

Tap keyboard on the screen and enter characters. If there are several windows to enter, tap the window to enter the figure by keyboard. Tap OK and fix the input value.

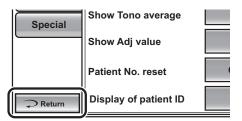




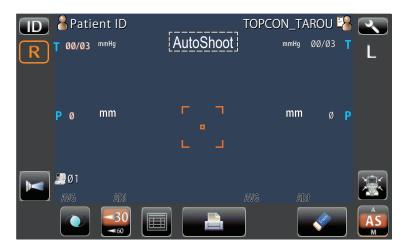
The set value is updated when an Options button is tapped.

RETURNING TO THE MEASUREMENT SCREEN

1 Tap the Return button.



2 The Measurement screen is displayed.



LIST OF SETUP ITEMS

Setup items are categorized into 6 large indexes.

"Initial Settings"	items related to the initial status after power on
"Internal Printer"	items related to output from the internal print
"Comm"	items related to data output with the external device
"Network Settings"	items related to output using the LAN
"Operator Settings"	items related to Operator ID
"Special"	items related to maintenance (for service personnel only)

INITIAL SETTINGS

Initial contains settings related to the initial status after power on, clearing all measurement values, etc.

Descriptions	Options	Details	Initial value	
Buzzer sound	OFF	Buzzer does not sound.	ON	
Buzzei sound	ON	Buzzer sounds.	ON	
	Manual	Default start mode is set to Manual.		
Start mode	AutoShoot	Default start mode is set to Auto Shoot.	SemiAuto	
	SemiAuto	Default start mode is set to Semi-Auto.		
Printer output	OFF	Internal printer is disabled.	ON	
Frinter Output	ON	Internal printer is active.	ON	
Show Pacho value	OFF	Pacho value is not displayed.	ON	
Show Facilo value	ON	Pacho value is displayed.	ON	
Show Tono average	OFF	Tono average value is not displayed.	ON	
Show forto average	ON	Tono average value is displayed.		
Show Adj value	OFF	Adjusted value is not displayed.	ON	
Show Auj value	ON	Adjusted value is displayed.	ON	
Patient No. reset	OFF	Patient No. is not reset upon power on.	OFF	
Fallent No. Teset	ON	Patient No. is reset upon power on.	OFF	
Display of patient ID	OFF	Patient ID is not displayed.	ON	
Display of patient ID	ON	Patient ID is displayed.		
Dationt ID (Mandaton)	OFF	Patient ID is not required.	OFF	
Patient ID (Mandatory)	ON	Patient ID is required.		
Device ID number	1-99 Set by ten-key display	Sets the Device ID number.	1	
Display of Device ID num.	OFF	Device ID is not displayed.	OFF	
Display of Device ID Hulli.	ON	Device ID is displayed.	OFF	
	OFF	Power save function is not used.		
	1 min	Power save status in 1min after last operation.		
	5 min	Power save status in 5min after last operation.		
Start time of sleep mode	10 min	Power save status in 10min after last operation.	10 min	
	20 min	Power save status in 20min after last operation.		
	30 min	Power save status in 30min after last operation.		
	60 min	Power save status in 60min after last operation.		
Cout.cycle(TONO)	2-10 Set by ten-key display	The number of continuous measurements.	3	
Date/Time	Set by ten-key display	Sets year, month, day, time (24hrs), minute and second	Installation date/time	
	mmHg	Display in mmHg		
Tono dienlov Unit	digit	Display in digit	mm∐c	
Tono display Unit	hPa	Display in hPa	mmHg	
	Torr	Display in Torr	-	
Dealer Bentan Hay	mm	Display in mm		
Pacho display Unit	μm	Display in μm	mm	

Press average Mode	Integer	Display in Integer	Integer	
Fless average Mode	Real	Display in Real	integer	
IOP Adjustment	OFF	IOP adjustment type is OFF.	OFF	
IOF Adjustillerit	ON	IOP adjustment type is ON.	OFF	
Center CCT Base	0-999 Set by ten-key display	Sets the central cornea thickness base value. (Used when IOP adjustment is "ON.") A: Center CCT Base	545	
Adjustment Coefficient	0-9999 Set by ten-key display	Sets the adjustment coefficient. (Used when IOP adjustment is "ON.") B : Adjustment Coefficient	500	
R/L or OD/OS	R/L	Right/left eyes is displayed by R/L.	R/L	
R/L 0I OD/OS	OD/OS	Right/left eyes is displayed by OD/OS.		
	LEVEL 1 (dark)			
Control panel brightness (Setup of the brightness of	LEVEL 2	The brightness of central panel is set up	LEVEL 4	
control panel)	LEVEL 3	The brightness of control panel is set up.		
,	LEVEL 4 (bright)			
Packing mode	Execute	This instrument is set to the condition for packing.	_	
Llac original IDA font	OFF	A line of the frame is shown to the character of the measurement values, etc.	OFF	
Use original IPA font	ON	A line of the frame disappears in the character of the measurement values, etc.	OFF	
	Data on credibility	Measurement data is displayed in the order from low to high reliability.	Data as	
Meas. data recording way	Data without error	The measurement data without error is displayed.	Data on credibility	
	Data with error	All the measurement data (including data with error) is displayed.	Credibility	
IOL LED Brightness	0 - 100% Set by up/down button	Sets brightness of alignment dot in IOL mode.	28(%)	

^{*} The adjusted IOP can be determined by the equation below:

When display unit of input value of cornea thickness is set to "µm"

Adjusted IOP*1 = Measured IOP - (Measured CCT - A) x (B/10000) *2

A: Center CCT BASE [μm]

B: Adjustment Coefficient

IOP: Intraocular pressure [mmHg]

input value of cornea thickness :CCT [μm]

When display unit of input value of cornea thickness is set to "mm"

Adjusted IOP*1 = Measured IOP - (Measured CCT - A/1000) x (B/10) *2

A: Center CCT BASE $[\mu m]$

B: Adjustment Coefficient

IOP: Intraocular pressure [mmHg]

input value of cornea thickness: CCT [mm]

^{*1:} The adjusted IOP that is calculated on A and B is just a reference value.

^{*2:} A correction factor inputs a value integrally

INTERNAL PRINTER

Print contains settings related to output from the internal printer.

	•			
Descriptions	Options	Details	Initial value	
Daraada	OFF	Barcode is not printed.	OFF	
Barcode	ON	Barcode is printed.	OFF	
Operator ID	OFF	Operator ID is not printed.	OFF	
	ON	Operator ID is printed.	OFF	
Name	OFF	"Name" space is not available.	ON	
Name	ON	"Name" space is available.	ON	
Dete	OFF	Date is not printed.	ON	
Date	ON	Date is printed.	ON	
	YMD	Print in Year/Month/Day format.		
Date style	MDY	Print in Month/Day/Year format.	DMY	
	DMY	Print in Day/Month/Year format.		
D-6	OFF	Patient No./Patient ID is not printed.	ON	
Patient No./Patient ID	ON	Patient No./Patient ID is printed.	ON	
D : 1D 1	OFF	Device ID number is not printed.	055	
Device ID number	ON	Device ID number is printed.	OFF	
0 1 1	OFF	Serial No. is not printed.	ON.	
Serial number	ON	Serial No. is printed.	ON	
T0000111	OFF	TOPCON logo is not printed.	- ON	
TOPCON logo	ON	TOPCON logo is printed.	ON	
Management	OFF	Message is not printed.	OFF	
Message print	ON	Message is not printed.		
Input message	Set by keyboard display	String of up to 72 characters.	NULL	
Line space	0-24 Set by ten-key display	Line space is set in dot units.	0	
Auto Cut	OFF	Auto cut is not carried out.	ON	
Auto Cut	ON	Auto cut is carried out.	ON	
	R/L	TONO measurement value and PACHO measurement value are separately printed.		
Print Layout	DATA	The order is right eye and left eye regardless of the TONO measurement value and PACHO measurement value.	SIMPLE	
	SIMPLE	Print in the SIMPLE format. Under SIMPLE format the measurement data up to the 3 latest times are printed.		
mmHg Display on hPa	OFF	mmHg is not printed on hPa.	ON	
	ON	mmHg is printed on hPa.	ON	
Magazira carrection	OFF	Corrected measurement value is not printed.	ON	
Measure correction	ON	Corrected measurement value is printed.	ON	
IOD AD I Formula	OFF	Center CCT Base and Adjustment Coefficient for IOP ADJ formula are not printed.	ON	
IOP ADJ Formula	ON	Center CCT Base and Adjustment Coefficient for IOP ADJ formula are printed.	ON	

DATA COMMUNICATION (COMM)

Comm contains settings related to data output with the external device.

Descriptions	Options	Details	Initial value	
	MODE1	Average value output format		
	MODE2	Latest value output format]	
Communication Format	STD1	TOPCON STD1 format	MODE1	
	STD2	TOPCON STD2 format]	
	STD5	TOPCON STD5 format]	
Use of Output port	OFF	Output port is disabled.	OFF	
Ose of Output port	ON	Output port is enabled.		
Baudrate setting	2400bps	Baudrate value: 2400bps	9600bps	
Baudrate Setting	9600bps	Baudrate value: 9600bps	addopps	
MODE2 Retransmit	ON	In case of selecting MODE2, the last measured data is retransmitted after pushed the PRINT OUT button.	ON	
MODEZ RETAIISIIIL	OFF	In case of selecting MODE2, the last measured data is not retransmitted after pushed the PRINT OUT button.	ON	

LAN CONNECTION (LAN)

LAN contains settings related to data output via LAN.

Descriptions	Options	Details	Initial value	
LAN connection	OFF	LAN connection is off.	OFF	
LAN COTTIECTION	ON	LAN connection is on.		
Shared Folder Setting	Shared Folder (up to 32 characters) User Name (up to 32 characters)	Path and permission to the shared folder is set.	NULL	
	Password (up to 16 characters) Set by keyboard display			
IP Address Setting	FIX	Assign IP address manually.	FIX	
ii Address Setting	AUTO	Assign IP address automatically.	11/	
IP Address	0. 0. 0. 0 Set by ten-key display	IP address of CT-800A to output data.	0.0.0.0	
Subnet Mask	0. 0. 0. 0 Set by ten-key display	Subnet mask address of CT-800A.	0.0.0.0	
Default Gateway	0. 0. 0. 0 Set by ten-key display	Default gateway address of CT-800A.	0.0.0.0	
Primary DNS Server	0. 0. 0. 0 Set by ten-key display	Primary DNS Server number.	0.0.0.0	
Secondary DNS Server	0. 0. 0. 0 Set by ten-key display	Secondary DNS Server number.	0.0.0.0	

OPERATOR SETTINGS

OPERATOR contains settings related to Operator ID.

Descriptions	Options	Details	Initial value	
Use of Operator ID	OFF	Operator ID will not be displayed on the control panel and printer output.	- OFF	
ose of Operator ID	ON	Operator ID will be displayed on the control panel and printer output.	- 055	
Prefix of Ope. ID	Set by ten-key display. (up to 3 characters)	The Prefix of Operator ID can be registered.	NULL	
Operator ID (Mandatory)	OFF	Operator ID is not required.	OFF	
Operator ID (Mandatory)	ON	Operator ID is required.		
Fixed Ope. ID setting	OFF	Operator ID is not fixed.	OFF	
Fixed Ope. ID setting	ON	Operator ID is fixed.	UFF UFF	
Fixed Ope. ID entry	ASCIIZ string up to 13 characters including terminated null char.	Input fixed operator ID.	NULL	

SPECIAL

SPECIAL is a mode for service personnel only; it can not be accessed.

MAINTENANCE

DAILY CHECKUPS

USER MAINTENANCE ITEM

Item	Inspection time	Contents
Inspection	Before using	 The instrument works properly. The objective lens must be free of stains and/or flaws. Confirm whether the foreign object is attached to the measuring nozzle and the area around the measuring nozzle. Air check Confirm that the safety stopper setting and measuring nozzle do not move to the patient's side beyond the safety stopper setting position.
Cleaning	When the part is stained	Objective lensExternal cover, control panel, etc.
Replacement	As required	Printer form

MANUFACTURER MAINTENANCE ITEMS

Item	Checking time	Contents
Cleaning each component	Within 12 months	Cleaning outer coversChecking the optical systemCleaning POWER unit
Operation check	Within 12 months	Checking the main body operationChecking switches
Accuracy check	Within 12 months	Confirming the ocular pressure measurement functions (using special tools)

MANTENACE AFTER USE

- After using, refer to "HOW TO CLEAN THIS INSTRUMENT" on page 60.
- For this instrument, dust may cause errors. When not in use, replace the measuring window cap and dust cover.
- When not in use, turn off the POWER switch.

HOW TO CLEAN THIS INSTRUMENT

CLEANING THE COMPONENTS THAT COME INTO CONTACT WITH THE PATIENT

When the forehead rest and chinrest become stained, use a neutral tableware detergent and warm water. Dip a soft cloth in the solution, squeeze out the excess water and then wipe off the stain.

DAILY MAINTENANCE

- For this instrument, dust may cause errors. When not in use, replace the nozzle cap and dust cover.
- When not in use, turn off the POWER switch.

CLEANING THE EXTERNAL COVER



- Do not use or apply any aerosol-type cleaner near the instrument.
 - If a drop of cleaner remains inside the measuring nozzle, the patient's eye may be injured during measurement.
- Do not use tweezers or gauze, as these may scratch the lens and glass surfaces.



Do not clean plastic parts with solvents.

Benzine, thinner, ether, gasoline and chemical duster may cause discoloring and decomposition.

- 1 If the external cover, control panel, etc. get soiled, wipe the surface clean with a dry cloth.
- **2** If the external cover is noticeably stained, wipe the surface with a damp cloth which is moistened in a tepid water solution of neutral detergent.

CLEANING THE CONTROL PANEL



- Since the control panel screen is a touch panel, be sure to turn off the POWER switch before wiping. The touch panel will react and malfunction.
- When the monitor cleaner has become dirty, wash it. When washing, rinse
 it thoroughly so no detergent is left. If any detergent remains, it may cause
 uneven wiping.

CONTAMINATION BY DUST

Remove the dust with a soft brush, and wipe with the attached monitor cleaner.

CONTAMINATION BY FINGERPRINTS

Wipe with the attached monitor cleaner.

If the stain still remains, moisten the monitor cleaner with water and then wipe off the stain.

CLEANING THE MEASURING WINDOW

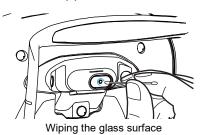
- To secure auto alignment and correct measurement values, clean the measuring window glass after each day's work.
- Clean the glass when "CLEAN THE MEASURING WINDOW GLASS" is displayed on the control panel screen.



To clean the measuring window glass, measuring nozzle and the glass inside the measuring nozzle, use ethanol. Using other chemicals may cause damage to the patient's eye during measurement.



- Do not apply unreasonable force to the measuring nozzle while cleaning.
- To avoid problems, do not leave the cotton fibers inside.
- · Be sure to use only the attached applicator.
- **1** Prepare the ethanol.
- **2** Using a blower, remove dust and dirt from the glass surface.
- **3** Moisten the applicator with ethanol.
- **4** Wipe the glass surface lightly with the applicator, from the center outward.



5 Use a new applicator and wipe the glass surface in a similar manner; repeat this several times.



To ensure thorough removal of grease from the measuring window, be sure to replace the applicator and use a new one for each of these repeated wiping operations.

6 The Cleaning is completed when grease is thoroughly removed. If stains cannot be removed easily, call your dealer.



When the measuring window becomes stained, "CLEAN THE MEASURING WINDOW GLASS" is displayed on the control panel screen.

CLEANING THE MEASURING NOZZLE AND THE GLASS INSIDE THE MEASURING NOZZLE

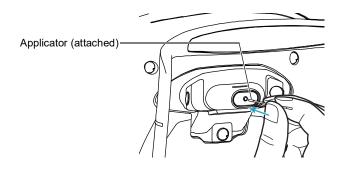
- If there is any foreign matter on or around the measuring nozzle, it may enter and damage the patient's eye during the measurement. If there is any, clean the measuring nozzle.
- When the glass inside the measuring nozzle becomes stained, it makes the fixation target unclear, causing errors in auto alignment and measurement values. If the fixation target is unclear or measurement values with parentheses are frequent, clean the glass inside the measuring nozzle.
- Clean the glass when "CLEAN INSIDE NOZZLE/GLASS" is displayed on the control panel screen.

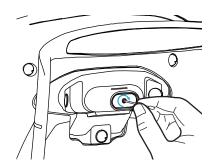


To clean the measuring window, measuring nozzle and the glass inside the measuring nozzle, use ethanol. Using other chemicals may cause damage to the patient's eye during measurement.



- Do not apply unreasonable force to the measuring nozzle while cleaning.
- To avoid problems, do not leave the cotton fibers inside.
- · Be sure to use only the attached applicator.
- **1** Prepare ethanol.
- **2** Moisten the applicator with ethanol.
- **3** Insert the applicator into the measuring nozzle, lightly touch the glass surface, and turn the applicator a few times.





4 Use a new applicator and wipe the glass surface in a similar manner; repeat this a few times.



The used applicator contains grease and it only scatters grease if used again; the light transmittance is not improved at all. Be sure to replace the applicator and use a new one for each of these repeated cleaning operations.

5 If the fixation target is clearly seen, cleaning is completed. If stains cannot be removed easily, call your dealer.



When the glass becomes stained, "CLEAN INSIDE NOZZLE/GLASS" is displayed on the control panel screen.

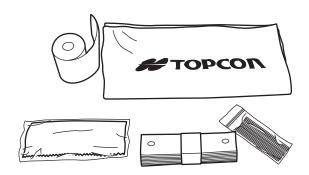
REPLACING AND ORDERING CONSUMABLE ITEMS

ORDERING CONSUMABLE ITEMS

• When ordering consumable items, tell the product name, product code and quantity to your dealer or TOPCON at the address listed on the back cover.

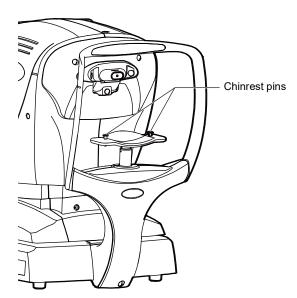
Product name	Product code
Chinrest tissue	403104082
Monitor cleaner	448001001
Dust cover	423609002

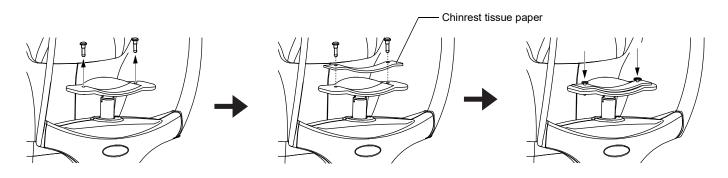
Product name	Product code
Applicator	416018606
Printer paper	448004001



REPLACING THE CHINREST TISSUE PAPER

• When the chinrest tissue paper has run out, pull off the chinrest pins and replace it with new tissue paper.





TROUBLESHOOTING

TROUBLE-SHOOTING OPERATIONS

MESSAGE LIST

ERROR	Displayed when the measurement is an error. If changing alignment mode to manual, it may be able to measure by manual. For measuring in manual mode, refer to "MEASUREMENT IN MANUAL MODE" on page 42.	
OVER	Displayed when the measurement is over. If changing measurement range to 1-60, it may be able to measure.	
Finished	Displayed when normal measurements are completed for the set measurement count.	
CLEAN THE MEASURING WINDOW GLASS	Displayed when a blot is detected on the measuring window during TONO measurement. Clean the measuring nozzle and the glass inside the measuring nozzle by referring to "CLEANING THE MEASURING NOZZLE AND THE GLASS INSIDE THE MEASURING NOZZLE" on page 62.	
CLEAN INSIDE NOZZLE/GLASS	Displayed when a blot is detected on the measuring window during TONO measurement. Clean the measuring window by referring to "CLEANING THE MEASURING WINDOW" on page 61.	
Range of Input value is 0.3-0.8	Displayed when PACHO value is set to a value out of the specified input range. Enter a value within the input range.	
Range of Input value is 300.0-800.0	Displayed when PACHO value is set to a value out of the specified input range. Enter a value within the input range.	
ALIGNMENT OK	The eye is within a range of measuring OK.	
LOCKED	Displayed while safety stopper is setting.	
MOVE LEFT TO AVOID THE LIMIT.	Displayed when it reached the limit to the left in auto alignment. Move to the left by operating the control lever.	
MOVE RIGHT TO AVOID THE LIMIT.	Displayed when it reached the limit to the right in auto alignment. Move to the right by operating the control lever.	
LOWER CHIN REST TO AVOID THE LIMIT.	Displayed when it reached the upward limit in auto alignment. Move the chinrest to the downward.	
RAISE CHIN REST TO AVOID THE LIMIT.	Displayed when it reached the downward limit in auto alignment. Move the chinrest to the upward.	
MOVE FORWARD TO AVOID THE LIMIT.	Displayed when it reached forward (patient's side) limit in auto alignment. Move to the forward by operating the control lever.	
MOVE BACKWARD TO AVOID THE LIMIT.	Displayed when it reached backward (operator's side) limit in auto alignment. Move to the backward by operating the control lever.	
Previous measurements are left. Please press the Clear button.	Displayed when the output of all output-set data fails.	
Patient ID is required. Please set patient ID.	Displayed when the output operation is requested when the setting "Patient ID (Mandatory)" is ON but the patient ID is not inputted. Enter the patient ID and then request the output operation.	
Operator ID is required. Please set Operator ID.	Displayed when the output operation is requested when the setting "Operator ID request" is ON but the operator ID is not inputted. Enter the operator ID and then request the output operation.	
Rescan ID.	Displayed when barcode reader is connected and the print out button is pushed without reading the barcode again in the readable state after reading barcode in the state to be inhibited to read. If this message is displayed, read the barcode again.	

Displayed when applying network setting as "LAN connection" in the "LAN" is	
switched to ON or OFF.	
Displayed when all output settings are OFF.	
The printer cover is open. Close the cover until it clicks.	
Printer paper is used up. Supply printer paper.	
Displayed when the printer unit does not operate normally, such as the cutter does not work. Call the service personnel.	
LAN data output is in process.	
LAN data output is completed.	
Failed to reset the LAN connection. Confirm that the LAN cable connection and the LAN setting are in the correct way.	
Failed to resolve the host name of the destination (to be connected with the shared folder). Confirm the inputted host name or DNS server address.	
Failed to connect to the shared folder. Confirm the address, folder name, user name and password of the destination (to be connected with the share folder).	
Failed to create the file. Confirm that write permission to the share folder is set correctly.	
Failed to write to the file. Check the free space capacity at the save location.	
Failed to reset the LAN connection. Confirm that the LAN cable connection and the LAN setting are in the correct way.	
Failed to reset the LAN connection. Confirm that the LAN cable connection and the LAN setting are in the correct way.	
Failed to reset the LAN connection. Confirm that the LAN cable connection and the LAN setting are in the correct way.	
Failed to communicate to DHCP server.	
Failed to communicate to DHCP server.	
Failed in IP address auto assignment. Set a fixed IP address, or check if the DHCP server is running.	
Displayed when the IP address is duplicated.	
Displayed in case of a LAN error other than the LAN errors mentioned previously.	
RS-232C data output is in process.	
RS-232C data output is completed.	
RS-232C data transmission failed.	
Displayed when the "Cont. Cycle" is set to a value out of the specified input range. Enter a value within the input range.	
Warns that the measuring head is too close to the patient's eye.	
Displayed when the first octet of IP address, default gateway, primary DNS server or secondary DNS server is set to a value out of the specified input range.	
Displayed when the octet is set to a value out of the specified input range. Enter a value within the input range.	
Displayed when the subnet mask is set to a value off the input rule. Enter a value within the input rule.	
Displayed when the input examiner ID prefix is less than 3 characters. Enter a prefix with 3 characters.	
Displayed when the password inputted to select a special mode is incorrect.	
Indicates that the packing operation is in process. Wait until it is completed.	

Packing has finished! Please turn off power.	Indicates that the packing operation is completed. Switch off the machine.
Please check the DATE/TIME	The battery for the built-in clock has become worn out. Before using, confirm the time and date on the SETUP menu. If the message comes up frequently, call your service personnel.
Cannot detect x position. Please turn the switch off/on.	Displayed when the auto alignment sensor and the machine are not correctly connected or not connected at all.
Cannot detect y position. Please turn the switch off/on.	Displayed when the auto alignment sensor and the machine are not correctly connected or not connected at all.
Cannot detect z position. Please turn the switch off/on.	Displayed when the auto alignment sensor and the machine are not correctly connected or not connected at all.
Perform air check?	Displayed to confirm whether to perform air check.
Air checked. Press OK to continue.	Displayed when normal air check operation is confirmed.
Confirm abnormal action(-) of air check	Displayed when an anomaly occurred during air check. Check the measuring nozzle for any foreign matter.
Confirm abnormal action(+) of air check	Displayed when an anomaly occurred during air check. Check the measuring nozzle for any foreign matter.

AIR CHECK

If a problem is suspected, do the air check.

If the result is "abnormal action(+)" or "abnormal action(-)," call your dealer or TOPCON at the address printed on the back cover of this manual. For details about the air check, see "AIR CHECK" on page 28.

TROUBLE-SHOOTING OPERATIONS



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

If a problem is suspected, use the following check list.

If following instructions does not improve the condition, or if your problem is not included in the list, contact your dealer or TOPCON at the address on the back cover.

CHECK LIST

Trouble	Condition	Check	Page
Control panel does not turn on.		Is power cord unplugged?	22
		Is power cord connected to the instrument?	22
Control panel is not clear.	The image is dark.	Adjust the brightness by "Control panel Brightness Adjust".	56
Any trouble is found in a movable part.		Do not move it forcibly but call our service personnel.	27
Printing is not done.	Paper comes out without printing.	Confirm the direction of paper winding. If the direction is incorrect, reset paper to the proper direction.	24
	Paper does not come out.	If "PAPER END" displayed on control panel, replenish printer paper.	24

PRINTER PAPER JAM

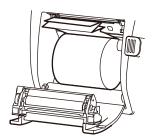


- When setting a printer paper, keep a patient's face away from the instrument. Some part of the instrument may touch the patient's lip or nose if the printer button is pressed.
- To avoid potential injury in case of malfunction, including a paper jam, be sure to shut off the power before attempting to repair it.
- To avoid potential injury, do not touch the printer body including metal parts or the paper cutter, while the printer is in operation or when replacing the printer paper.



- If the printer paper is jammed in the printer, printing will stop and the jam should be cleared.
- Pay much attention not to touch the internal printer's body when the cover is open. If touched, it may result in trouble due to electrostatic discharge.

1 Shut off the power and open the printer cover, take out the jammed paper pieces.





If the power is turned on to start after removing the jammed printer paper, a blank sheet is printed out by tapping the printer button.

SPECIFICATIONS AND PERFORMANCE

SPECIFICATIONS AND PERFORMANCE

Ocular pressure	Measuring range: 1 to 60mmHg
measurement	(Display unit: 1mmHg step display, Average value: 1mmHg/0.1mmHg
	step display)
	Measuring range: 1 to 30/1 to 60mmHg , 2 step display
External I/O terminal	USB (for Import), RS-232C (for Export), LAN (for Export)

GENERAL INFORMATION ON USAGE AND MAINTENANCE

INTENDED PATIENT POPULATION

The patient who undergoes an examination by this instrument must maintain concentration for a few minutes and keep to the following instructions:

- · To fix the face to the chinrest, forehead rest.
- · To keep the eye open.
- To understand and follow instructions when undergoing an examination.

INTENDED USER PROFILE

Users shall be limited to ophthalmologists, optometrists, orthoptists, other qualified healthcare workers, or persons who are under the guidance of a doctor (Persons qualified to use this product based on laws and regulations of each country and region).

ENVIRONMENTAL CONDITIONS OF USE

Temperature : 10°C to 35°C

Humidity: 30% to 90% (without condensation)

Pressure : 800hPa to 1060hPa

STORAGE, USAGE PERIOD

1. Environmental conditions (without package)

*Temperature : 10°C to 40°C

Humidity: 10% to 95% (without condensation)

Pressure: 700hPa to 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 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

(Product in its normal transport and storage container as provided by manufacturer)

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

Pressure : 700hPa to 1060hPa

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTATION

(Product in its normal transport and storage container as provided by manufacturer)

Temperature : -40°C to 70°C Humidity : 10% to 95%

Pressure : 700hPa to 1060hPa

ELECTRIC RATING

Source voltage : 100-240V AC Frequency : 50-60Hz Power input : 30-60VA

SAFETY DESIGNATIONS PER IEC 60601-1 STANDARD

· Type of protection against electric shocks: Class I

The Class I equipment provides means to connect itself to the protective grounding system of utilities to thereby independently provide protection against electric shocks by keeping connectable metal components nonconductive in case of a failure in the basic insulation.

- Degree of protection against electric shocks: B type applied component
 The B type applied component provides the specified degree of protection against electric shocks with
 regard to the reliability particularly of leak current, patient measuring current and protective utility con nection (in case of Class I equipment).
- Degree of protection against harmful intrusion of water (IEC 60529): IPX0
 This product does not provide protection against intrusion of water.

 (The degree of protection against harmful ingress of water defined in IEC 60529 is IPX0)
- Classification by sterilization/disinfection method specified by manufacturer This product does not have a component requiring sterilization/disinfection.
- Classification by safety of use in air/flammable anesthetic gas, oxygen or nitrous oxide/flammable anesthetic gas atmosphere
 - Equipment not suited for use in air/flammable anesthetic gas, oxygen or nitrous oxide/flammable anesthetic gas atmosphere
 - This product should be used in an environment free of flammable anesthetic gas and other flammable gases.
- · Classification by operation mode

Continuous operation refers to an operation under normal load conditions, within the specified temperature and without limitations on the operating time.

DIMENSIONS AND WEIGHT

Dimensions : 317~341mm(W) × 521~538mm(D) × 437~467mm(H)

Weight: 17.0kg

OPERATION PRINCIPLE

Ocular Pressure Measurement:

By ejecting air from the measuring nozzle to the cornea, detect by a pressure sensor the internal cylinder pressure required for the cornea to reach a prescribed deformed state (with a certain plane area), and calculate the ocular pressure value by computing. Detecting the applanation of cornea is performed, irradiating the cornea by near infrared light from a IOP measurement optical system (XY LED) and receiving the reflected beam by an applanation sensor.

CHECKPOINTS FOR MAINTENANCE

- 1. Regularly maintain and check the equipment and parts.
- 2. When resuming the use after a long period of storage, verify that the instrument operates correctly and safely.
- 3. To ensure the correct reading, do not mar the measuring window with finger prints, dust, etc.
- 4. If the measuring window is soiled, clean it following the "CLEANING THE MEASURING NOZZLE" AND THE GLASS INSIDE THE MEASURING NOZZLE" instructions on page 62.

DISPOSAL

When disposing of the instrument and/or parts, follow 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.



You cannot replace batteries by yourself. When you need to replace and/or dispose batteries, contact your dealer or TOPCON listed on the back cover.



EU Battery Directive

This symbol is applicable for EU members states only.

Battery users must not dispose of batteries as unsorted general waste, but treat properly. If a chemical symbol is printed beneath the symbol shown above, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration. This will be indicated as follows:

Hg: mercury(0.0005%), Cd: cadmium(0.002%), Pb: lead(0.004%)

These ingredients may be seriously hazardous to human and the global environment.

This product contains a CR 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

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 IEC 60601-1. If you are compelled to use any device not conforming to IEC 60601-1, use an insulation transformer.

Do not use the power strip in the patient's environment. Connect the power supply of the device to the commercial power supply.

Radius 1.5m

Devices applicable to the patient's environment

• Barcode reader (Note 1)

2.5m

1.5m

Note 1: Use the device conforming to IEC 62368-1.



- Don't connect an additional power strip or an extension cord to the system.
- Don't connect the device which is not recognized as one component of the system.

SAFETY OF LED PRODUCT

LED output
(Green)
,

KOSHI LED (For fixation)	
Aperture of LED	Measuring nozzle*
Output of cornea	50μw
Wavelength	563nm
Half width	40nm
Beam divergence	0.012rad
Pulse width	CW
ZENGAN LED (For Anterior segment observation)

LED output (infrrared)

Half width	40nm
Beam divergence	0.012rad
Pulse width	CW
ZENGAN LED (For Anterior segment observation)
Aperture of LED	Anterior lighting window*
Output of cornea	70μw
Wavelength	940nm
Half width	4.2nm
Beam divergence	0.87rad
Pulse width	CW - 14.8μs(270Hz)
XY LED (For XY alignment)	
Aperture of LED	Measuring nozzle*
Output of cornea	50μW
Wavelength	870nm
Half width	50nm
Beam divergence	(Parallel)
Pulse width	CW
Z LED (For Z alignment)	
Aperture of LED	Measuring window*
Output of cornea	25μW
Wavelength	770nm
Half width	30nm
Beam divergence	(Parallel)
Pulse width	CW

LED light source (Green)

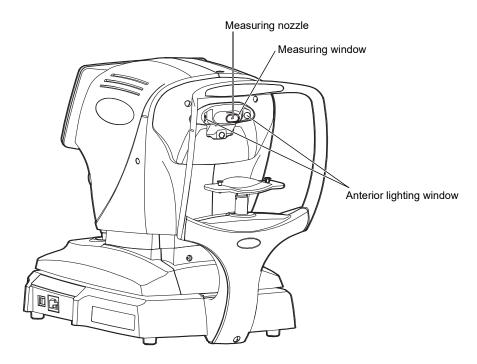
KOSHI LED	
Class of LED	Class 1
Output	1.9mW(CW)
Wavelength	563nm
Half width	40nm
Beam divergence	0.70rad

LED light source (Infrared)

ZENGAN LED	
Class of LED	Class 1
Output	55mW(CW)
Wavelength	950nm
Half width	42nm
Beam divergence	0.70rad
XY LED	
Class of LED	Class 1
Output of cornea	40mW(CW)
Wavelength	870nm
Half width	50nm
Beam divergence	1.74rad
Z LED	
Class of LED	Class 1
Output of cornea	20mW(CW)
Wavelength	770nm
Half width	30nm
Beam divergence	0.35rad



- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- Do not remove the enclosures. LED high-power is radiated.
- *: LED light is output from Measuring nozzle, Measuring window, and Anterior lighting window.



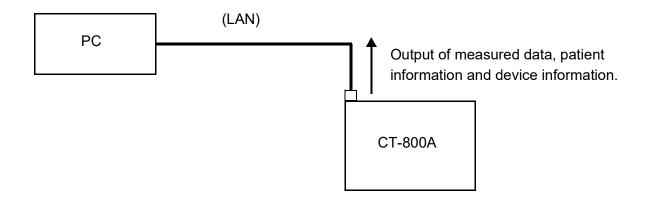
REQUIREMENTS FOR THE EXTERNAL DEVICE

The external device connected to the analog and digital interfaces must comply with the respective IEC or ISO standards (e.g. IEC 62368-1 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).

IT NETWORK ENVIRONMENT

- CT-800A can be connected with personal computer (PC), output the measurement data by operating the main unit.
- Refer to the figure below for the characteristics, configuration, technical specification, intended information flow and route when connected with an IT network.
- When connected with an IT network, ensure the appropriate and sufficient security to prevent the infection with a computer virus, the leak of information, etc.
- When any failure occurs in IT systems, some troubles may be caused by it. For example, the output data cannot be sent to the devices connected with network.
- When connected with an IT network with which a device other than CT-800A is connected, the patient, the operator or the third party may suffer unexpected and unacceptable risks. Before using CT-800A, it is recommended to identify, analyze, evaluate and manage these risks.
- When the IT network has been changed after the connection, a new risk may occur. So an additional analysis is necessary.
- The change of IT network includes the following items:
 - Change in the IT network configuration;
 - Connection of additional items to IT network;
 - Removal of items from IT network;
 - Update of the device connected with IT network;
 - Upgrade of the device connected with IT network.



ELECTROMAGNETIC COMPATIBILITY

This product conforms to the EMC standard IEC 60601-1-2:2014+AMD1:2020 (Ed.4.1).

The expected electromagnetic environment for the whole life cycle is home medical treatment environment.

- 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 EQUIP-MENT.
- 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.
- f) Do not use the devices generating electromagnetic waves within 30cm from all the parts of the instrument and system. Those devices may have influence on this instrument.

Item	Cable shield	Ferrite core	Length (m)
AC power cord (AC100/120V)	No	No	1.5
AC power cord (AC230V)	No	No	3.0
AC power cord for PC	No	No	2.0
AC power cord for display	No	No	1.7
USB cable for Barcode Scanner	Yes	No	1.5
LAN cable	Yes	Yes	3.0
Serial cable	Yes	No	3.0
RGB cable	Yes	Yes	1.7
DisplayPort to VGA conversion adapter cable	Yes	Yes	0.2
USB cable for keyboard	No	No	1.8
USB cable for Mouse	No	No	1.8
Barcode scanner	_	_	_
Personal computer	_	_	_
Display	_	_	_
Keyboard	_	_	_
Mouse	_	_	_
DisplayPort to VGA conversion adapter		_	_

Guidance and manufacturer's declaration - electromagnetic emissions			
The CT-800A is intended for use in the electromagnetic environment specified below. The customer or the user of the CT-800A should assure that it is used in such an environment.			
Emissions test Compliance Electromagnetic environment - guidance			
RF emissions CISPR 11	Group 1	The CT-800A 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	The OT 200A is suitable for use in all satablishments including
Harmonic emissions IEC 61000-3-2	Class A	The CT-800A is suitable for use in all establishments including domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	purposes.

Guidance and manufacturer's declaration - electromagnetic immunity

The CT-800A is intended for use in the electromagnetic environment specified below. The customer or the user of the CT-800A should assure that it is used in such an environment.

Immunity test	Test level	Compliance level	Electromagnetic environment - guidance		
Electrostatic discharge (ESD) IEC 61000-4-2	± 8 kV contact ± 15 kV air	± 8 kV contact ± 15 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 Repetition frequency 100kHz	± 2 kV for power supply lines ± 1 kV for input/output lines Repetition frequency 100kHz	Main 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	Main 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	$<0\%~U_{\rm T}$ for 0.5 cycle (with phase angle 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°) 0% $U_{\rm T}$ for 1 cycle 0° 70% $U_{\rm T}$ for 25/30 cycles 0° 0% $U_{\rm T}$ for 250/300 cycles	<0% <i>U</i> _T for 0.5 cycle (with phase angle 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°) 0% <i>U</i> _T for 1 cycle 0° 70% <i>U</i> _T for 25/30 cycles 0° 0% <i>U</i> _T for 250/300 cycles	Main power quality should be that of a typical commercial or hospital environment. If the user or the CT-800A requires continued operation during main power interruptions, it is recommended that the CT-800A be powered from an uninterruptible power supply or battery.		
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 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. main voltage prior to application of the test level.					

Guidance and manufacturer's declaration - electromagnetic immunity

The CT-800A is intended for use in the electromagnetic environment specified below.

The customer or the user of the CT-800A should assure that it is used in such an environment.

Immunity test	Test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150kHz to 80MHz 6Vrms Within ISM band and amateur radio band of 150kHz to 80MHz 10V/m 80MHz to 2.7GHz Proximity electromagnetic field from radio communication equipment a)	3 Vrms 150kHz to 80MHz 6Vrms Within ISM band and amateur radio band of 150kHz to 80MHz 10V/m 80MHz to 2.7GHz Proximity electromagnetic field from radio communication equipment a)	Portable and mobile RF communications equipment should be used no closer to any part of the CT-800A, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = \frac{6}{E} \sqrt{P}$ where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer, d is the recommended separation distance in meters (m), and E is the radiation electromagnetic field level in volt/meter (V/m).
Proximity magnetic fields IEC 61000-4-39	30kHz CW 8A/m 134.2kHz PM2.1kHz 50% 65A/m 13.56MHz PM50kHz 50% 7.5A/m	30kHz CW 8A/m 134.2kHz PM2.1kHz 50% 65A/m 13.56MHz PM50kHz 50% 7.5A/m	The exterior surface of the CT-800A should be kept at least 0.15m from RF emitters such as RFID readers.

NOTE

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

a) The table below shows the proximity electromagnetic field from radio communication equipment.

Test frequency [MHz]	Band [MHz]	Equipment	Modulation	Maximum output (W)	Distance (m)	Immunity test value [V/m]	
385	380-390	TETRA 400	Pulse modulation 18Hz	1.8	0.3	27	
450	430-470	GMRS 460 FRS 460	FM ±5kHz 1kHz sine	2	0.3	28	
710						9	
745	704-787	LTE Band 13, 17	Pulse modulation 217Hz	0.2	0.3		
780							
810		GSM 800/900					
870	800-960	TETRA 800 iDEN820 Pulse modulation 18Hz	2	0.3	28		
930		CDMA850 LTE Band 5	10112				
1720		GSM 1800 CDMA1900 GSM 1900 DECT LTE Band 1,3,4,25 UMTS	2	0.3	28		
1845	1700-1990						
1970	1700-1330		LTE Band 1,3,4,25	2	0.0	20	
2450	2400-2570	Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE Band7	Pulse modulation 217Hz	2	0.3	28	
5240							
5500	5100-5800	WLAN 802.11 a/n	WLAN 802.11 a/n Pulse modulation 217Hz	0.2	0.3	9	
5785							

REFERENCE

SHAPE OF PLUG

Country	Voltage/frequency	Shape of plug
Mexico	110V/50Hz	Type C&E
Argentina	220V/60Hz	Туре А
Peru	220V/60Hz	Type A
Venezuela	110V/50Hz	Type C&E
Bolivia & Paraguay	220V/60Hz	Type A (Most common)
Dolivia & Faraguay	220 7/001 12	Type H (Infrequently)
Chile	220V/60Hz	Type A
Colombia	110V/50Hz	Type C
Brazil	220V/60Hz	Туре А
DIAZII	127V/60Hz	Type C
Ecuador	110V/50Hz	Type C&E
United States	120V/60Hz	Type A (Hospital Grade)
Canada	120V/60Hz	Type A (Hospital Grade)

ABOUT THE BARCODE AND THE QR CODE OF THE BACK COVER

The barcode and the QR code of the back cover indicates the parts management code of the manual.



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 - (a)a copy of the Derived Program; and
 - (b)any additional file created by the font developing program in the course of creating the Derived Program that can be used for further modification of the Derived Program, if any.
 - (2)It is required to also Redistribute means to enable recipients of the Derived Program to replace the Derived Program with the Licensed Program first released under this License (the "Original Program"). Such means may be to provide a difference file from the Original Program, or instructions setting out a method to replace the Derived Program with the Original Program.
 - (3) The Recipient must license the Derived Program under the terms and conditions of this Agreement.
 - (4)No one may use or include the name of the Licensed Program as a program name, font name or file name of the Derived Program.
 - (5) Any material to be made available online or by means of mailing a medium to satisfy the requirements of this paragraph may be provided, verbatim, by
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- 1. The term of this Agreement shall begin from the time of receipt of the Licensed Program by the Recipient and shall continue as long as the Recipient retains any such Licensed Program in any way.
- 2. Notwithstanding the provision set forth in the preceding Paragraph, in the event of the breach of any of the provisions set forth in this Agreement by the Recipient, this Agreement shall automatically terminate without any notice. In the case of such termination, the Recipient may not use or conduct Reproduction and Other Exploitation of the Licensed Program or a Derived Program: provided that such termination shall not affect any rights of any other Recipient receiving the Licensed Program or the Derived Program from such Recipient who breached this Agreement.

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- 2. This Agreement shall be construed under the laws of Japan.

Please specify the following when contacting us regarding questions about your unit.

Model name: CT-800A

Serial No.: Marked on the rating nameplate.

Period of use: Please inform us of the date of purchase.

• Defective condition: Please provide us with as much detail as possible.

COMPUTERIZED TONOMETER CT-800A

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

COMPUTERIZED TONOMETER

CT-800A

TOPCON MEDICAL SYSTEMS, INC.

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

TOPCON HEALTHCARE SOLUTIONS, INC.

111 Bauer Drive, Oakland, NJ 07436, U.S.A. Phone:+1-201-599-5100 Fax:+1-201-599-5250 www.topconhealth.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. (EU Importer)

(European Representative)(European Sole Sales Company)

Essebaan 11 2908 LJ Capelle a/d IJssel THE NETHERLANDS
Phone:+31-(0)10-4585077 FAX:+31-(0)10-2844944 Email: medical@topcon.eu; www.topcon-medical.eu

ITALY OFFICE

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

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

TOPCON DEUTSCHLAND MEDICAL 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-medical.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-medical.es

TOPCON FRANCE MEDICAL S.A.S.

1 rue des Vergers, 69760 Limonest, FRANCE

Phone:+33 (0) 437581940 Fax:+33 (0) 472238660 E-mail:topconfrance@topcon.com; www.topcon-medical.fr/fr/

TOPCON SCANDINAVIA A.B.

Neongatan 2, S 431 53 Mölndal, SWEDEN Phone: +46-(0)31-7109200 Fax: +46-(0)31-7109249 E-mail: medical@topcon.se; www.topcon-medical.se

TOPCON (GREAT BRITAIN) MEDICAL LTD.

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

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

TOPCON SINGAPORE MEDICAL PTE. LTD.

100G Pasir Panjang Rd #05-05 Interlocal Centre Singapore 118523 Phone:+65-6872 0606 Fax:+65-6773 6150 www.topcon.com.sg

TOPCON INSTRUMENTS (MALAYSIA) SDN.BHD.

No. 6, Jalan Pensyarah U1/28, Hicom Glenmarie Industrial Park, 40150 Shah Alam, Selangor, MALAYSIA Phone: +60-(0)3-50223688 Fax: +60-(0)3-50313968

TOPCON INSTRUMENTS (THAILAND) CO.,LTD.

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

MEHRA EYETECH PVT. LTD.

801 B Wing, Lotus Corporate Park, Graham Firth Steel Compound Goregaon (East) Mumbai 400063 Maharashtra, India Phone: +91-22-61285455 Fax: +91-22-24378531

TOPCON (BEIJING) MEDICAL TECHNOLOGY CO., LTD.

Room 2808, Tower C, JinChangAn Building No. 82 Middle Section of East 4th Ring Road, Chaoyang District, Beijing 100124, People's Republic of China Phone:+86-10-87945176

TOPCON CORPORATION

Phone: +81-(0)3-3558-2522/2506 Fax: +81-(0)3-3966-5106 www.topcon.co.jp

Manufacturer

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

Parts management code

