

**USER MANUAL  
COMPUTERIZED LENSMETER**

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**CL-300**



# INTRODUCTION

Thank you for purchasing the TOPCON Computerized Lensmeter CL-300.

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## FEATURES

This instrument has the following features:

- High accuracy measurements with ease of operation
  - The LCD touch panel will facilitate operation
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## PURPOSE OF THIS MANUAL

This Instruction Manual covers an overview of the TOPCON Computerized Lensmeter CL-300, basic operations, troubleshooting, maintenance and cleaning.

To ensure the efficient, safe use, read through “DISPLAYS AND SYMBOLS FOR SAFE USE” and “GENERAL SAFETY INFORMATION” and use the instrument correctly.

Keep this Instruction Manual within reach for future reference.

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  2. The contents of this manual are subject to change without prior notice and without legal obligation.
  3. 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.
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# GENERAL SAFETY INFORMATION



## WARNINGS

### Preventing Electric Shocks and Fire

To avoid fire and electric shocks, do not place a cup or vessel containing water/fluid on the instrument.

To avoid electric shocks, do not insert objects through vent holes or gaps or force them inside the machine body.

To avoid electric shocks, do not attempt disassembling, rebuilding or repairing. For repairs, call your dealer.

To avoid fire/electric shocks, do not install the instrument in a place where it may get wet.

If there is a malfunction or if the instrument produces smoke, immediately turn OFF the POWER switch and unplug the power cable. To avoid a possible fire due to malfunction, call your dealer and ask for repairs.



## CAUTIONS

### Ensuring the Safety of Patients and Operators

To avoid injury by falling, do not install the instrument on a slope or in an unstable place.

### Preventing Electric Shocks and Fire

Do not open the cover. For repairs, contact your Topcon dealer.  
[The instrument may injure someone by electric shock.]

### Electromagnetic Compatibility (EMC)

This instrument has been tested (with 120V/ 230V) and found to comply with IEC60601-1-2 Ed.3.0:2007. This instrument radiates radio frequency energy within standard and may affect other devices in vicinity. If you have found out by turning on/off the instrument that it affects other devices, it is recommended to change the direction, keep a proper distance against other devices or change the outlet. If you have a question, consult with the selling agent.

# HOW TO READ THIS MANUAL

- Read the instructions on pages 5 to 8 before using the machine.
- If you would like an overview of the system, begin by reading "USING THE INSTRUMENT"(page 21).
- For setting various functions, see "SETTING FUNCTIONS ON SETUP SCREEN" on page 42.

# 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 COVER GLASSES

For details, see page 50 of this manual.

# DISCLAIMERS

- TOPCON shall not take any responsibility for damages due to fire, groundquake, actions by third person, or the negligence and misuse by the user and used under unusual conditions.
- TOPCON shall not take any responsibility for damage derived from the inability to use this equipment, such as a loss of business profit and suspension of business.
- TOPCON shall not take any responsibility for damage caused by operations other than those described in this Instruction Manual.

# DISPLAYS AND SYMBOLS FOR SAFE USE

In order to encourage the safe use of this product, warnings labels are placed on the product and written in the instruction manual.

We suggest that everyone understands the meaning of the following displays and icons before reading the “GENERAL SAFETY INFORMATION” and text.

## DISPLAYS

Display	Meaning
 <b>WARNINGS</b>	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTIONS</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 <b>NOTES</b>	Useful functions to know and attentions to prevent troubles are noted.

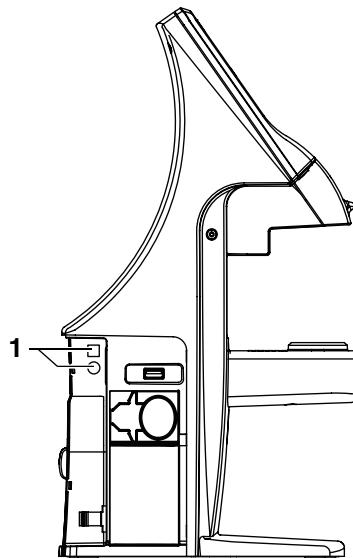
## SYMBOLS

Symbol	IEC/ISO Publication	Description	Description (French)
~	IEC 60417-5032	Alternating Current	Courant alternatif
○	IEC 60417-5008	Off (power: disconnection from the main power supply)	Éteint (courant: coupure avec le secteur)
	IEC 60417-5007	On (power: connection to the main power supply)	Allumé (courant: raccordement sur le secteur)
	ISO 7010-W001	General warning sign	Symbol d'avertissement général

# WARNING INDICATIONS AND POSITIONS

To insure safety, warning labels are provided.

Use the equipment correctly by following the warning instructions. If any of the following labels are missing, please contact us at the address stated on the back cover.

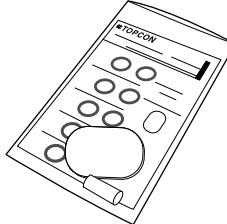
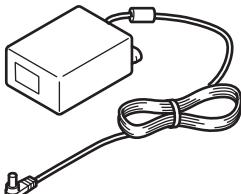
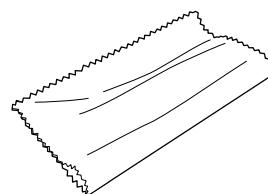
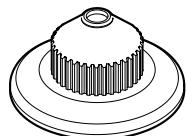
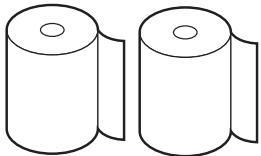
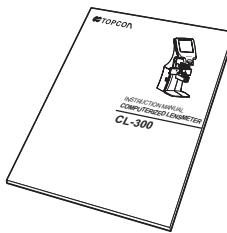
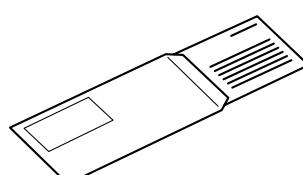


No.	Label	Meaning
1		<p><b>WARNING</b> To avoid injury caused by electric shock, do not open the cover. Ask your dealer for service.</p> <p><b>WARNING</b> To avoid injury, do not touch the AC adapter jack while using the AC adapter.</p>

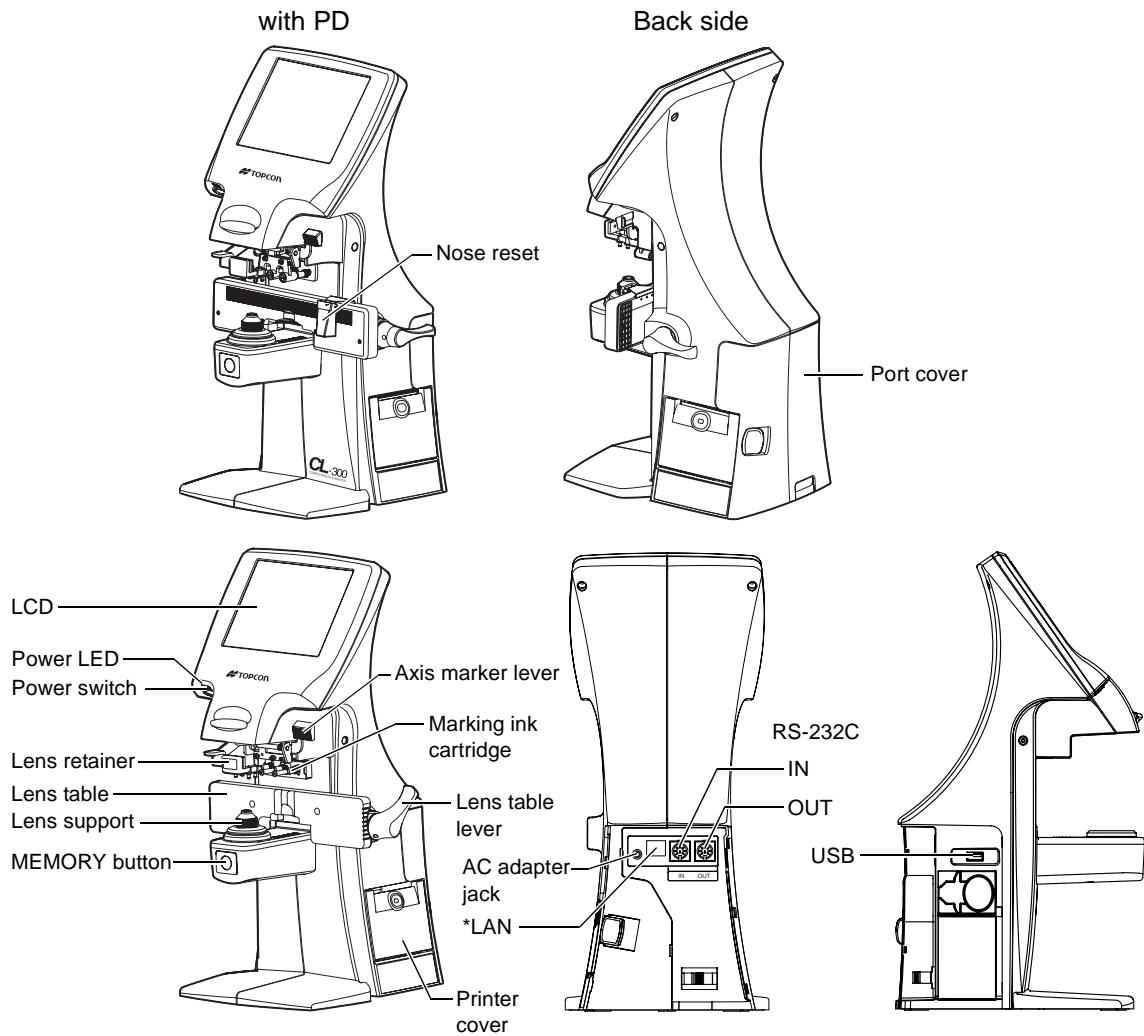
# COMPONENTS

## ACCESSORIES

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

Power cable (1)	Lens protection pad (1) 
AC adapter (1) Model name: BPM040S09F02 	Silicon cloth (1) 
Contact lens support (1) 	Dust cover (1) 
Printer paper (2) (with printer specification) 	User manual (1) Instruction manual (1) 
Guarantee sheet (1) 	

## COMPONENT NAMES



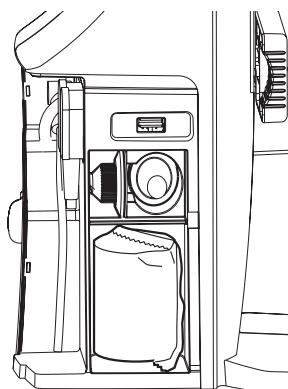
\*The model without LAN is also provided.



- Use a LAN cable within 30m.
- The USB is for maintenance, not used normally.
- Power LED
  - Orange lamp ON: Power OFF
  - Green lamp ON: Power ON
  - Green lamp blinks: Under power save
- The model without PD and LAN function is not provided nose-pad and LAN.

## **COMPARTMENT SPACE**

A space for keeping the contact lens holder, printer paper, etc. is secured in the back.

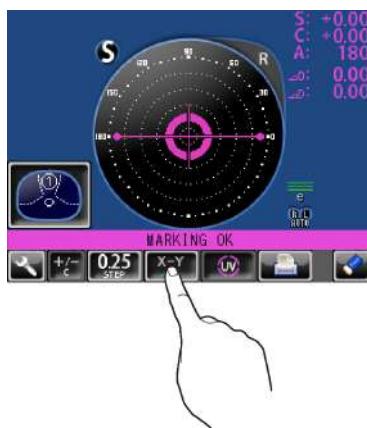


## **OPERATION METHOD OF CONTROL**



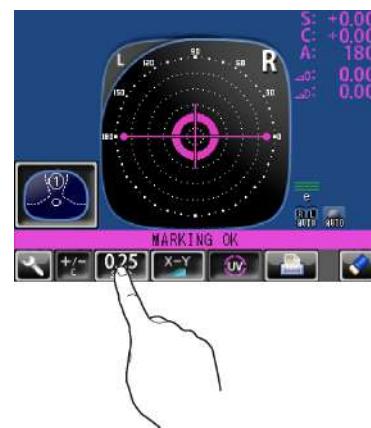
The control panel is a touch panel. Do not use any sharp tools; e.g. ball point pen.

Tap → To select any relevant item.



Touch the screen softly with a finger.

Continue to press → Used for long button press.



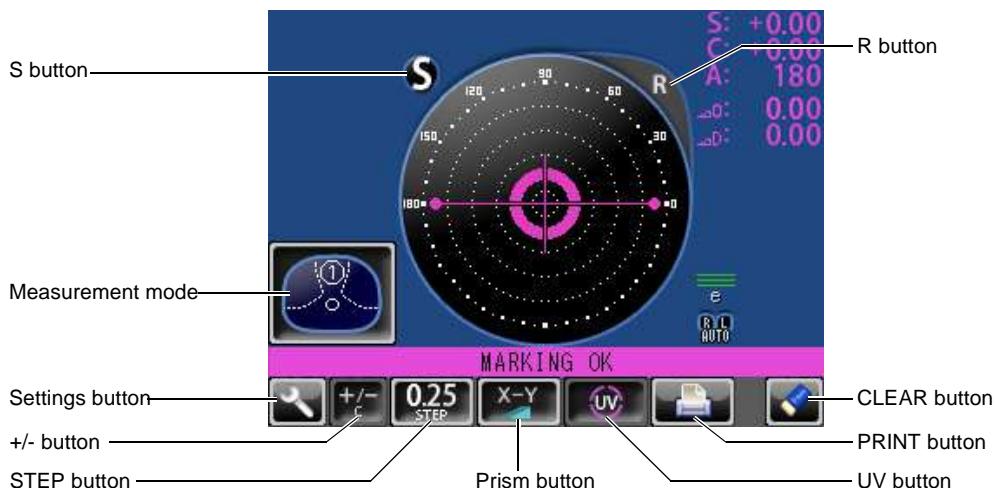
Continue to touch the screen softly with a finger.

## **CONTROL PANEL COMPONENTS**

### **THE FUNCTION BUTTONS**

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.

### **SINGLE MODE**



### **R/L MODE**



## BUTTON NAMES



Settings button

Displays the SETUP screen.



+/- button

Used to change the degree (performed when an orange frame is displayed).



STEP button

Used to change the step of measurement value.  
(Press it long time for A:step setting.)



Long button press:



Prism button

Used to change the prism display.



UV button

Used to change ON/OFF of UV measurement.  
(performed when an orange frame is displayed).



PRINT button

Press to obtain a print out readings.

Press to output data through RS-232C.



CLEAR button

Used to delete all data in memory.

To delete R and L separately, hold the button down.



Measurement mode button

Used to change the setting of measurement mode.



## **MEASUREMENT SCREEN**

### **SINGLE MODE**



### **R/L MODE**



- When saved, S/R/L changes the color and stops.
- When the measurement value turns white, the measurement is finished.
- When the measurement value is yellow, the measurement of a multi-focal lens is being performed.

## TARGET



Optical center's off.  
[OFF CENTER] is displayed when the optical center is off by  $4\Delta$  or more.  
Blue: +, measurement value



[ALIGNMENT OK]  
○ mark appears when the lens is ready for measurement.  
Green: +, measurement value



[MARKING OK]  
Place + in ○ mark, the lateral line will extend, getting the instrument ready for marking.  
Pink: +, measurement value



The + target indicates optical center position.  
And it varies depending on the symbol used in the spherical equivalent power.  
Be noted that the target motion is different from that of Topcon telescopic lensmeters.  
For axis marking procedures, don't use target's position but the prism value.  
Refer the instruction in Page 27.

## RESULT DISPLAY

When **INITIAL/DISPLAY/NORMAL** is selected, the display is normal.



When **INITIAL/DISPLAY/HORIZONTAL LARGE** is selected, the SCA display is horizontally enlarged.



When **INITIAL/DISPLAY/VERTICAL LARGE** is selected, the SCA display is vertically enlarged. The graphic moves to the opposite side.



## SCREEN PRINT DISPLAY: (WHEN ENLARGED)

For framed lenses, of which both R and L are memorized, pressing the PRINT button enlarges the SCA of both eyes. To return to the original state, tap the  button.



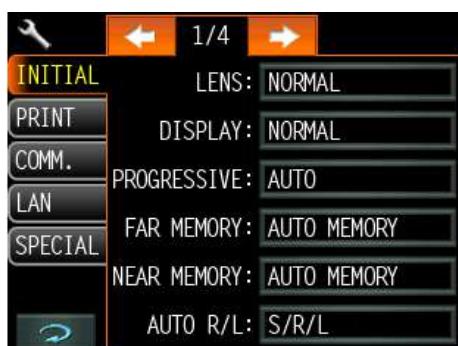
The button which is not allowed change.



- When the setting is **[PRINT/AUTO PRINT/ON]**, printing is performed automatically after saving the measurement value of both eyes.
- By tapping the  button, the measurement screen is returned, leaving measurement values as saved.
- By tapping the  button, the measurement screen is returned, clearing measurement values.

## SETUP SCREEN

The Setup screen is displayed by tapping the Settings button  on Measurement screen.



# PREPARATION

## INSTALLATION



### WARNING

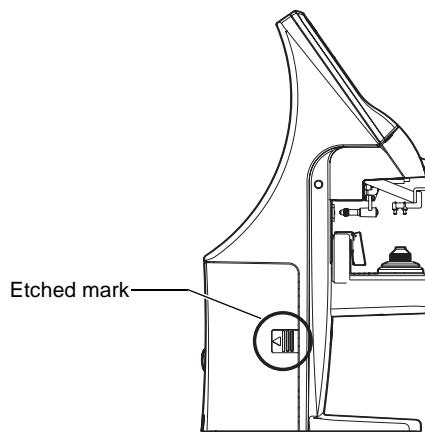
To avoid fire/electric shocks, connect the power plug to a 3P AC outlet (with ground) and secure grounding.



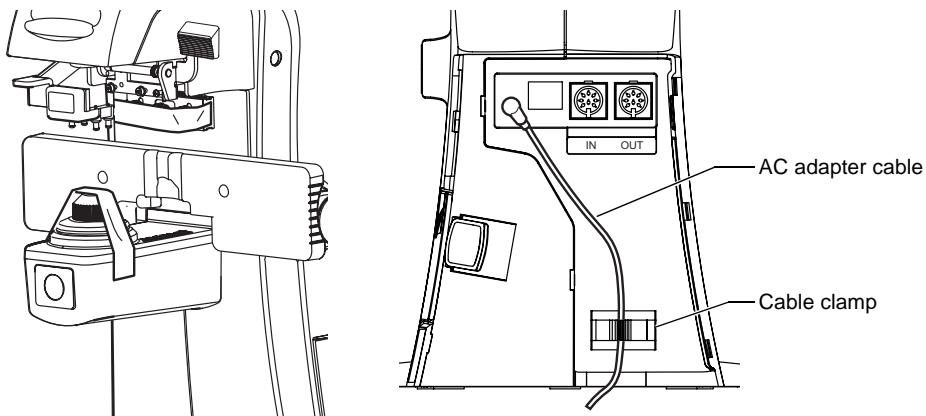
### CAUTION

To avoid injury by falling, do not install the instrument on a slope or in an unstable place.

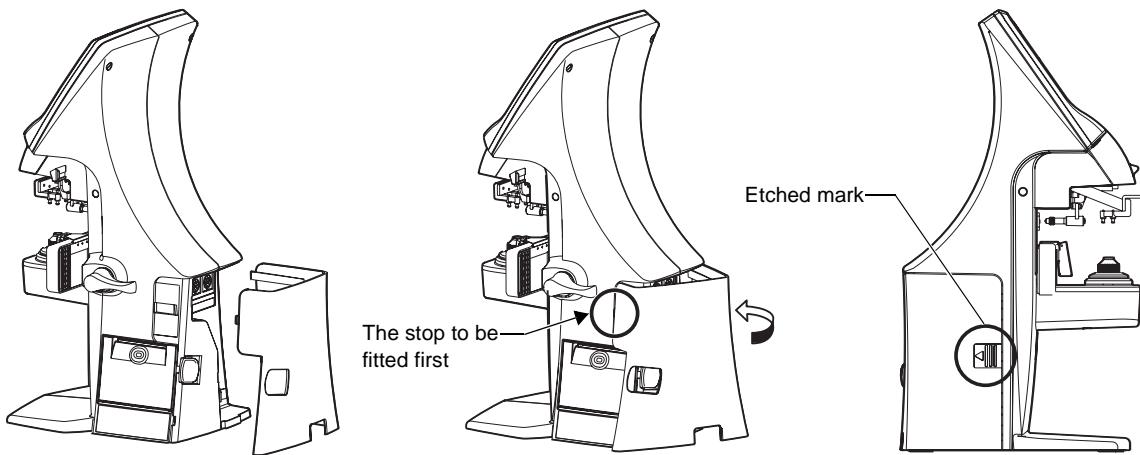
- 1** Remove the tape from the lens support.
- 2** Remove the tape from the marking ink cartridge.
- 3** Remove the port cover. Push the etched mark and move the cover to the arrow direction.



- 4** Plug in the power cable to the AC adapter.
- 5** Pass the cable through the cable clamp.
- 6** Connect the AC adapter plug to the AC adapter jack located on the rear panel of the main body.



## 7 Setting the Port Cover.



Fit the stop of the figure above to the main body. After fitting the stop, turn the cover along the arrow direction.

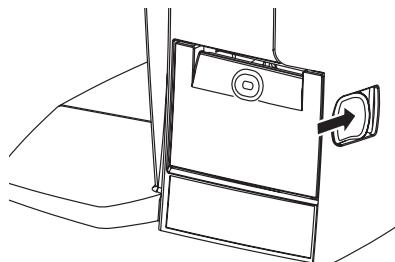
Fit the stop by pushing the etched mark.



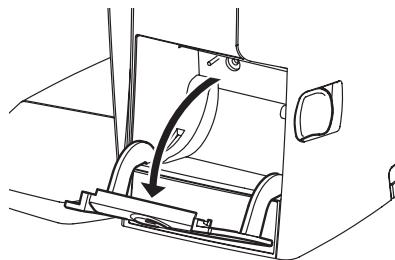
By connecting an AC adapter, the main body starts automatically.

## SETTING THE PAPER

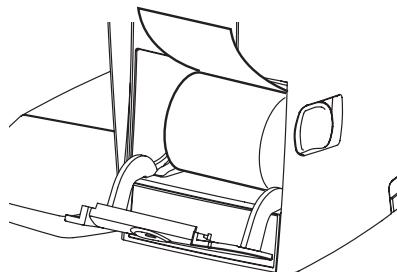
### 1 Press the PRINTER button and open the cover.



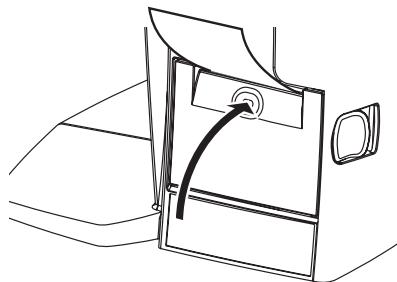
### 2 Open the printer cover to the limit.



- 3** 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.



- Printer feed function: Hold PRINTER button down.
- In case the printer cover is not firmly closed, printing will not start.
- A 58mm wide paper roll (example: TP-50KJ-R [Nippon Paper Co.]) is recommended.  
Other paper rolls may cause abnormal printing noise or unclear print.

## **AUTO POWER SAVE FUNCTION**

- 1** When switch/tap operations are not done for about 10 minutes, or if no patient lens is set, power save starts automatically.
- 2** During power save, the screen saver is actuated.
- 3** When the Memory button is pressed continuously for more than 2 seconds, the backlight of the monitor goes off and the Power switch LED blink.
- 4** For reset, either tap the monitor, or press the Memory button, or press the Power switch . Incidentally, press the Power switch short, or if pressed and held long, the power is shut off
- 5** If auto power save function is not required, select **INITIAL/AUTO OFF/NO**.
- 6** To actuate power save manually, press the Memory button longer than 2 seconds.

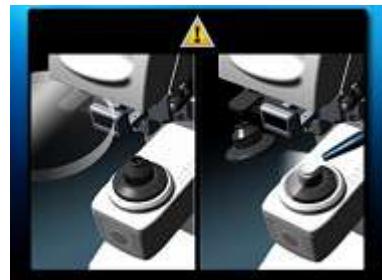
# USING THE INSTRUMENT

## CHECKING BEFORE MEASURING

- 1** Check to see that there is no lens on the lens support.
- 2** Turn on the power switch.
- 3** Display will appear on the screen in a few seconds.



The ERROR screen will appear when there is a lens left on the lens support or dust left on the cover glass. Remove the lens or dust.  
By tapping the screen, the error screen is cleared.



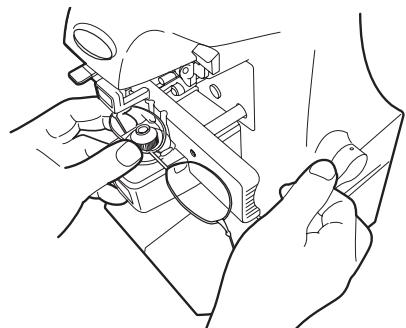
## SETTING OF A LENS

### A SINGLE LENS SETTING

- 1** Place the lens with the concave surface facing down on the lens support.
- 2** Lift and place down the lens retainer.
- 3** When holding a sharp-curve lens, provide your hand in case the lens falls.

### A FRAMED LENS SETTING

- 1** Place the flamed lens on the lens support.
- 2** Turn the lens table lever and place the glass frame against the lens table for measurement.  
Alignment  
Right and left....Place the frame against the lens table, and move the frame right and left finely.  
Vertically .....Move the table finely with the lens table lever.
- 3** Lift and place down the lens retainer.



## MEASURING A SINGLE FOCAL LENS

When a measurement mode button is , a single focal lens can be measured.

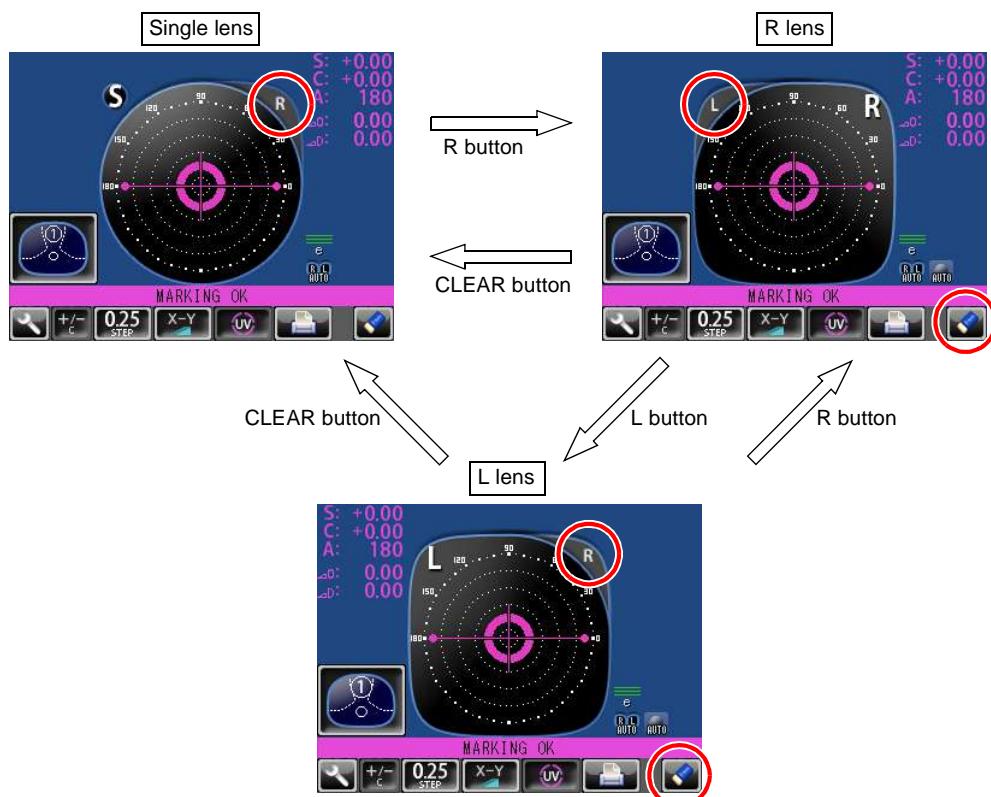
**INITIAL/PROGRESSIVE/AUTO** , **INITIAL/PROGRESSIVE/OFF**

- 1** Move the lens and move the target near the center.
- 2** ALIGNMENT OK will be displayed when the target image center is within the minimum circle ( $0.5\Delta$  or smaller).
- 3** The MARKING OK is displayed when the target image center is reached. If is displayed, "single focal lens" is memorized automatically.  
When BEEP function is ON, the buzzer will sound.  
(Note) The target may move in a contrary manner immediately after the lens is placed.

### WHEN R/L DESIGNATION IS REQUIRED:

Tap the R button. The R/L display screen is displayed.

By tapping the L button, L is displayed. By tapping the CLEAR button, S is returned.



- When the setting is **INITIAL/AUTO R/L/ R/L**, the Single Lens screen is returned by tapping the CLEAR button.
- By tapping the CLEAR button, saved measurement values are cleared.

## MANUAL SAVING:

Press the Memory button . The flicker-zooming "S" stops at the zoomed-up state and the color is changed. (When R/L is displayed, R and L are changed.)



- When printing

Tap the PRINT button . When connecting with computer, data is transmitted.

## MEASURING A FRAMED LENS

- When INITIAL/AUTO R/L OFF is set. ( is not displayed):  
Tap the R button.

First align the right lens and press the Memory button .

Tap the L button.

Align the left lens and press the Memory button .

- When INITIAL/AUTO R/L / R/L & INITIAL/AUTO MEMORY/ON is set.

(  are displayed):

\*Measurement of framed lens.

First, align the right lens to display "MARKING OK". Then the result is automatically memorized, when the right lens is hold.

Removing the right lens will automatically move to the L measurement.

Align the left lens, then the result is automatically memorized, when the left lens is hold.

- When INITIAL/AUTO R/L / R/L & INITIAL/AUTO MEMORY/ S:OFF R/L:ON is set.

( are displayed):

\*Measurement of single lens/framed lens

Tap the R button. ( is displayed)

At first, align the right lens to display "MARKING OK". Then the result is automatically memorized, when the right lens is hold.

Removing the right lens will automatically move to the L measurement.

Align & hold the left lens. The result is automatically memorized.

## MEASURING A PROGRESSIVE LENS

When a measurement mode button is or , a progressive lens can be measured.

When auto progressive recognition mode is on.

Discrimination of single focal lens and progressive focal lens can be done, which is not easily possible from appearance.

When progressive only is set.

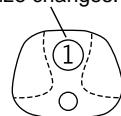
The auto progressive recognition measurement can be omitted. Start measurement from step 3 below.

### 1 Measure the lower frame center

(position in the measurement mode button ①);

If the measurement is finished, Measurement mode button changes to .

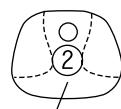
The figure blinks and the size changes.



### 2 Measure the frame center

(position in the measurement mode button ②);

If the difference is over 0.50D or more, the screen changes.



The figure blinks and the size changes.



### 3 Measure progressive lens for distance vision. (Excluding horizontal prism prescription lenses) By moving the frame in all directions along the arrow mark displayed on the screen, align + with ○.

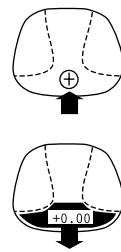


- 4** When the distance vision measurement is obtained and saved, the screen automatically changes to the near vision measurement display.  
(The distance vision region can be easily detected, as you repeat moving and stopping the lens little by little at measuring.)

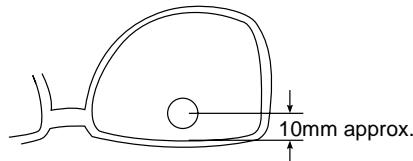


- By pressing the Memory button , you may manually store the result of distance vision power measurement. The screen will then switch to the near vision measurement.

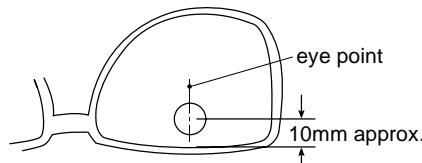
When **INITIAL/FAR MEMORY/OFF** is selected as the default setting, the result of the distance vision measurement is not automatically stored. With this setting, you must press the Memory button  to save the distance vision.



- For high-power lenses, sometimes the distance vision region cannot be easily detected. In this case, obtain the measurement in the approximate position that is shown on the above, and then press Memory button .



- For horizontal prism prescription lenses, press the MEMORY button  at the distance reference point.



- 5** Measure progressive lens for near vision.

While watching the screen, draw out the lens table forward: the bar-meter extends and the "+" appears. To bring this "+" to the bar-meter center, swing the lens right-left and extend the bar-meter.

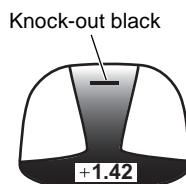


- 6** The condition illustrated below indicates that a position outside of the progressive zone is being measured. Move the lens in the direction of the arrow to bring the "+" into the center of the progressive zone.



- 7** The "+" becomes larger as it comes closer to the near vision position.

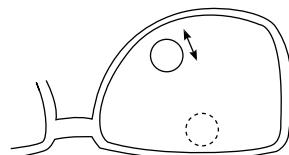
- 8** The ADD power is saved, the progressive lens measurement is completed.



- By pressing the MEMORY button , you may manually store the result of near vision power measurement.

When **INITIAL/NEAR MEMORY/OFF** is selected as the default setting, the result of the near vision measurement is not automatically stored. With this setting, you must press the MEMORY button  to save the near vision.

- When measuring a lens mounted in a large frame, the ADD power may be higher because some lenses increase the ADD power at a position below the near vision region. Accordingly, if the lens is measured at a point lower than the near vision eye point, the ADD power reading may be higher. If you want to know the accurate prescription, it is advisable to check the measurement position at the hidden mark.



## ASPHERICAL RANGE PROGRESSIVE RECOGNITION

If a progressive lens is positioned so that the lens is outside of the progressive zone, the icon  of a screen bottom will change to . By tapping the  button, the screen will automatically switch to the distance vision measurement screen.

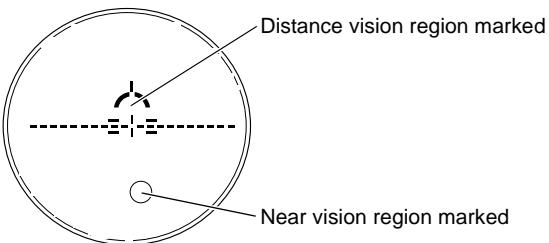
This appears when measuring the aspherical range of the progressive lens.



When the  button is displayed, auto saving is not available.

## MEASURING AN UNPROCESSED PROGRESSIVE LENS

As each unprocessed lens has a mark on the measuring point. Do measurement on the mark position.



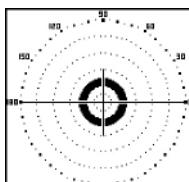
- The measuring point for the distance or near vision region may be narrowed by marks. Take care that the luminous flux may not be shaded during measurement.  
ADD values will flicker when the luminous flux is shaded by marks or off the progressive zone at the time of measuring the near vision region.  
An EX lens may not be provided with accurate measurements when measured in the boundary.
- When the Setup screen appeared in the middle of measurement, measurement values are cleared when the Measurement screen is returned.

## **MEASURING BI-FOCAL AND TRI-FOCAL LENSES**

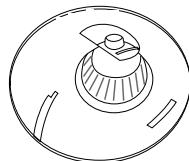
When a measurement mode button is  , bi-focal and tri-focal lenses can be measured.

**INITIAL/PROGRESSIVE/AUTO** , **INITIAL/PROGRESSIVE/OFF**

- 1** Align the distance vision in the center of the target image and press the MEMORY button .



- 2** Move the lens into the near vision region (bi-focal segment).

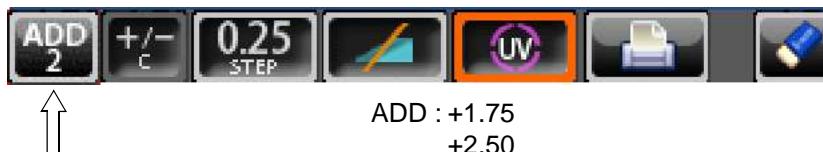


- 3** Press the Memory button  (Near Vision Measurement Start button in this case).

The measurement mode button is changed to .

- 4** Measure the bi-focal power and press the MEMORY button  again.

To measure the 2<sup>nd</sup> near vision of tri-focal lenses, storing the 1<sup>st</sup> mid vision power automatically changes the  button to the  button. Tap the button starts the near vision measurement.



When the Setup screen appeared in the middle of measurement, measurement values are cleared when the Measurement screen is returned.

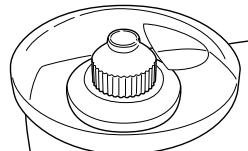
## **MEASURING BI-FOCAL AND TRI-FOCAL LENSES (MEASURING THE DIOPTER POWER OF LENSES WITH THE CONCAVE SIDE UP)**

Measurement is possible when the measurement mode is .

### **INITIAL/PROGRESSIVE/REVERSE**

- 1** Set the lens with the concave side down as usual, align the distance vision region, and press the MEMORY button .

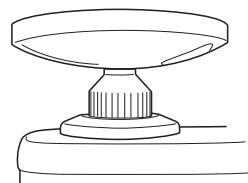
Lens position



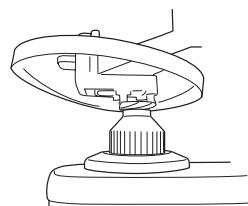
Screen



- 2** Set the lens with the concave side up, align the distance vision region, and press the MEMORY button .



- 3** Leaving the lens with the concave side up, align the near vision region and press the MEMORY button .

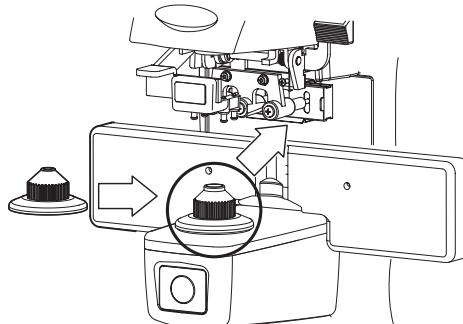


When the Setup screen appeared in the middle of measurement, measurement values are cleared when the Measurement screen is returned.

## **MEASURING A CONTACT LENS**

### **MEASURING A HARD CONTACT LENS**

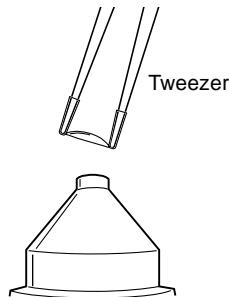
- 1** Replace the lens support with the contact lens support.



- 2** Select **INITIAL/LENS/HARD CONTACT**. Setup icon will be displayed on the screen.



- 3** Put the contact lens on contact lens support with special tweezer.



## MEASURING A SOFT CONTACT LENS WITHOUT ASTIGMATISM

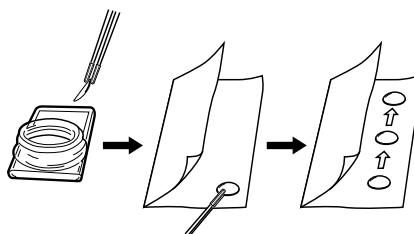


A soft contact lens cannot be accurately measured because of its structure. Although you can measure a soft contact lens power in following way, consider the results an average and not the exact value.

- 1 Use the contact lens support for measuring as measuring a hard contact lens.
- 2 Select **INITIAL/LENS/SOFT CONTACT**. Setup icon  will be displayed on the screen.

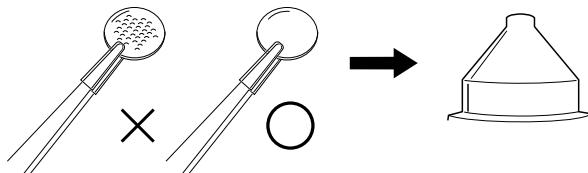


- 3 Pinch the soft contact lens with special tweezers to remove moisture from the lens. Put the lens between paper and move three times to remove moisture from the surface.



If there is moisture on the soft contact lens surface, it is not possible to measure because the luminous flux malfunctions.

- 4 If there is moisture dew on the surface when the contact lens is held to the light, put the lens in the special solution again, and repeat the above. Moreover, take care about turning inside out. When in the normal position, the lens looks like a bowl. However, when the lens turns inside out, the rim looks warped. If the lens is ready for measurement, place it on the contact lens holder and observe the shape (with tweezers) for alignment. After 30 seconds or more, the lens power changes since the internal moisture evaporates, therefore, measure it as quickly as possible.



Use the hard contact mode when measuring a toric soft contact lens. When Contact Lens is selected, the measurement mode button is changed to , and this cannot be changed.

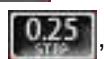
## A:STEP MODE

Select **INITIAL/A:STEP/5** and hold STEP button down, change to the A:STEP 

The axial angle is rounded to 5°.

It is convenient for inputting the result by doing measurement with the trial lens left in the temporary frame.

For release, press the  button long.

Return to the STEP button , the 5° rounding is reset.

 STEP of the measurement value is the state before changing to the temporary frame (A:step).

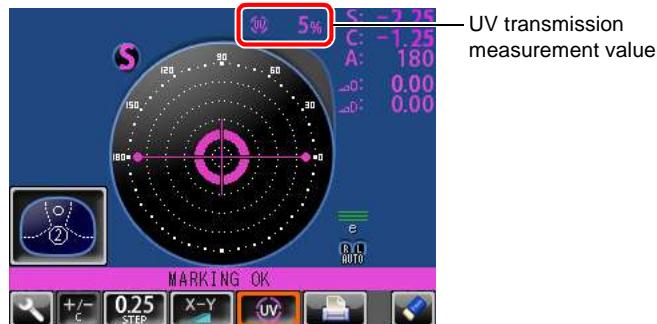
## UV TRANSMISSION MEASUREMENT

UV Transmission Measurement is available when the UV button is orange-framed .

If not orange-framed, tap the UV button and make it orange-framed.

- 1** Move the lens and move the target near the center.
- 2** ALIGNMENT OK is displayed when the target image center is within the smallest circle (within  $0.5\Delta$ ).
- 3** MARKING OK is displayed when the target image center is reached.
- 4** Press the Memory button .
- 5** The SCA value is saved, and the UV transmission measurement value is displayed in a few seconds.

 After pressing the Memory button , do not move the lens until an UV transmission measurement value is displayed.



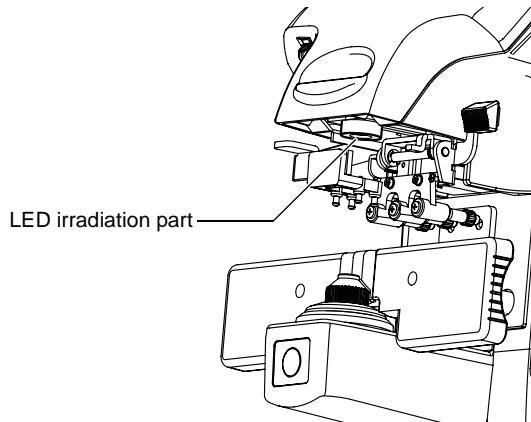
## CORRECTING THE UV TRANSMISSION

If UV transmission is not 100% after removing the lens, perform correction.

- 1** Confirm that no lens is put on the lens support.
- 2** Press and hold the UV button.
- 3** When correction is finished, the buzzer beeps.



During the UV transmission measurement/correction, do not look into the LED irradiation part.



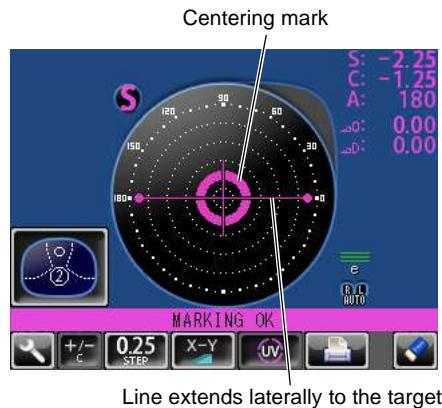
## **AXIS MARKING**

### **(CARTRIDGE SPECIFICATION/STEEL NEEDLE SPECIFICATION)**

Using the cartridge, one light touch to the lens can put a clear ink mark.

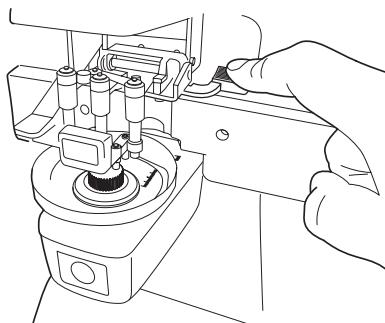
#### **MARKING A LENS WITHOUT ASTIGMATISM**

- 1** Move the lens until the centering mark coincides with the target image completely, and MARKING OK will appear.



Line extends laterally to the target

- 2** Depress the marking lever to mark the lens.



## MARKING A LENS WITH ASTIGMATISM

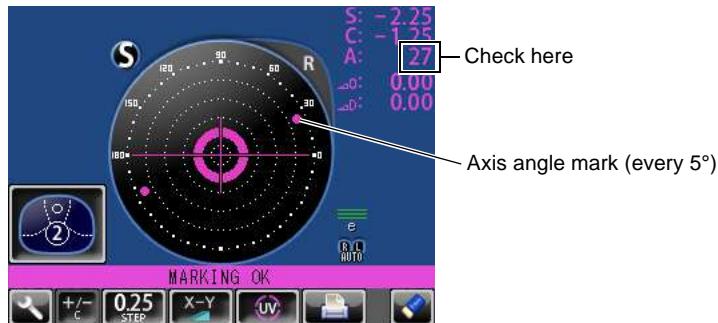
- Axis marking, maintaining the axis as prescribed

Align the target image with the center mark, approximating the axis angle mark to the angle as prescribed. Finally, adjust by the numerical display of axis angle A:.



Before performing alignment, set auto memory to off.

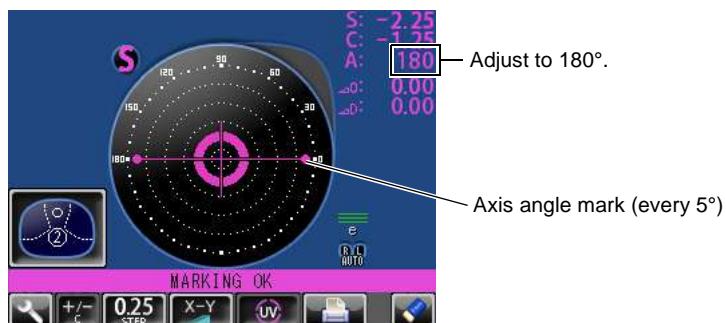
Confirm is not displayed at the setup icon.



- Marking a cylindrical axis

Match the center mark with the target image, approximating the axis angle mark to 180 degrees.

Adjust A of the axis angle to 180 degrees.



## MARKING A LENS WITH PRISM POWER

- When the prescription is displayed with X-Y (orthogonal coordinates) (**INITIAL/PRISM/X-Y**)

Tap the prism button and get  display.

Carry out aligning according to the prism value as prescribed and as displayed on the screen.

- $\Delta I$  in prism value: Base In
- $\Delta O$  in prism value: Base Out
- $\Delta U$  in prism value: Base Up
- $\Delta D$  in prism value: Base Down



- When the prescription is displayed with P-B (polar coordinates) (**INITIAL/PRISM/P-B**)

Tap the prism button and get  display.

Carry out aligning according to the prism value as prescribed and as displayed on the screen.

- P: Prism value
- B: Base orientation



Take care that the polar coordinates are not the same as the value on the angular scale in the target image.

- When the unit is mm (**INITIAL/PRISM/mm**)

Tap the prism button and get  display.

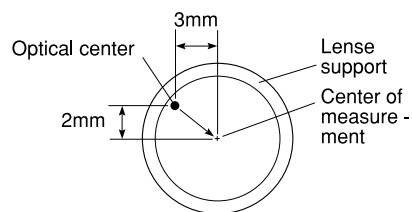
The  $\uparrow \downarrow \leftarrow \rightarrow$  marks show the optical center reaches the center of measurement by moving the lens in the arrow directions by the distance as displayed.

$\rightarrow$  : 3.0mm

$\downarrow$  : 2.0mm The position is shown in the right figure.



- 0 will be displayed if the spherical power S is around 0.
- When the prism value is more than 10 $\Delta$  (vertical direction), the measurement value is recognized as a reference value. For reference value, \* (asterisk) is displayed at the measurement result. Measurement values recognized as reference value: SCA value, prism value, ADD value



## **PRINTING ADDITIONAL TEXTBOX (WITH PRINTER SPECIFICATION)**

On the print out with the measuring data, the user can input his own text, like office name, address or special message. The available space is three line of 24 characters each.

Tap the **PRINT/NAME/INPUT**.

Text enter screen will appear.



Tap the desired enter window, tap the **AC** button and input with keyboard.  
Setting is completed by tapping the OK button.

Printout

Printing the  
additional textbox

The printout displays the following information:

- TOPCON CL-300
- <R> S C A  
+0.00 +0.00 180
- ADD 0.75
- PSM 0.00 OUT 0.00 DWN
- <L> S C A  
-0.75 -0.25 85
- ADD 0.75
- PSM 0.00 OUT 3.50 DWN
- TOPCON CL-300 IS A  
GOOD ADVISER FOR YOU  
TO MEASURE LENS.

A callout line points from the text "Printing the additional textbox" to the bottom right corner of the printout area.

## SETTING A SEQUENCE NO.

Setting is carried out when writing a sequence No. on printing paper and transferring the serial No., using RS-232C.

Tap the **[INITIAL/SEQ.NO./INPUT]**, and the screen as shown below will appear.



Enter numerals and fix by tapping the OK button.

No printing or counting is carried out in case of 0000.

Press MEMORY button , PRINT button  and CLEAR button  in this order, and counting will be carried out. (except for single lens).

-  If the OK button is tapped without filling all 4 digits, the empty digit is saved as "0."  
Example) **[12]** → OK  
**[0012]** is saved.

## LENS PROTECTION PAD

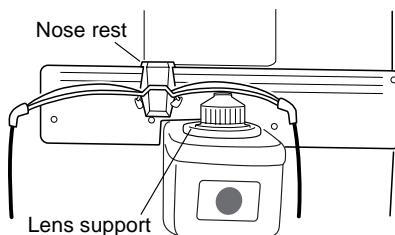
The attached lens protection pad allows a soft contact with the measuring lens.

- 1** Fit the lens protection pad according to the instructions.
- 2** Select **[INITIAL/LENS/NORMAL(PAD)]**, and the measurement result will be automatically compensated.

## **MEASURING PD (PD FITTING) (WITH PD SPECIFICATION)**

**1** Select **INITIAL/PD/ON**.

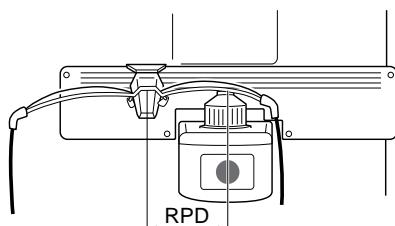
**2** Put the spectacle frame onto the nose rest.



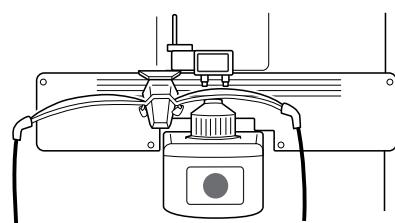
**3** Align the lens until marking is OK. OK if the spectacle frame is horizontal along the lens table line. If the spectacle frame has a camber, align it horizontally.



Errors will appear when the spectacle frame is not horizontally aligned.



**4** Press the lens retainer since the lens is in contact with the lens support sideways. Let your hand go with the spectacle frame to prevent PD value shifting.

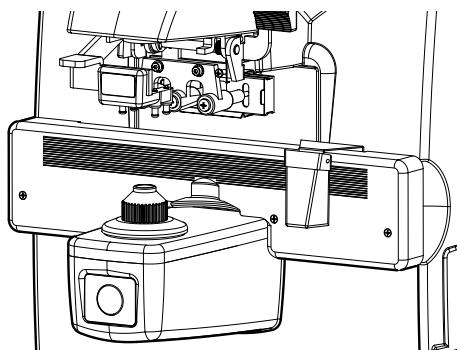


**5** Press Memory button.

- 6** Follow the similar steps to measure the lens on the opposite side.  
Totalled PD will be displayed.

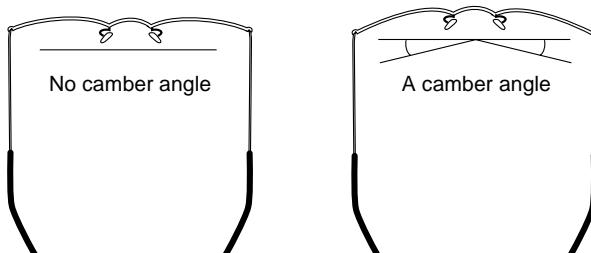


- 7** Bring the nose rest to the extreme right and fold it. It will stick to the lens table by means of a magnet.  
Range 25~45mm on one side (minimum 0.5mm)

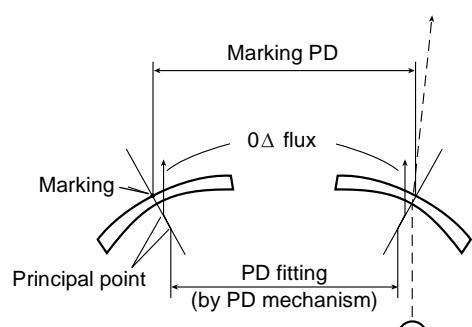


If the measured PD value differs from that of marking PD.

- 8** Difference may occur by the measurement technique and with low-power lenses having a large camber angle.



Since the optical center of the glasses mounted for the infinite far is searched, the measured PD value of CL-300 is called the PD/fitting value.



When the pupil is on the marking position in the case of a concave lens, a prism is added outside.

## **HOW TO OUTPUT DATA**

### **OUTPUT USING RS232C**

This instrument can output data to a PC, etc. via the RS232C interface.

- 1** Connect the RS232C cable to RS232C OUT.
- 2** Connect the other end of the cable to the PC., etc.
- 3** Confirm that set up of data communication settings.  
For details, refer to “DATA COMMUNICATION (COMM.)” on page 47.
- 4** Perform measurements.
- 5** Tap the PRINT button  of the control panel.  
Data is outputted to the connected external device.

### **OUTPUT USING LAN**

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

- 1** Connect the network cable to LAN OUT.
- 2** Connect the other end of the cable to the PC., etc.
- 3** Confirm that set up of LAN connection settings.  
For details, refer to “LAN CONNECTION (LAN)” on page 48.
- 4** Perform measurements.
- 5** Tap the PRINT button  of the control panel.  
Data is outputted to the connected external device.

# SETTING FUNCTIONS ON SETUP SCREEN

## OPERATING THE SETUP SCREEN

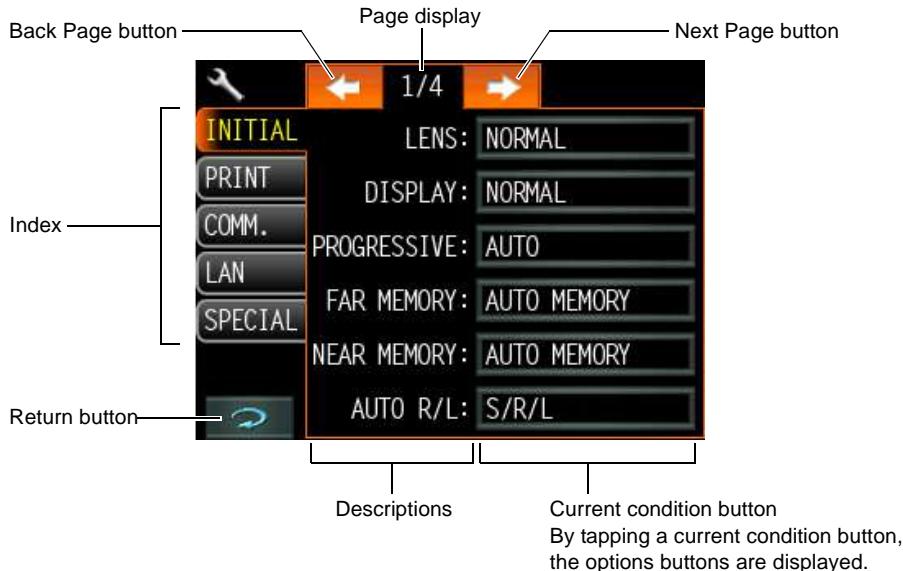
Various functions can be set on the SETUP screen.

### PREPARATIONS FOR SETTING

- 1 Make sure that the power cable is connected.  
For connection, refer to "PREPARATION" on page 18.
- 2 Turn ON the POWER switch.
- 3 Tap the SETTINGS 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 **NEXT PAGE button** or **BACK PAGE 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, ten-key and keyboard would be displayed.

#### 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. Setting is complete by tapping **OK**.

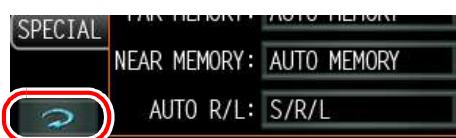


#### KEYBOARD:

Tap keyboard on the screen and enter characters. If there are several windows to enter, tap the desired window, then enter the character by keyboard. Setting is complete by tapping **OK**.



- After entering all setting items, save the setting items and return to the Measurement screen by tapping the Return button



To return the setting to the previous status, turn off the power before tapping the Return button .

## LIST OF SETUP ITEMS

Setup items are categorized into 5 large indexes.

- "Initial" .....items related to the initial status after power on
- "Print" .....items related to output from the internal printer
- "Comm" .....items related to data input/output with the external device
- "LAN" .....items related to output using the LAN
- "Special" .....items related to maintenance (for service engineer only)

### INITIAL (INITIAL SETTING)

Initial contains settings related to the initial status after power on.

Descriptions	Options button	Contents of setup	Display of Setup icon/ Display of button	Default
LENS	NORMAL	Measures a normal lens.	—	NORMAL
	NORMAL (PAD)	Measures a normal lens wearing the lens protection pad.		
	SOFT CONTACT	Measures a soft contact lens.		
	HARD CONTACT	Measures a hard contact lens.		
DISPLAY	HORIZONTAL LARGE	Horizontally enlarges the SCA display.	—	NORMAL
	VERTICAL LARGE	Vertically enlarges the SCA display.	—	
	NORMAL	Normal display	—	
PROGRESSIVE	OFF	Auto progressive recognition mode OFF.		AUTO
	AUTO	Auto progressive recognition mode ON.		
	PROGRESSIVE ONLY	Always begins with the Progressive zone center search mode of the progressive lens.		
	REVERSE	Measures the diopter power with the concave side up.		
FAR MEMORY	ON	Auto memory of distance vision measurement.	—	ON
	OFF	Manual memory of distance vision measurement.	—	
NEAR MEMORY	ON	Auto memory of near vision measurement	—	ON
	OFF	Manual memory of near vision measurement	—	

AUTO R/L	R/L	Measurement of framed lens: Auto R/L switching		S/R/L
	S/R/L	Measurement of single lens/framed lens: Auto R/L switching		
	OFF	S/R/L switching	—	
AUTO MEMORY	ON	Auto memory is ON when the lens optical axis is aligned.		S : OFF R/L : ON
	S : OFF R/L : ON	Auto memory OFF at measurement of single lens. It is ON at measurement of framed lens.		
	OFF	Auto memory OFF.	—	
UV	ON	UV measurement is ON		OFF
	OFF	UV measurement is OFF		
UV STEP	1% STEP	UV measurement is ON: Step 1%	—	1% STEP
	5% STEP	UV measurement is ON: Step 5%	—	
BEEP	ON	Buzzer sounds when a measured value is stored or a button is pushed.	—	ON
	OFF	Buzzer OFF	—	
STEP	0.25	0.25-step measurement.		0.25
	0.12	0.12-step measurement.		
	0.01	0.01-step measurement.		
A:STEP	5	Rounds axial angle settings to 5°		5
	1	—	—	
PRISM	NO DISPLAY	No prism display.		X-Y
	X-Y	Rectangular coordinate display		
	P-B	Polar coordinate display		
	mm	mm display at PD/OFF		
CYLINDER	MIX	Mixed display		MIX
	+	Plus-fixed display		
	-	Minus-fixed display		

AUTO OFF	YES	Power save ON	—	YES
	NO	Power save OFF	—	
BRIGHTNESS	LEVEL1	Level of LCD brightness level 1(dark) — level 6 (bright)	—	LEVEL6
	LEVEL2		—	
	LEVEL3		—	
	LEVEL4		—	
	LEVEL5		—	
	LEVEL6		—	
ABBE	NORMAL	50-60 Abbe	—	NORMAL
	MID	40-50 Abbe		
	LOW	30-40 Abbe		
PD	ON	PD value display	—	ON
	OFF	No PD value display	—	
SEQ.NO.	INPUT	Serial No. print mode	—	

### SETTING OF INTERNAL PRINTER (PRINT)

Print contains settings related to output from the internal printer.

Descriptions	Options button	Contents of setup	Display of Setup icon/ Display of button	Default
PRINTER	ON	Printer output ON	—	ON
	OFF	Printer output OFF	—	
AUTO PRINT	ON	Auto memory output (S: When the lens is removed) R/L: When both lenses are the same class (1st/2nd near vision of distance vision)		ON
	OFF	Manual memory output	—	
NAME	SET	Printing additional textbox	—	

### DATA COMMUNICATION (COMM.)

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

Descriptions	Options button	Contents of setup	Display of Setup icon/ Display of button	Default
RS-232C	NEW FORMAT	External output (NEW FORMAT)	—	STD1
	OLD FORMAT	External output (OLD FORMAT)	—	
	STD1	External output (STD FORMAT)	—	

## LAN CONNECTION (LAN)

LAN contains settings related to data input/output via LAN.

Descriptions	Options button	Contents of setup	Display of Setup icon/ Display of button	Default
IP ADDRESS	INPUT	Set the IP address of CL-300.	—	—
		Set the subnet mask of CL-300.	—	—
		Set the default gateway of CL-300. • When not used, set 0.0.0.0.	—	—
SETTING1	INPUT	Set the IP address of the PC to output data.		
		Set the shared name of the PC to output data.		
SETTING2	INPUT	Set the folder name of the PC to output data. • The holder name which can be set up is in the directly under hierarchy of a shared name.		
		Set the name of the user who makes access to the PC to output data.		
		Set a password to make access to the PC to output data.		

## SPECIAL

SPECIAL is the mode for service engineer only; it can not be accessed.

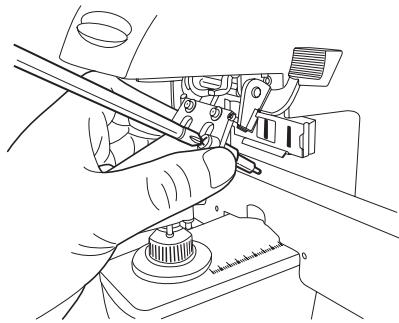


For models without LAN function, LAN connection is not possible.

# MAINTENANCE

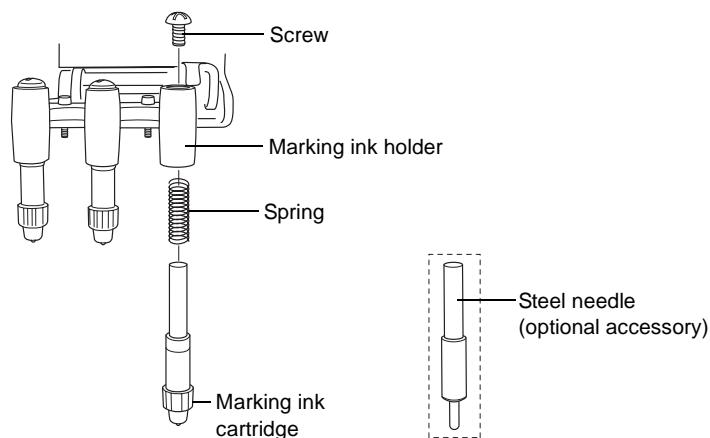
## REPLACING THE MARKING INK CARTRIDGE (THE SAME APPLIES TO STEEL NEEDLE SPECIFICATION)

- 1 To replace the marking ink cartridge, remove the top screw. Pull out the cartridge while applying pressure to it so as the spring not jump out from the inside.  
Work the lens holder/stopper under the lowered condition.



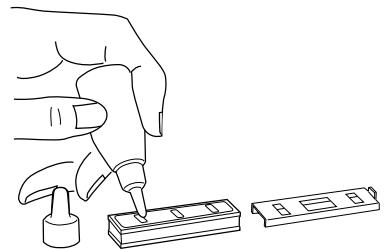
When not in use, put the dust cover over the cartridge (to prevent insect damage).

- 2 To set the cartridge, insert the spring and keep the cartridge top well above the marking ink holder, and then fasten the screw.



## SUPPLY OF INK FOR THE OPTIONAL STEEL NEEDLE

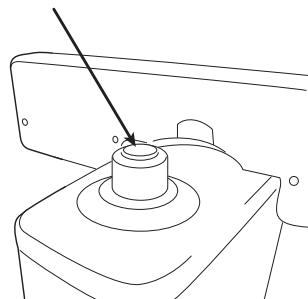
- 1** Replenish ink when poor marking happens.
- 2** Slide laterally and pull out the inkpot.
- 3** Slide off cover from the inkpot.
- 4** Infiltrate supply ink into the sponge well.



## CLEANING COVER GLASSES

If the glass is dirty as indicated by arrows, it will affect measurement accuracy adversely. If this occurs, clean them with the attached silicon cloth.

Remove the lens support before cleaning the cover glass.



If the mark illustrated right appears at the lower part on the screen, it means that the cover glass is dirty.

Carry out the following operation;



- 1** Wipe off the cover glass for cleaning.
- 2** Press CLEAR and TRANS buttons simultaneously and the instrument will restart. If the measurement screen appears, continue the operation.

## CLEANING THE INSTRUMENT

- 1** Wipe cover with damp cloth at regular interval. Never use cleanser or other chemicals.

# BEFORE REQUESTING SERVICE

## CAUTION MESSAGES

CLEAN THE COVER GLASS	Carry out cleaning of the cover glass.
DIOPTER OVER PRISM OVER ERROR	Check to see that the lens is in the measurable scope. Check to see that the lens is free from any flaw, dust or oil. Clean both glasses and turn power on again.
PAPER END	Printer paper is out. Load new paper.
CLOSE PRINTER COVER	Close printer cover.
UV CALIBRATION NG	Is the lens left on lens support? Remove the lens from the lens support, and perform calibration again.
PRINTER HEAD OVER HEAT	It is possible that the temperature of a printer head is rising. Please turn off the power, and switch on a power supply again after waiting for a while.
PRINTER CUTTER ERROR	Please check whether the printer cover has closed or whether there is not any foreign object in a printer.
PRINTER THERMISTOR NG	Call service engineer.
INITIAL ERROR (ERROR CODE)	Call service engineer. The error code of four digits is displayed.

## CHECK ITEMS

The instrument does not get ready for operation even if the power switch is turned on.	Re-plug the power cord.
Operation of a button is not effective. Power supply cannot be turned off even if you push the power switch.	Press and hold the power switch for 10 seconds or more. Then, the power supply turns off.
S, C values are wrong.	Is the lens place with power on? Remove the lens and turn on power again. Is the measuring beam blocked by, dust, marks, grease, etc. in the measured lens?
Marking is poor.	Replace the marking ink cartridge. For a lens with sharp surface curve, use the optional steel needle marking set.
The screen went out all of a sudden.	The auto shut-off function is on. Tap the control power, and the instrument will resume.
Pushed the PRINT button but the printer does not work.	Is printer paper set properly? Not inside out?

# SPECIFICATIONS

## SPECIFICATIONS

Measurable scope	S: 0~±25D, C: 0~±10D, ADD: 0~+10D (0.01/0.12/0.25) P: 0~13Δ (horizontal) 0~18Δ (vertical) (0.01/0.12/0.25), A: 1~180° (1°)
Cylinder mode	MIX/-/+
Prism mode	No display / X-Y (Rectangular coordinates) / P-B (polar coordinates) / mm
Contact lens	Contact lenses are measurable.
Progressive focal lens	Single focal/progressive lens recognition, distance vision detection, ADD power bar-meter display
Display screen	Color LCD 320x240 dots 5.7 Type S, C, A, P, ADD, ADD R/L display, Enlarged SCA display.
Frame	Auto R/L function
Menu screen	Easy-to-watch screen with icon display
Lens diameter	Ø5-100mm
Power supply	100-240V~ 50-60VA 1.2A (Auto shut-off in 10 minutes)
Dimensions, weight	197 (W)x220 (D)x404 (H) 3.8kg approx.

\* Subject to changes in design and/or specifications, without advanced notice.

## WITH PRINTER SPECIFICATION

Printer : Thermal printer, paper width 58mm, Printing additional textbox, AUTO PRINT

## OPTIONAL ACCESSORIES

Steel needle marking set (steel needle x3, supply ink, inkpot, holder)

## ORDERING CONSUMABLE SUPPLIES AND SPARES

When ordering consumable supplies, please tell the Product name, Part code number, necessary quantity and this Machine type.

	Product name	Part code No.	Remark
Consumables	Marking ink cartridge (3 cartridges/set, white)	42028 4020	Standard accessory
	Lens protection pad	42036 5500	Standard accessory
	Printer paper	44800 4001	Standard accessory
	Steel needle marking set	42039 4010	Optional accessory
	Supply ink	42039 4001	Optional accessory
	Marking ink cartridge (3 cartridges/set, red)	42039 4030	Optional accessory

# **GENERAL INFORMATION ON USAGE AND MAINTENANCE**

## **ENVIRONMENTAL CONDITIONS FOR USE**

Indoor use Altitude up to 2,000m

Pollution degree II Temperature range: 5-40°C

Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C

## **STORAGE, USAGE PERIOD AND OTHERS**

### **1. Environmental conditions for use**

Indoor use Altitude up to 2,000m

Pollution degree II Temperature range: 5-40°C

Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly 50% relative humidity at 40°C

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

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

(2) Store the instrument where air pressure, temperature, moisture, ventilation, sunlight, dust, salt/sulfurous air, etc. do not give any negative side effect.

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

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

### **3. Usage period**

8 years from delivery providing regular maintenance is performed (according to the self-certification [TOPCON data]).

## **SAFETY DESIGNATIONS PER IEC 60601-1 STANDARD**

- Type of protection against electric shocks: Class I equipment**

Class I equipment does not depend on basic insulation only for protection against electric shocks. It can also be earthed; therefore, the metal parts with which one comes into contact do not become conductive if the basic insulation fails.

- Degree of protection against harmful ingress of water: IPx0**

CL-300 has no protection against ingress of water. (The degree of protection against harmful ingress of water defined in IEC 60529 is IPx0)

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

- Classification according to the degree of safety of application in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide: Equipment not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide. CL-300 should be used in environments where no flammable anesthetics and/or flammable gases are present.**

- Classification according to the mode of operation: Continuos operation.**

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

## **MAINTENANCE AND CHECKS**

1. Regularly maintain and check all equipment and parts.
2. When using the instrument after a prolonged period of inactivity, confirm normal and safe operation beforehand.
3. Take care not mar the cover glass with fingerprints and dirt.
4. When this instrument is not in use, apply the dust cover to it.
5. When the cover glass gets dirty, clean it following the "CLEANING COVER GLASSES" of the User Manual.

## **DISPOSAL**

Dispose of the instrument according to local disposal and recycling laws.



This symbol is applicable for EU member countries only.

To avoid potential negative consequences for 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.

## **INTENDED USER PROFILE**

This lensmeter is an electric instrument and it must be used in accordance with its Instruction Manual.

## **ELECTROMAGNETIC COMPATIBILITY**

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

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

Item	Article code	Model No.	Length (m)
RS-232C cross cable	418120002	-	4.9
LAN CABLE	-	-	5.1

<b>Guidance and manufacturer's declaration - electromagnetic emissions</b>		
The CL-300 is intended for use in the electromagnetic environment specified below. The customer or the user of the CL-300 should assure that it is used in such an environment.		
<b>Emissions test</b>	<b>Compliance</b>	<b>Electromagnetic environment - guidance</b>
RF emissions CISPR 11	Group 1	The CL-300 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 CL-300 is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC61000-3-2	Complies	
Voltage fluctuations/ flicker emissions IEC61000-3-3	Complies	

<b>Guidance and manufacturer's declaration - electromagnetic immunity</b>			
The CL-300 is intended for use in the electromagnetic environment specified below. The customer or the user of the CL-300 should assure that it is used in such an environment.			
<b>Immunity test</b>	<b>IEC 60601 test level</b>	<b>Compliance level</b>	<b>Electromagnetic environment - guidance</b>
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact  ±8 kV air	±6 kV contact  ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines  ±1 kV for input/output lines	±2 kV for power supply lines  ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode  ±2 kV common mode	±1 kV differential mode  ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and Voltage variations on power supply input lines IEC 61000-4-11	<5% $U_t$ (>95% dip in $U_t$ ) for 0.5 cycle 40% $U_t$ (60% dip in $U_t$ ) for 5 cycles 70% $U_t$ (30% dip in $U_t$ ) for 25 cycles <5% $U_t$ (>95% dip in $U_t$ ) for 5 sec.	<5% $U_t$ (>95% dip in $U_t$ ) for 0.5 cycle 40% $U_t$ (60% dip in $U_t$ ) for 5 cycles 70% $U_t$ (30% dip in $U_t$ ) for 25 cycles <5% $U_t$ (>95% dip in $U_t$ ) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user or the CL-300 requires continued operation during power mains interruptions, it is recommended that the CL-300 be powered from an uninterruptible power supply or battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE $U_t$ is the a.c. mains voltage prior to application of the test level.			

<b>Guidance and manufacturer's declaration - electromagnetic immunity</b>			
The CL-300 is intended for use in the electromagnetic environment specified below. The customer or the user of the CL-300 should assure that it is used in such an environment.			
<b>Immunity test</b>	<b>IEC 60601 test level</b>	<b>Compliance level</b>	<b>Electromagnetic environment- guidance</b>
Conducted RF IEC 61000-4-6	3 Vrms 150kHz to 80MHz	3 V	Portable and mobile RF communications equipment should be used no closer to any part of the CL-300, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Radiated RF IEC 61000-4-3	3 V/m 80MHz to 2.5GHz	3 V/m	<p><b>Recommended separation distance</b></p> $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P} \quad 80MHz \text{ to } 800MHz$ $d = 2.3\sqrt{P} \quad 800MHz \text{ to } 2.5GHz$ <p>where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, <sup>a</sup> should be less than the compliance level in each frequency range. <sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p><b>NOTE 1</b> At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p><b>NOTE 2</b> These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p><sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the CL-300 is used exceeds the applicable RF compliance level above, the CL-300 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the CL-300.</p> <p><sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

<b>Recommended separation distance between portable and mobile RF communications equipment and the CL-300</b>			
<b>Rated maximum output power of transmitter W</b>	<b>Separation distance according to frequency of transmitter m</b>		
	<b>150kHz to 80MHz</b> $d = 1.2\sqrt{P}$	<b>80MHz to 800MHz</b> $d = 1.2\sqrt{P}$	<b>800MHz to 2.5GHz</b> $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

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

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

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

## **SHAPE OF PLUG**

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

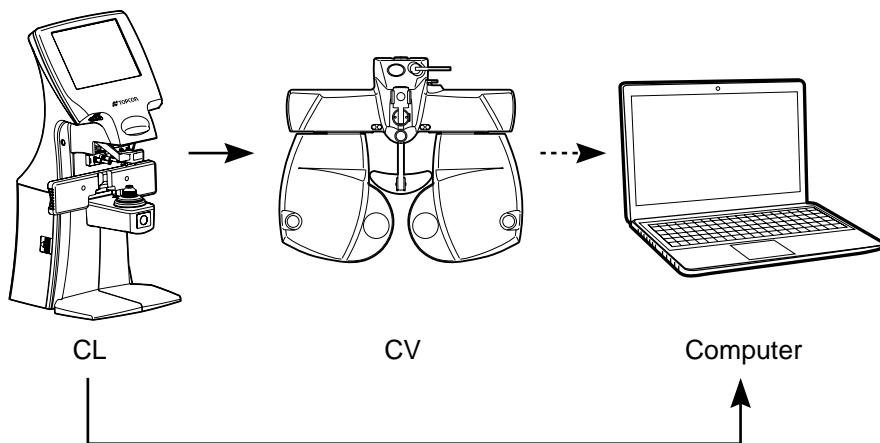
# USING THE INSTRUMENT AS A SYSTEM

This product can perform data transfer with other devices.

For connectable devices and conditions for connection, ask your dealer/service engineer.

## **ON - LINE SYSTEM**

The data of computerized lensmeter can be transferred to the instruments through RS-232C interface, and also measuring data of the instruments can be transferred to computerized visiontester.



## **CONNECTING EXTERNAL I/O TERMINALS**



When connecting this product with a commercial personal computer, use one conforming to IEC60950-1, with a separation unit.

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

- Machine type: CL-300
  - Manufacturing No. (Shown on the rating plate on the back of the instrument)
  - Period of Usage (Please give us the date of purchase).
  - Description of Problem (as detailed as possible).
- 

## COMPUTERIZED LENSMETER CL-300

### USER MANUAL

Version of 2012 (2012.02-100LW0)

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**COMPUTERIZED LENSMETER**

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