

Operations Manual

<Important> Read this manual thoroughly before use. Keep this manual on hand at all times.



RB-501-B02A

INTRODUCTION

This manual provides you information on correct handling and operational procedures as well as safety considerations pertinent to the GL-7000.

Before carrying out any measurements, read the instructions thoroughly so that effective operation is ensured. As this continues an important reference and user guide, be sure to keep it on hand at all times.

NOTE

- (1) The information contained in this manual is subject to change without notice.
- (2) While reasonable efforts have been made in the preparation of this document to ensure its accuracy, you should contact your local distributor immediately, if any queries arise due to editorial errors or omissions etc.
- (3) If you find any imperfect collating or missing pages, contact your local distributor for replacement.

General definitions of safety symbols are indicated below.

	Personal injury or physical damage may occur when this warning is ignored. General warning. Caution. Risk of danger.
0	General mandatory action.

SAFETY CONSIDERATION

General Precautions –

- GL-7000 is NOT a medical device.
- Fingerprints or dust on the optical parts such as lenses may affect the measurement accuracy. Always avoid touching such parts with fingers and keep away from dust getting on them.
- When fingerprints or dust are attached onto such parts, gently wipe them with the supplied dust cloth.



- When water or any liquid gets on the instrument, or when any foreign matters gets inside the instrument, unplug the power cord immediately and contact your local distributor.
- In case of occurrence of abnormality (noise or smoke), unplug the power cord immediately and contact your local distributor. Using the instrument in such a condition may cause fire or physical damage.
- Never dismantle the instrument. Fire or physical damage may result.
- In case of malfunction, never try to repair by yourself. Unplug the power cord immediately and contact your local distributor.

Precautions on power source

- The power cord must be grounded at all time.
- Avoid damaging the power cord (such as bending it in an extremely small size, pulling, placing a heavy object on it). When the power cord is damaged (breaks, damage of cover, etc), replace it to a new cord to prevent any electric shock or fire from ocurring.
- Insert the power cord firmly into the outlet and the instrument. If not, fire or electric shock may occur.
- Keep the power cord clean without any dust or oil on it. The dirty terminal may cause malfunction or fire.
- When the power cord becomes hot after used, check for the dirt at the terminal part. If you find no dirt, replace the power cord to a new cord. The dirty terminal may cause malfucation or fire.
- Always use GL-7000 with the rated powe voltage. Using the instrument out of the rated voltage range may cause malfunction or fire.
- When pluging and unpluging the power cord, always hold the plug.
- Do not touch the plug when your hands are wet.
- When the instrument is not used for a long time, unplug the power cord from the outlet.

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1. Parts Identification

1.1. Overview





Rating nameplate

1.2. Contents in a packing box

When you unpack the box, please check the followings are all packed without any damages. Contact your distributor if any accessories are missing or damaged.

- GR-7000
- Power cord
- Contact lens stand
- Rolls of printer paper
- Printer shaft
- Dustproof cover
- Dust cloth
- Operations manual

2. Installation Environment

1) Do not expose the optic parts, i.e. lens stand, directly to sunlight or bright light from other sources.

Strong light or glare to the instrument may cause the failure of measurement.

- 2) Do not install the instrument in places where either dust or rubbish may accumulate.
- 3) Environments with extremes in heat and humidity should also be avoided.

Temperature range for use: $10^{\circ}C \sim 40^{\circ}C$ Temperature range for storage: -10° C ~ 60° C Humidity range for use/storage: 70%HR (no dew condensation allowed)





- 4) Keep away from inflammable or explosive gases as well as storage areas of medical supplies and chemicals.
- 5) Keep away from sites that experience strong vibrations or sudden shocks.
- 6) Malfunction is likely to occur if the instrument is not properly stabilized of accidentally overturns. To prevent internal/external damage caused by sudden impact, install the instrument on a surface that is solid and secure. Do not store in high, 'out of reach' places.



3. Safeguard Summary

- 1) Ensure the instrument is properly grounded when connected to the power source.
- 2) Do not touch or allow dust to settle on the optical parts (i.e. lenses), as their measuring accuracy could be adversely affected and incorrect value may result.



When dust or fingerprints appear, use the supplied dust cloth or a soft cloth to gently wipe off the build-up. Take great care when cleaning these parts, as they are particularly sensitive and fragile.

3) If the surfaces of the measuring unit and main unit including the operation switches are dirty, gently wipe with a dry cloth. For hard to remove stains, a damp cloth or neutral cleanser is recommended.



At no time use organic solvents which will damage the water based paint finish of the instrument.



- GL-7000 is a precision optical instrument. Handle with care at all times, making sure not to accidentally drop it.
- 5) If the instrument is not to be used for any length of time, remove the power cord from the outlet.
- 6) When not in use, the instrument should be protected with the provided dustproof cover.
- If the instrument fails to function properly, do not attempt to perform internal service or adjustment. Contact immediately your nearest registered agent, distributor or retail outlet.



4. Measurement Screen



4.1. Switch Function

Name		Description		
		designates a type of the lens to be measured:		
	$\overline{\mathbf{S}}$	a single lens		
LENS switch	$\left(\begin{array}{c} R \\ R \end{array} \right)$	a lens for a right eye		
		a lens for a left eye		
Massurament selection		switch the measurement mode:		
switch		a single focal lens measurement		
lens>		a progressive lens measurement.		
CLEAR switch		changes the symbol of cyl in the order of $-$, $+$, and \pm .		
Cyl switch	Ð	prints out the data.		
		stores the measurement data in memory when a single focal lens is measured.		
		determines the measurement value of the far point when the		
Memory/Add switch		determines the far point for auto measurement of the progressive		
		lens. For the manual measurement determines the measurement		
		positions and values for the far and near points.		
		Clears the measurement data by pressing it for a long time.		
MENU switch		corresponds to pressing two switches shown on the right at the same time. Shift S		

4.2. Each Setting

4.2.1. Set up Screen

You can set each measurement condition in the Menu screen.

Set up	1/2			Set up	2/2	
Step	0.12 0.25 0.01			Language	中国语 English	
Lens	HCL Normal SCL			Brightness	<mark>5</mark> 0%	
Prog Auto	on Off			ID	ID Screen	
ADD Measure	Manual Auto	I ╋ X		RS 232C	RS 232C Screen] 🕂 🔪
Prog. Graph	On Off			Date/Time	Date/Time Screen	
Graph Print	on Off					
Prism	р-в X-Y Off	」└──∕				
Prism(mm)	on Off					
Abbe	60 50 40 30 20					
Ray	d e					
Stand by	5 3 Off 10					
			L			

Item	Description	Initial Setting
Step	Selection of the increment in diopter. <0.25 / 0.12 / 0.01>	0.25
Lens	Setting of the lens type to be measured <normal: a="" cont:="" contact="" contact<br="" for="" glasses="" h="" hard="" lens="" s="" soft="">lens></normal:>	Normal
Prog Auto	Selects whether to perform the automatic judgment for progressive lens. <off: not="" on:="" perform=""></off:>	Off
ADD Measure	Selects whether to determine the near point automatically or manually. <auto: automatic="" manual="" manual:=""></auto:>	Auto
Prog. Graph	Selects whether to display the automatic assessment gauge of the near point when the progressive lens is measured. <off: displayed="" not="" on:=""></off:>	Off
Graph Print	Selects whether to print the automatic assessment gauge for near point after the progressive lens is measured. <off: not="" on:="" printed=""></off:>	Off
Prism	Selects whether to display prism values, and which unit is used if displayed. <off: -="" base="" direction="" display="" displayed="" not="" p-b:="" prism="" value="" x-y="" x-y:=""></off:>	X-Y
Prism(mm)	Selects whether to display the prism value of X-Y direction in mm. <off: displayed="" not="" on:=""></off:>	Off
Abbe	Selects Abbe number of the lens measured<20 / 30 / 40 / 50 / 60>	40
Ray	Selects the reference wavelength of measurement <e: d="" d:="" e="" line=""></e:>	е
Stand by	Sets how long it takes until power saving function is activated. <off: 10="" 10min:="" 3="" 3min:="" 5="" 5min:="" minutes="" zero=""></off:>	Off
Language	Selection of language displayed on the screen EN:English 中国语: Chinese	EN
Brightness	Brightness adjustment of the screen 0 ~ 100% (step: 5%)	Adjustment value
ID	Switch to ID screen	-
RS 232C	Switch to RS 232C screen	-
Date/Time	Switch to Date/Time screen	-

4.2.2. ID Screen



This screen allows you to create the data that would always appear on the printout such as a store name or messages:

Screen (1): for writing the information Screen (2): for changing and erasing the information

(during Memory/Add switch pressed).

In the Screen (1), select letters and symbols using

and (

Any changes made will overwrite the original letters and symbols.

Screen (2): Memory/Add switch is pressed



To make some changes, press Memory/Add switch to call up Screen (2). Using and move the cursor to the letter or symbol you wish to change. Then, release Memory/Add switch to return to the Screen (1). Select the letter or symbol you wish to change and press .

To erase the letters or symbols selected, press Memory/ ADD switch to call up Screen (2). Move the cursor to the letters or symbols you wish to erase using and , and press .

To shift from ID screen to the measurement screen, press



4.2.3. RS 232C Screen

RS 232C		
BandRate	2400 38400 9600	
Character	7 8	
Parity	Even None Odd	
Stop Bit	1 2	
Data Out	Manual Print Auto	
		<u> </u>

In RS 232C screen, you can set the communication parameters to send the measurement values to a personal computer.

Use to select the item you desire to change, and press to set the item in detail.

To return to the measurement screen from RS232C screen, press \bigcirc .

Item	Description		Initial Setting
BaudRate	Transfer rate	38400	
Character	Character length		8
Parity	Parity check		None
Stop Bit	Stop bit	1	
	How to output the data	Icon	
	Print: print out from the build-in printer		
Data Out	Manual: measurement values are output from RS 232C terminal using the switch. Auto: measurement values are continuously output from RS 232C terminal.	10101	Print

<Signal names and connection>

Connect each connector of the serial interface as shown below. Connection shall be made to a CE-mark approved instrument.





[Connection sample 2]

D-Sub 9pin(female)	D-Sub 9pin(female)
GL-7000 Connection	PC
1	1
2	- 2
3	- 3
4	- 4
5	- 5
6	~ 6
7	- 7
8	- 8

4.2.4. Date/Time Screen

Date/Time		
Date Form	D/M/Y Y/M/D м/D/Y	
Date	20 02 / 01 / 18	
Time	10:08:28	
		•

This is the screen to set date and time shown on the printout.

Select the item you wish to change usin \frown and
and set the detail with .
Date Form: Y/M/D: year, month, date
D/M/Y: date, month, year
M/D/Y: month, date, year

Date: change of the date

Screen (2): Memory/Add switch is pressed		
Date/Time		
Date Form	D/M/Y Y/M/D M/D/Y	
Date	20 02 / 01 / 18	
Time	10:08:28	_ (♣)

Move the cursor to the item you wish to change with . While Memory/Add switch is pressed, Screen (2) will be displayed. Make changes using



Time: change of the time

Follow the procedure of 'Date' above.

Press to return to the measurement screen from Date/Time screen.

5. How to operate the lensmeter

5.1. Lens holder

- (1) Raise the lever to the operational direction until it is unlocked.
- (2) Lower the lens holder slowly and fix the lens.





Great care shall be taken to avoid giving a strong impact to the lens when lowering the lens holder.

Make sure that the lens holder is raised to the top when raising it.

5.2. Lens plate

The lens plate is a reference of the astigmatic axis.

- (1) Push the PUSH mark on the lens plate to unlock it. The lens plate will come out.(To lock the lens plate, push it again.)
- (2) The lens plate comes out until it touches the lens when pushed. Place the frame lens on the lens stand so that the bottom touches the plate.



5.3. Marking lever

5.3.1. How to operate

The marking lever provides the marking on the lens, which indicates the center and axis direction of the lens.

- (1) Rotate the marking lever.
- (2) Lower the lever slowly until the pen tip lightly touches on the lens.





5.3.2. Replacement of marking pen

(1) Hold the pen tip of the marking pen (the plastic part) and turn the screw to the left to remove.



- (2) Attach the spring to the new marking pen as shown on the right, and insert it into the marking finger.
- (3) Keep holding the pen tip (the plastic part) and lightly fix it with the screw.

? Use the marking pen exclusively designed for GL-7000 only.

- ? Avoid touching the pen tip when replacing. The tip may be damage so that the marking can not be done.
- ? Do not fasten the screw too tightly when replacing. You may damage the part.
- ? The screw and spring are the part of the unit. Avoid losing them.



5.4. Printer

5.4.1. How to operate

When measurement is finished, press The measurement result is printed out. \checkmark

5.4.2. Type of print out

<<Print out sample when lenses for right and left eyes are measured>>



<<Print out sample when a single focal lens is measured>>

······	······	
<u>2003 01 20 10:25</u> NAME	<u>2003 01 20 10:25</u> NAME	2003 01 20 10:25 NAME
<pre><s> SPH: 0.00 CYL: -2.75 AXS: 90</s></pre>	<s> SPH: -3.00 CYL: -0.50 AXS: 90</s>	<s> SPH: 2.25 CYL: 0.00 AXS: 180</s>
ADD: 2.00	PSM: 0.00 253B	ADD : 2.50
PSM : I 0.00 D 3.25	Grand Seiko Co., Ltd. GL-7000 S/N:130001D	PSM: O 1.25 U 5.00
Grand Seiko Co., Ltd. GL-7000 S/N:130001D		
h	Г	
D value is printed out when		FV NV
ifocal or progressive lens is		Grand Seiko Co., Ltd.
isurea.		GL-7000 S/N:130001D

AD mutifocal or progressive lens is measured.

Optical characteristics graph printed. (When Graph Print is set for On at the progressive lens measurement.)

5.4.3. Setting and replacement of printer paper

(1) Push the printer-cover open button to open the cover, and then remove the cover.



(2) Insert the printer shaft into the roll of the paper and set it in the printer unit.



(3) Hook the tabs of the cover to the tabs of the unit. Take out the end of the paper a little and close the cover.



6. Measurement

6.1. Check before Measurement

- Check that the lens stand is set properly.
- Check that the lens under the lens stand is clean.



A lens stand removed

(If it is dirty, clean it with a soft cloth.)

• Plug the power cord to the outlet.



Always make sure that the cable is grounded.

- Set the printing paper in a printer. (See '5.4.3 Setting and replacement of Printer paper.')
- Check that no lenses are placed on the lens stand.
- Turn the power on. The screen below will appear in a few seconds.



6.2. Lens without frames

(1) Place a lens on a lens stand. Lower the lens holder softly on the lens.

The screen as shown on the right will appear.



Step 0.25 C Measuring

Alignment mark

Abbe 40

S

Ē

 \bigcirc

Œ

 \bigcirc

Cyl

ent OK

Alignm

(2) Move the lens and bring the cross cursor to the alignment mark. The message "Alignment OK" will appear on the screen when alignment completes.

The alignment mark represents the optical center of the lensmeter and the cross cursor that of the lens.

Optical center of the lens

S C A

-3.75

-1.25

Px 10.25

Py U 0.25

10

S

(3) Move the lens until the cross cursor and the alignment matches. When they match, the message "Marking OK" will appear to indicate that marking is ready to be carried out.



Message to tell you are ready to mark.

(4) Press Memory/Add switch to store the measurement values of S, C, A and prism in memory.

The measurement value display area changes to yellow and the values stored turnes to red and are fixed.

To delete the data stored in memory, press Memory/Add until you hear the bleep.

(5) Press to print out the values.



Great care should be taken not to give strong impact to the lens when lowering the lens holder.

Confirm that the lens holder is locked at the top when pushing it up.

6.3. Framed Lens

- (1) Push "PUSH" mark of a lens plate. The lens plate will come to the front.Place a lens on a lens stand so that the bottom of the frame touches the lens plate.
- (2) Press s of the operation switches to specify the lens as either right or left (in this case, right). Press the switch to display R on the upper right of the screen.
- (3) Align the lens, following the same procedure as a single lens measurement.





- (4) When the measurement completes, press Memory/Add switch to store the measurement values. The values of S, C, A and prism will be indicated in red and fixed when stored in memory. The measurement value display area also changes the color to yellow.
- (5) Press R to switch to the lens for a left eye.At this time, the measurement result for the right lens is fixed on the screen.
- (6) Press \checkmark to print out the values.



NOTE -

You can start measurement from either right or left lens.

When both of right and left lens data are stored in memory, you can delete the measurement value of your selection by pressing Memeory/Add switch long enough.

6.4. Multifocal Lens

- (1) Place a lens on a lens stand and lower the lens holder gently.
- (2) Measure the far point and press Memory/Add switch. When Memory/Add switch is pressed, the values of S, C, A and prism turn to red and are fixed. The measurement value display area also changes its color to yellow.

Press it again, then, the value of Ad1 is also shown.



(3) Measure the near point. Move the lens so that the near point comes to the center of the lens stand.

NOTE: "Alignment OK" and "Marking OK" are not necessarily displayed for the near point measurement.

(4) Press Memory / Add switch to store the ADD value of the near point in memory.

After the measurement values are stored, Ad1 values will become red.

For a trifocal lens, Press ADD switch again to display Ad2 on the screen. Bring the second near point into the center of the lens stand again. Then, repeat the step (3) and (4).

- (5) Press (R) to change to the right lens measurement. The measurement result of the left lens is left displayed on the screen at this time.
- (6) Press \checkmark to print out the values.





Add value

6.5. Progressive Lens

(1) Set up the items for progressive lens measurement in the Menu screen. Press MENU switch and set ProgreJudge and ProgreLOC.

ADD Measure:

- Off: No automatic judgment for a progressive lens
- On: automatic judgment for a progressive lens

Prog. Auto:

- Auto: Automatic measurement of a near point
- Manual: Manual measurement of a near point

Set up	1/2	
Step	0.01 0.25 0.12	
Lens	H cont Normal S cont	
Prog Auto	On Off On	
ADD Measure	Manual Auto	[🕂 💙
Prog. Graph	On Off	<u> </u>
Graph Print	On Off	
Prism	оff X-Y р-в	
Prism(mm)	On Off	
Abbe	20 30 40 50 60	
Rav	в	
Stand by	3 5 Off 10	
		•

(2) Press the measurement selection switch (see 4.1 Switch function) to display the progressive lens measurement screen.



When Prog. Auto is On, you can automatically check whether the lens is a progressive lens or not. Set the lens so that the possible progressive area is placed on the lens stand. Then, the automatic judgment starts.

When the lens is identified as a progressive lens, the progressive lens measurement screen appears. When the lens is not a progressive lens, the progressive lens measurement screen does not appear.

- NOTE -

- When ADD value is small (under 1D), automatic judgment may fail. When the progressive area is not properly placed on the lens stand, automatic judgment may also fail. In such a case, try to move the lens slowly back and forth or to the right or left.
- When ADD value is small (under 1D), the lens in the frames is small, or the lens has significant flaws or stains, the far and near points may not be automatically detected. In such a case, try to measure manually.

(See the last part of this section for manual operation of a progressive lens

- (3) How to measure the progressive lens (when ProgreLOC is set for On)
 - 1) Detection of the progressive area

First move the lens slowly to the right and left, and back and forth to find the progressive area. When the progressive area is detected, the screen (2) appears.

When the progressive area can not be detected because the ADD value is small, press Memory/Add switch. You can call up the screen (2).

2) Far point measurement

When you move the lens toward the instrument according to , the shape of the alignment cursor changes. Move the lens <u>slowly</u> to the far point.

When the progressive area is off the lens stand, the arrow changes to and the cursor changes to or . In such a case, move the lens to the right and left until the arrow and cursor change back to and cursor change back to the instrument.

Once the far point is detected, The alignment cursor changes to a symmetrical cross as shown in the screen (3). When the Memory/Add switch is pressed, the cursor becomes green Then, the measurement value of the far point is stored in memory.

3) Near point measurement

Move the lens **<u>slowly</u>** toward you according to the arrow as shown in the screen (4) so that the alignment cursor moves toward the near point.

When the near point approaches, the alignment cursor changes from blue to red. Carry out alignment carefully. When the near point is attained, a bleep sounds and the cursor becomes red. At the same time, the Add value is automatically stored in memory.









* Pressing Memory/Add switch after the measurement allows you to store the Add value (Ad2) at any given position aside from the Add value already stored in memory.

After completion of the measurement, set the lens for the left eye and press $\left(\begin{array}{c} R \\ R \end{array}\right)$. The progressive judgment screen appears again.

Measure the lens following the same procedure for the right lens.

* You can start measurement from either right or left lens.

(4) Press \checkmark to print out the values.



Manual Operation and Graphical Representation of Add value and Assessment

When you set "ProgreGraph" for ON in the Menu screen, a graph for progressive lens is displayed on the measurement screen.

Normally the near and far points are automatically detected. However, some lenses may be difficult to do so. In such a case, measure manually based on the graphs of Add value and assessment.

To measure the far point manually, carry out alignment according to the shape of the alignment cursor das you do for auto measurement.

For near point measurement, press Memory/Add switch where the Add value becomes the highest while the alignment cursor stays in the progressive area.

The near point is where the amount of change in progressive is zero. Carefully perform alignment referring to the shape of a curson and a position of the graph.



<Frame Lens (Reference)>



6.6. Contact lens

6.6.1. Preparation

(1) To measure a hard contact lens, select 'H C' in the Menu screen. For a soft contact lens, select 'S C'.

Set up		
Step	0.01 0.25 0.12] 🔶)
Lens	SCHC Normal	
Prog Auto	On Off	
ADD Measure	Manual Auto] 🕂 >
Prog. Graph	On Off	
Graph Print	On Off	
Prism	Оff Х-Ү Р-В	עשן
Prism(mm)	On Off	
Abbe	20 30 40 50 60	
Rav	d e]└┸╯∕
Stand by	3 5 Off 10	

(2) Change the lens stand to the contact lens stand included in the accessories and measure the contact lens.





Standard nosepiece

Contact lens stand

6.6.2. How to measure

- (1) Set the contact lens in the contact lens stand as shown below.
- (2) Remove the standard lens stand and mount the contact lens stand.
- (3) Lower the lens holder and hold the contact lens stand.
- (4) Move the contact lens stand vertically and horizontally to bring the lens's center to the center of the instrument.
- (5) Press (\Rightarrow) to print out the values.



7. Marking

Refer to '5.3 Marking lever' for the lever operation.

7.1. Lens without Astigmatism

(1) Move a lens until a cross cursor matches with the alignment mark.

When "Marking OK" is displayed, you are ready for marking.

(2) Lower the marking lever to mark on the lens.



7.2. Lens with Astigmatism

- Marking on the cylindrical axis
- (1) Match the target so that the AXIS marks become approximately 180° .
- (2) To be more precise, align so that the AXIS value becomes 180° .

This method is frequently used for process by a patternless edger.



- Marking according to the axis in the prescription
- Match the target so that the AXIS mark matches the value in the prescription.

Then, match the target more precisely referring to the display of the axis angle.



7.3. Marking of prism Lens

- Prescription expressed in X-Y
- (1) Select "X-Y" from "Prism" in the Menu screen.
- (2) Move the lens so that the prism values displayed on the screen accord with those of the prescription.

Indicated values for prism are as follows.

Px :	Ι	Base In
Px :	0	Base Out
Py :	U	Base Up
Py:	D	Base Down



Prescription expressed in P-B

- (1) Select "P-B" from "Prism" in the Menu screen.
- (2) Move the lens so that the prism values displayed on the screen accord with those of the prescription.
 - P: Prism value
 - B: Base direction



Prescription expressed in mm

- (1) Select "On" from "Prism(mm)" in the Menu screen.
- (2) Move the lens so that the prism values displayed on the screen accord with those of the prescription.

Arrows $(- - \neg \mathbb{R})$ indicates the direction you should move the lens to make its optical center reached the measurement center.



8. Error Messages

8.1. Descriptions

Message	Status	Description	
Measure Error	Abnormality of the instrument	When the power is turned, values are not initialized (values are not zero (0)).	
Paper Empty		No papers are set in the printer.	
Printer Cover Open		The printer cover is open.	
Printer Heat Over		The printer is overheated.	
EEPROM Fault		Abnormality of momory	
DRAM Error		Abiomanty of memory	
SPH Over	Measurement abnormality	SPH value exceeds the measurement range.	
CYL Over		CYL value exceeds the measurement range.	
Prism Over		Prism value exceeds the measurement range.	
ADD Over		ADD value exceeds the measurement range.	
Retry Error	Abnormality of image processing	Measurement fails because of dust, flaws, unnecessary light, and so on.	
Notarget Error		The measurement light does not enter into the receiving light sensor.	

8.2. Measures taken for the errors

Measure Error

The message appears if the lens is on the lens stand when the power is turned on, or if the lens under the lens stand is dirty.

Remove the lens if it is on the lens stand. If the lens under the lens stand is dirty, gently wipe it with a soft cloth. Then, turn the power back again. (See 6.1 Check before Measurement.)

Paper Empty

The message appears if no papers are set or papers are not set appropriately in the printer. Set the paper appropriately. (5.4.3. Setting and replacement of printer paper.

• Printer Cover Open

The message appears when the printer cover is open. Check the cover and close it if it is open.

• SPH/CYL/Prism/ADD Over

The message appears when the lens exceeds the upper limit of the measurement range is measured. Measure the lens within the measurement range. (See 9. Specifications.)

• Retry Error or Notarget Error

The message appears when the direct sunlight or strong glare is on the instrument, or the lens under the lens stand is extremely dirty or has some flaws.

When the lens under the lens stand is dirty, gently wipe it with a soft cloth. Then, turn the power back on.



When error messages other than described above appears, or the situation does not improve after the measures above are taken, cut the power and unplug the power cord, and then contact your distributor.

9. Specification

	Sphere	-25D ~ +25D	(0.01/0.12/0.25 step)	
Measurement Range	Cylinder	0 ~ ±10D	(0.01/0.12/0.25 step)	
	Axis	1 ~ 180°	(1°)	
	Addition	0 ~ +10D	(0.01/0.12/0.25 step)	
	Prism	0 ~ 10Δ (±25D)	(0.01/0.12/0.25 step)	
Measurement wavelength	660nm			
Measurable lens	Blank lens (Ma	ax. diameter: 100mm)	monofocal lens, multifocal lens,	
	Frame lens	ſ	progressive lens	
	Hard contact lens		A smastel approximate manying d	
	Soft contact lens		A special accessory is required.	
Power supply	100 ~ 240V			
	50/60Hz			
Printer	Thermal printe	er (paper width 58mm)		
Monitor	Color LCD monitor (5.7 inches)			
Dimension/weight	200(W)x395(D)x365(H)			
	approx.5.4kg			
Environmental condition	Temperature: $10^{\circ}C \sim 40^{\circ}C$			
for use	Humidity: 70%HR (no dew condensation allowed)			

10. Applicable Laws and Standards

•	Law	Electromagnetic Compatibility Directive 89/336/EEC Low Voltage Directive 72/23/EEC
•	Standard	Safety of a devices EN 61010 1.2001

• Standard <Safety of a device> EN 61010-1:2001 <Electromagnetic compatibility> EN 61326-1: 1997, Amendment A2: 2001 Class A



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Agency