IMPORTANT NOTICE

This product may malfunction due to electromagnetic waves caused by cellular phone, transceivers, radio-controlled toys, and etc. Be sure to avoid having objects such as, which affect this product, brought near the product.

The information in this publication has been carefully checked and is believed to be entirely accurate at the time of publication. MEDIZS assumes no responsibility, however, for possible errors or omissions, or for any consequences resulting from the use of the information contained herein.

MEDIZS reserves the right to make changes in its products or product specifications at any time and without prior notice, and is not required to update this documentation to reflect such changes.

Operation Manual Ver 1.09 / 2015.10

ⓒ 2011 MEDIZS Inc.

94-10, Techno-2ro, Yuseong-gu, Daejeon,

305-509, Republic of Korea

Contents

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1. Introduction and feature

RK 11 performs usual Refractometry and Keratometry. Also base curve of contact lens can be measured with this instrument.

The main features of RK11 are as follows.

1. RK11 offers various measurement modes.

2. Because the RK11 covers a wide measurement range, from -30D to +22D, even an examinee with strong myopia can be measured.

3. RK11 provides user-friendly environment by adopting smooth curved shape, stylish color and user-centered design and user interface (GUI).

4. RK11 provides Height Auto Tracking.

2. Safety information

2-1 Symbols marked on the instrument

Symbol	Description
⍟	TYPE B EQUIPMENT
⏚	Protective earth (ground)
∼	Alternating current
⚠	Attention, consult ACCOMPANYING DOCUMENTS
○	Off (power: disconnect to the mains)
│	On (power: connection to the mains)
🗑	Do not throw away the waste to inappropriate place
Manufacturer	Manufacturer
EC REP Authorized EC representative	Authorized Representative in the European community
📖	Consult operating instructions

2-2 EU Countries

The following mark, the name & address of the EU Representative shows compliance of the instrument with Directive 93/42/EEC.

CE 1023

EU Representative:

CALMED INVEST Kft.

1182 Budapest, Fiume utca 3., Budapest, Hungary

2-3 General safety information

If you see any warnings or cautions printed on the warning labels, follow the safety instructions in this manual. Ignoring such cautions or warnings while handling the product may result in injury or accident. Be sure to read and fully understand the manual before using this product.

Keep this manual in easy-to-access place.

⚠ **WARNING**	This indicates a potentially hazardous situation which could results in death or serious injury to you or others.
⚠ **CAUTION**	This indicates hazardous situations which may result in minor injury to you or others, or may result in machine damage.
📃 **NOTE**	This is used to emphasize essential information. Be sure to read this information to avoid incorrect operation.
⚠ **WARNING**	Only operate the instrument with the power supply indicated on the rating plate. Otherwise, it may result in fire or electric shock.
⚠ **WARNING**	Be sure to turn OFF the power switch before connecting or disconnecting the cables. Also, do not handle them with wet hands. Otherwise, you may get an electric shock that may result in death or serious injury.
⚠ **WARNING**	Should any of the following occur, immediately turn OFF the power switch, unplug the power cable from the AC outlet, and contact the dealer or the agent who/where you purchase this instrument. ▪When there is smoke, strange odor or abnormal sound. ▪When liquid has been spilled into the instrument or a metal object has entered through an opening. ▪When the product has been dropped or its housing damaged.
⚠ **WARNING**	Never disassemble or modify this instrument because it may result in fire or electric shock. Also, since this instrument incorporates high-voltage parts and other hazardous parts, touching them may cause death or serious injury.

⚠ **WARNING**	Do not Keep way the place where the temperatures very much.
⚠ **CAUTION**	This instrument is shipped with a grounding type power cable. To reduce the risk of electric shock, always plug the cable into a grounded power outlet.
⚠ **CAUTION**	Wipe the forehead rest with ethanol or glutaraldehyde solution to disinfect it each time a different examinee uses it, in order to prevent infection.
⚠ **CAUTION**	Ensure that the examinee has not placed his/her hand or fingers under the chin rest. Otherwise, hand or fingers may be hurt.

1. An exposure to the direct sunlight or very bright indoor lights may influence on the result of accurate measurement. Recommend to use in appropriate test room.
2. A sudden heating of the room in cold areas will cause condensation on the protective glass in the monitor screen and on optical parts inside the instrument. In this case, just wait until condensation disappears before performing measurement.
3. This instrument is used with accessories from MEDIZS. If consumer would like to use the accessories from other manufactures, safety of accessories should be verified and identified by manufacturer or by MEDIZS.
4. Operation manual should be keep at the place where the user can easily access.
5. This instrument can be installed and maintained by the person who have completed training or education course.
6. When moving this instrument, please keep vibration or impact away from the equipment. It can bring some damage inside or outside of the instrument. Please carefully handle the instrument.
7. When moving equipment, fix the stage, always keep power off, and then lift the bottom of the unit with both hands.
8. To connect this instrument with other relevant equipment, consult with the dealer about the way to make it.

9. In case there is smoke, strange odor or noise on working, disconnect the power supply and consult the dealer.
10. Don't use organic solution such as alcohol, thinner, benzene, etc. to clean the surface of this instrument. It may damage the instrument.
11. Do not disassemble or modify this instrument.
12. If you are not using this instrument a long time, disconnect the power supply and protect the unit with dust cover.
13. Do not pull on the cable of equipment.
14. Please check the condition of unit appearance before using the instrument.

3. Notes for using the instrument

3-1 Before use

1. Stand 40 minutes and get it worked if it is stored in low temperature place. If the inside temperate of instrument is too low, it may cause on ERROR or inaccurate measurement.
2. A sudden heating of the room in cold areas will cause condensation on the protective glass in the monitor screen and on optical parts inside the instrument. In this case, just wait until condensation disappears before performing measurement.
3. Check printing papers are ready.
4. Check the condition of unit appearance and operation such as chin rest working.
5. Check horizontality of unit.
6. Remove dusts, especially on the measurement window. It may cause on ERROR or inaccurate measurement.

3-2 When you use

1. Do not make dirty, such as fingerprint, on the lens of measurement window. It may cause on ERROR or inaccurate measurement.
2. Do not put other object on this equipment.
3. If you want to keep measurement result for a long time, make a copy of it.

Printed data on thermal paper may be disappeared after a long time.

3-3 After use

1. Cover up the instrument with dust cover and unplug if do not use long.
2. If the measurement window is not clean, wipe it with soft and dry cloth carefully to avoid any scratch.
3. When moving this instrument, please keep vibration or impact away from the equipment. It can bring some damage inside or outside of the instrument.

3-4 Storage space

1. Not humid place and not in the vicinity of water.
2. Not dusty and not in the vicinity of filthy place with salt or sulphur.
3. Not in the vicinity of vibration or shock.
4. Plain place.
5. Not in the vicinity of direct sunlight.

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4. Description

4-1 Front side of body
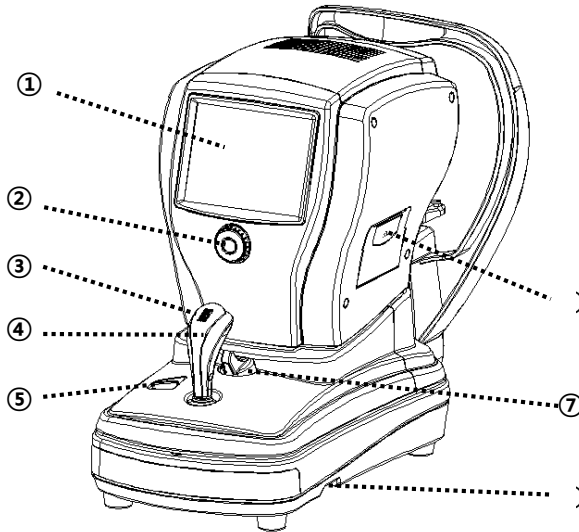
[Fig.1] Front side of body

Name	Description
① Monitor	Monitor that displays Measurement
② Operation Buttons & Wheel	There are function keys
③ Measure Button / Body Wheel	Press this button for measurement. And Regulating height of Body
④ Operation Lever	It adjust the main body forward, backward, right side and left side. (for adjusting the focus)
⑤ Chinrest Up/Down Buttons	Regulating height of chin rest
⑥ Power Switch	Switch for turning power ON and OFF.
⑦ Stage Holing Lever	Holds the movement of stage
⑧ Printer	Print the measured result

⚠ CAUTION	Ensure that the examinee has not placed his/her hand or fingers under the chin rest. Otherwise, hand or fingers may be hurt.

Smart RK11 — Auto Refracto / Keratometer

⚠ CAUTION	Wipe the forehead rest with ethanol or glutaraldehyde solution to disinfect it each time a different examinee uses it, in order to prevent infection.
⚠ WARNING	Be sure to turn OFF the power switch before connecting or Disconnecting the cables. Also, do not handle them with wet hands. Otherwise, you may get an electric shock that may result in death or serious injury.

4-2 Back side of body
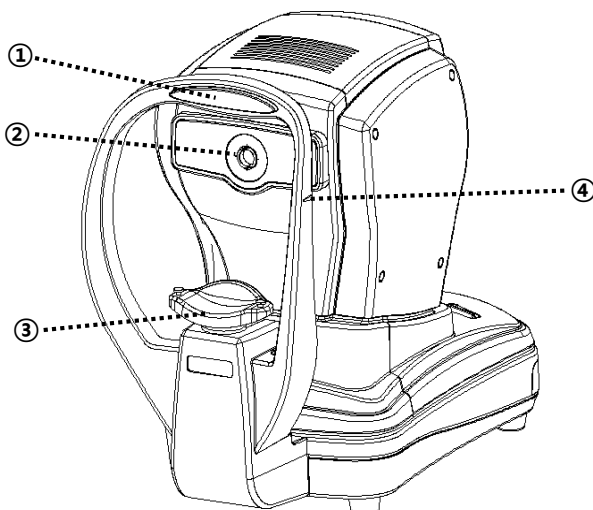
[Fig.2] Back side of body

Name	Description
① Headrest	Place the examinee's chin on the rest.
② Measurement Window	Window for the examinee to look at for measurement
③ Chinrest	Place the examinee's chin on the rest.
④ Height lining mark	Lining up eye level of patient by regulating chin rest

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4-3 Bottom side of body
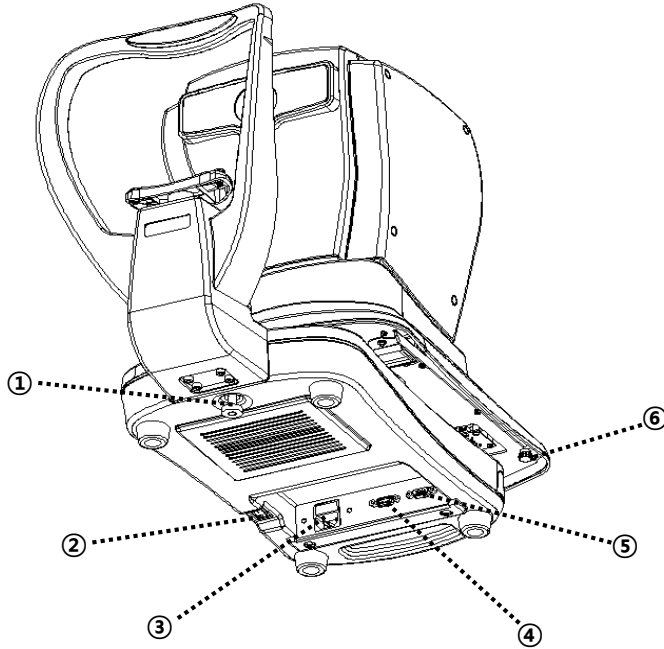
[Fig.3] Bottom side of body

Name	Description
① Stage Clamping Bolt	Makes the system stage fixed
②Power Switch	Switch for turning power ON and OFF
③ Power IN LET	Power IN LET
④RS-232 Connector	Connect with external equipment
⑤ EXT Video	Connect with external Video equipment.
⑥ Stage Fixing Knob	Makes the system stage fixed

- Rotate the stage clamping bolt located in the bottom of body counterclockwise and release. [Fig.5]
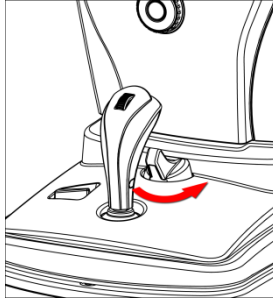
[Fig.6]

- Rotate the stage holding lever to 'UNFIXING' direction. [Fig.6]
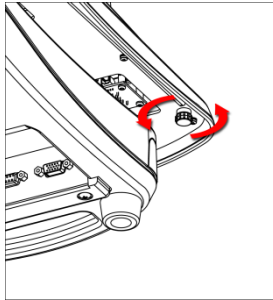
[Fig. 7]

- push the stage to right side and then fasten the stage fixing knob by rotating it clockwise. and do the same on left side. [Fig.7]
- Check whether stage is moving freely

5-2 Connecting the power cable

- Connecting the power cable to the connector on the bottom of main body.
- Plug into AC outlet after switch off the instrument.

5-3 Putting rest papers (Refer to 9-4 Replacement of paper)

- Pick out both holding pins on chin rest.
- Insert both pins into holes on chin rest papers and stick it on chin rest.

5-4 Engage printing papers

- Refer to 9-4 Replacement of paper.

5-5 Check setting

 ◆ Please check the information such as VD, CYL format, SPH/CYL step, VD form KER unit, KER index, date, etc on the measure screen and setting mode.

5-6 To connect with other equipment

 ◆ This equipment is able to transfer test results other equipments. Consult with the dealer for details.

| ⚠️ **WARNING**	Be sure to turn OFF the power switch before connecting or disconnecting the cables. Also, do not handle them with wet hands. Otherwise, you may get an electric shock that may result in death or serious injury.

6. Practicing by model eye

Practice measurement by using the model eye offered with RK11.

Measurement window

Fix Pin
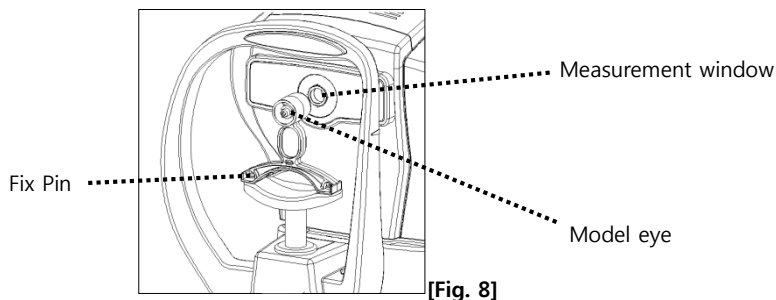
Model eye

[Fig. 8]

6-1 Turn on the power

6-2 Set the model eye on

 ◆ Align the holes on the base of the model eye with the holes on the chin rest and then insert pins.

6-3 Release stage lock

 ◆ Rotate the stage holding lever to 'UNFIXING' direction. (Refer to [Fig.6])

6-4 Mode selection

 ◆ Choose REF or R/K mode by rotating the Operation Buttons& Wheel of front body.

(Refer to **4-4Operation Buttons& Wheel**)

6-5 Adjust the height and focus on the model eye

1. Adjust the height of the model eye. (Support the height auto tracking.)

   ◆ Adjust the height of the model eye to match with measurement window by using chinrest up/down button.

   ◆ By looking at focusing circle, turn the Body Wheel up or down aims to the center, RK11 does **height auto tracking.**

   ※**Operation the Body wheel** ※

<Turn the Body wheel>   <Turn by pressing the Body Wheel>
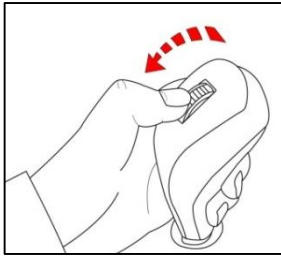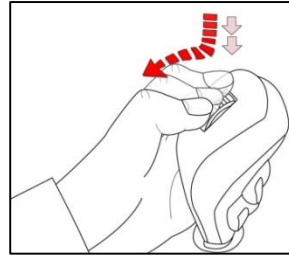
   - Turning up & down the Body Wheel : the fine-tuning height of main body.

   - Turning up & down by pressing the Body Wheel : Lifting up & down the height of the main body quickly.

<The limited point of the main body movement>
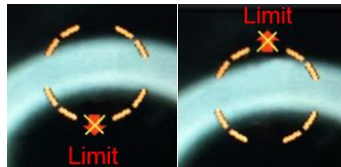
   - Red 'X' mark& Limit sign: Using Body Wheel cannot raise or lower the main body.

2. Adjust the Focus on ring of the model eye

- ◆ Move the Operation Lever to arrow direction (right side or left side)

- ◆ Move the Operation Lever backward and forward to find the focus of ring.
- ◆ Three colors of circles appear on the screen. When circle is yellow, it means focused, orange and white circles mean defocused.

6-6 Measurement

- ◆ Manual measurement
  ① Press the Measure Button after adjust the position and focus on the model eye.
  ② Measurement result is displayed on the screen. If some other message is displayed, repeat the procedure **6-5Adjust the height and focus on the model eye** and measure again.
  ③ Check whether Diopter value is correct or not. Diopter value is marked on the bottom of the model eye.
- ◆ Automatic measurement

  ① Press the Auto/Manual (RIGHT) button. (Refer to **4-4**)
  ② Adjust the position and focus on the model eye.
  ③ Automatic shooting begins when it is well focused.
     (When focus indicator circle is yellow, it means focused.)

	Please set STEP to 0.12 for Validation of Model eye.
NOTE	Because label value of Model eye is result at STEP 0.12. If you have set STEP to 0.25, the measurement result of Model eye may be higher or lower than label value.

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6-7 Print

◆ Pressing the Print (DOWN) button, printing on the paper.

NOTE	After printing, former measurement results will be cleared automatically when staring next measurement.
NOTE	Record on thermal paper can be spoiled by heat. And Printed data on paper will be disappeared as time goes by.If the result should be kept in long period, please copy the result.

<Example Printer>
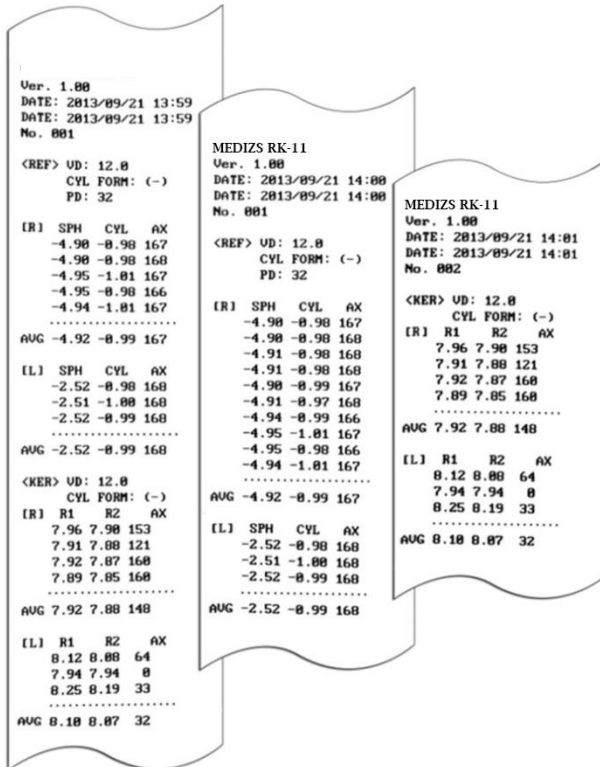
7. Measurement

7-1 REF mode

Refractometry can be performed on REF mode.
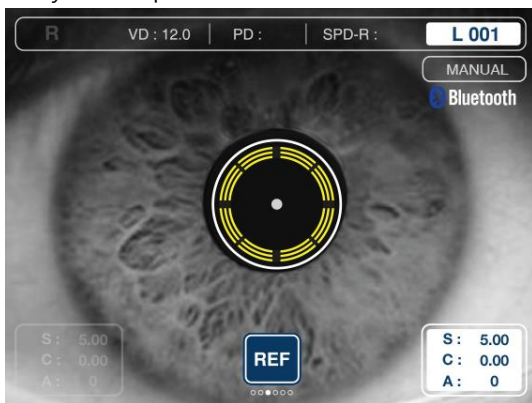
■ Operation Buttons & Wheel functions in REF mode

KEY	Function	Description
SET/OK	Configure	Operate Configure mode
LEFT	IOL	IOL mode ON/OFF
RIGHT	Auto/Manual	Select auto/manual measurement
UP	Result	Display measurement result
DOWN	Print	Print measurement result
WHEEL_LEFT	Mode Select	Select measurement mode
WHEEL_RIGHT	Mode Select	Select measurement mode

1. Rotate the Operation Buttons & Wheel until REF mode is displayed on the screen.

2. Check whether required options (VD, STEP, CYL and etc.) were set properly.
3. Adjusting the height of examinee's eye
   ◆ By using the Chinrest Up/Down button or the Body Wheel button of control

lever, adjust the height until examinee's eye is aligned with the mark on side of head rest.

⚠ **CAUTION**	Keep hand or fingers out of under chin rest. Could damage and injured.

4. Positioning and Focusing
   * Move control lever (to left/right side) to make center of examinee's pupil (bright dot) locate in the targeting mark
   * By moving the Operation Lever (to front/back side), focus to get clear mire ring mark.
   * In this procedure, RK11 analyze the focusing condition and display the level of focus.
   * Please, refer to **6-5**.

5. Measurement
   * Manual measurement mode (MANU mode)
   ① Press the Measure Button.
   ② After finishing measurement, result is displayed on bottom of screen.

📋 **NOTE**	If measurement is failed with 'TRY AGAIN' message, perform the measurement 1 more time. Regarding description of each message, please refer to the 'section 9-1'.

   * Automatic measurement mode (AUTO mode)
   ① Press Auto/Manual (RIGHT) button until Auto Icon is displayed.
   ② When the focus circle is yellow, RK-11 will measure automatically and continuously by setting repeat count.

◆ Repeated measurement

① Press the Measure Button. Please take care not to move focusing and measurement point.

(In AUTO mode, automatically measured when focused well)

② Every time user performed the measurement, latest result is displayed on the screen.

③ And the user can check measurement results in Result mode.

Each left/right eye can be displayed maximum 10 results in order.

6. Measuring another eye

After finishing measurement for 1 eye, move the lever to opposite side. And then repeat the procedure 4~6.

⚠️ CAUTION	When moving the stage to measure another eye, pull main body to examinee's side to avoid injury of patient's face (especially nose).

7. Displaying measurement result

◆ Press Result(UP) button of Operation Buttons & Wheel and then measurement result is displayed on the screen (maximum 10 results).

Results ◄ **REF**   KER   PK   CLBC ►

SPH(D)	CYL(D)	AXIS		SPH(D)	CYL(D)	AXIS
-5.00	0.00	0	1	-5.00	0.00	0
-5.00	0.00	0	2	-5.00	0.00	0
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
-5.00	0.00	0	Avg	-5.00	0.00	0

8. Printing

◆ Press the Print(DOWN)button and then measurement data will be printed.

7-2 KER mode

The radius of corneal curvature is measured on KER mode.
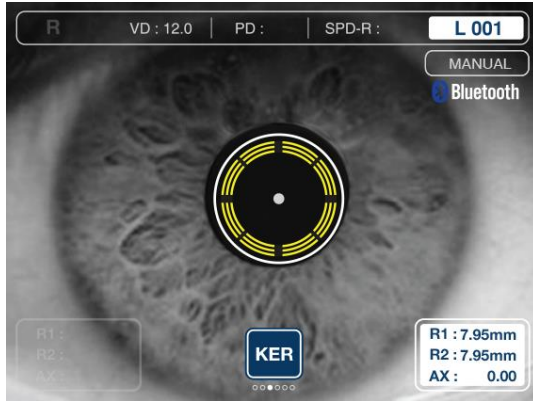
■Operation Buttons & Wheel functions in KER mode

KEY	Function	Description
SET/OK	Configure	Operate Configure mode
LEFT	-	-
RIGHT	Auto/Manual	Select auto/manual measurement
UP	Result	Display measurement result
DOWN	Print	Print measurement result
WHEEL_LEFT	Mode Select	Select measurement mode
WHEEL_RIGHT	Mode Select	Select measurement mode

1. Rotate the Operation Buttons & Wheel until KER mode is displayed on the screen.

2. Check whether KER mode is displayed on the screen.
3. Check whether required options were set properly.
4. Adjust the height of examinee's eye and perform measurement.

   ◆ **Refer to the section 6-5 and 7-1 '3~7'.**

5. Displaying measurement result.

 • Press Result(UP) button and then measurement result is displayed on the screen (maximum 10 results).

Results	◄	REF	**KER**	PK	CLBC	►
R1(mm)	R2(mm)	AXIS		R1(mm)	R2(mm)	AXIS
7.95	7.95	0	1	7.95	7.95	0
7.95	7.95	0	2	7.95	7.95	0
7.95	7.95	0	3	7.95	7.95	0
			4			
			5			
			6			
			7			
			8			
			9			
			10			
7.95	7.95	0	Avg	7.95	7.95	0

6. Printing
   • Press the Print(DOWN)button and then measurement data will be printed.

7-3 RK mode

RK mode performs Refractometry and Keratometry at the same time.
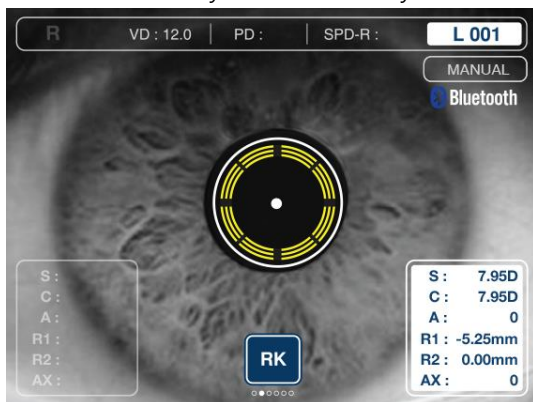
■Operation Buttons & Wheel functions in RK mode

KEY	Function	Description
SET/OK	Configure	Operate Configure mode
LEFT	IOL	IOL mode ON/OFF
RIGHT	Auto/Manual	Select auto/manual measurement
UP	Result	Display measurement result

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DOWN	Print	Print measurement result
WHEEL_LEFT	Mode Select	Select measurement mode
WHEEL_RIGHT	Mode Select	Select measurement mode

1. Rotate the Operation Buttons & Wheel until RK mode is displayed on the screen.

2. Check whether RK mode is displayed on the screen.
3. Check whether required options were set properly.
4. Adjust the height of examinee's eye and then perform measurement.

   ◆ **Refer to the section 6-5 and 7-1 '3~7'.**

5. Displaying measurement result

   Press Result(UP) button and then measurement result is displayed on the screen .

6. Printing

   ◆ Press the Print(DOWN)button and then measurement data will be printed.

7-4 PK mode

Curvature of corneal periphery is measured on PK mode.
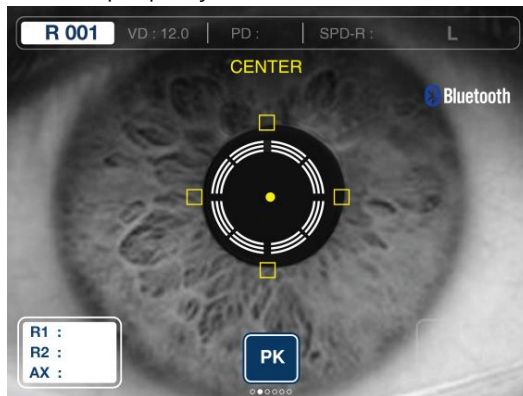
Measuring points are center of cornea (CENTER), upside from the center of cornea

(SUP), bottom side from the center of cornea (INF), from the center of cornea to the temple of examinee, and from the center of cornea to the nose of examinee. Measurement sequence is 'CENTER → SUP → INF → TEM → NAS'.

■Operation Buttons & Wheel functions in PK mode

KEY	Function	Description
SET/OK	Configure	Operate Configure mode
LEFT	-	-
RIGHT	-	-
UP	Result	Display measurement result
DOWN	Print	Print measurement result
WHEEL_LEFT	Mode Select	Select measurement mode
WHEEL_RIGHT	Mode Select	Select measurement mode

1. Rotate the Operation Buttons & Wheel until PK mode is displayed on the screen.

2. Check whether PK mode is displayed on the screen.
3. Measuring point mark on the screen will indicate the center.
4. Focus to match with the height of examinee's eye.

   ◆ **Refer to the section 6-5 and 7-1 '3~4'.**

5. Measuring center of Cornea

   ① Press the Measure Button to measure center of cornea.

   ② After finishing the measurement, result is displayed on the screen.

   ③ Curvature on center of cornea is same as curvature which measured on KER mode.

6. Measuring periphery of Cornea

   ◆ There are 4 marks of measuring point (top/bottom/left/right side of mire ring). When measurement value existed, the mark is filled with color. When the value not existed, the mark is empty.

   ◆ If periphery measuring is started, measuring point mark blinks. At the same

time, indicator lamp lights up to lead examinee's eye.

 • After finishing the measurement, value and direction of each periphery are displayed on the screen.

 • Direction of periphery
   - Superior(SUP) : upside from the center of cornea
   - Inferior(INT) : bottom side from the center of cornea
   - Nasal(NAS)   : From the center of cornea to the nose of examinee.
   - Temple(TEM)   : From the center of cornea to the temple of examinee

 • Measurement is performed as below sequence
   SUP → INF → TEM → NAS

① After measuring center of cornea, periphery indication mark blink according to above sequence.

② Check the location and instruct the examinee to see indication lamp. And then focus the mire ring (Refer to the section **6-5'2'** Position and Focusing').

③ After focusing well, press the Measure Button to perform peripheral Keratometry.

<SUP>   <INF>

<TEM>   <NAS>
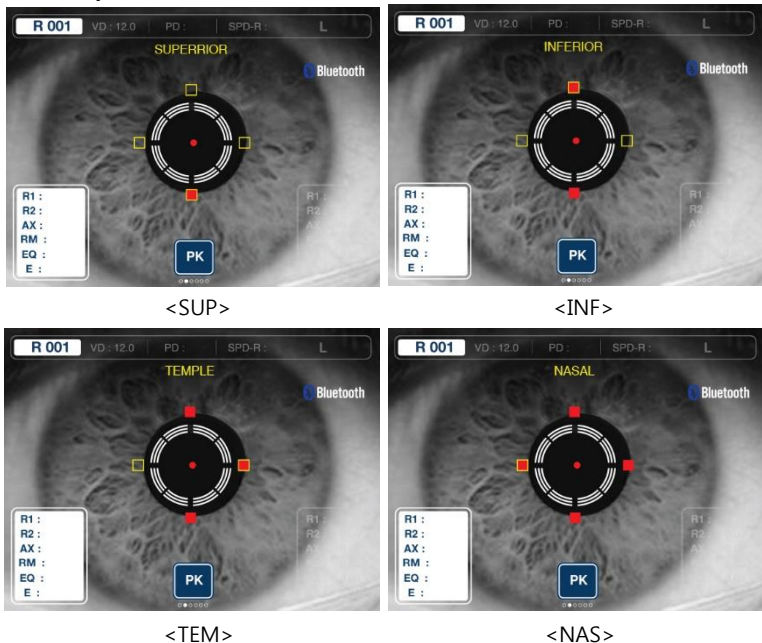
7. Re-measuring

① If the measurement was failed or re-measurement is needed, user can switch measurement location by pressing LEFT or RIGHT button.

② If the periphery mark was filled, it means that former measurement result exists.

8. Measuring another eye

- Move the stage to opposite side and then repeat the procedure 4~7.

9. Displaying measurement result

- Press Result(UP) button, then measurement result for periphery and center of cornea will be displayed together on the screen.

| Results | ◄ | REF | KER | **PK** | CLBC | ► |

R1(mm)	R2(mm)	AXIS		R1(mm)	R2(mm)	AXIS
7.95	7.95	0	1	7.95	7.95	0
7.95	7.95	0	2	7.95	7.95	0
7.95	7.95	0	3	7.95	7.95	0
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			Avg			

10. Printing

- Press the Print(DOWN) button and then measurement result will be printed.

7-5 CLBC mode

Base curve of contact lens is measured on CLBC mode.

Contact Lens

3. Put model eye on the chinrest. Please take care not to drop the contact lens.

4. Adjust the height and focus of model eye. Refer to section 6 'Practicing by Model Eye'.

5. After focusing, press the Measure Button.

6. After measurement was finished, result will be displayed on the screen.
   * Axis of base curve will be reverse of corneal axis.

7. Displaying measurement result
   ◆ Press the Result(Up) button, then measurement result for periphery and center of cornea will be displayed together on the screen.

Results	◀ REF	KER	PK	CLBC ▶			
R1(mm)	R2(mm)	AXIS		R1(mm)	R2(mm)	AXIS
7.95	7.95	0	1	7.95	7.95	0
7.95	7.95	0	2	7.95	7.95	0
7.95	7.95	0	3	7.95	7.95	0
			4			
			5			
			6			
			7			
			8			
			9			
			10			
7.95	7.95	0	Avg	7.95	7.95	0

8. Printing
   ◆ Press the Print(DOWN) button and then measurement data will be printed.

Smart RK11

7-6 IOL measuring mode

Measure with IOL (LEFT) button when check IOL operated patient or crystalline are blurred like cataract patient. If such eye is measured with turning on IOL, it can make less errors.
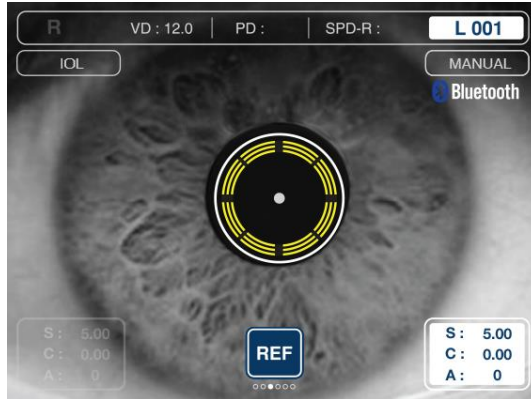
1. Mode selection

   ① Rotate the Operation Buttons & Wheel until REF or RK mode is displayed.

   ② Press IOL(LEFT) button. Check IOL icon is turned up.

2. Shooting

   ① Keep doing **7-3**(RK mode), or **7-1**(REF mode) Shoot automatically.

NOTE	Iris has damaged on Some of IOL patient. If damage is deep, measurement result may have some error.

7-7 SIZE mode

Diameter of Iris or Pupil is measured in SIZE mode (Step: mm).
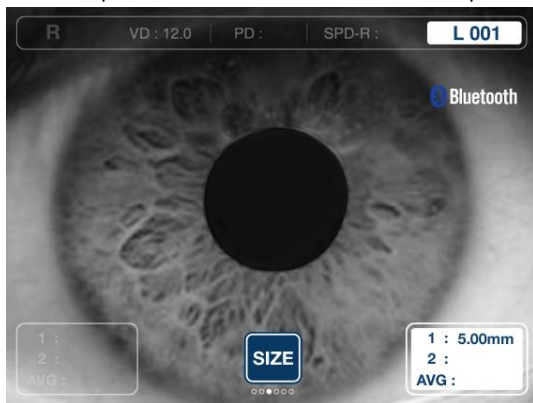
▣Operation Buttons & Wheel functions in SIZE mode

KEY	Function	Description
SET/OK	Configure	Operate Configure mode
LEFT	-	-
RIGHT	-	-
UP	-	-
DOWN	Print	Print measurement result
WHEEL_LEFT	Mode Select	Select measurement mode
WHEEL_RIGHT	Mode Select	Select measurement mode

1. Rotate the Operation Buttons & Wheel until SIZE mode is displayed.
2. Check whether SIZE mode is displayed on the screen.
3. Adjust examinee's eye position by using the Chinrest Up/Down button or the Body Wheel button of control lever.
4. Move control lever to left/right side to show examinee's eye on the screen.
5. Move control lever back and forth to focus the part which need to be measured
6. Press the Measure Button to enter into SIZE measurement mode.
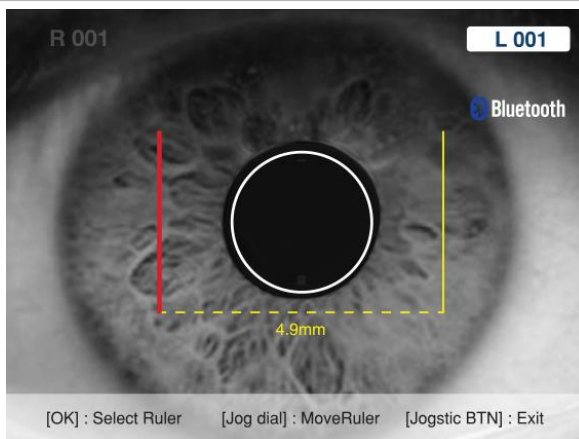
■Operation Buttons & Wheel functions in SIZE measurement mode

KEY	Function	Description
SET/OK	Select ruler	Select left or right ruler
LEFT	-	-
RIGHT	-	-
UP	-	-
DOWN	-	-
WHEEL_LEFT	Move ruler	Move 1 step of selected ruler
WHEEL_RIGHT	Move ruler	Move 1 step of selected ruler

7. On SIZE measurement mode, 2 rulers (one on left side and another one on right side of screen) are displayed on the screen.
   - Rulers consist of 2 (left/right side) ruler.
   - Press Select ruler(SET/OK) of Operation Buttons & Wheel, then the mode will be selected. 1st procedure is moving left side ruler and 2nd is moving right side ruler.
8. Select ruler moving mode and rotate the Operation Buttons & Wheel. Then ruler will be moved.
9. Move the ruler to correct position and press the Measure Button. Then measurement result will be saved and screen will be goes back to SIZE mode.
10. Measured diameter is displayed.

11. Maximum 2 times measurement per each eye is available. If measurement was performed 2 times, average value will be displayed.

12. Measure another eye with same method.

13. Printing
    - Press the Print(DOWN) button and then measurement data will be printed.

8. Other modes

8-1 Result mode (Seeing measurement result screen)

Show saved measurement result on LCD screen.

Measurement mode is changed to Result mode once Result(UP) button of the Operation Buttons & Wheel was pressed.

■Operation Buttons & Wheel functions in Result mode

KEY	Function	Description
SET/OK	Exit	Exit from Result mode
LEFT	Page Select	Select the page
RIGHT	Page Select	Select the page
UP	Delete	All result data delete.
DOWN	-	-
WHEEL_LEFT	-	-
WHEEL_RIGHT	-	-

8-2 Configure mode

Set various options such as measuring, printing, system and etc.

■Operation Buttons & Wheel functions in Configure mode

KEY	Function	Description
SET/OK	Exit	Exit from Configure mode
LEFT	Page Select	Select the page
RIGHT	Page Select	Select the page
UP	Item select	Select the item
DOWN	Item select	Select the item
WHEEL_LEFT	Value change	Change the value
WHEEL_RIGHT	Value change	Change the value

1. Quick Configure

Choose the options which are used frequently.
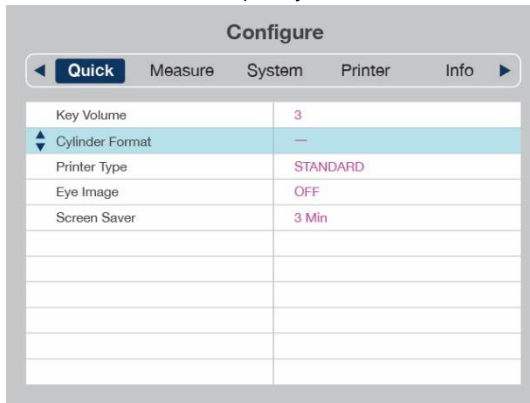
Option	Value
Key Volume	0~10
Cylinder Format	- / + / +-
Print Type	STANDARD/AVERAGE
Eye Image	ON/OFF
Screen Saver	0/3/5/10 Min

◆ Key Volume

Choose the volume of sound.

• Cylinder Format

Choose indication type of Cylinder value and form.

• Print Type
  ▪ STANDARD :   Print all data.
  ▪ AVERAGE   :   Print average value only.
  ▪ OFF   :   Turn off printing function

• Eye Image

Set print image option: print image of emmetropia/hyperopia/myopia

• Screen Saver

Set timer to power saving mode. If RK11 is not operated until selected time, power saving mode will be activated.

2. Measure Configure

<table>
<tr><td colspan="5">Configure</td></tr>
<tr><td>◄ Quick</td><td>Measure</td><td>System</td><td>Printer</td><td>Info ►</td></tr>
</table>

VD	12.0	
Cylinder Format	—	
Step	0.25	
Kerato Unit	Diopter (D)	
Kerato Index	1.3375	
Auto Start	MANUAL	
Repeat	2	
IOL	OFF	
Fogging	1 Time	
Vertical Tracking	ON	
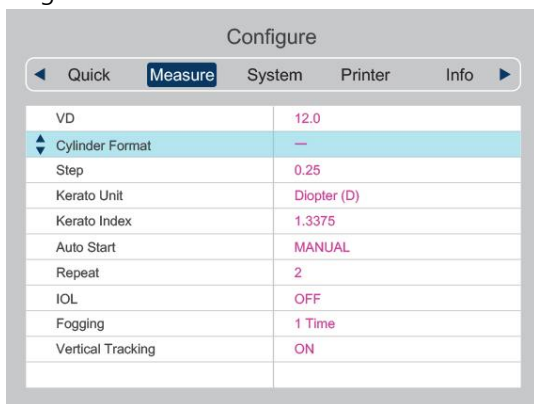
Option	Value
VD	0.0/10./12.0/13.5/15.0
Cylinder Format	-/+/+-
Step	0.01/0.12/0.25
Kerato Unit	Radius(mm) / Diopter(D)
Kerato Index	1.3375 / 1.332 / 1.336

Auto Start	MANUAL/ AUTO
Repeat	1/3/5/7
IOL	ON/OFF
Fogging	1 Time / Always
Vertical Tracking	ON/OFF

◆ VD

　Choose Vertex Distance.

◆ Cylinder Format

　Choose indication type of Cylinder value and form.

◆ Step

　Choose measurement data units.

◆ Kerato Unit

　Choose indication type of Keratometry.

- RADIUS(mm) : Corneal curvature
- DIOPT(D) : Corneal refraction power

◆ Kerato Index

　Choose cornea equivalent refractive index.

◆ Auto Start

　Choose automatic shooting.

- MANUAL : Manual measuring
- AUTO　　 : Automatic measuring

◆ Repeat

　Fix the time of automatic shooting.

◆ IOL

　Set IOL mode

◆ Fogging

◆ Vertical Tracking

　Automatic Vertical Tracking of the pupil

3. System Configure
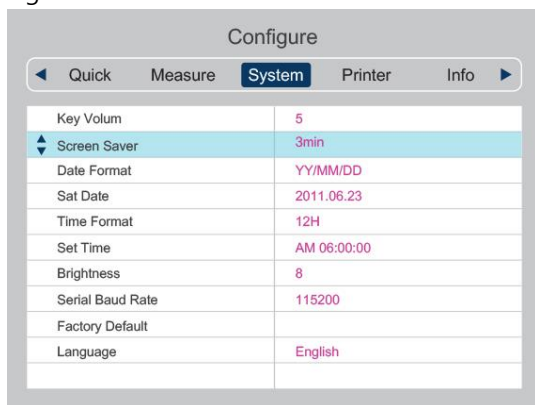
Option	Value
Key Volume	0 ~ 10
Screen Saver	0/3/5/10(min)
Date Format	YMD/DMY/MDY
Set Date	2011/06/23
Time Format	12H/ 24H
Set Time	AM 06 : 00 : 00
Brightness	0~10
Serial Baud Rate	9600 / 57600 / 115200
Factory Default	-
Language	English/Spanish/Korean

◆ Key Volume

Choose the volume of sound.

◆ Screen Saver

Set timer to power saving mode. If RK11 is not operated until selected time, power saving mode will be activated.

◆ Date Format

Choose indication type of date

◆ Set Date

Set current date.

Set Date

2001 - 02 - 31

Set current date?

CANCLE   OK

• Time Format

Choose indication type of time.

• SET TIME

Set current time.

Set Time

08 : 40 : 35

Set current date?

CANCLE   OK
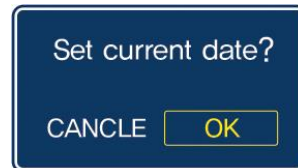
• Brightness

Select the brightness of LCD screen.

• Serial Baud Rate

Choose serial communication speed with other equipment.

• Factory Default

Reload the factory data. (Initialize Configure data)

• Language

Support English, Spanish, Portuguese and Korean.

4. Printer Configure
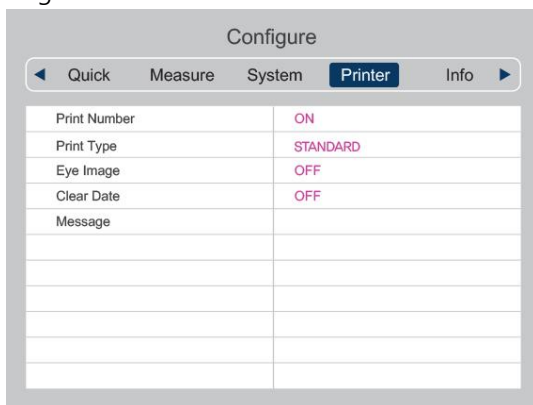
Option	Value
Print Number	ON/OFF
Print Type	STANDARD/AVERAGE/OFF
Eye Image	ON/OFF
Clear Data	ON/OFF
Message	

◆ Print Number

  Choose the option concerning the number of printing.

- ON   : Print the number of printing.
- OFF   : Don't print the number of printing.

◆ Print Type

  Choose printing format.

- STANDARD : Print all data.
- AVERAGE : Print average value only.
- OFF   : Turn off printing function

◆ Eye Image

  Set print image option: print image of emmetropia/hyperopia/myopia

◆ Clear Data

  Clear the measurement result datas after printing on paper.

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◆ Message

If you set your message, it is printed bottom of paper.

♣How to set message♣

Select Message Option and press the SET/OK button.

As below Set Message Box appears.

You can set message with the Operation Buttons & wheel.

To select a letter, use Wheel and set with SET/OK button.

You can exit by pressing the SET/OK button long time.

■Operation Buttons & Wheel functions in Set Message

KEY	Function	Description
LONG SET/OK	Save& Exit	Save Message. And exit from Set Message.
SET/OK	Set	Set a letter.
LEFT	Delete	Delete a letter
RIGHT	Space	Insert a space
UP	Caps ON	Letter is change to uppercase (or lower case).
DOWN	Line Feed	Line Feed
Measure Button	Delete All	Delete all selected letters.
WHEEL_LEFT	Select	Select a letter.
WHEEL_RIGHT	Select	Select a letter.

5.Information
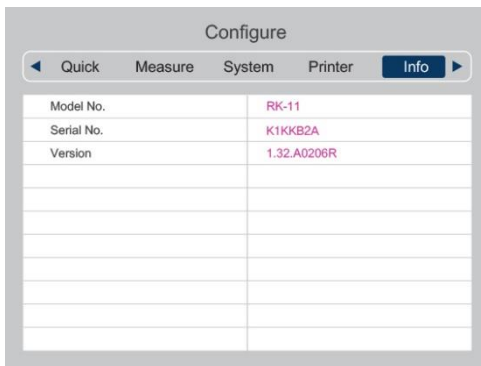
Option	Value
Model No.	RK-11
Serial No.	K1-----
Version	1.00.-----r

- Model No.: Model number
- Serial No. : Show serial number of the instrument.
- Version : Show software version.

8-3 External Video Display

RK11 supply RK image display function on external monitor. Connect RK11 and external monitor with external video connector, then user can check the image on external monitor.

8-4 TARGET BRIGHTNESS

pupil

<Target Image>

TARGET BRIGHTNESS
1 2 3 4
Set [SER/DK], Cancel [UP], Select [RIGHT / LEFT]
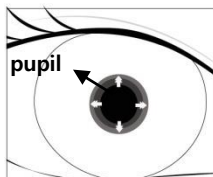
When pupil size is   small, then you can control target brightness with pressing the [Left] Button long time. Then small pupil will be

bigger than before.

9. Self Inspection and Maintenance

9-1 Before calling Service Person

Warning message will be displayed on the monitor if some problems occur. It might be operation errors or problems of the instrument. In this case, refer the following instructions.

If the operation is still not recovered, disconnect the power supply and consult the dealer.

1. Message when power on

Message	Cause	Remedy
CHART SENSOR ERROR	Internal error	Turn off the power switch and turn on again after 10 seconds .If the message appears again, consult the dealer.
CHART MOTOR ERROR		
IRIS SENSOR ERROR		
IRIS MOTOR ERROR		

2. Message on Measuring

Message	Cause	Remedy
TRY AGAIN	Alignment is improper.	Measure after aligning the pupil and the alignment mark properly.
	Eyelid or eyelashes are covering the pupil.	Instruct the examinee to open his or her eyes wide, or lift up the eyelid lightly with your fingers and measure again.
	When the Mire Image is odd shaped because of tears.	Instruct the examinee to open and close this or her eyes several times and measure again.
TRY AGAIN	When the Mire Image is not clear because the cornea is dry.	

	Examinee has strong irregular astigmatism or corneal disease.	Impossible to measure
	When the pupil is smaller than the outer alignment mark.	The minimum pupil diameter that can be measured is 2.0mm. Although it is possible to measure in the bright place, don't expose examinee's eyes to the direct sunlight or too bright indoor lights to prevent the contraction of the pupil.
	When the examinee has some illness like cataract.	Observe the eye in IOL mode. If cataract is not severe, measurement can be performed in the IOL mode.
	Examinee has IOL (Intra-Ocular Lens) implanted.	Measure in the IOL mode.

3.Message on printing

Message	Cause	Remedy
NO PAPER	The printer is out of paper.	Replace printer paper.
Cover Opened	Printer Cover was Opened.	Check the Printer Cover and Close it.

9-2 Cleaning

1. Keep the instrument clean. Don't use volatile object, thinner or benzene, etc.
2. Polish each part with a dry cloth containing detergent solution.

9-3 When Moving the Instrument

1. Lock the stage holding screw. And then Turn off the power switch.
2. Disconnect the power cable.
3. Move the instrument holding lower part of the main body to keep horizontally.

## 9-4 Replacement of Paper

1.Replacement of printing paper

Replace the roll of printing paper if the red line appears on the paper, or if 'NO PAPER' message is displayed on the screen.
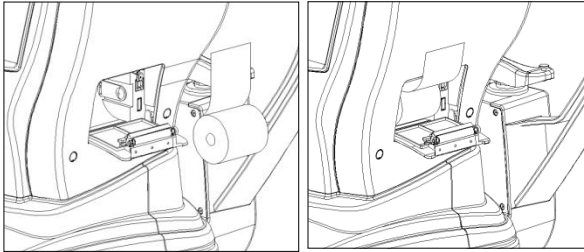
① Open the printer cover by pushing cover open button on right side of body.

② As above figure, insert the paper roll and then close printer cover.

2.Replacement of Chinrest Paper

① Pull out 2 holding pins on chinrest.

Chin rest paper
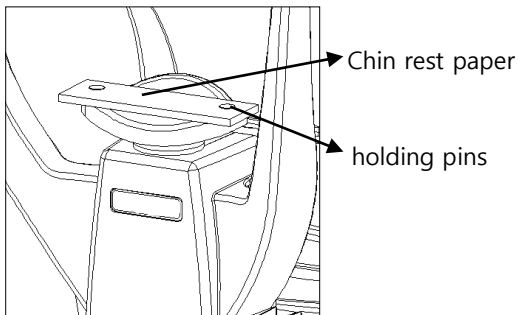
holding pins

Insert holding pins into the hole on chinrest paper.

(more than 50pcs available)

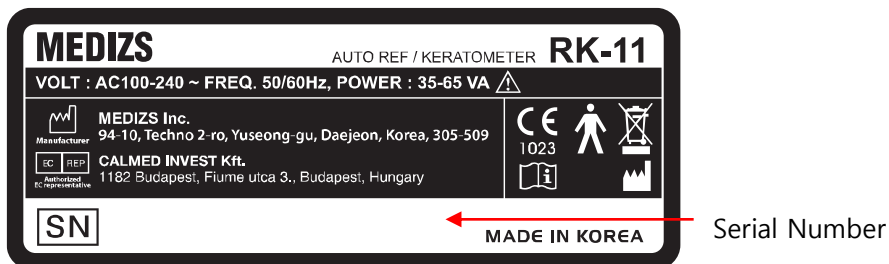② Insert 2 holding pins into the hole on chinrest

10. Service information

If problem cannot be solved even after taking the measures indicated in

section**9**, contact the distributor for repair.

Please refer to the name plate and system information on Configure menu, and then let us have the following information:

1. Information

Serial Number

- ◆ Name of the instrument   : RK-11
- ◆ Serial number : 7-digit characters indicated on the name plate
- ◆ Symptom : Please describe detail symptom for fast service.

2. Limit for supplying performance parts for repair

Performance parts (required to maintain the functioning of the product) of the product will be stocked for six years after discontinuation of product, to allow for repair.

3. Disposal of the instrument

This instrument incorporates a lithium battery, which may pollute the environment if the instrument is abandoned. Please ask a professional waste company to handle disposal or distributor before disposing of the instrument.

11.   Specifications

Refractometry	
SPH (Sphere power)	-30.00 ~ +22.00D
CYL (Cylinder power)	0.00 ~ +/-10.00D
AXIS	1 ~ 180°
VD (Vertex Distance)	0.0, 10.0, 12.0, 13.5, 15.0
PD (Pupil Distance)	10 ~ 85mm
Minimum Pupil Diameter	Ø2.0mm
Keratometry	
Corneal Power	33.00 ~ 67.50D
Corneal Astigmatism	0.00 ~ -15.00D
Radius of Curvature	5.0 ~ 10.2mm
AXIS	1 ~ 180°
SIZE	
Corneal Diameter	2.0~12.00mm
Storage Memory	
maximum 10 test results (per L/R eye)	
Hardware	
Internal printer	Thermal line printer
Power saving	Power saved after set time. Go back once any button pressed. (3 min/5 min /10 min)
Monitor	6.5 inch color TFT LCD (LED Type)
Power supply	AC 100V~240V, 50/60Hz
Power consumption	35~65 VA
Dimension	260(W)X570(D)X440(H)mm / 10.2(W)X22.4(D)X17.3(H)inch
Weight	16 kg / 35.3 lbs
Environment	
Operation environment	Temperature: +10℃ ~ +40℃ Humidity: 30% ~ 80% RH
Storage and movement environment	Temperature: -10℃ ~ +55℃ Humidity: 10% ~ 90% RH

12. Components

①②③④

⑤⑥⑦
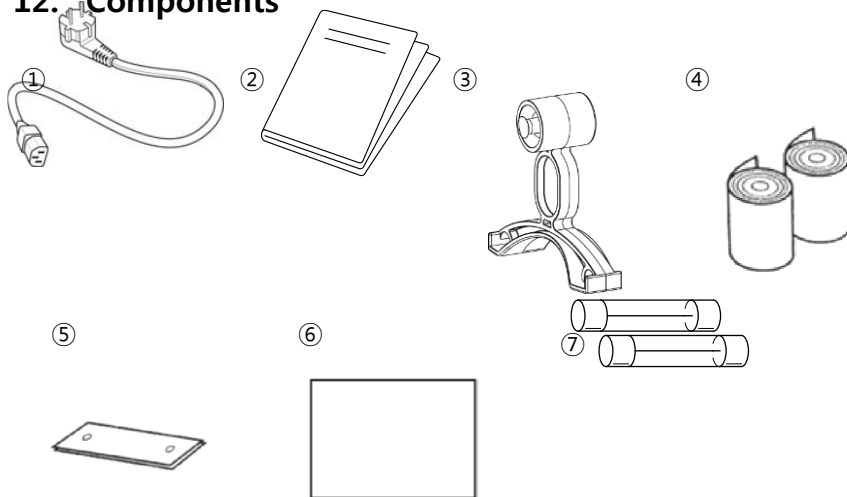
Description	Quantity
1. Power cable	1
2. Operation manual	1
3. Model eye	1
4. Printing paper	2 Rolls
5. Chin rest paper	About 100 sheets
6. Dust cover	1
7. Fuse	2

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