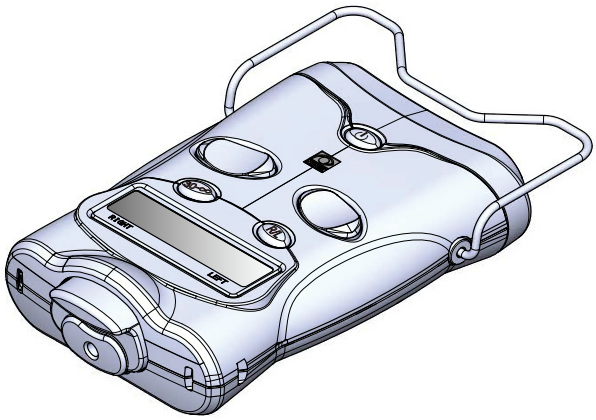
NIDEK

PD METER

PM-700

OPERATOR'S MANUAL



Be sure to read the SOFTWARE LICENSE AGREEMENT (page Ⅱ) before using this product.

Original instructions

NIDEK CO., LTD.

NIDEK CO., LTD.
(Manufacturer) : 34-14 Maehama, Hiroishi-cho, Gamagori, Aichi 443-0038, JAPAN
Telephone: +81-533-67-6611
URL: https://www.nidek.com/

NIDEK INC.
(United States Agent) : 2040 Corporate Court, San Jose, CA 95131, U.S.A.
Telephone: +1-800-223-9044 (USA Only)
URL: https://usa.nidek.com/

NIDEK S.A.
(EU Authorized Representative) : Ecoparc, rue Benjamin Franklin, 94370 Sucy En Brie, FRANCE

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Before Use

This Operator's Manual contains information necessary for the operation of the NIDEK PD Meter PM-700.

This manual includes operating procedures, safety precautions, specifications, and information about accessories and maintenance. This manual is necessary for proper use. Especially, the safety precautions and operating procedures must be thoroughly understood prior to the operation of the device.

Keep this manual handy for reference.

If you encounter any problems or have questions about the device, please contact NIDEK or your authorized distributor.

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b) such Amendments are commercially reasonable and not contrary to the objective of this Agreement, even if such Amendments are disadvantageous to you.

Prior to the amendments, NIDEK will notify you of the terms and the effective date of such Amendments on the website or by any other means.

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7.2. If this Agreement is terminated in accordance with the provision of 7.1., you must immediately cease the use of the Software, and delete, destroy and erase all the Software. Any fees paid by you for the license of the Software will not be refund for any reasons.

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11.1. If any provision or any portion of any provision of this Agreement will be held to be invalid or unenforceable, that provision will be severed from this Agreement and such invalidity or unenforceability will not affect the remaining provisions of this Agreement. The remaining provisions of this Agreement will continue in full force and effect.

12. SURVIVAL

12.1. The provisions of 2, 3, 5, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19 and this provision will survive the termination of this Agreement and will be binding after the termination of the Agreement.

13. ASSIGNMENT

13.1. This Agreement or any part of this Agreement may not be assigned or transferred without prior written consent of NIDEK. The permitted assignee or transferee must agree to all the terms and conditions of this Agreement prior to the assignment or transfer.

13.2. This Agreement will be binding upon the permitted assignee or transferee and be enforceable by NIDEK.

14. ENTIRE AGREEMENT

14.1. This Agreement constitutes the entire agreement between you and NIDEK concerning the Software, and supersedes any prior written or oral agreement between you and NIDEK. No modification of this Agreement will be binding unless otherwise agreed in writing.

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15.1. The failure of NIDEK to enforce at any time or for any period the provisions hereof in accordance with its terms will not be construed to be a waiver of such provisions or of the rights thereafter to enforce each and every provision.

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a) If you use the Software in any countries outside Japan, the license agreement for the Software shall be executed and delivered in a text using the English language. The text using the English language shall prevail and control; and

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Table of Contents

1 SAFETY PRECAUTIONS

1.1 For Safe Use

⚠ **For safe use of this device, read this manual.**
Cautions for safety and operating procedures must be thoroughly understood before using this device.

CAUTION! U.S. Federal Law restricts this device to sale, distribution, and use by or on the order of a licensed eye care practitioner.

1.2 Safety Precautions

In this manual, signal word is used to designate the degree or level of the safety alert. The definition is as follows:
⚠ **WARNING** Indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.
⚠ **CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage accident.
Even cases indicated by ⚠ **CAUTION** may result in serious injury under certain conditions. Safety precautions must be strictly followed at all times.

1.3 Usage Precautions

Before Use

⚠ WARNING

- If any serious device-related incident occurs, report it to NIDEK and the competent authority in the country where the user or patient, or both reside.

⚠ CAUTION

- Do not use the device in any manner other than its intended purpose.

  NIDEK will not be responsible for accidents or malfunctions caused by carelessness. *"O Intended Use" (page 7)*

- The cautions for safety and operating procedures must be thoroughly understood before using the device.

  Use of the device outside the scope of this operator's manual may cause unanticipated failure or adverse events.

- Use the accessories specified by NIDEK only.

  Using the components outside the operator's manual may cause unanticipated failure or adverse events.

- Never modify the device. Never touch the inside of the device.

  Doing so may result in an electric shock or device malfunction.

  No components other than the battery in the PM-700 can be replaced by the user.

- Do not store the device in a place where it may get wet.

  Doing so may result in an electric shock or device malfunction.

- Use the PM-700 in the following environment.

  - Environmental conditions during use

    "O Specifications" (page 35)

- Before using the device, perform check before use in *"3.3.1 Device startup and check before use" (page 22)*.

During Use

⚠ CAUTION

- Before measuring each patient, clean the nose pad and forehead arm with a cloth dipped in alcohol for disinfection.
- Perform visual and operation checks before using the device. If any abnormality is found, do not use the device.

  Continued use of the device under such abnormal conditions may affect the data accuracy. Unexpected malfunction or faulty diagnosis may induce unexpected health hazards.
- Prior to use, adequately explain the measurement purpose and method to the patient.
- Do not perform servicing or maintenance on the device during use.
- When moving the forehead arm, take care not to get fingers pinched.

  If a finger gets caught, injury may occur.
- Perform measurement with the patient eye sufficiently fixated and eyelids are fully open.

  Failure to do so may result in improper measurement results.
- Be careful so that the measuring window is not soiled with grime or fingerprints. Check that there is no grime on the window before measurement.

  If the measuring window is soiled, proper measurement value may not be obtained.
- Hold the PM-700 and measure the pupillary distance so that the device is not tilted against patient's face.

  If the device is tilted, proper measurement value may not be obtained.
- Measure the pupillary distance in a location where the measuring window is not exposed to strong external light such as sunlight or spot light.

  If a strong external light enters, proper measurement value may not be obtained.
- When using the device, use the hand strap or the optional neck strap to prevent it from being dropped. Replace the strap if it is damaged or worn.

  Otherwise the device may be dropped causing injury or malfunction. If any problem occurs in the accuracy or function due to dropping, contact NIDEK or your authorized distributor.

After Use

⚠ CAUTION

- After use, clean the nose pad and forehead arm using a cloth dipped in alcohol for disinfection.
- Remove batteries from the battery case when the device will not be used for a prolonged periods.

  Failure to do so may cause a device malfunction or damage the periphery due to leakage.

Maintenance

⚠ CAUTION

- When the device is sent back to NIDEK for repair or maintenance, disinfect it by wiping the surfaces (especially, the areas that came into contact with patients) of the device with a clean cloth dampened with ethyl alcohol for disinfection.
- Only service personnel properly trained by NIDEK are allowed to disassemble, repair, or modify the device.

  NIDEK assumes no responsibility for accidents resulting from improper servicing.
- Remove any dust on the measuring window with a blower brush before wiping the windows.

  If the measuring window is wiped with dust on it or is rubbed with excessive force, the surface may be scratched.
- Do not clean the windows with wet cloth such as cleaner.

  The surface may become smudged or the coating damaged.
- Never use an organic solvent such as paint thinner or the abrasive cleanser to clean the device.

  The surface may be ruined.
- Do not use old and new batteries or batteries for other model together.

  The PM-700 may not work normally or it may cause a device malfunction or damage the periphery due to leakage.
- Do not use the device past its service life.

  Even under the proper maintenance, the targeted device reliability and safety may not be maintained.

Disposal

⚠ CAUTION

- Follow local governing ordinances and recycling plans regarding disposal or recycling of device components when disposing of the device.

  It is recommended to entrust the disposal to a designated industrial waste disposal contractor.

  Inappropriate disposal may contaminate the environment.
- The disposal method of batteries varies according to the government. Follow local ordinances regarding disposal of them.

  Inappropriate disposal may contaminate the environment.
- When disposing of packing materials, sort them by material and follow local governing ordinances and recycling plans.

  Inappropriate disposal may contaminate the environment.

1.4 Labels and Symbols

■ To call attention to the user, label and indications are displayed on the device. If labels are curling up or characters fade and become barely legible, contact NIDEK or your authorized distributor.

	Indicates that the operator is advised to refer to the related instructions in the operator's manual. “ *Before Use” (page 2)*
	Indicates that the PM-700 is classified as a device with a Type B applied part. The applied parts are the nose pad and forehead arm. *“2.2 Device Configuration” (page 9)*
	Indicates the manufacturer.
	Indicates the date of manufacture.
	Indicates that this product is to be disposed of in separate collection of electrical and electronic equipment in EU.
	Medical device
	Unique Device Identifier
	Catalogue number
	Serial number
	EU authorized representative
	Swiss authorized representative
	Indicates the switch that brings the device into the stand-by condition. For the PM-700, the device is in the stand-by condition when the display is off.

2 BEFORE USE

2.1 Device Outline

■ The PD meter model PM-700 (referred to as “device” in this manual) is a pupillary distance meter improved with a built-in computer and LCD digital display.

○ Intended Use

The PD meter model PM-700 is intended to measure the pupillary distance for proper wear of the spectacle lenses.

○ Intended patient population

- Age
  Except babies and infants (under 3 years old)
- Health condition
  Able to answer the operator’s questions
- Conditions - Visual function
  One or both eyes are normal or have disease.
  Eyes that have lost the visual function are not targeted.
  Person who wants to wear glasses
- Conditions - Other
  Person whose pupillary distance of a single eye is 23.5 mm or more and 41.5 mm or less

○ Intended user profile

Any qualified personnel such as ophthalmologists, nurses, ORT, OD, optician facility staff, or optometrists

○ Intended use environment

Medical facility or optical store

○ Principles

The patient focuses on the fixation target through the measuring window in the device. An apparent distance between the patient's eye and fixation target is preset to 1 m using the convex lens placed between them. The examiner looks at the patient's eye through the eyepiece, and aligns the hairlines on the LCD with the LED reflection point on the cornea.

The aligned hairline positions are indicated on the display as the pupillary distance.

The apparent viewing distance is set to 1 m. The interpupillary distance is calculated according to the working distance set with the Distance setting button 

.

The PM-700 displays the pupillary distance for a vertex distance (VD) of 12 mm.

Vertex distance: Distance between the corneal vertex to the spectacle lens when the patient wears the glasses

When obtaining the pupillary distance for a vertex distance other than 12 mm, convert the value with the following formula.

$$PD = PD\infty \times \frac{WD - VD}{WD + 13}$$

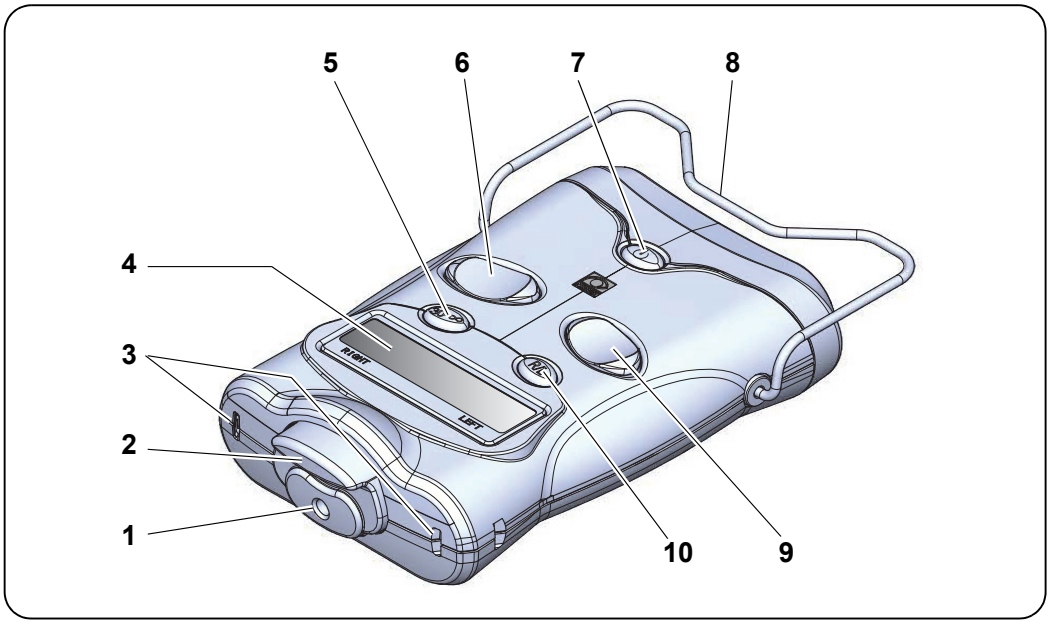
PD: Pupillary distance (mm)

PD ∞ : PD value (mm) when the working distance is set to ∞

WD: Working distance (mm)

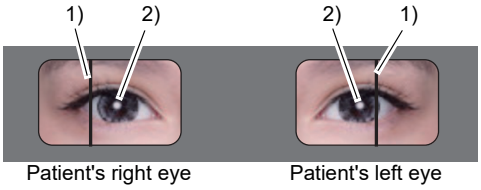
VD: Vertex distance (mm)

2.2 Device Configuration



1 Eyepiece

The examiner looks at the patient's eyes through this eyepiece.



Number	Name	Explanation
1)	Hairline	Vertical line displayed aligned on the patient's eye Move to the right and left over the eye to align with the corneal reflection point.
2)	Corneal reflection point	LED reflection light on the patient's cornea

2 Eyepiece cover

3 Strap holes

Holes for attaching the hand strap or the optional neck strap.

4 Display

Displays measured PD data (right eye PD, binocular PD, left eye PD).

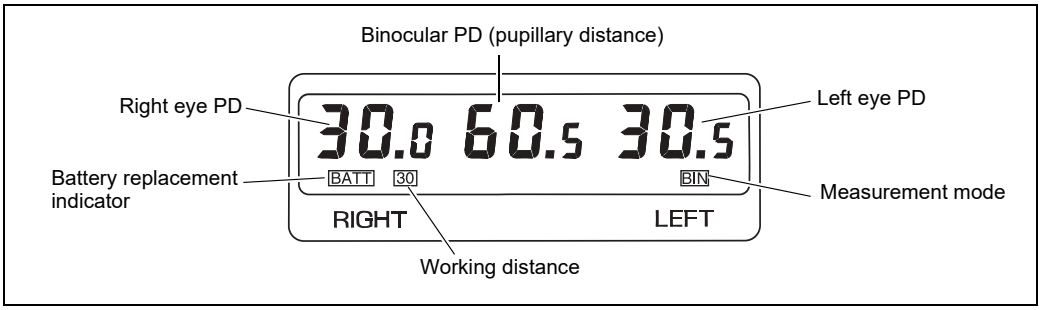
PD: Pupillary Distance

In addition to the measured value, the following are indicated.

Battery replacement indicator..... BATT

Working distance..... 30 - ∞

Measurement mode..... BIN / R / L



5 Distance setting button 

Sets the working distance.

The distance can be cycled from among 8 steps, 30cm, 35cm, 40cm, 50cm, 65cm, 1m, 2m, and ∞. The distance advances each time  is pressed.

6 Right PD measurement button 

Moves the hairline (vertical line) displayed on the patient's right eye.

	Pressing the right side of the button moves the hairline towards the nose.
	Pressing the left side of the button moves the hairline towards the temple.

7 Power button 

Turns on or off the power.

Press and hold this button for two seconds to turn off the device.

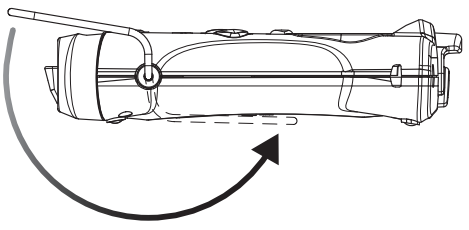
Owing to the Auto-off function, the power will turn off automatically after a short while even if a user forgets to turn it off manually.

"3.3.3 Auto-off function" (page 23)

8 Forehead arm

Place it against the patient's forehead to stabilize the position of the main body.

If the forehead arm is not used, it can be folded under the bottom.



9 Left PD measurement button 

Moves the hairline (vertical line) displayed on the patient's left eye.

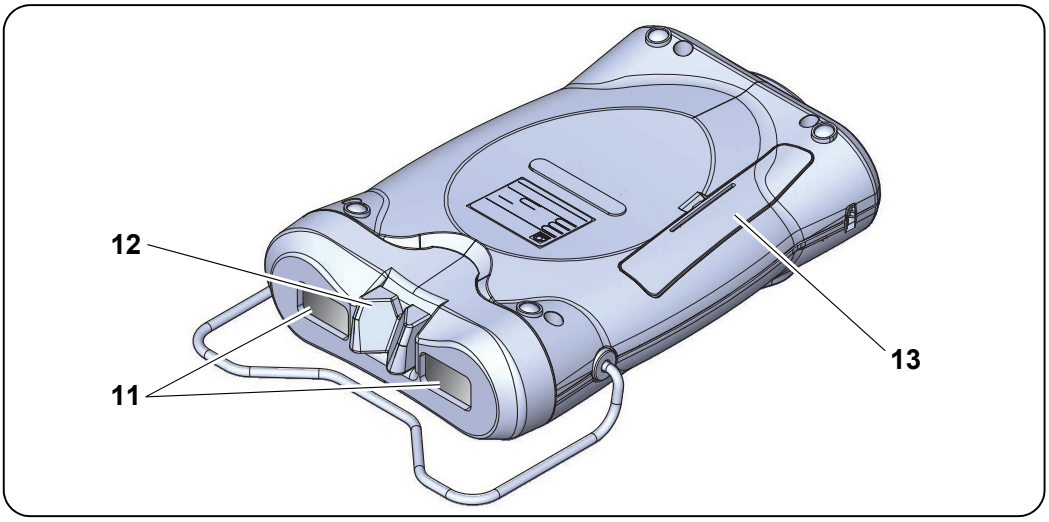
	Pressing the right side of the button moves the hairline towards the temple.
	Pressing the left side of the button moves the hairline towards the nose.

10 R/L button 

Used to occlude either side of the patient's eyes.

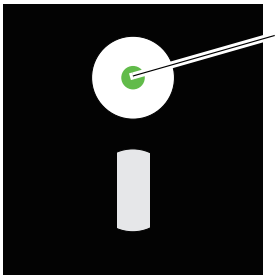
Each pressing changes the setting in the order of binocular open BIN, right eye measurement R (left occluded), and left eye measurement L (right occluded).

To change the indication of the measured value, press and hold this button for two seconds. (0.1 mm / 0.5 mm)



11 Measuring window

The patient focuses on the green fixation target through this window.



12 Nose pad

Place this nose pad against the patient's nose lightly. The nose pad can be replaced.

13 Battery cover

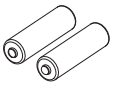
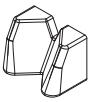
Note

- Parts that come into contact with the patient during refraction are composed of the following materials:

  Nose pad: silicon rubber
  Forehead arm: stainless steel
  Buttons, body, and eyepiece cover: ABS resin
  Hand strap: nylon

2.3 Packed Contents

The following are included in the standard configuration. Check the contents before use.

Parts name	Quantity	Appearance
Alkaline AA battery (LR6)	2 units	
Nose pad (spare)	1 unit	
Hand strap	1 unit	
Operator's manual	1 unit	

2.4 Before First Use

■ Before using the device, attach the following parts and conduct the following settings.

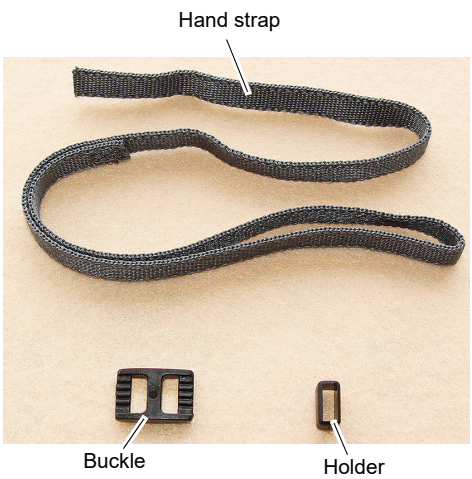
Attaching strap	See *"2.4.1 Attaching hand strap" (page 13)* or *"2.4.2 Attaching neck strap (optional)" (page 15)*.
Attaching batteries	See *"4.3 Replacing Batteries" (page 32)*.
Setting measurement increments and indication switching	See *"2.4.3 Setting measurement increments and indication switching" (page 17)*.

2.4.1 Attaching hand strap

■ To attach the hand strap, follow the procedures below.

■ The strap holes are on the right and left sides as viewed from the examiner. Attach the strap to the side easy to use.

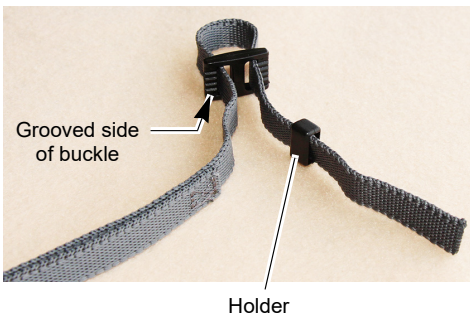
1 Take out the strap, buckle, and holder from the bag.



2 Pass the strap through the buckle.

The buckle has an inside and an outside. Insert the strap from the grooved side.

3 Pass the strap through the holder.



4 Pass the end of the strap through the strap hole from the side.

There are strap holes on the right and left sides of the main body. Pass the strap through the desired hole.

5 Bend the strap and pass it through the holder.

6 Pass the strap through the buckle. (inside of the buckle)

7 Adjust the buckle position to adjust the strap length.

8 Take up any slack and check that there is no play in the strap.

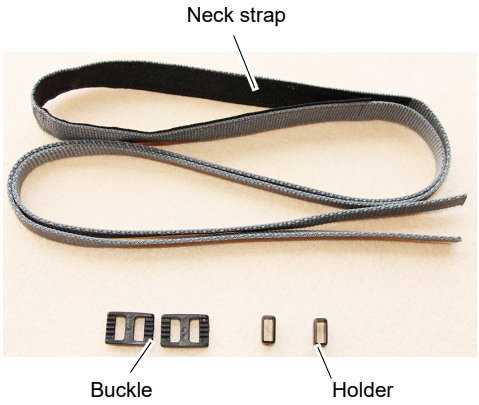
- Be sure to extend off the strap end at least 1 cm through the buckle.

  If the extended part of the strap is too short, the strap may come loose from the buckle.

2.4.2 Attaching neck strap (optional)

- To attach the neck strap (optional), follow the procedures below.
- When using the device wearing its strap around the neck, attach the neck strap instead of the hand strap.

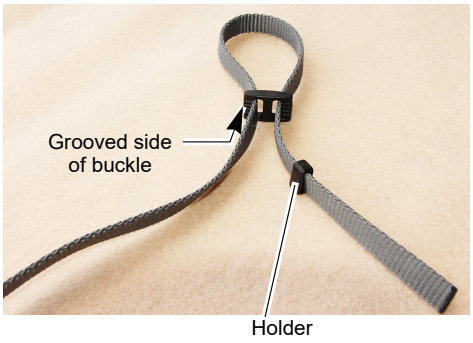
1 Take out the strap, buckle, and holder from the bag.



2 Pass the end of the strap through the buckle.

The buckle has an inside and an outside. Insert the strap from the grooved side.

3 Pass the strap through the holder.



4 Pass the end of the strap through the strap hole from the side.

5 Bend the strap and pass it through the holder.

6 Pass the strap through the buckle. (inside of the buckle)

7 Adjust the buckle position to adjust the strap length.

8 Take up any slack and check that there is no play in the strap.

- Be sure to extend off the strap end at least 1 cm through the buckle.

  If the extended part of the strap is too short, the strap may come loose from the buckle.

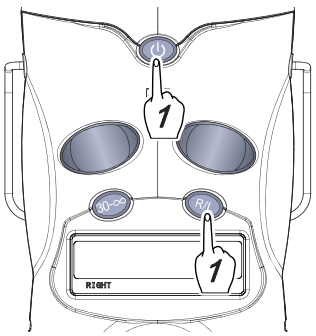
9 Attach the other end of the strap to the device in the same manner.

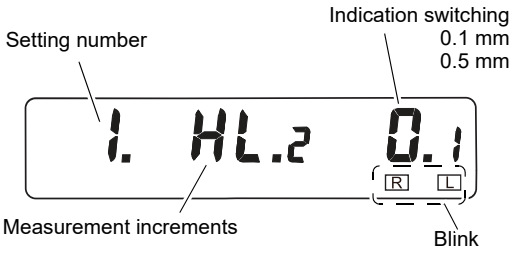
2.4.3 Setting measurement increments and indication switching

- To set the measurement increments and indication switching, follow the procedures below.
- For details of measurement increments and indication switching, "● *Measurement increments*" *(page 18)* and "● *Indication switching*" *(page 18)*.

1 With the device is turned off, press ⏻ while pressing R/L.

The device enters Measurement setting mode and the current settings are indicated on the display.





The measurement increments is displayed with a symbol.

Symbol	Measurement increments
HL.2	0.25 mm
HL.1	0.50 mm

2 Each pressing of R/L changes the setting in the order of 1.→2.→3.→4.→1.→….

Setting number	Measurement increments	Indication switching	Display indications
1. (default setting)	0.25 mm	0.1 mm	1. HL.2 0.1 R L
2.	0.25 mm	0.5 mm	2. HL.2 0.5 R L
3.	0.50 mm	0.1 mm	3. HL.1 0.1 R L
4.	0.50 mm	0.5 mm	4. HL.1 0.5 R L

3 With the desired settings displayed, press and hold ⏻ for two seconds to save the settings and turn off the device.

Note

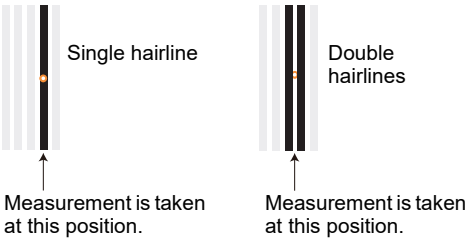
- When the device is turned off by the Auto-off function, the settings are not saved.

- Measurement increments

  - When the measurement increments is set to 0.25 mm: The hairline moves alternating between single and double lines.

  - When the measurement increments is set to 0.50 mm: The hairline moves in 0.5 mm increments always displayed as a single line.

  - The hairline is moved over the eye and when it is in alignment with the corneal reflection point, the device measures the hairline position.
    For the double hairlines, the clearance between the two hairlines is aligned to the corneal reflection point and that position is measured.



- Indication switching

  - When the indication switching is set to 0.1 mm: the measurement result is rounded off and displayed in 0.1 mm increments.

  - When the indication switching is set to 0.5 mm: the measurement result is rounded off and displayed in 0.5 mm increments.

  - The binocular PD displayed on the center is the combined value of the right eye PD and the left eye PD. Therefore, the precision of the value may exceed ±0.5 mm.

To change the indication of the measured value, press and hold R/L for two seconds.

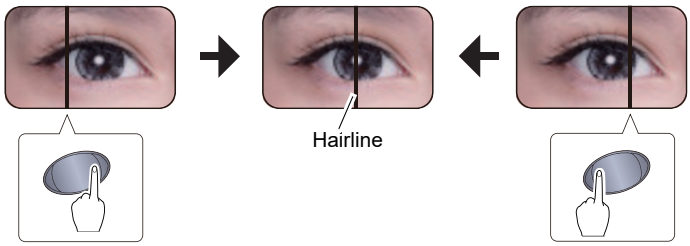
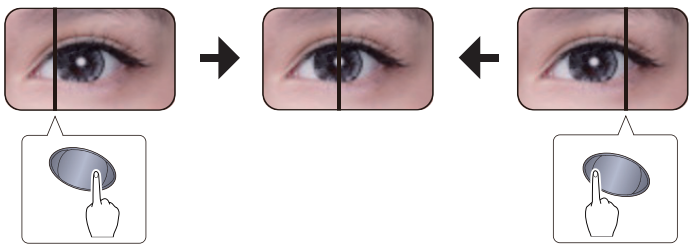
Note

- The values indicated on the display are the values calculated according to the set working distance based on the PD measured with the viewing distance of 1 m. The indicated values are rounded up or down according to the set indication switching. Therefore, the values indicated on the display may not change at the interval set for the indication switching. However, this does not affect the performance of the device.

3 OPERATING PROCEDURES

3.1 Button Operation

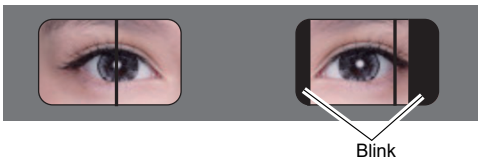
■ Operations of each button are as follows:

Power button	Press the Power button to turn on the device. Press and hold this button for two seconds to turn off the device.
Distance setting button	Each pressing changes the working distance.  Working distance
R/L button	Used to occlude either side of the patient's eyes. Each pressing changes the setting in the order of binocular open BIN, right eye measurement R (left occluded), and left eye measurement L (right occluded).  Opened patient's eye
Right PD measurement button	Moves the hairline on the patient's right eye.  Hairline
Left PD measurement button	Moves the hairline on the patient's left eye. 

• If  or  is pressed to move the hairline outside the measurement range, the hairline cannot be moved further and the followings are displayed.

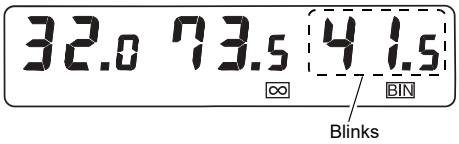
- Black side bars blink on both sides of the patient's eye.

[The hairline on the left eye is outside the measurement range]



- The monocular PD field in the display blinks.

[The hairline on the left eye is outside the measurement range]



3.2 For Proper Measurement

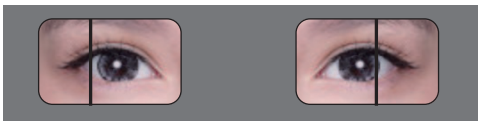
For proper measurement:

- Place the nose pad against the patient's nose

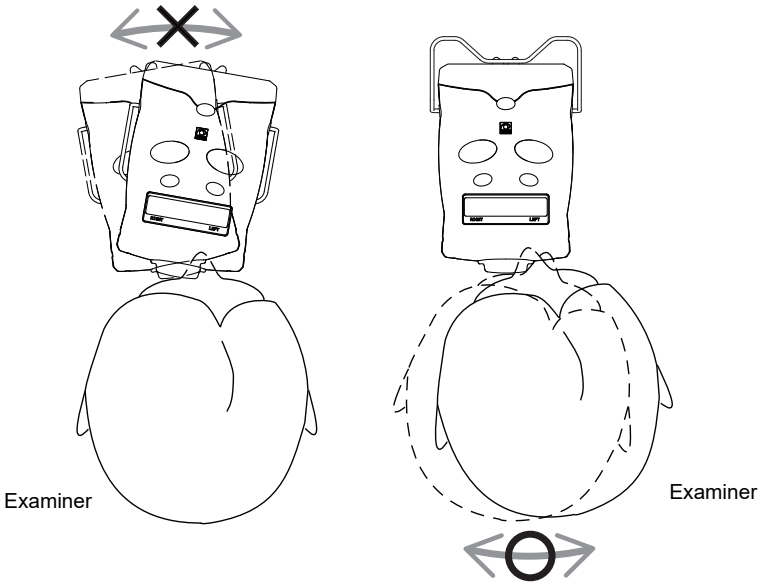
  As the PD value is measured with reference to the bridge of the patient’s nose, be sure to place the nose pad against the patient’s nose.
- Hold the device securely so that the device is not tilted against the patient's face.
- When looking at both of the patient's eyes, do not move the device right or left. Doing so results in inaccurate measurement.

  Within the visual field of the eyepiece, the patient's right and left eyes cannot be observed at the same time as in the figure.

  To look at the patient's right eye, look through the eyepiece at an angle with the examiner's head slightly moved to the right. To look at the patient's left eye, move the examiner's head slightly to the left. At this time, do not move the device.



Patient's right eye Patient's left eye



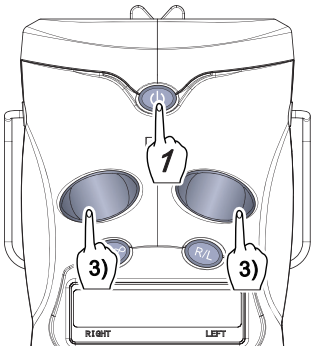
3.3 Startup and Shutdown

■ The device startup, Auto-off function, and device shutdown are explained.

3.3.1 Device startup and check before use

1 Press ⏻ to turn on the device.

2 Perform the following checks before use.



1) Check that BATT is not indicated on the display.

   If BATT is displayed, replace the batteries.

   "4.3 Replacing Batteries" (page 32)

2) Look into the measuring window to confirm that the green fixation target can be seen.

3) Look into the eyepiece to check that the displayed hairlines can be moved with ◐ and ◑.

4) Confirm that the measuring window is clean.

   If the windows are dirty, clean them. *"4.2.4 Cleaning the measuring window" (page 31)*

5) Clean the nose pad and forehead arm.

   "4.2.2 Cleaning the nose pad" (page 30), *"4.2.3 Cleaning the forehead arm" (page 31)*

3.3.2 After use

1 Press and hold ⏻ until the display indication disappears.

2 Store the device in a clean condition.

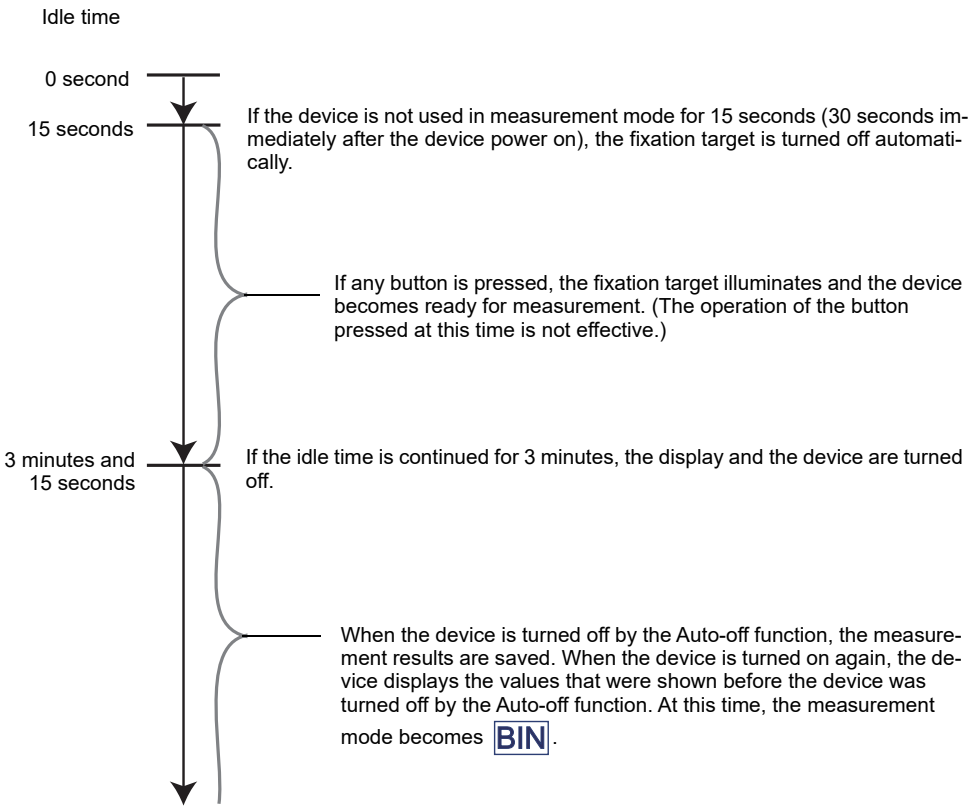
If any part is dirty, clean the part.

"4.2.2 Cleaning the nose pad" (page 30), *"4.2.3 Cleaning the forehead arm" (page 31)*, *"4.2.4 Cleaning the measuring window" (page 31)*

3.3.3 Auto-off function

To prevent battery drain due to the user forgetting to turn it off, the device is equipped with the Auto-off function. This function turns off the fixation target after 15 seconds of idle time, and automatically turns off the power after 3 minutes of idle time.

- Idle time and Auto-off function



3.4 Measurement Method

■ To measure the PD (pupillary distance), follow the procedures below. Monocular and binocular measurements are explained separately.

3.4.1 Measurement without eye occlusion

The procedure below explains the PD measurement without occlusion of the eyes.

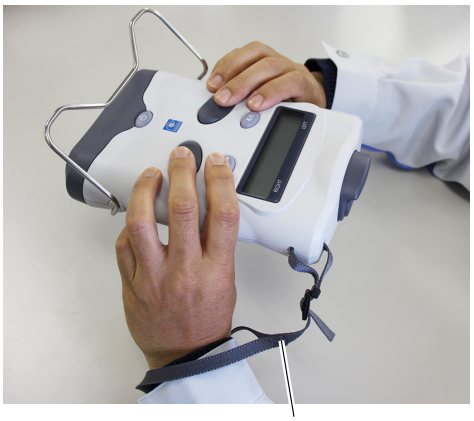
⚠ CAUTION

- Before measuring each patient, clean the nose pad and forehead arm with a cloth dipped in alcohol for disinfection.

"4.2.2 Cleaning the nose pad" (page 30), "4.2.3 Cleaning the forehead arm" (page 31)

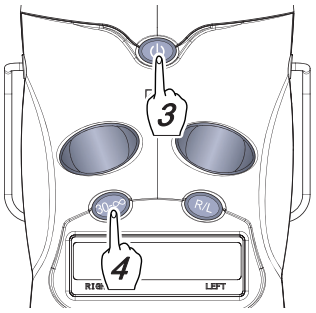
1 Ask the patient to be seated, and remove their glasses or contact lenses.

2 With the hand strap wrapped around the examiner's wrist, and hold the device with both hands.



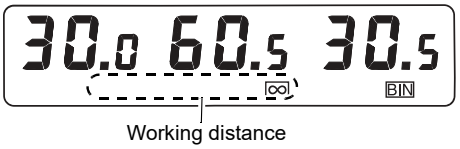
3 Press ⏻ to turn on the device.

When the device was turned off by the Auto-off function, the previous measurement results are displayed.



4 Select the working distance.

Each pressing of 30-∞ changes the working distance and indicated on the display. (8 steps of 30 cm to ∞)



The working distance can be changed after measurement. In this case, the PD value is recalculated according to the changed working distance.

5 Place this nose pad against the patient's nose.

Or have the patient hold the sides of the device and place the nose pad on their nose.

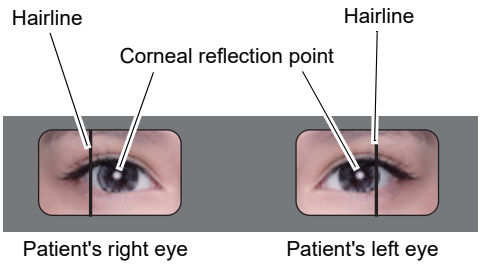
- Pressing the nose pad strongly may cause the patient to feel discomfort.
- If the patient's hands are around the measuring windows, the patient's eye may be darkened. In such a case, have the patient release one's hand from the device.

6 Instruct the patient to open their eyes and focus on the green fixation target through the measuring window.

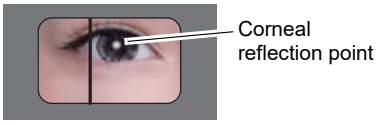
7 As necessary, lightly place the forehead arm against the patient's forehead.

8 Look at the patient's eye through the eyepiece.

The right eye can be seen on the left side and the left eye on the right side.



- The height of the corneal reflection point is different according to the shape of the bridge of the patient nose. It is not necessary that the reflection point be in the center of the measuring window.

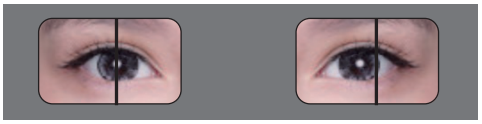


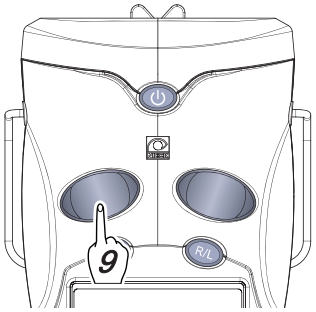
If the PM-700 is moved to align the corneal reflection point in the center of the measuring window, the patient's nose may be come off the nose pad. If this happens, proper measurement cannot be performed.

9 Look at the patient's right eye through the eyepiece. Use  to align the hairline with the corneal reflection point on the patient's right eye.

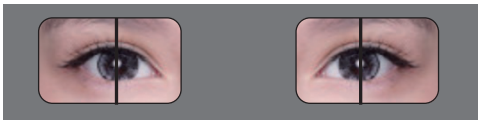
"3.1 Button Operation" (page 19)

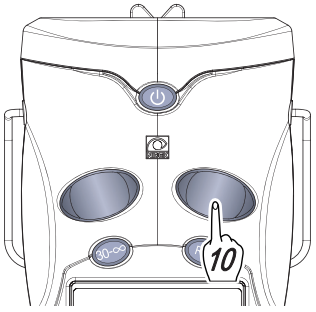
"● Measurement increments" (page 18)





10 Use  to align the hairlines with corneal reflection point on the patient's left eye in the same manner.





11 When the corneal reflection point and hairline are aligned for both eyes, the measurement is complete. Write down the displayed measurements.

12 Press  until the display disappears and the device is turned off.

3.4.2 Measurement with one eye occluded

The procedure below explains the PD measurement with one eye occluded.

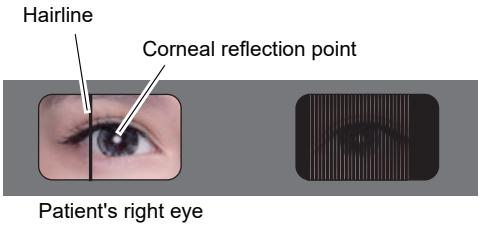
⚠ CAUTION

- Before measuring each patient, clean the nose pad and forehead arm with a cloth dipped in alcohol for disinfection.

"4.2.2 Cleaning the nose pad" (page 30), "4.2.3 Cleaning the forehead arm" (page 31)

1 As in the Steps 1 to 8 in *"3.4.1 Measurement without eye occlusion" (page 24)*, have the patient to focus on the green fixation target and look through the eyepiece.

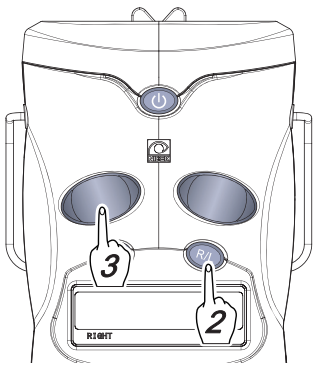
2 Press R/L to occlude the left eye.



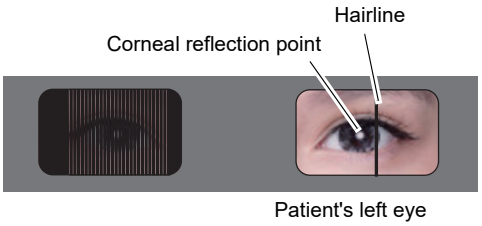
R is indicated on the display.

3 Look at the patient's right eye through the eyepiece. Use ⬭ to align the hairline with corneal reflection point on the patient's right eye.

"3.1 Button Operation" (page 19)
"● Measurement increments" (page 18)

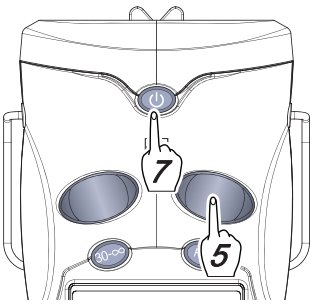


4 Press R/L to occlude the right eye.



L is indicated on the display

5 Look at the patient's left eye through the eyepiece (the eye on the right as viewed from the examiner). Use to align the hairlines with corneal reflection point on the patient's left eye.



6 When the corneal reflection point and hairline are aligned for both eyes, the measurement is complete. Write down the displayed measurements.

7 Press until the display disappears and the device is turned off.

4 MAINTENANCE

4.1 Troubleshooting

In the event that the device does not work correctly, correct the problem according to the following table before contacting NIDEK or your authorized distributor.

Symptom	Remedy
The display does not turn on even though  is pressed.	• The batteries may be drained. Replace them and check whether the display is turned on. *(page 32)*
The fixation target goes out suddenly. The display remains turned on.	• It is likely that the Auto-off function turned out the fixation target. Illuminate the fixation target by pressing any button.
The display goes out suddenly.	• It is likely that the Auto-off function turned off the device. Press  to turn on the device. • The device may have been turned off by electrostatic discharge noise. Press  to turn on the device. If the symptom occurs even after the power is restored, check the installation environment according to the EMC information provided in this manual.
It seems that there is a difference in color between the green fixation target and its peripheral part.	• Due to the characteristics of the LED light source, the fixation target may appear slightly colored. However, it does not affect the measurement. Use the device as is.

* If the above items are checked but the problem is not corrected, contact NIDEK or your authorized distributor.

4.2 Cleaning

■ To clean the device exterior, nose pad, forehead arm, and measuring window, follow the procedures below.

4.2.1 Cleaning the exterior

When the exterior display, or eyepiece cover of the device become dirty, wipe with a dry and soft cloth. For stubborn dirt, soak the cloth in a neutral detergent, wring well and wipe. Finally wipe off with a dry and soft cloth.

- Never use an organic solvent such as paint thinner or the abrasive cleanser to clean the device.
  The surface may be ruined.

4.2.2 Cleaning the nose pad

⚠ CAUTION

- Before measuring each patient, clean the nose pad with a cloth dipped in alcohol for disinfection.

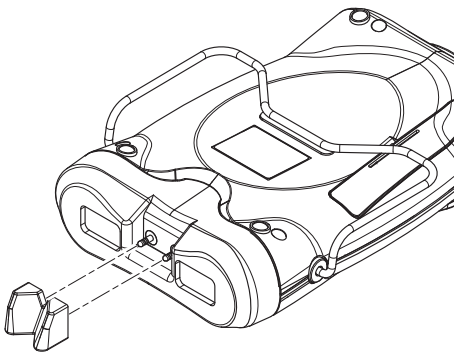
1 Pull out the nose pad.

2 Clean the nose pad using a cloth dipped in alcohol for disinfection.

3 Reattach the nose pad as it was.

Align the pins to the nose pad hole and insert the nose pad completely.

If the nose pad becomes dirty, replace it with spare nose pad.



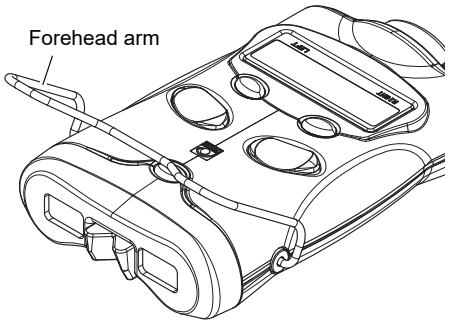
Nose pad

4.2.3 Cleaning the forehead arm

⚠ CAUTION

- Before measuring each patient, clean the forehead arm with a cloth dipped in alcohol for disinfection.

Clean the forehead arm using a cloth dipped in alcohol for disinfection.



4.2.4 Cleaning the measuring window

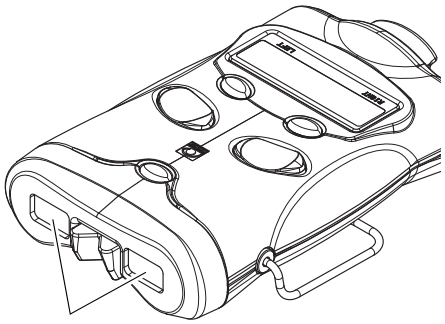
Check the measuring windows before each measurement. If the measuring windows are dirty, clean them.

⚠ CAUTION

- Remove any dust on the measuring windows with a blower brush before wiping the windows.
  If the measuring windows are wiped with dust on it their surface may be scratched.
- Do not clean the windows with a cloth dampened with liquid such as cleaner.
  The surface may become smudged or the coating damaged.

1 Remove any dust on the measuring window with a blower brush.

2 Slightly moisten a soft cloth with alcohol for disinfection and wipe the window slowly and softly.



4.3 Replacing Batteries

■ To replace the batteries, follow the procedures below.

When batteries run out, BATT is indicated on the display. When BATT is indicated, replace the batteries with new ones.

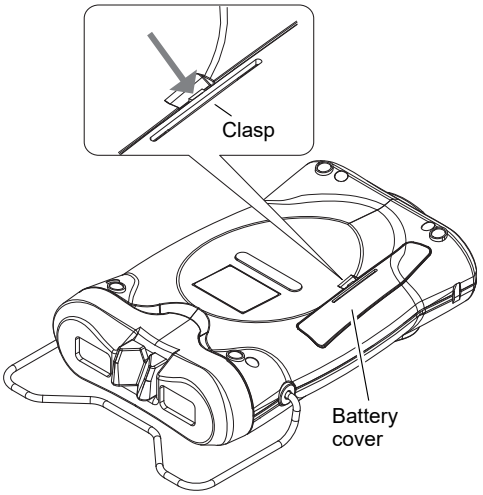
⚠ CAUTION

- Do not use old and new batteries or batteries of different types together.
  The device may not work normally or it may cause a device malfunction or damage the periphery due to leakage.
- Batteries must be inserted with their plus and minus marks oriented in the same direction as the plus and minus marks (⊕ ⊖) on the battery case.
  Leakage of battery acid may cause a malfunction of the device or damage the periphery.
- When replacing the batteries, be sure to prevent any foreign matter from getting inside the battery case.
  Otherwise the device may not work normally. In addition, an increase in the battery temperature due to short circuit may cause battery leakage, resulting in device malfunction or soiling the peripheral parts.
- When replacing the batteries, do not touch any other person.

- Be sure to use the battery specified by NIDEK.
  - Specified battery: alkaline AA battery (LR6) (two units) or rechargeable Ni-MH AA battery (HR6) (two units)

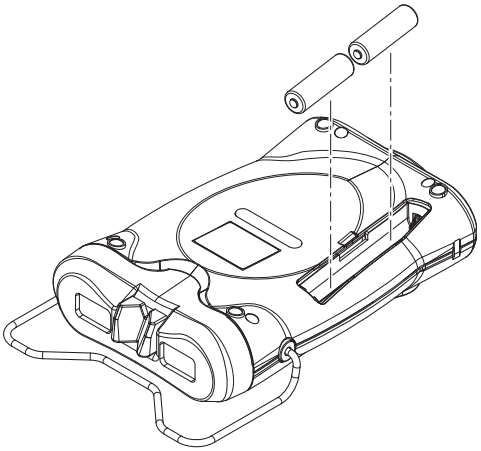
1 Turn off the power.

2 Pull the clasp to remove the battery cover.

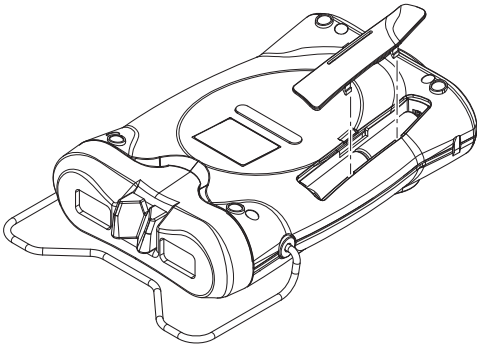


3 Remove the used batteries.

4 Attach the new batteries.



5 Attach the battery cover back in place.



4.4 List of Consumables

Part name	Part number
Alkaline AA battery (LR6) (2 units)	804-16-00012 For use battery, see *"4.3 Replacing Batteries" (page 32)*.
Nose pad	35111-M101
Hand strap	35241-M023

5 SPECIFICATIONS AND TECHNICAL INFORMATION

5.1 Specifications

○ Specifications

• Measurement item	Pupillary distance value	
• Display method	LCD digital display	
• Viewing distance	1 m	
• Distance setting range	8 steps from 30 cm to ∞ (30 cm, 35 cm, 40 cm, 50 cm, 65 cm, 1 m, 2 m, and ∞)	
• Fixation target	Green fixation point Transillumination method	
• Auto-off function	The fixation target goes off automatically after 15 seconds of idle time. After the fixation target goes off, 3 minutes of idle time turns off the power.	
• Monocular occlude function	 allows selection of right eye occlusion, left eye occlusion, and binocular open. Liquid crystal shutter is used.	
• Measurement range	47.0 to 83.0 mm (working distance is set to ∞, indication switching is set to 0.5 mm) (23.5 to 41.5 mm per eye)	
• Measurement increments	0.25 mm, 0.5 mm	
• Measurement accuracy	±0.5 mm (pupillary distance for one eye)	
• Illumination light source for fixation target	LED	
• Forehead arm	When not used, it can be folded out of the way.	
• Power source	Alkaline AA battery (LR6) (× 2)	
• Dimensions	147 (W) × 235 (D) × 60 (H) mm (exclude forehead arm)	
• Mass	560 g (exclude batteries and strap)	
• Environmental conditions (during use)	Temperature	10 to +35ºC (50 to 95ºF)
	Humidity	30 to 90% (non-condensing)
	Atmospheric	800 to 1,060 hPa
	Others	Indoor A well ventilated place free from hazardous particles, smoke or fumes Level, stable surface free from vibration and bumping A place not exposed to water

• Environmental conditions (storage condition without packing)	Temperature	-10 to + 55ºC (14 to 131ºF)
	Humidity	10 to 95% (non-condensing)
	Atmospheric	700 to 1,060 hPa
• Environmental conditions (transport and storage condition in the packing state)	Temperature	-30 to + 70ºC (-22 to 158ºF)
	Humidity	10 to 95% (non-condensing)
	Atmospheric	500 to 1,060 hPa
• Others	Expected service life	8 years from the date of initial operation (defined by manufacturer) *Proper maintenance is necessary.
	Packing unit	1 unit
• Classifications	Form of protection against electric shock: Internally powered device Degree of protection against electric shock: Type B applied part Degree of protection against liquid entry: IPX0 Degree of safety in the presence of a flammable anesthetic mixture with air, or a flammable anestheticmixture with oxygen or nitrous oxide: The device should not be used in the presence of a flammable anesthetic mixture with air, or a flammable anesthetic mixture with oxygen or nitrous oxide caused by leakage or a discharge. Degree of suitability for use in an oxygen rich environment: The device is not intended for use in an oxygen rich environment. Operation mode: Continuous operation	

○ Configuration

• Standard accessories	Alkaline AA batteries (LR6) (× 2), hand strap, spare nose pad, operator's manual	
• Accessory	Neck strap	35241-M024

5.2 EMC (Electromagnetic Compatibility)

The device is suitable for use in stores and hospitals except for near active HF surgical equipment and RF shielded rooms with an ME system for magnetic resonance imaging, where the intensity of electromagnetic disturbances is high, electrophysiology laboratories, or areas where short-wave therapy equipment is used.

⚠ WARNING

- Do not use the device near, on, or under other electronic equipment or electromagnetic disturbance sources. Otherwise, it could result in improper operation. If such use is necessary, the device and the other equipment should be observed to verify that they are operating normally.
- Use of accessories, cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and cause improper operation.
- Portable RF communications equipment (including peripherals such as antenna cables and external antennas) or electromagnetic disturbance sources as shown below should be used no closer than 30 cm (12 inches) to any part of the device, including the specified or provided cables. Otherwise, degradation of the performance of this equipment could result.

  The following are examples of electromagnetic disturbance sources:
  - Induction cooking appliance and ovens
  - RFID readers
  - Electronic article surveillance (EAS) systems
  - Sponge detection systems
  - Equipment used for position detection (e.g. in catheter labs)
  - Wireless power transfer charging systems for electrical vehicles

○ Specified cable

No cable is connected to the device.

○ Essential performance

PD measurement function

◆ Compliance for Emission Standard

Phenomenon	Product family standard	Compliance
Conducted and radiated RF emissions	CISPR 11	Group 1 Class B
Harmonic distortion	IEC 61000-3-2	Not applicable
Voltage fluctuations and flicker	IEC 61000-3-3	Not applicable

◆ Test specifications for enclosure port immunity to RF wireless communications equipment

Test frequency (MHz)	Band (MHz)	Service	Modulation	Immunity test level (V/m)
385	380 to 390	TETRA 400	Pulse modulation 18 Hz	27
450	430 to 470	GMRS 460, FRS 460	FM ±5 kHz deviation 1 kHz sine	28
710	704 to 787	LTE Band 13, 17	Pulse modulation 217 Hz	9
745				
780				
810	800 to 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation 18 Hz	28
870				
930				
1720	1700 to 1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation 217 Hz	28
1845				
1970				
2450	2400 to 2570	Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE Band 7	Pulse modulation 217 Hz	28
5240	5100 to 5800	WLAN 802.11 a/n	Pulse modulation 217 Hz	9
5500				
5785				

◆ Compliance for Immunity Standard

Phenomenon	Basic EMC standard	Immunity test levels
Electrostatic discharge	IEC 61000-4-2	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air
Radiated RF electromagnetic field	IEC 61000-4-3	10 V/m 80 MHz - 2.7 GHz 80% AM at 1 kHz
Proximity fields from RF wireless communications equipment	IEC 61000-4-3	See “Test specifications for enclosure port immunity to RF wireless communications equipment”.
Rated power frequency magnetic fields	IEC 61000-4-8	30 A/m 50 Hz or 60 Hz

6 INDEX