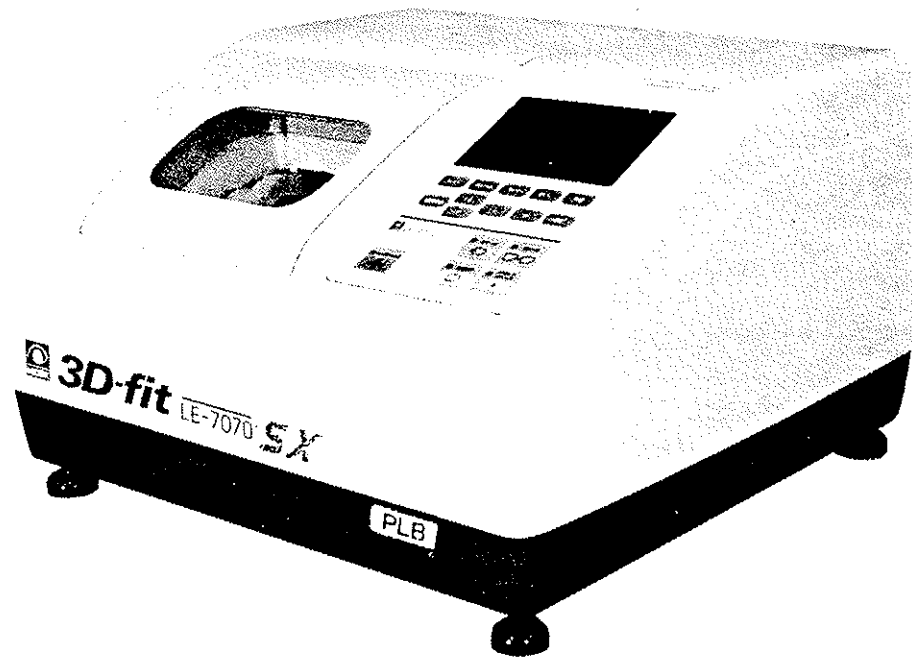


NIDEK PATTERNLESS EDGER


Model LE-7070SX TYPE PLB

OPERATOR'S MANUAL



NIDEK CO., LTD.

 BEFORE USE OR MAINTENANCE, READ THIS MANUAL.

 THIS MANUAL DOES NOT CONTAIN TECHNICAL INFORMATION ABOUT LENS GRINDING AND LAYOUT.

This Operator's Manual contains information necessary for the operation of the NIDEK PATTERNLESS EDGER Model LE-7070SX Type PLB.

This manual provides operating procedures, cautions for safety, specifications, accessories, and maintenance. IEC and UL are applied in this manual. For correct use, this manual is needed. Especially, cautions for safety and operating procedures must be thoroughly understood before using the machine. Be sure to keep this manual together with the machine and read it whenever it is needed.

If you find any problem or question about the machine during the operation, please contact your authorized distributor.

Table of Contents

	Page
§1 INTRODUCTION	1-1
1.1 Outline of the Product	1-1
1.2 Symbol Information	1-1
§2 SAFETY	2-1
2.1 Cautions in Use	2-1
2.2 In Storage	2-2
2.3 In Transference	2-2
2.4 In Installation	2-2
2.5 In Wirings	2-3
2.6 After Use	2-3
2.7 Maintenance and Check	2-3
2.8 Labels	2-4
§3 CONFIGURATION	3-1
§4 OPERATION PROCEDURES	4-1
4.1 Operation Flow	4-1
4.2 Preparation	4-2
4.3. Tracings	4-3
4.3.1 Rim tracings	4-3
4.3.1.1 Tracing both rims	4-3
4.3.1.2 Tracing single rims	4-4
4.3.1.3 Semiauto tracing	4-4
4.3.1.4 Tracing goggle type frames	4-5
4.3.2 Pattern tracing	4-6
4.3.3 Dummy lens tracing	4-8
4.3.4 Tracing while grinding	4-9
4.3.5 Stop of tracing	4-10
4.3.5.1 Stop of frame tracing	4-10
4.3.5.2 Stop of pattern or dummy lens tracing	4-10
4.4 Layouts	4-11
4.4.1 Inputting grinding conditions and layouts	4-11
4.4.2 Inputting height from the lens outline	4-14
4.4.2.1 Layout of bifocal lenses	4-15
4.4.2.2 Layout of progressive power lenses	4-16
4.4.3 Eye point layout	4-17
4.5 Lens Blockings	4-18
4.5.1 Blocking by active mode	4-18
4.5.1.1 Blocking progressive power lenses	4-19

4.5.2 Blocking by passive mode.....	4-19
4.5.3 Blocking bifocal lenses	4-20
4.6 Grindings.....	4-21
4.6.1 Bevel placements	4-21
4.6.1.1 Auto grinding mode.....	4-21
4.6.1.2 Guided grinding mode	4-23
4.6.1.3 In the case of EX lens and cataract lens.....	4-26
4.6.2 Beveled edge polishing	4-27
4.6.3 Flat (rimless) edging.....	4-28
4.6.4 Flat edge polishing	4-29
4.6.5 Other grindings.....	4-30
4.6.5.1 Grinding for frame changing	4-30
4.6.5.2 Grinding half-eye lenses.....	4-33
4.7 Size Check	4-35
4.7.1 Size check	4-35
4.7.2 Lens size correction	4-35
4.8 Grinding the Other Side	4-36
4.9 Treatment after Daily Use	4-36
4.10 Daily Checks	4-37
4.10.1 Daily checks before use	4-37
4.10.2 Daily checks after use	4-37
§5 OTHER FUNCTIONS	5-1
5.1 Process Counter	5-1
5.2 Parameter Settings	5-2
5.3 Memorization of Initial Display	5-5
5.4 Loading and Memorizing the Pattern data	5-6
§6 TROUBLESHOOTING GUIDE.....	6-1
§7 STORAGE.....	7-1
§8 MAINTENANCE.....	8-1
8.1 Wheel Dressing	8-1
8.2 Replacement of Water and Filter	8-3
8.3 Replacement of Fuses.....	8-4
8.4 Cleaning Exterior	8-5
8.5 Compensation of Size Error	8-6
8.6 Compensation of Bevel Displacement	8-7
8.7 Compensation of Axis Rotation	8-9
8.8 Adjustment of Lens margin allowed for finishing	8-10
8.9 Adjustment of Polishing	8-11
8.9.1 In the case that the parts of unpolishing is made locally	8-11
8.9.2 In the case that the parts of unpolishing is made at front side	8-12
or back side from bevel	
8.10 List of Consumable Articles	8-13

§9	SPECIFICATIONS	9-1
§10	ACCESSORIES	10-1
	10.1 NIDEK-type Accessories	10-1
	10.2 WECO-type Accessories	10-1
	10.3 SANTI-type Accessories	10-2
§11	SUPPLEMENTATION	11-1
	11.1 Selection of Tracings	11-1
	11.2 Selection of Layouts	11-3
	11.3 Selection of Blockings	11-4
	11.4 Selection of Girndings	11-5

§1 INTRODUCTION

1.1 Outline of the Product

This machine is a fully-automatic lens edger which reads the lens outline of eyeglasses directly from the frame (frame tracer), and grinds lens edges into the shape of frames. This edger has a grinding unit on the left, a display and a control unit on the right, and a tracing unit on the top of the body, if seen from the front. The tracing unit measures the frame shape, the control panel controls the lens layout, and the grinding unit grinds the lens into a specified shape.

There are various kinds of grinding wheels in the grinding unit, and this machine selects the most suitable wheels and the grinding sequences according to the material of the grinding lens.

* For some words on the display, two types of expressions are used depending on the shipping destination. As to such words as shown below, this manual carries both.

Grinding mode : FLT (Flat) / RIM (Rimless)

Frame material: CEL (Celluloid) / ZYL

[Lens materials and grinding styles available for LE-7070PLB]


Lens material				Grinding			
Plastic	Polycarbonate	Acrylic resin	Glass	Beveling	Flat (Rimless) edging	Beveled edge polishing	Flat edge polishing
○	○	○	×	□	□	□	□


○ : Available.


× : Not available.

□ : Available (excluding glass lenses).

1.2 Symbol Information

 This symbol on the body indicates that caution should be taken. Reference of operator's manual is necessary before use.

 This symbol on the power switch indicates that the power is ON.

 This symbol on the power switch indicates that the power is OFF.

§2 SAFETY

In this manual, Signal Words are used to designate a degree or level of safety alerting, whose definitions are as follows.

- ⚠ **DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
- ⚠ **WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
- ⚠ **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage accident.

2.1 Cautions in Use

⚠ WARNING

- Be sure to keep the soundproof cover closed while grinding lenses.
Splashes including grinding waste may damage your eye.
- Never touch the grinding wheel when it is turning.
You may be injured.
- Be sure to use this machine only to grind the lens of glasses.
If this machine grinds any other thing, the grinding wheels may be damaged and cannot perform normal grinding. To make matters worse, it may break and its broken pieces may injure the personnel.

⚠ CAUTION

- Never disassemble nor touch the internal structure.
An electric shock or failure of machine may occur.
- Be sure to use the socket which meets the power specification.
If the line voltage is too high or low, the machine may not give full performance. Malfunction or a fire also may occur.
- Never hold the cable, hold the plug of the power cable when the power cable is disconnected from the socket.
Inside wires may break and it may cause an electric shock, a short circuit or a fire.
- When the wires inside of cables are exposed, the power turns ON and OFF by moving the power cable, or the cable or plug becomes too hot to hold it; unplug the power cable and contact your authorized distributor.
It may cause an electric shock or a fire.
- Do not crush the power cable.
Damage of cable may result in a fire or an electric shock.
- Every once in a while, clean the pins of the power plug with a dry cloth.
If dust settles thick on them, they will become damp, and may cause a short circuit or a fire.
- Plug the power cable correctly until its pins are fully inserted into the socket.
If the machine is used with an insecure connection, a fire may occur.

CAUTION

- In the event that the machine gives out smoke or strange smell, etc., turn OFF the power and unplug the power cable. After the smoke is not coming out of the machine any more, contact your authorized distributor.
 - If a machine having this kind of abnormal condition is used, a fire or an electric shock may occur.
- When specifying the lens material, be sure to select the material which will be edged.
 - If wrong material is selected, the lens may break or lifetime of grinding wheels may be reduced.
- Handle the stylus of the tracing unit with care.
 - The stylus is easy to bend or break.

2.2 In Storage

NOTE

- Avoid rain and water splashes.
- Store the machine in a place away from dust and direct sunlight.
 - Be sure to store it under the specified temperature and humidity conditions.

2.3 In Transference

CAUTION

- Two people should move the machine.
 - You may hurt your back or may fall down if you do so alone.

2.4 In Installation

NOTE

- Install the machine in a stable and level place where shock does not occur.
 - The machine may not grind the lens correctly.
- Avoid installing the machine in high temperature, high humidity and direct sunlight.

2.5 In Wirings

 CAUTION

- Be sure to ground the machine.
An electric shock may occur in the event of trouble or electric leakage.

2.6 After Use

NOTE

If the machine will not be used for a long time, unplug the power cable from the socket.

If dust settles thick on them, they will become damp, and may cause a short circuit or a fire.

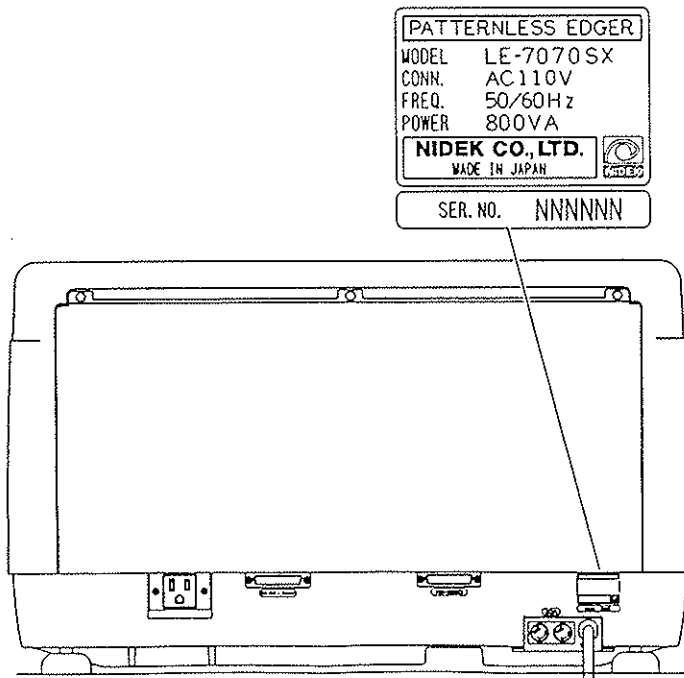
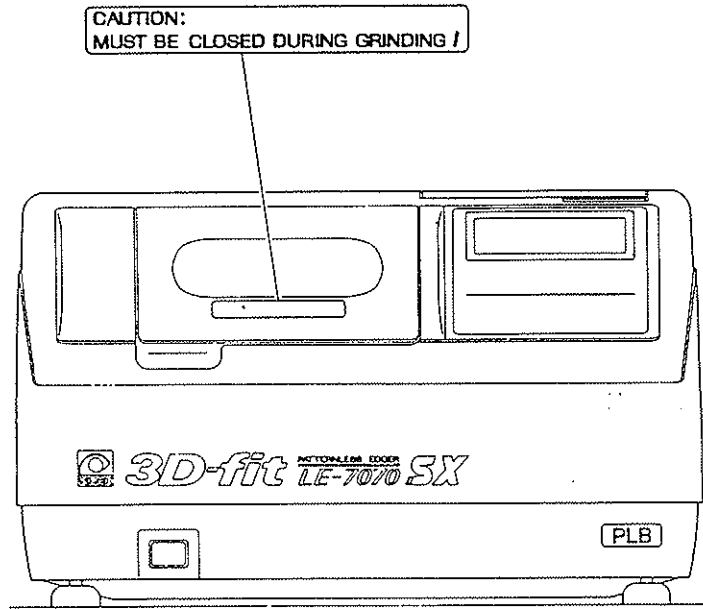
2.7 Maintenance and Check

 CAUTION

- Be sure to use the specified fuses for replacement.
A fire may occur.
- Be sure to use a dressing stick which fits the grinding wheel.
The grinding wheel may be damaged.
- Never dress the PLA roughing wheel.
The wheel may be damaged.
- Be sure to use the specified stocking filter only.
The filter or water supply pipe may become clogged.
- The stocking filter is a throwaway article. Do not reuse it.
It may be ripped or have a run and will not function as a filter. The water supply pipe may also be clogged.
- Never use an organic solvent such as paint thinner to clean the exterior.
This could dissolve the surface.

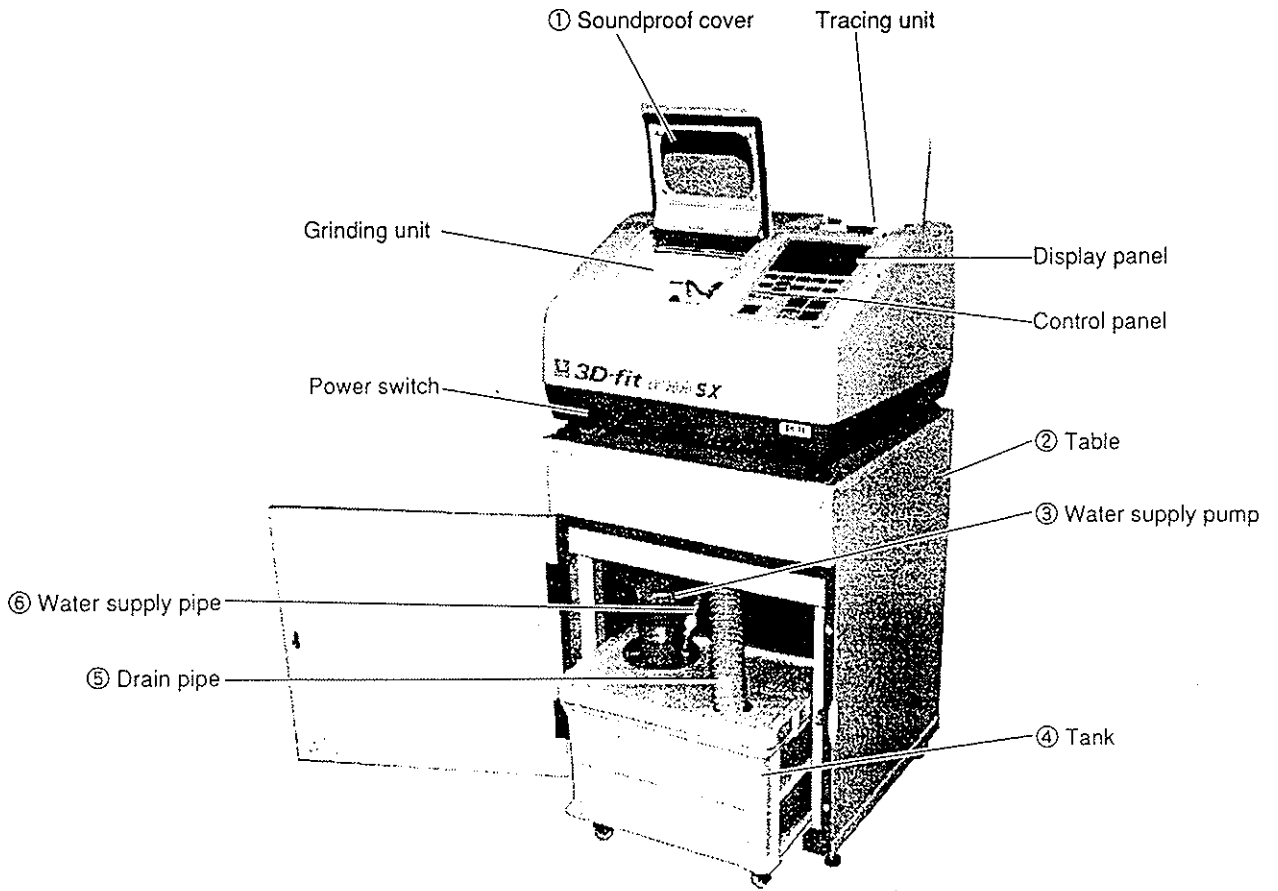
2.8 Labels

The following labels provide safety information about each part.

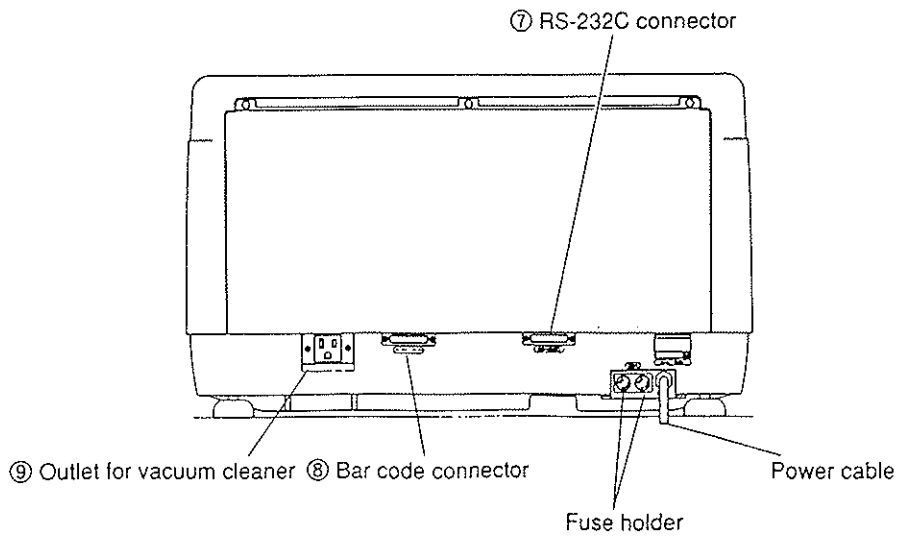


§3 CONFIGURATION

[Whole System]

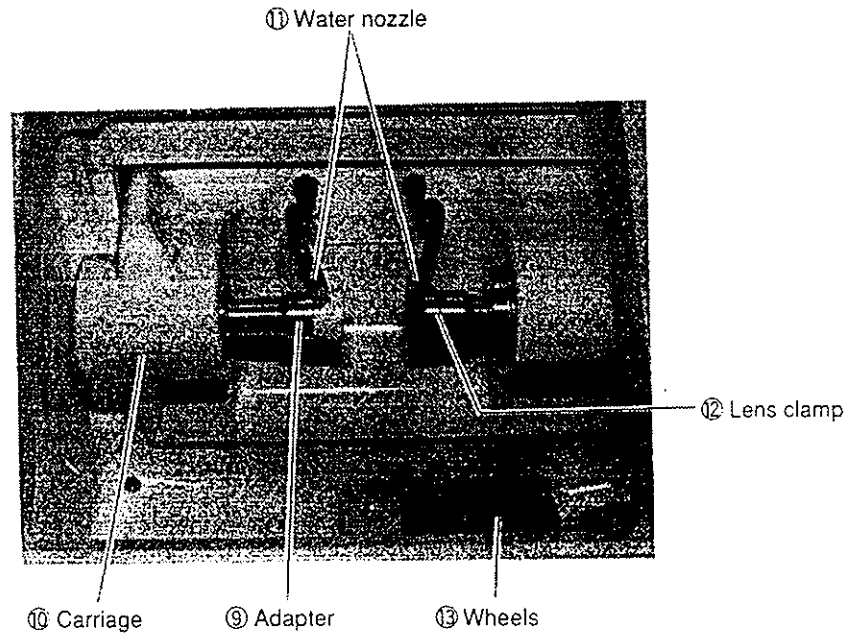


[Rear Side of the Main Body]

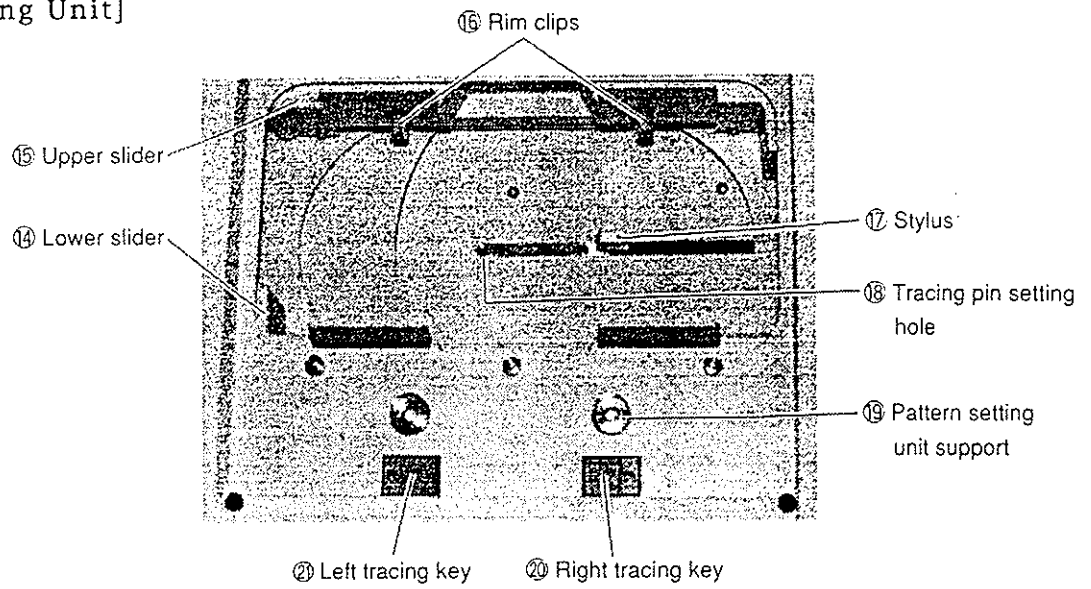


- ① Soundproof cover
Prevents water and grinding waste from splashing, and decreases grinding noises.
This cover must be closed during the grinding process.
- ② Table
A special table for the machine, in which pump and tank can be stored.
Drain pipe and water supply pipe are connected to the main body through a hole in the table.
- ③ Water supply pump
Supplies grinding water from the tank to the grinding unit.
- ④ Tank
A tank to pool the waste water.
- ⑤ Drain pipe
A pipe thorough which the waste water flows into the tank.
- ⑥ Water supply pipe
A pipe through which the grinding water flows to the grinding unit.
- ⑦ RS-232C connector
Used for communication with external PC, NIDEK quick pattern tracer model LT-200, etc.
- ⑧ Bar code connector
Used for optionaly bar code scanner, etc.
- ⑨ Outlet for vacuum cleaner
A power outlet for a vacuum cleaner, which is used for gathering the grinding waste of polycarbonate lenses. The power supply for the cleaner will be synchronized to the power switch of the main body.

[Grinding Unit]

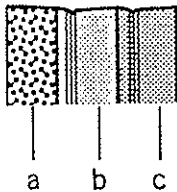


[Tracing Unit]



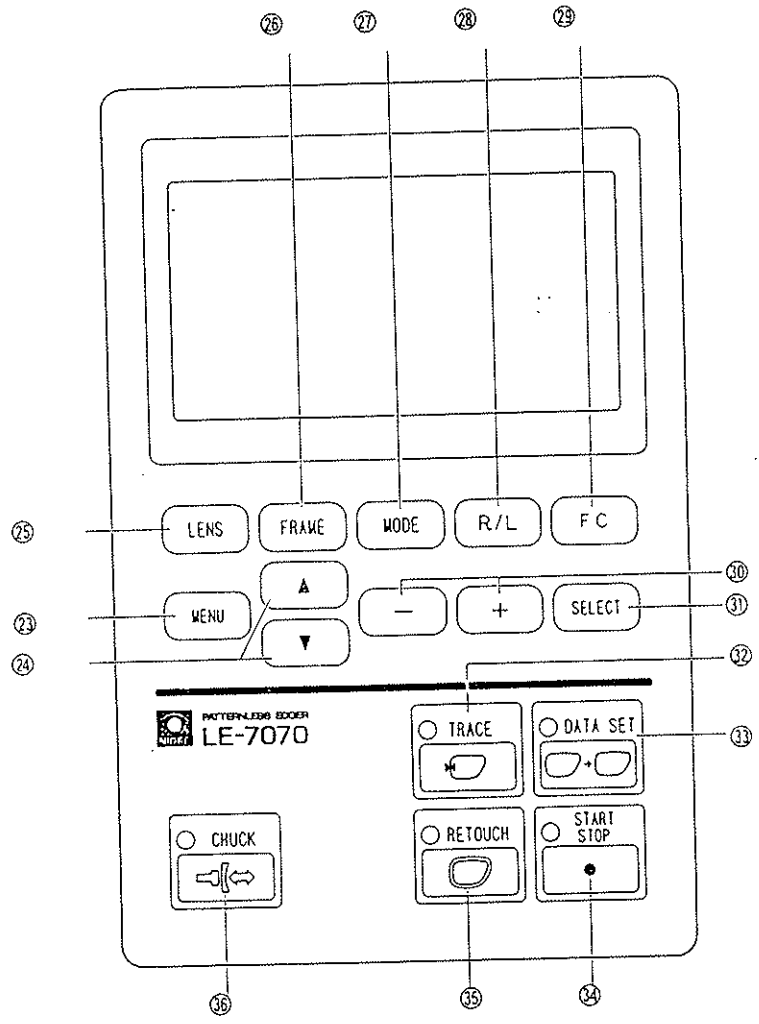
- ⑩ Adapter
Holds the blocked lens.
- ⑪ Carriage
Moves the lens to the grinding position in accordance with the traced data.
- ⑫ Water nozzle
Pours water at the grinding part of the lens.
- ⑬ Lens clamp
Pushes the lens set in the adapter from the opposite side to fix it.
- ⑭ Wheels
Several different types compose a set of grinding wheels.
- PLA roughing wheel
Used to rough-grind the plastic, polycarbonate and acrylic lenses.
 - Fine grinding wheel
Used to fine-grind the lenses.
 - Polishing wheel
Used to polish the lens edge.
- ⑮ Stylus
Measures the frame shape by tracing the bevel groove.
- ⑯ Tracing pin setting hole
A hole to insert the tracing pin for tracing patterns or dummy lenses.
- ⑰ Pattern setting unit support
Mounts the pattern setting unit with a pattern or a dummy lens set on it.
- ⑱ Right tracing key
Traces the right rim.
- ⑳ Left tracing key
Traces the left rim.

[Wheel combination]



- ⑮ Lower slider
- ⑯ Upper slider
The frame is set between these sliders.
- ⑰ Rim clips
Holds the rim of frame.
Upper and lower sliders have two clips each.

[Control Panel]



23 **MENU**

Switches the display in the following order: Layout display → Menu display → Parameter exchange mode display. This key does not work during the grinding process.*1

24 **▲, ▼**

Used to move the cursor.

25 **LENS**

Used to select lens materials; PLA (plastic), PC (polycarbonate) or ACR (acrylic resin).

26 **FRAME**

Used to perform beveling or flat (rimless) edging. In the case of beveling, it is used to select the lens material.

- CEL (ZYL) ⇔ Beveling
- MTL ⇔ Beveling
- PNT ⇔ Flat (rimless) edging
- NYL ⇔ Flat (rimless) edging

27 **MODE**

Used to select whether to perform the polishing or not.

- NON ⇔ Polishing will not be performed.
- POL ⇔ Polishing will be performed.

Grinding mode	FRAME setting	MODE setting
Beveling	CEL (ZYL) / MTL	NON
Beveled edge polishing	CEL (ZYL) / MTL	POL
Flat edging	PNT / NYL	NON
Flat edge polishing	PNT / NYL	POL

28 **R/L**

Used to specify the side of grinding lens, right (R) or left (L).

29 **FC**

Turns ON/OFF the frame changing mode.

30 **+, -**

Used to input the prescription data, etc.

31 **SELECT**

Used to change the inputting form of layout data, etc.

32 **TRACE**

Starts/stops tracing.

33 **DATA SET**

Sets the traced data and shows it on the display.

34 **START STOP**

Starts/stops grinding.

35 **RETOUCH**

Starts retouching.

36 **CHUCK**

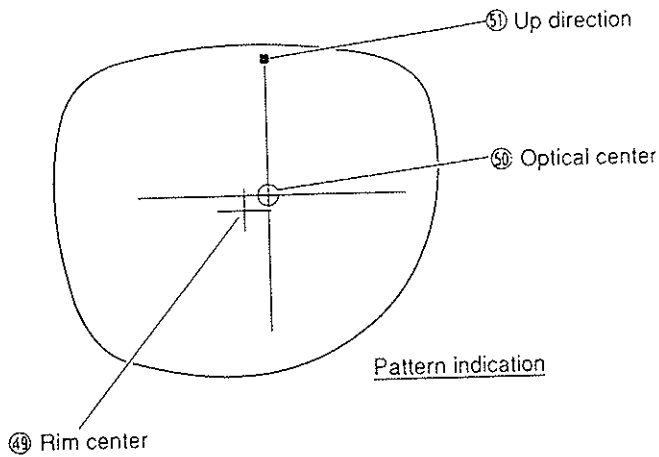
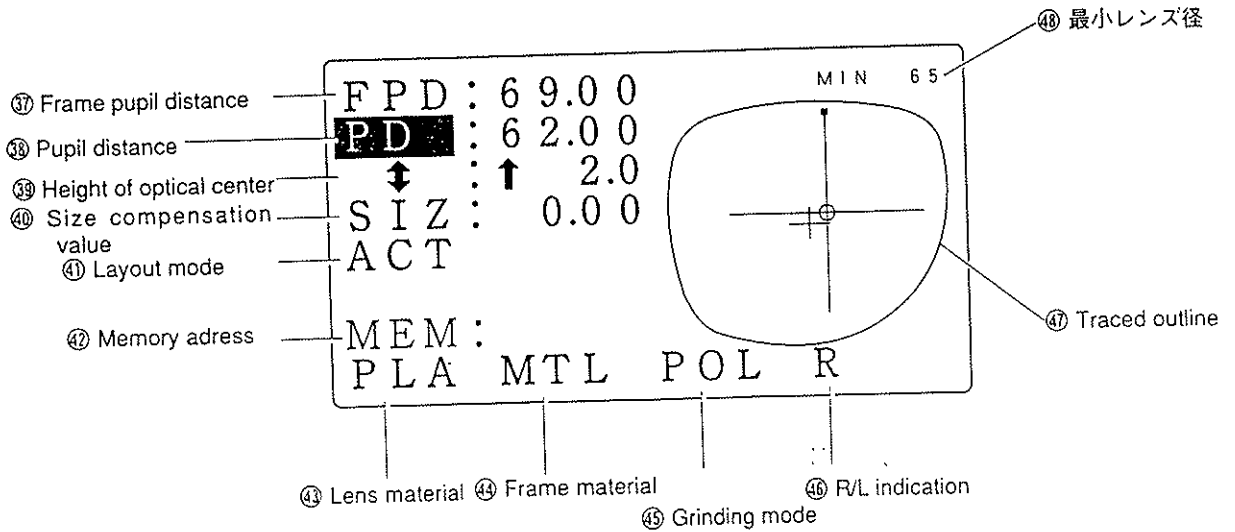
Fixes/releases the lens with the lens clamp.

*1 In the modes which performs the beveling (Auto, Guided, EX lens grinding modes), pressing this key during roughing process switches the display between bevel simulation and layout.

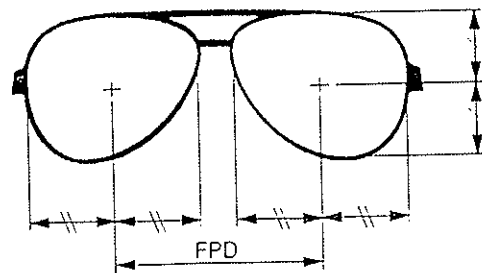
[Display Panel]

LAYOUT DISPLAY

Lens layouts and prescription data input, etc. are performed on this display.

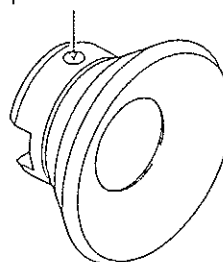


③⑦ Frame pupil distance (FPD)
 Represents the distance between right and left rim centers. [30.00~99.50 mm (step: 0.50mm)] The rim centers are calculated by the boxing system.



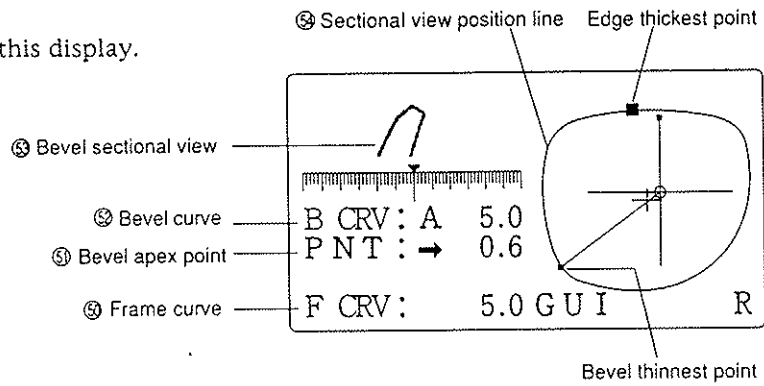
- ③⑧ Pupil distance (PD)
Represents the pupil distance which is on the prescription. [30.00~99.50 mm (step: 0.50 mm)] It is also available to input monocular PD (1/2PD).
- ③⑨ Height of optical center (↕)
Represents the height of optical center from the level of rim center (boxing center).
[↓ 15.0~ ↑ 15.0 mm (step: 0.1 mm)]
- ④⑩ Size compensation value (SIZ)
Represents the compensation value for the desired finishing size in diameter, related to the traced size of frames or patterns (0.00). [-9.95~+9.95 mm (step: 0.05 mm)]
- ④⑪ Layout mode
Represents the selected layout mode [Active mode, Bifocal mode, or Passive mode].
- ④⑫ Memory address
Used to storing or to reading the traced pattern data when the memory function is used.
- ④⑬ Lens material
Represents the specified lens material [PLA (plastic), PC (polycarbonate) or ACR (acrylic resin)].
- ④⑭ Frame material
[MTL (metal), CEL (celluloid)/ZYL, or FLT (flat)/RIM (rimless)].
- ④⑮ Grinding mode
[Blank or POL]
As for the relation with the grinding mode, see page 3-6.
- ④⑯ R/L indication
Represents the selected side of the grinding lens [R/L].
- ④⑰ Traced outline
This is a plain figure of traced outline in actual size.
- ④⑱ Minimum lens diameter (MIN)
Represents the minimum lens diameter required for grinding. It appears when data of ④⑰~④⑲ are entered.
- ④⑲ Rim center
Indicates the position of the Rim center.
- ④⑳ Optical center (↔↔)
Indicates the position of the optical center.
In Bifocal mode, the segment ◡ appears instead of the optical center.
- ⑤① Up direction (·)
Represents the direction which a mark on the blocked cup faces.

Top direction



· BEVEL SIMULATION DISPLAY

Bevel is simulated on this display.



· MENU DISPLAY

Select functions or modes which are used for maintenance and adjustments.

```

***** M E N U *****
***** Length R:143.78 L:143.76 *****
- Process counter
  Wheel dressing
  Size adjustment
  Bevel adjustment
  AXIS adjustment
  *Execute : Press SELECT
    
```

· PARAMETER EXCHANGE MODE DISPLAY

This mode is used for parameter settings, including inputting constants (preset values) of size compensation value, PD, or height of optical center, or anyother adjustments.

```

*****
* Parameter exchange mode *
* Ver. MASTER V1.00 *
* TRACER V1.00 *
* TYPE : PLB *
*****
- 1) Size preset (PLA, MTL) : 0.00
  2) Size preset (PLA, CEL) : 0.00
  3) Initial value of FPD :+70.0
  4) Initial value of PD :+62.0
    
```

```

*****
* Parameter exchange mode *
* Ver. MASTER V1.00 *
* TRACER V1.00 *
* TYPE : PLB *
*****
- 1) Size preset (PLA, MTL) :+0.00
  2) Size preset (PLA, ZYL) :+0.00
  3) Initial value of FPD :+70.0
  4) Initial value of PD :+62.0
    
```

⑫ Frame curve (F CRV)

Represents the frame curve value measured by the tracing unit.

⑬ Bevel apex point (PNT)

Represents the amount that the bevel is moved, either backward or forward.

The bevel position can be moved backward or forward horizontally in Guided grinding mode, by changing this value with ⊕ or ⊖ after the cursor is moved to this position.

⑭ Bevel curve (B CRV)

Represents bevel curve value.

The bevel curve can be changed with ⊕ or ⊖. In Guided grinding mode, after the cursor is moved to this position. The “A” mark on the head of the value means that it is calculated by computer and is the most suitable value.

⑮ Bevel sectional view

Represents bevel section at the point where “⑯ Sectional view position line” indicates on the traced outline.

The mark “▼” on the scale represents the bevel apex point.

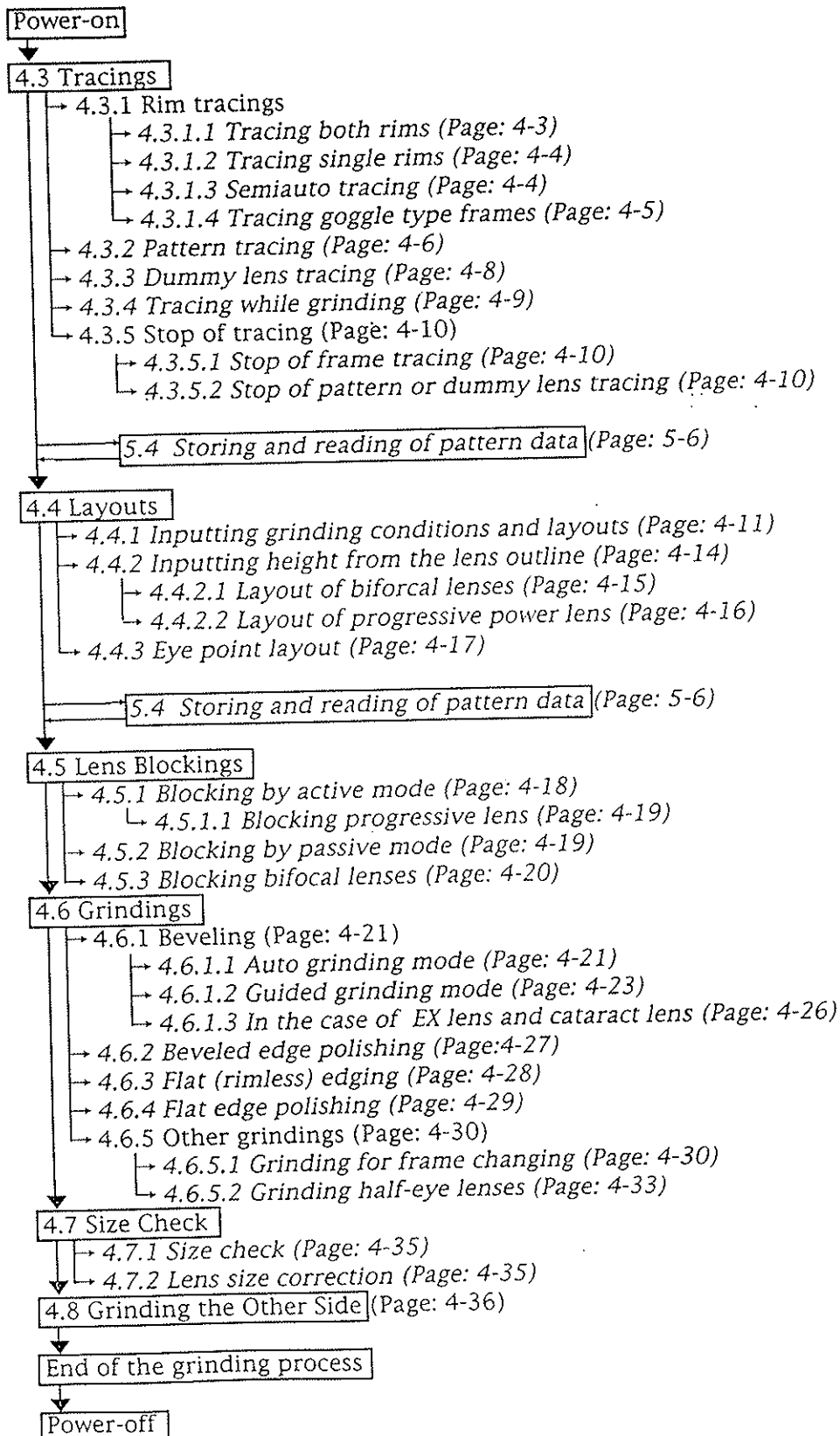
One graduation of the scale is equivalent to 0.2 mm.

⑯ Sectional view position line

Represents the position of bevel section which is currently shown.

S4 OPERATION PROCEDURES

4.1 Operation Flow



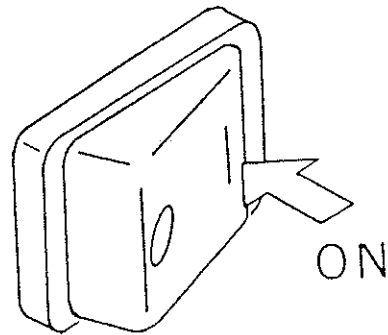
4.2 Preparation

1. Plug the power cable in the socket.

CAUTION

- Pins of the plug must be completely inserted into the socket.
Incomplete connection may cause a fire.

2. Turn ON the power.



4-3

4.3. Tracings

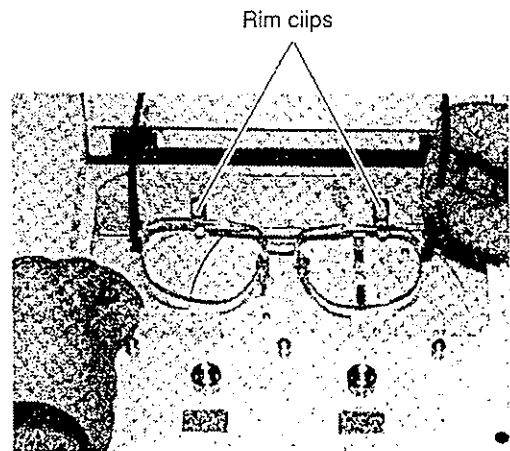
4.3.1 Rim tracings

4.3.1.1 Tracing both rims

This is a procedure to measure the outline of both rims as well as the frames pupillary distance.

1. Set a frame into the tracing unit.

- 1) Open the cover of the tracing unit.
- 2) Set top of the frame.
Draw the lower slider and place the frame top between the rim clips on the upper slider.
- 3) Set the bottom the frame.
Slowly release the lower slider, placing the frame bottom between the rim clips on the lower slider.



4) Bring the frame to the center of the tracing unit.

2. Start tracing both rims.

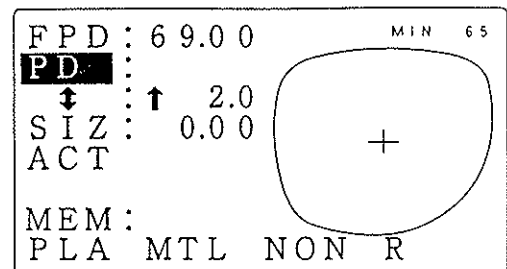
Press **TRACE**.

The tracing is finished when the frame is released. The lamp on the **TRACE** button will turn ON.

3. Set the traced data.

Press **DATA SET**.

The traced outline appears on the display and the lamp on the **TRACE** button turns OFF.



4. Draw the Lower slider and take out the frame.

4.3.1.2 Tracing single rims

This is a procedure to trace one of the frame rims.

1. Set a frame into the tracer.
Refer to step 1. of "4.3.1.1 Tracing both rims" (page: 4-3).
2. Press one of tracing keys on the tracing unit.
For left rim ⇒ Press the left tracing key.
For right rim ⇒ Press the right tracing key.

NOTE

- The FPD cannot be measured when tracing a single rim.
It needs to be manually measured and entered during lens layouts.

4.3.1.3 Semiauto tracing

When the stylus cannot be located into the bevel groove, follow this procedure to bring the stylus into it manually.

1. Set a frame into the tracing unit.
Refer to step 1. of "4.3.1.1 Tracing both rims".
2. Press **TRACE**¹ and hold it for three seconds.
The stylus moves and stops at the start position of tracing.
3. Use your finger to locate the stylus into the bevel groove.
4. Start tracing.

Press **TRACE**.

When the tracing is finished for one eye, the stylus moves to the other rim and stops at the trace start position.

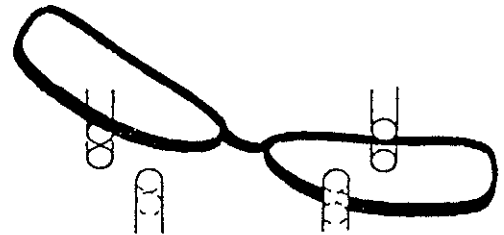
5. Trace the other rim in the same manner as steps 3. and 4.

¹ If tracing only one eye, press right or left tracing key and hold it for three seconds.

4.3.1.4 Tracing goggle type frames

When tracing steep curved frames, such as goggles, the stylus may come off from the bevel groove. In such a case, set only one rim between the rim clips and the temple of the other eye at around the hinge while tracing. The following only describes the procedure for the rim for right eye since either rim can be traced in this way.

1. Set the rim for the right eye horizontally to the tracing unit.
 - Do not set the rim for the left eye.
 - Hold the left temple at around hinge to keep the right rim horizontal.
 - Make sure that the left rim is touched to the frame guide of the lower slider.



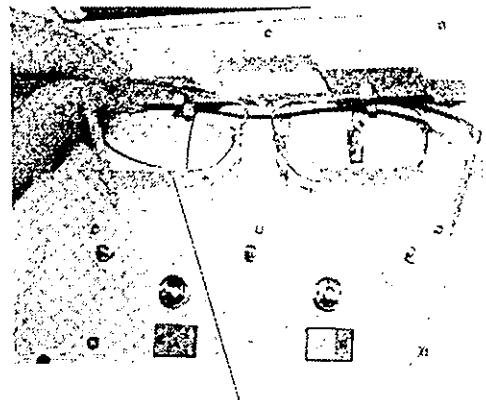
Non-tracing side
Hold with finger.
Do not set.

Tracing side
Set the rim horizontally
between the rim clips.

2. Start tracing.
Press the right tracing key.

NOTE

· The rim clips hold the right rim tight, however do not take your hand off the temple. If the frame moves during the tracing, accurate data cannot be obtained.



Frame guide

3. Set the traced data.
Press **DATA SET**.
The traced outline appears on the display.
4. Take out the frame from the tracing unit.

NOTE

· The FPD cannot be measured when tracing goggle type frame. It needs to be manually measured and entered during lens layouts.

4.3.2 Pattern tracing

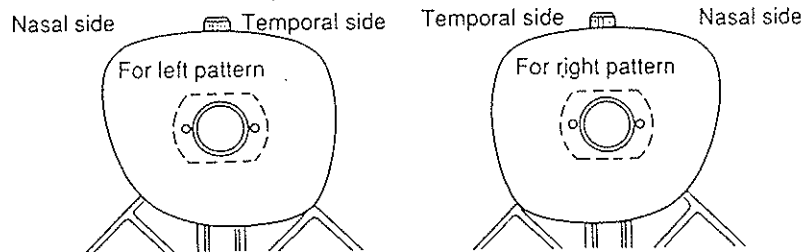
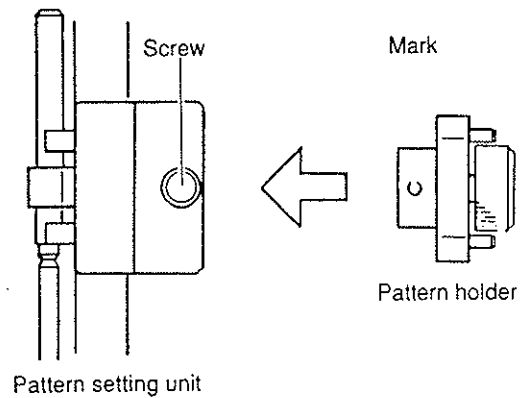
1. Set a pattern onto the pattern setting unit.

1) Set the pattern holder into the pattern setting unit and fix it with a screw on the unit.

Make sure that the mark on the pattern holder is aligned to the position of the screw.

2) Remove a screw on the pattern holder.

3) Fit the pattern to the pattern setting unit as shown on the following figure, and fix it with the screw on the pattern holder.



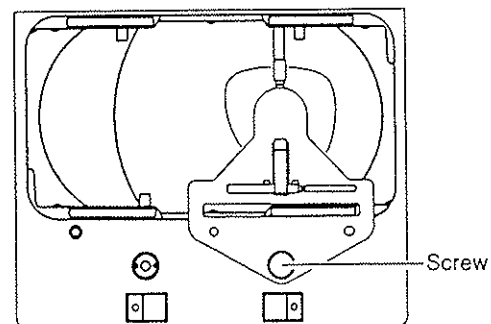
2. Set the pattern setting unit to the tracing unit.

1) Open the cover of the tracing unit.

2) Fix the pattern setting unit into the tracing unit.

Draw the lower slider and set the pattern setting unit as shown on the right figure.

Fit the top of the lower slider into the rectangular hole and guide pins into the two holes on the pattern setting unit.



[For setting right pattern]

As to the left pattern, set it to the left side.

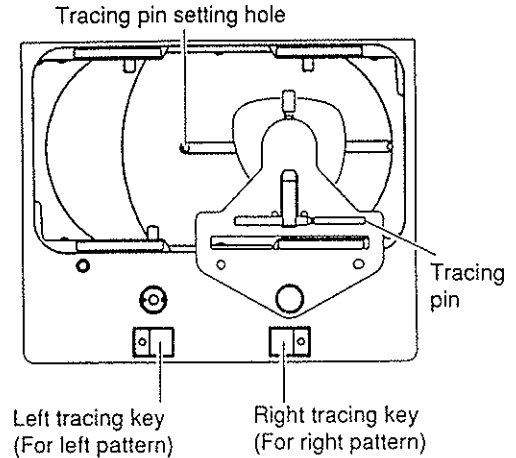
3) Fix the pattern setting unit with a screw.

3. Press the right (or left) tracing key.

For right pattern ⇒ Right tracing key

For left pattern ⇒ Left tracing key

The tracing pin setting hole moves to the center and stops.



4. Set the tracing pin.

Insert the tracing pin deep into the tracing pin setting hole.

5. Start tracing.

Press **TRACE**.

6. When the tracing is completed, pull out the tracing pin.

7. Press **TRACE** again.

The tracing pin setting hole moves back into position and stops.

8. Loosen the screw and remove the pattern setting unit from the tracing unit.

NOTE

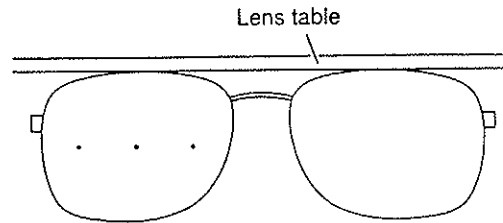
- The FPD cannot be measured when tracing patterns. It needs to be manually measured and entered during lens layouts.
- Be sure to attach the tracing pin back to the pattern setting unit, and make sure that it is set securely, otherwise the pin could be lost or dropped on the tracing unit which could cause possible damage.

4.3.3 Dummy lens tracing

1. Block the concave side of a dummy lens with a dummy lens holder.

- 1) Mark at the estimated center of the dummy lens with a lens-meter.

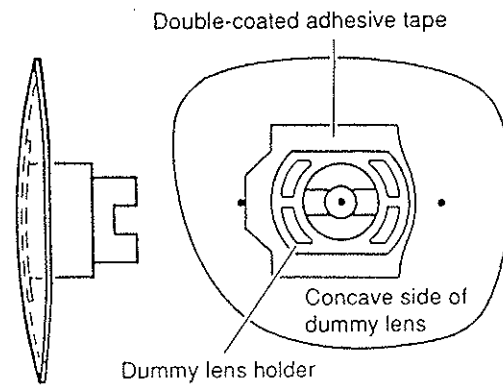
Set the dummy lenses fit in the frame and make sure that the frame is touched to the lens table to mark the lenses.



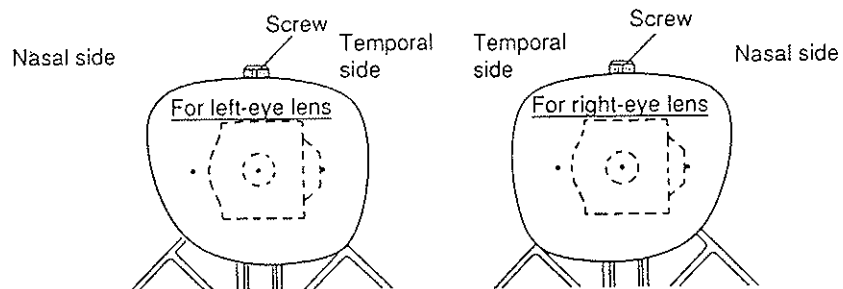
- 2) Place a provided double-coated adhesive pad on the dummy lens holder.

- 3) Block the concave side of the dummy lens with a dummy lens holder.

Align the marks on the dummy lens to the direction of the groove on the holder to block it.

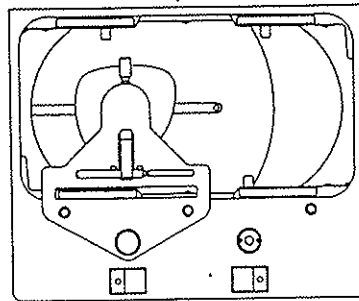


2. Fit the dummy lens holder into the pattern setting unit and fix it with a screw.

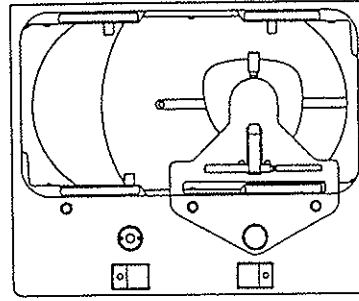


4-9

3. Trace the dummy lens in the same manner as steps 2.~8. of “4.3.2 Pattern Tracing”. Set the right dummy lens to the right side of the tracer and left dummy lens to the left side just like tracing patterns.



[For left-eye]



[For right-eye]

NOTE

- The FPD cannot be measured when tracing dummy lenses. It needs to be manually measured and entered during lens layouts. Instead of inputting FPD, you may also use eye point layouts (see “4.4.3 Eye point layout”, page:4-17).

4.3.4 Tracing while grinding

It is possible to perform the next tracing while grinding.

Set the frame and press **TRACE**. The lamp at **TRACE** lights.

After the main body starts rough-grinding the lens, the tracing unit starts next tracing. When the grinding is over, press **DATA SET**. The data of the traced outline will be set and shown on the display panel.

4.3.5 Stop of tracing

To stop tracing, follow the instructions below.

4.3.5.1 Stop of frame tracing

1. Press **TRACE**.
The stylus stops moving.
2. Press **TRACE** again.
The stylus returns to its original position and the frame will be released.

4.3.5.2 Stop of pattern or dummy lens tracing

1. Press **TRACE**.
The tracing pin returns to the center.
2. Remove the tracing pin.
3. Press **TRACE** again.
The tracing pin setting hole returns to its original position and stops.

4.4 Layouts

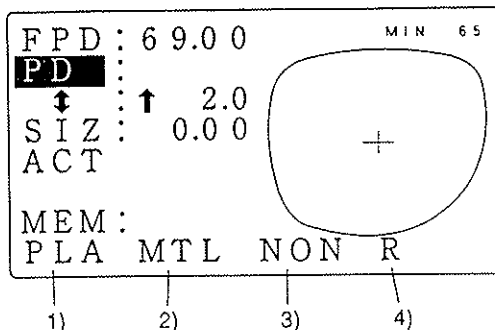
4.4.1 Inputting grinding conditions and layouts

1. Input the grinding condition.

- 1) Specify the lens material with **(LENS)**.
 [PLA (plastic), PC (polycarbonate),
 ACR (acrylic resin)]

CAUTION.

- Be sure to specify the correct lens material.
 Lifetime of grinding wheel may be shortened.
- Do not grind the glass lens.
 LE-7070PLB cannot grind the glass lenses. If it grinds them, the fine grinding wheel and polishing wheel may be damaged and polishing may not be done any more.



- 2) Select beveling or flat (rimless) edging with **(FRAME)**.
 [MTL, CEL(ZYL), PNT, NYL]
 Flat (rimless) ⇒ Select [PNT] or edging [NYL]
 Beveling ⇒ Select [MTL] or [CEL](ZYL)

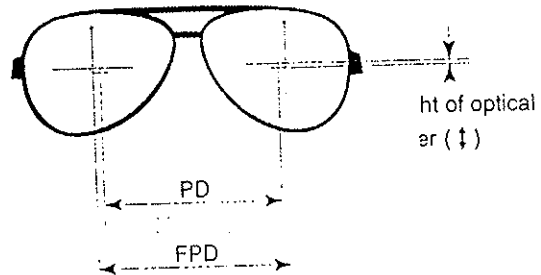
Grinding mode	(FRAME)	(MODE)
Beveling	MTL/CEL (ZYL)	NON
Beveled edge polihsing	MTL/CEL (ZYL)	GUI
Flat (rimless) edging	PNT/NYL	NON
Flat edge polishing	PNT/NYL	POL

- 3) Select whether to perform polishing or not with **(MODE)**.
 [POL, NON]
 To polish the lens edge ⇒ POL mode
 Without polishing ⇒ NON

4) Specify the side of the grinding lens with **(R/L)**.
 [R (right) or L (left)]

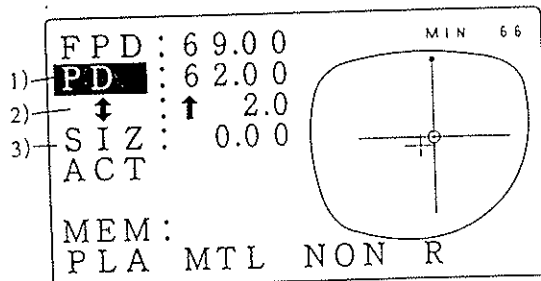
2. As necessary, change the setting of the layout mode.
 Align the cursor (█) to the layout mode position and select the desired mode by pressing **(SELECT)**.
 [ACT (Active mode), BF (Bifocal mode), PAS (Passive mode)]
 [11.3 Selection of Blockings] (Page: 11-4)

3. Enter each data of the lens layout.
 Input values of FPD, PD and height of the optical center.



1) Input the PD value from the prescription.
 Align the cursor to **PD** and input the PD value with **(+)** and **(-)**.¹

2) Input height of the optical center.
 Align the cursor to **↑** and input height of the optical center from the level of the rim center with **(+)** and **(-)**.²

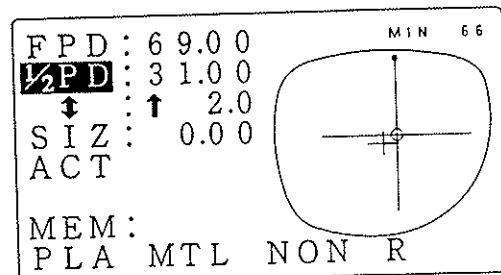


¹ PD can also be entered by monocular PD. It is a form to input the right and left distances measured from the center of the bridge to the eye point separately.

1) Align the cursor to **PD** and press **(SELECT)**.

The **PD** changes to **1/2PD**.

2) Input the monocular PD with **(+)** and **(-)**.



² You can also enter the height of the optical center by eye height from the bottom of the lens outline. (See "4.4.2 Inputting height from lens outline", page: 4-14.)

- 3) When the finished lens size should be compensated, move the cursor to **SIZ** and input the compensation value with \oplus and \ominus .
e.g. +1.00 : Finished lens size becomes 1 mm bigger.

The minimum lens diameter required for grinding is shown on the top right of the display at MIN.

NOTE

· This value is provided just for reference purpose. It is recommended to use the lens of 2 ~3 mm longer diameter in case the optical center and the center of the lens is not the same.

4.4.2 Inputting height from the lens outline

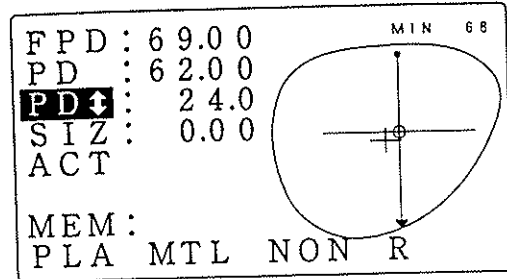
1. Select the input form.

Move the cursor to **PD** and press

SELECT.

PDHeight of the optical center from the straight-down point on the lens outline.

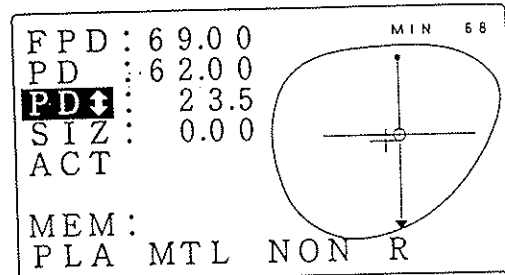
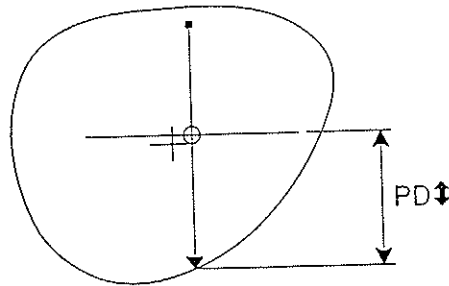
BTHeight of the level of optic center from the lowest point of the outline.



2. Input the height of the optical center.

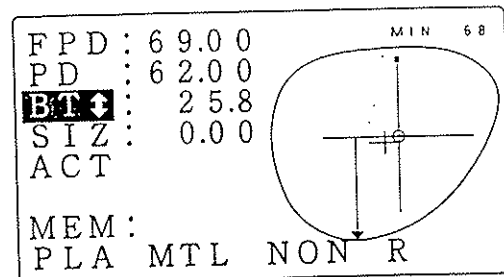
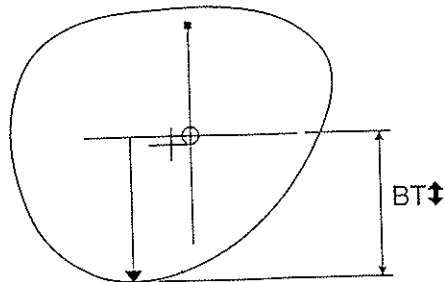
e.g. If the height of the optical center from the straight-down point on the outline were 23.5mm;

PD : 23.5



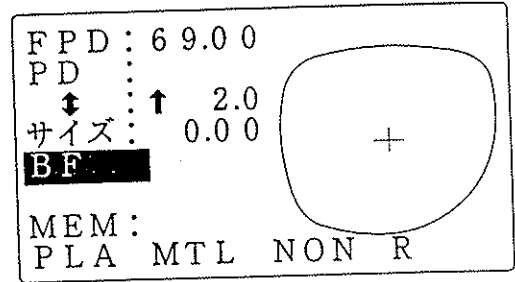
e.g. If the height at the level of the optical center from the lowest point of the outline were 25.8mm;

BT : 25.8

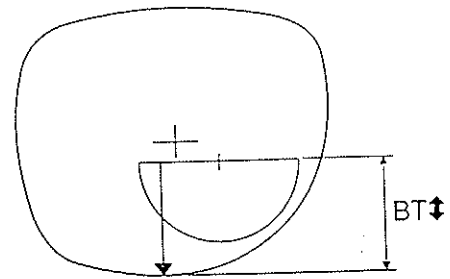
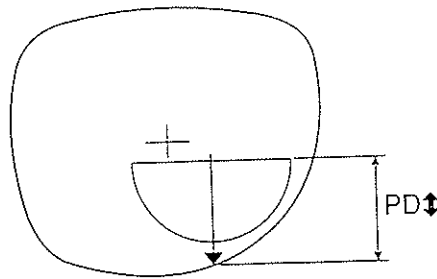
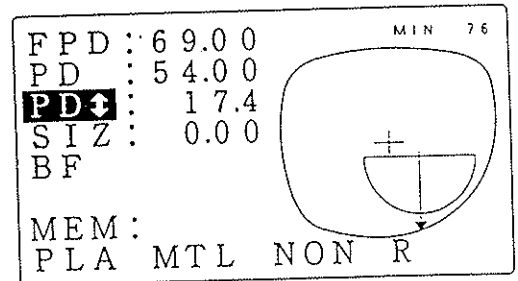


4.4.2.1 Layout of bifocal lenses

1. Enter the grinding conditions.
See "4.4.1 Inputting grinding conditions and layouts" (Page: 4-11).
2. Select **BF** (bifocal) for the layout mode.
3. Input the prescribed PD for near portion at **PD**.
4. Align the cursor to **↕** and select **PD↕** or **BT↕** with **(SELECT)**.
5. Input the segment height.



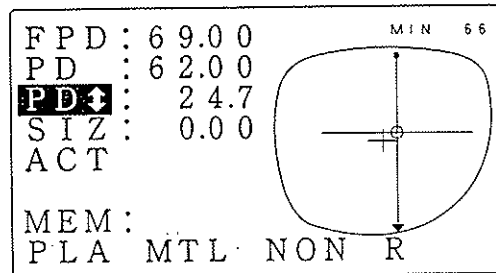
PD **↕**: From the center of the top line of the segment to the straight-down point on the lens outline.
 BT **↕**: From the center level of the segment top line to the lowest point on the lens outline.



For the blocking procedure, see "4.5.3 Blocking bifocal lenses". (Page: 4-20)

4.4.2.2 Layout of progressive power lenses

1. Enter the grinding conditions.
See "4.4.1 Inputting grinding conditions and layouts" (Page: 4-11)
2. Select **ACT** (Active) for the layout mode.
3. Input the prescribed PD at **PD**.
4. Input the height of the eye point marked on the dummy lens.
See "4.4.2 Inputting height from the lens outline". (Page: 4-14)



For the blocking procedure, see
"4.5.1.1 Blocking progressive power lenses". (Page: 4-19)

4.4.3 Eye point layout

This is a form to input the optical center by the distance from the nasal and bottom side of the lens outline.

This form serves to specify the position of the eye point, which is marked on the dummy lenses, as the optical center.

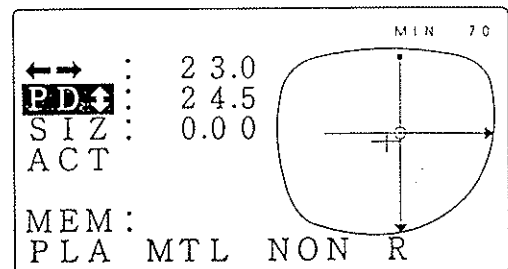
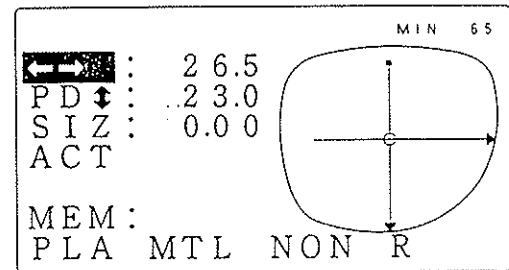
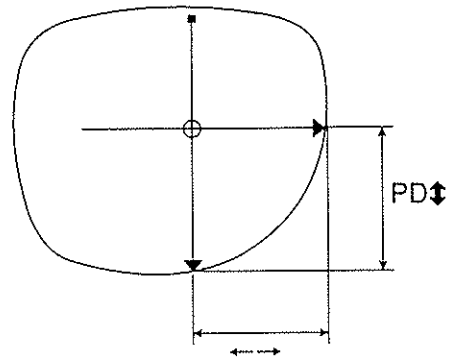
1. Align the cursor to **EPD** and press **(SELECT)**.

The display changes as shown in the right figure.

The mark "⊕" in the traced outline shows the position of the eye point.

The display with **EPD** returns if **(DATA SET)** is pressed again.

2. Input the distance from the eye point to its nasal level point on the lens outline at **←→**.
3. Input the height of the eye point from its straight-down point on the lens outline at **PD↕**.



4.5 Lens Blockings

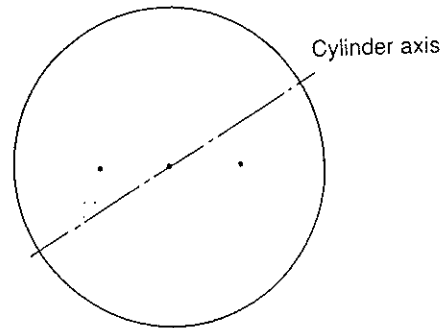
Blocking position of the suction cup varies with layout modes (Active mode, Bifocal mode, Passive mode). See "11.3 Selection of Blockings" (Page: 11-4)

4.5.1 Blocking by active mode

1. Mark at the optical center of the lens with a lensmeter.

When the lens has cylinder power, align the cylinder axis angle of the lens to the prescription value before marking.

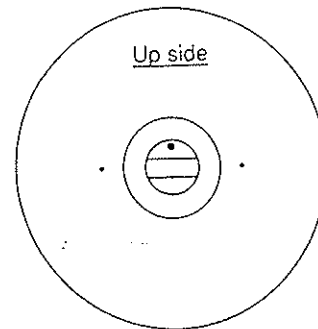
It is best to use NIDEK Auto lensmeter for this purpose.



2. Block the convex surface of the lens with a suction cup.

Direct the top mark on the cup to the up side of the lens.
Be careful not to block the wrong side up, especially for dual-tone colored lens.

It is best to use NIDEK Centering device Model CE-1 for blocking.

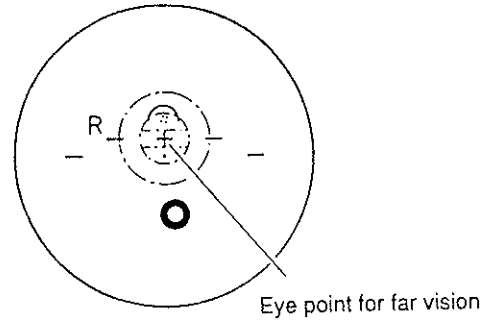


NOTE

For blocking a polycarbonate lens, use a leap cup in order to prevent the cup from moving while grinding.

4.5.1.1 Blocking progressive power lenses

Block the lens with a centering device at the eye point printed on the lens.



4.5.2 Blocking by passive mode

This is a procedure to block at the rim center by decentering the optical center, when PAS↓ (Passive) is selected for the layout mode, now much and in what direction the optical center should be decentered appears at PAS↔↓ after lens layout is finished. The on-the-frame-center blocking can be achieved by decentering the lens position as indicated.

FPD :	6 4.0 0	MIN 73
PD :	6 0.0 0	
↓ :	↓ 5.0	
SIZ :	0.0 0	
PLA↔ :	→ 2.0	
↓ :	↓ 5.0	
MEM :		
PLA	MTL	NON R

1. Mark at the optical center with a lensmeter.

See step 1. of "4.5.1 Blocking by active mode". (Page: 4-18)

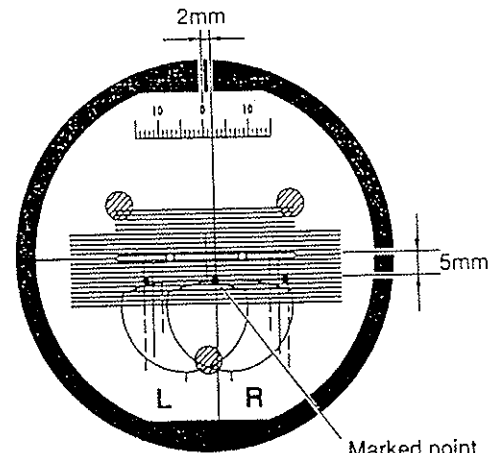
2. Block the convex surface of the lens with a suction cup.

Decenter the optical center according to the indications at PAS↔↓.

e.g. PAS↔: → 2.0

↓: ↓ 5.0

Decenter the optical center 2.0 mm to the right and 5.0 mm to the bottom.



When using NIDEK centering device CE-1

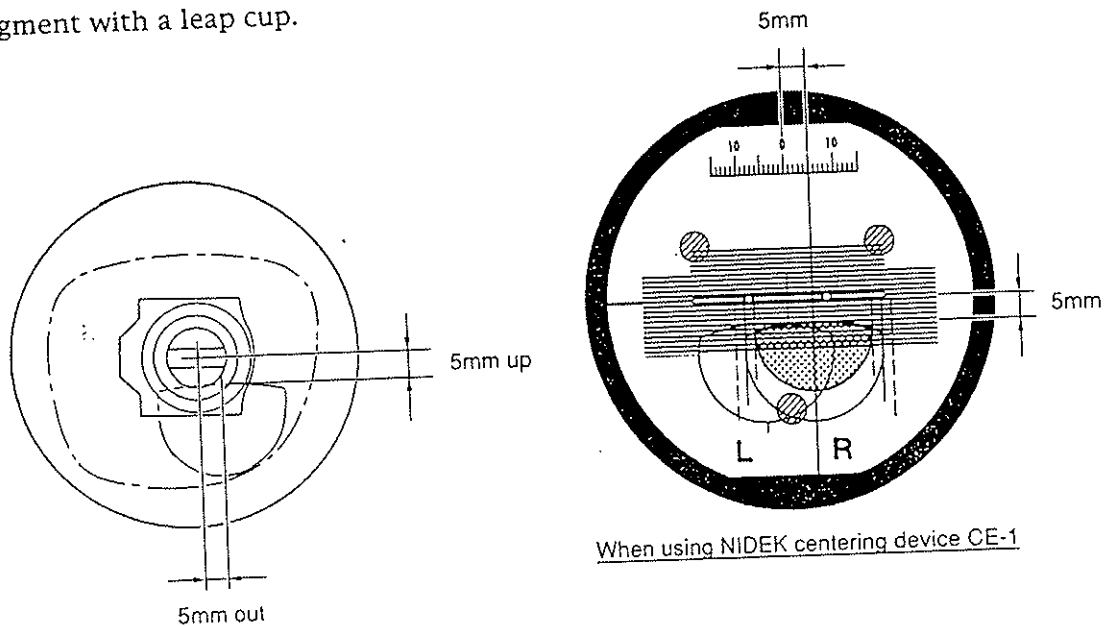
NOTE

For blocking a polycarbonate lens, use a leap cup in order to prevent the cup from moving while grinding.

4.5.3 Blocking bifocal lenses

When BF (bifocal) is selected for the layout mode, be sure to block the lens in the way mentioned below. See "4.4.2.1 Layout of bifocal lenses" (page: 4-15).

Block the lens at 5 mm up and 5 mm out position from the top line center of the segment with a leap cup.



4.6 Grindings

Grinding mode is specified by the combination of **FRAME** and **MODE** settings. See step 1. of "4.4.1 Inputting grinding conditions and layouts" (page: 4-11).

Grinding mode	FRAME	MODE
Beveling (See page: 4-21.)	MTL/CEL (ZYL)	NON
Beveled edge polishing (See page: 4-27.)	MTL/CEL (ZYL)	POL
Flat (rimless) edging (See page: 4-28.)	PNT/NYL	NON
Flat edge polishing (See page: 4-29.)	PNT/NYL	POL

4.6.1 Bevel placements

In the beveling, select the most proper grinding mode for the kinds of lens.

Grinding mode Lenses	AUT (Blank)	GUI			
		CRV	FRNT	REAR	RATIO
Monofocal lenses	<input checked="" type="radio"/>	<input checked="" type="radio"/>			<input type="radio"/> *1
Special lenses					
Progressive power	<input checked="" type="radio"/>	<input checked="" type="radio"/>			
Bifocal	<input checked="" type="radio"/>	<input checked="" type="radio"/>			
Cataract				<input checked="" type="radio"/>	
EX				<input checked="" type="radio"/>	

- : Most proper mode
 : Recommendation mode

NOTE

· The Auto grinding mode cannot be used for the EX and cataract lenses. Select the Guided grinding mode with the rear base curve.
See "4.6.1.3 In the case of EX lens and cataract lens" (page: 4-26).

4.6.1.1 Auto grinding mode

This mode is used to perform the computer beveling.

1. Confirm that the grinding mode setting is as follows.

FRAME : MTL or CEL (ZTL)

MODE : NON

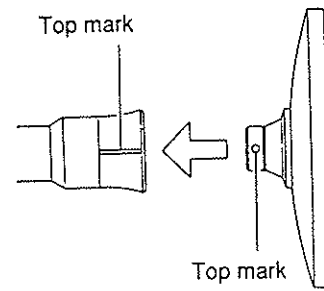
FPD : 6 9.0 0	
PD : 6 2.0 0	
<input checked="" type="radio"/> <input checked="" type="radio"/> : <input checked="" type="radio"/> 2.0	
SIZ : 0.0 0	
ACT	
MEM :	
PLA MTL NON R	

* 1 Please select the ratio from the following table.

- Low (+) power monofocal lens ⇒ 5 : 5
- Middle and high (+) power monofocal lens, Low (-) power monofocal lens ⇒ 4 : 6 or 5 : 5
- Middle (-) power monofocal lens ⇒ 3 : 7 or 4 : 6 · Low (-) power monofocal lens ⇒ 3 : 7

2. Set the lens to the adapter in the grinding unit.

Align the top marks on the suction cup and the adapter and insert the suction cup firmly.



3. Close the soundproof cover.

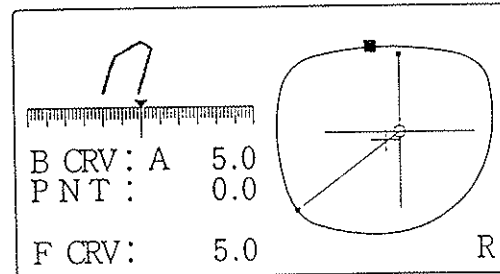
⚠ WARNING

· Be sure to close the soundproof cover while grinding the lens.
Splashes including the grinding waste may damage your eye.

4. Start grinding.

Press **(START·STOP)**.

- ① Lens chucking
↓
- ② Lens shape measurement
↓
- ③ Rough-grinding
[The display changes to bevel simulation.]
↓
- ④ Fine-grinding
↓
- ⑤ Grindings are complete.
[Layout display returns.]



* When the display changes to bevel simulation at step ③, sectional view position line rotates along the trace outline, and bevel section at that position will be shown.

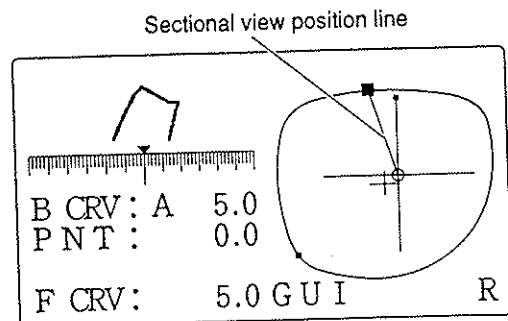
5. Take out the finished lens.

- 1) Open the soundproof cover.
- 2) Press **(CHUCK)** and take out the lens.

4.6.1.2 Guided grinding mode

This mode allows you to specify the bevel curve and position at will.

1. Start the grinding in the same way of the Auto grinding mode.
See "4.6.1.1 Auto grinding mode" step 1.~4. (page: 4-21).
2. Select Guided grinding mode.
Before the rough-grinding is finished, press **(SELECT)**.

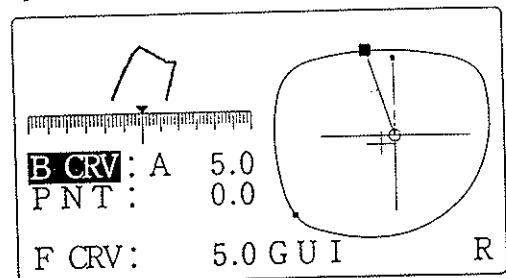


After the lens shape is measured or rough-grinding is finished, the machine goes into the guided grinding mode and pauses.

3. Simulate the bevel section at each point of the outline on the display.
 - (+)**: The sectional view position line rotates counterclockwise.
 - (-)**: The sectional view position line rotates clockwise.
 - If **(+)** or **(-)** is pressed again, the line stops rotating.
 - (SELECT)**: The sectional view position line jumps to the point that the lens edge is thinnest (■) and thickest (■) alternately.
4. Adjust the bevel position.

(a) To change the bevel position only at the part that the edge is thick.

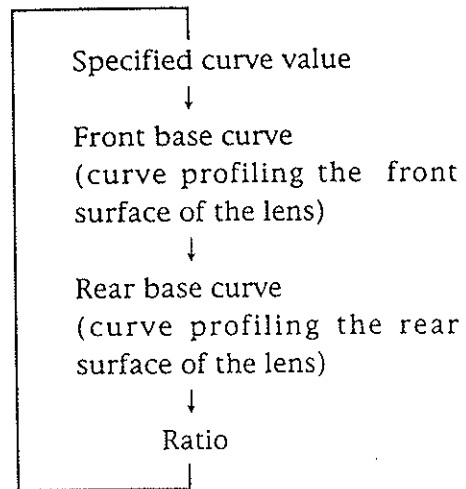
- 1) Align the cursor to **B CRV**.
- 2) Change the **B CRV** value to move the bevel position toward the front or rear surface of the lens.
 - (-)**: The bevel moves toward the front surface.
 - (+)**: The bevel moves toward the rear surface.



The "A" mark on the head of the value means that it is calculated by computer (and is the most suitable curve value). This value produces the same bevel curve that is processed by auto grinding mode.

-
- While the simulation display is presented, it can be changed to the layout display by pressing **(MENU)**. The layout display here, however, is just a reminder and its data cannot be changed. The simulation display returns by pressing **(MENU)** again, but once grinding has started, the display will not be able to change any more.

(SELECT): The curve of the front base curve (FRNT) or rear base curve (REAR) will be selected.

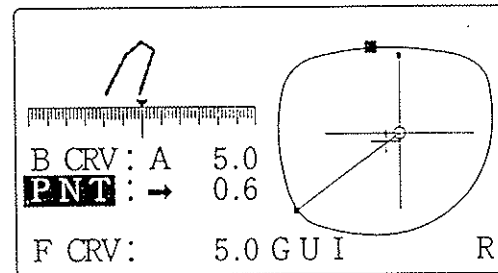


NOTE

• The curve value can only be selected within a range that bevel is on the lens edge.

(b) To change the position of whole bevel parallel to itself.

- 1) Align the cursor to **PNT**.
- 2) Press **(SELECT)** to simulate the bevel at the point that the edge is thinnest (■).



- 3) Change **B:CRV** value to move the bevel position toward the front or rear surface of the lens.

(-): The bevel moves toward the front surface.

(+): The bevel moves toward the rear surface.

The arrow at the value shows the direction that the bevel was moved.

e.g. B CRV: A5.0


PNT : → 0.6

This shows that the bevel was moved 0.6 mm toward the rear surface parallel to itself while **B:CRV** value was 5.0.

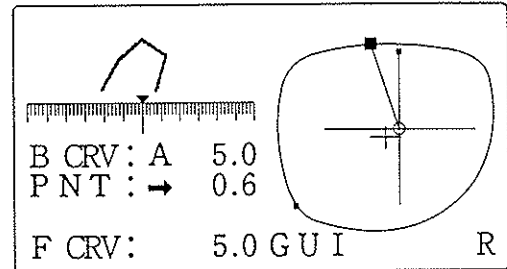
NOTE

• To prevent the bevel from coming off the thinnest position of edge, change the **PNT** value while checking the simulation at the thinnest position.

5. Check the bevel section.

- 1) Press  to let the cursor disappear.
- 2) Simulate the whole bevel to check if the desired bevel is obtained.
See step 5.

6. Repeat steps 3.~5. until desired bevel is obtained.



7. Start grinding.

Press **START STOP**.

① Rough-grinding



② Fine grinding



③ Grindings are complete. [Layout display returns.]

8. Take out the finished lens.

4.6.1.3 In the case of EX lens and cataract lens

This mode serves to edge the EX lens and cataract lens. In this mode, the bevel curve will be set to the curve of the rear lens surface.

NOTE

- Use the leap cup for blocking.
- The suction cup cannot hold the convex surface of the lens well enough.
- The cup may move during blocking.

1. Start grinding in the same way of Auto grinding mode.

See "4.6.1.1 Auto grinding mode, step 1.~4." (page 4-21).

2. Select the guided grinding mode.

Before the rough-grinding is finished, press **(SELECT)**.

After the lens shape is measured or the rough-grinding is finished, the machine goes into the guided grinding mode and pauses.

3. Select rear base curve.

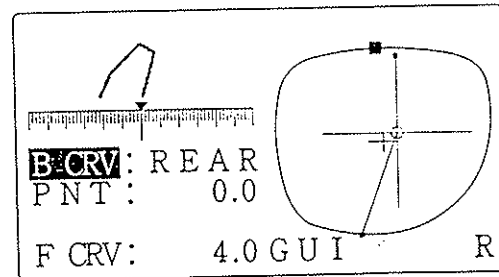
1) Align the cursor to **B:CRV**.

2) Select the REAR with **(SELECT)**.

4. Start grinding.

Press **(START·STOP)**.

5. Take out the finished lens.

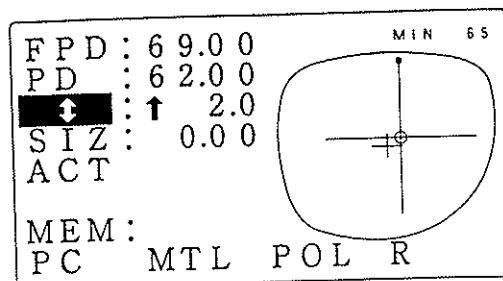


4.6.2 Beveled edge polishing

After the beveling, the lens edge is polished.

1. Confirm that grinding mode setting is as follows.

FRAME : CEL (ZYL) or MTL
MODE : POL



2. Set the lens to the adapter.
3. Close the soundproof cover.

⚠ WARNING

· Be sure to close the soundproof cover while grinding the lens.
 Splashes including the grinding waste may damage your eye.

4. Start grinding.*¹

Press **START·STOP**.

- ① Lens chucking
- ↓
- ② Lens shape measurement
- ↓
- ③ Rough-grinding [The display changes to bevel simulation.]
- ↓
- ④ Fine-grinding
- ↓
- ⑤ Polishing
- ↓
- ⑥ Grindings are complete. [Layout display returns.]

*When the display changes to bevel simulation at step ③, sectional view position line rotates along the trace outline, and bevel section at that position will be shown.

5. Take out the finished lens.

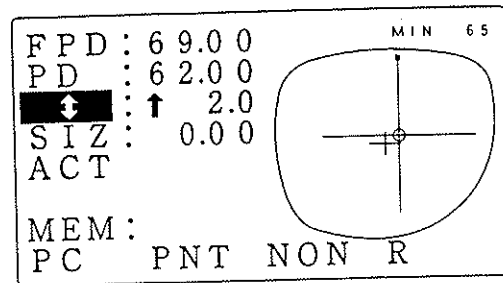
¹ To change the bevel curve and position, see "4.6.1.2 Guided grinding mode, step 2.~7. (page: 4-23).

To grind the EX lens and cataract lens, see "4.6.1.3 In the case of EX lens and cataract lens, see step 2.~4. (page: 4-26).

4.6.3 Flat (rimless) edging

1. Confirm that grinding mode setting is as follows.

FRAME : PNT*¹ or NYL
MODE : NON



2. Set the lens to the adapter.
3. Close the soundproof cover.

⚠ WARNING

· Be sure to close the soundproof cover while grinding the lens.
 Splashes including the grinding waste may damage your eye.

4. Start edging.

Press **(START·STOP)**.

- ① Lens chucking
- ↓
- ② Lens shape measurement *²
- ↓
- ③ Rough-grinding
- ↓
- ④ Fine-grinding
- ↓
- ⑤ Grindings are complete.

5. Take out the finished lens.

*¹ When PNT (Two point) is selected, perform auto-correction of FPD.
 FPD auto-correction is the function which is changed the value of FPD in connection with the change of size value.

*² The “áA Lens shape measurement” will not be performed if parameter item “Measure in flat edge” is set to “None”. See “5.2 Parameter Settings” (page: 5-2).