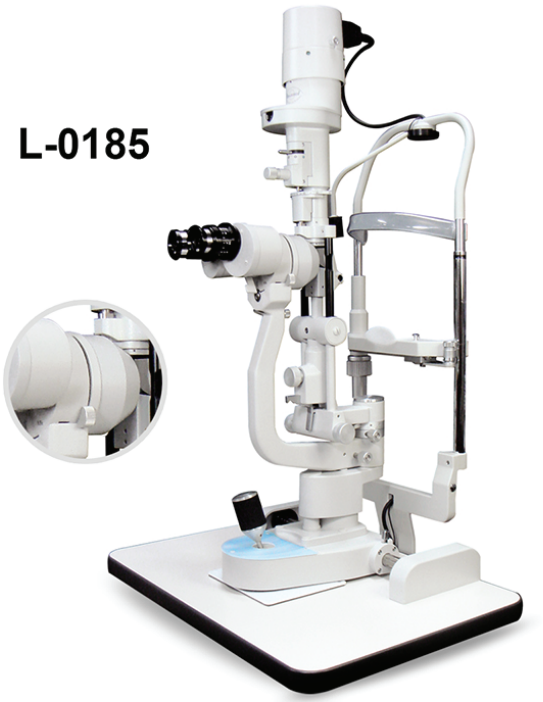
Inami

CLINICAL SLIT LAMP - SERIES

MANUAL

HALOGEN & LED

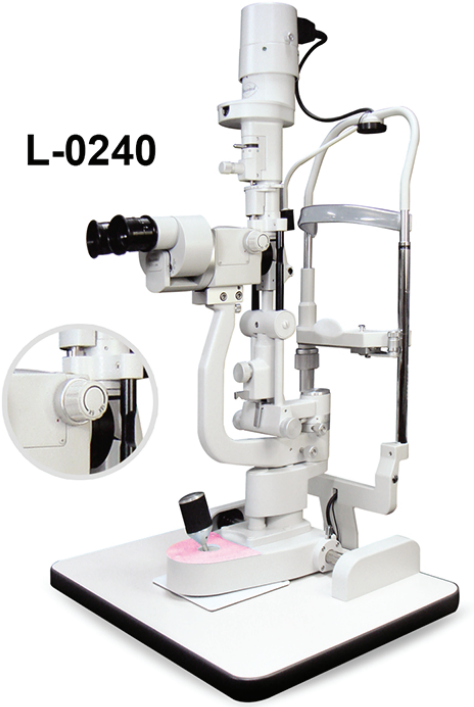
L-0185



L-0187

L-0189

L-0240



VIEWLIGHT
POWERED BY INNOVATION

MADE IN JAPAN

Before use this instrument, be sure to read this manual

EN

CONTENTS

Notice

1)In order to keep the instrumentinthe best condition, please readthis manual and performthe inspectionsof the instrument.

2) Please store the instrument avoiding humidity.

3)Beforeyou move this instrument, pleaseholdthe armand tightenthe handle to lockthe first arm.

The instrument with locked arm should be movedslowly.

4) The content of this manual maybe changed without prior notice according to the update of the product specification.

5) This manual is created completely. Please contact your dealer in the unlikely event that you find any

errors in writing or missing stated points.

6) The manual will be replaced with new one if it hasmanufacturing defects. Please contact your dealer.

Indication

Name plate

Caution

CF. instruciton manual

The name of the maker the location

Safety Instructions

Please read this operation manual carefully before using the instrument.
This manual should be kept in a place where it is available for the operator whenever they need.
You must follow the safety instructions below that describes the important precautions.
The symbols and their meanings are as follows.

⚠	**Danger**	indicates that death or serious physical injuries ***will*** occur if necessary safety precautions are not taken.
⚠	**Warning**	indicates that death or serious physical injuries ***can*** occur if necessary safety precautions are not taken.
⚠	**Caution**	indicates that a slight physical injury or material damage ***can*** occur if necessary safety precautions are not taken.

Material damage means expanded damages related to houses, household goods, etc.

⚠ Warning

・During the replacement of parts, make sure to set main power switch OFF (O).
If you operate while energizing, it will cause electric shock.
・Do not tilt the body of the main unit more than 10 degrees.
Physical injury or material damage of houses and other instruments can occur if the unit falls over.

⚠ Caution

・Do not use other than AC 220V.
The equipment cannot be used except for the specified power supply voltage.
Using wrong power supply voltage may cause ignition.
・Make sure to install the ground wire.
Electric shock may be caused when mechanical failure or electric leakage occurs.
・When unplugging /plugging in the power supply plug, hands must be dry to unplugging / plugging in the outlet with insertion plug.
Electric shock or ignition caused by short-circuit may occur.
・Do not use the power supply cord and plugs when they are deteriorated or damaged.
Electric shock or ignition caused by short-circuit may occur.
・Do not take following actions: damaging, bending with force, pulling, twisting and bundling the power supply cord as well as putting heavy things on it and pressing it.
The power cord may be damaged resulting in fire or electric shock.
・Keep the power cord clean at all times so that there is no dirt, oil etc.
If the terminal part is dirty, it may cause mechanical breakdown or fire.
・Except for medical treatment hours, please unplug the plug from the outlet.
It may cause electric leakage or fire.
・Do not use bulbs, fuses, electric parts other than specified.
There is risk of fire caused by heating.
・Handle lenses and mirrors carefully.
When lenses and mirrors are scratched, it will not be possible to observe properly.
・Do not use lenses other than specified.
When wrong lens are used, it will not be possible to observe with the proper focus and magnification.
・When setting the main unit with the table, fix them firmly with the handle of the table clamping system.
If the unit slides sideways on the table and falls over, physical injury or material damage of houses and other instruments can occur.
・Please never disassemble the unit body.
Disassembling the unit body will cause mechanical breakdown or fire.

1. L-0185 SLIT LAMP

New L-0185 & L0185DC, top line 911 series of INAMI Slit Lamp microscope, are now available with advanced features. L-0185 & L0185DC are designed based on experience of INAMI for over 90 years in designing, qualifying and manufacturing high quality ophthalmic instruments.

① Lamp Housing Cover
② Slit Length Scale
③ Filter Control Lever
④ Slit Rotation Control Lever and Slit Length Control Knob
⑤ Prism Housings
⑥ Eyepiece Focus Adjustment Ring
⑦ Eyeiece
⑧ Lever for converting magnification
⑨ Centering Screw
⑩ Slit Tilt Stops
⑪ Slit Tilt Latch
⑫ Slit Width Control Knob
⑫-A Slit Width Control Scale
⑬ Microscope Arm
⑭ Joystick (Horizontal & Vertical direction control)
⑮ Illumination Control Knob
⑯ Pilot Lamp
⑰ Power Switch
⑱ Joystick Glide Plate

⑲ Lamp Housing Cover Retaining Nuts
⑳ Headrest
㉑ Focusing Rod
㉒ Angle Scale Ring
㉓ Angle Index Ring
㉔ Illumination Arm Lock
㉕ Microscope Arm Lock
㉖ Horizontal Motion Lock㉗ Rack Cover
㉘ Control for Chinrest

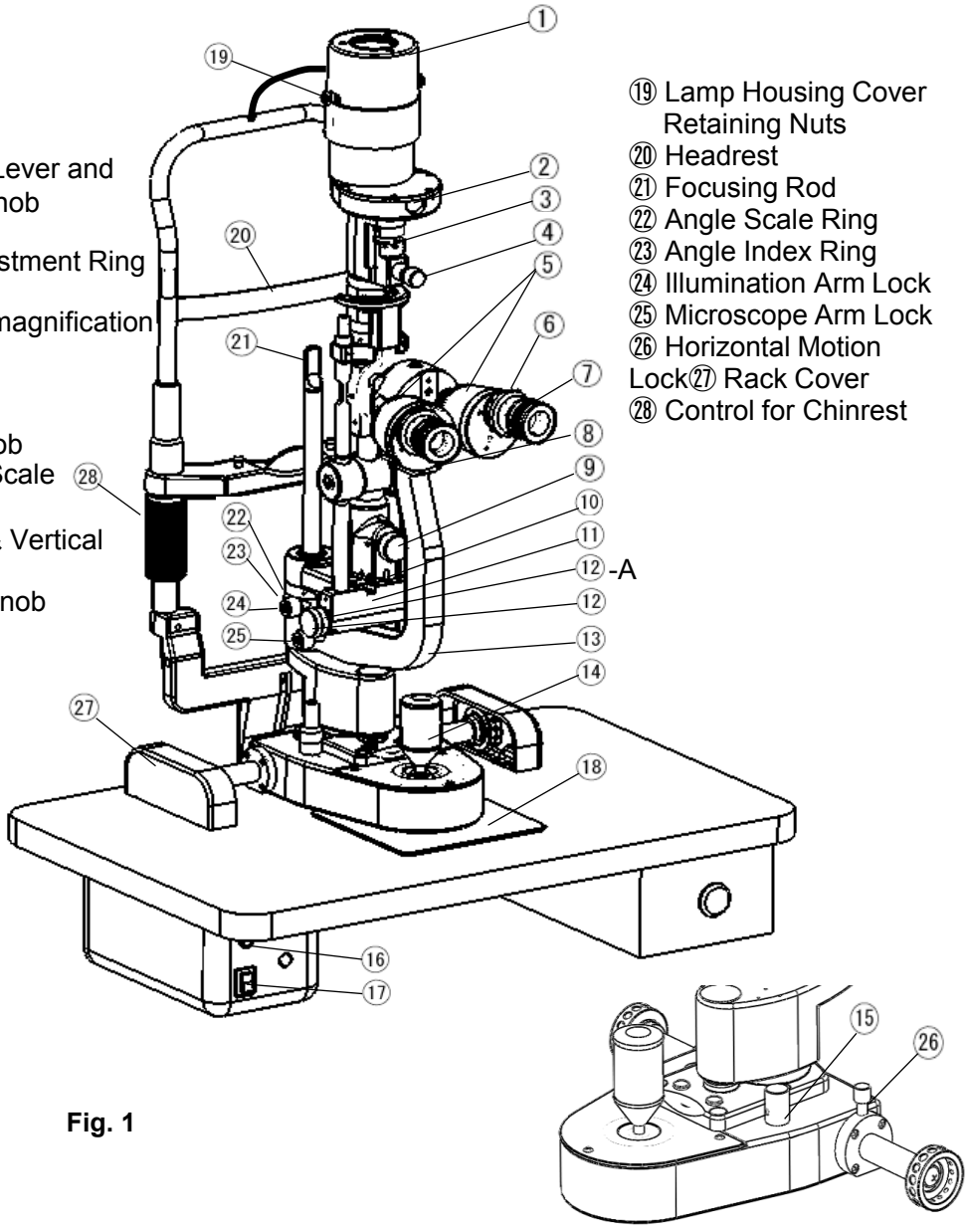


Fig. 1

Specification : L-0185

Converging binocular microscope		
Eyepiece	Eyepiece magnification: 10x, 16x Total magnification: 10x, 16x, 25x	Objectives magnification: 1x, 1.6x
P.D.adjustment	52-90mm (w/10x eyepieces)	
Illumination unit		
Slit	Slit image rotation angle: 0 - 180°, Slit diaphragm disc: 10 / 6 / 4 / 3 / 2 / 1 / 0.2mm Wedge-shaped diaphragm for variable slit lengths	Tilting illumination: 5, 10, 15, 20°
Filter	Unfiltered (Opened aperture), Cobalt blue, ND(T:50%), Heat absorbing, Red free filter	
Controller	Joystick (Horizontal & Vertical direction, coaxial control)	
Light source	12V/50W Halogen bulb (L0160H1) *prefocused	
Optional accessories		
Applanation tonometer, Fixation lamp		

2. L-0187 SLIT LAMP

INAMI L-0187 Slit Lamp microscope provides all the features required to perform a complete slit lamp examination for eye care professionals. L-0187 is designed based on experience of INAMI for over 90 years in designing, qualifying and manufacturing high quality ophthalmic instruments.

① Lamp Housing Cover
② Slit Length Scale
③ Filter Control Lever
④ Slit Rotation Control Lever and Slit Length Control Knob
⑤ Prism Housings
⑥ Eyepiece Focus Ring
⑦ Eyepiece
⑧ Magnification Control Knob
⑨ Centering Screw
⑩ Slit Tilt Stops
⑪ Slit Tilt Latch
⑫ Slit Width Control Knob
⑫-A Slit Width Control Scale
⑬ Microscope Arm
⑭ Joystick (Horizontal & Vertical direction control)
⑮ Illumination Control Knob
⑯ Pilot Lamp
⑰ Power Switch
⑱ Joystick Glide Plate
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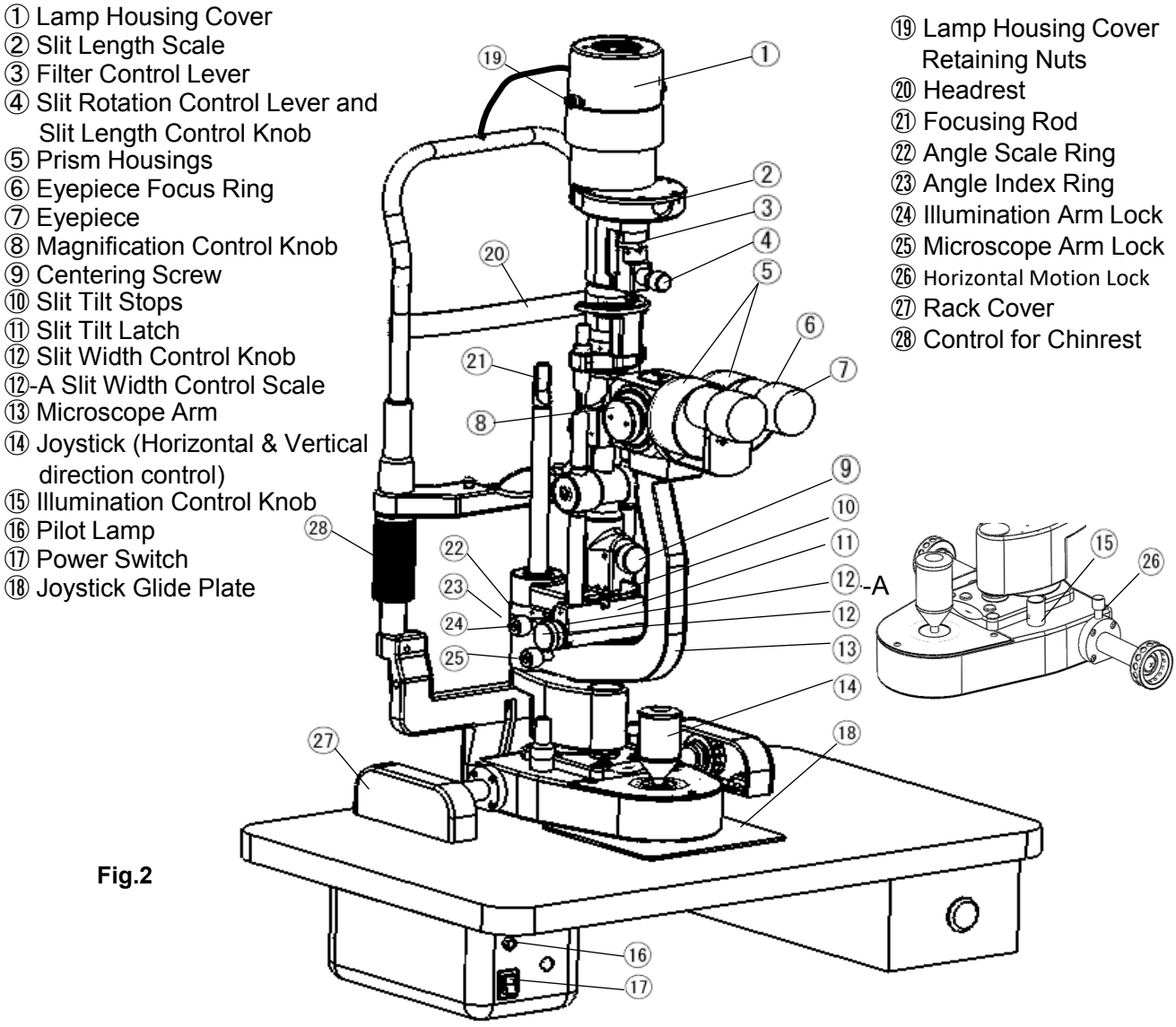


Fig.2

Specifications : L-0187

Parallel tube stereomicroscope	
Eyepiece	Eyepiece magnification: 12.5x, Variable magnification: 10x, 16x, 25x
	Working distance: 98mm, Diopter adjustment range: - 6D to + 6D
P.D.adjustment	53-83mm
Illumination system	
Slit	Slit length: 0.2, 1, 3, 4, 6, 10mm in steps / 0-10mm continuously variable
	Slit width: 0-10mm continuously variable
	Slit image rotation angle: 0 - 180°, Slit tilt: 5, 10, 15, 20°
Filter	Unfiltered (Opened aperture), Cobalt blue, ND(T:50%), Heat absorbing, Red-free filter
Light source	12V / 50W Halogen bulb (L0160H1) *prefocused
Optional accessories:	
Applanation tonometer, Beam splitter module, Obserbation tube for image rotation, 35mm camera adaptor,35mm SLR camera body with automatic film advance,CCD TV Camera & adaptor	

3. L-0189 SLIT LAMP

INAMI L-0189 Slit Lamp microscope provides all the features required to perform a complete slit lamp examination for eye care professionals. L-0189 is designed based on experience of INAMI for over 90 years in designing, qualifying and manufacturing high quality ophthalmic instruments.

① Lamp Housing Cover
② Slit Length Scale
③ Filter Control Lever
④ Slit Rotation Control Lever and Slit Length Control Knob
⑤ Prism Housings
⑥ Eyepiece Focus Ring
⑦ Eyepiece
⑧ Magnification Control Knob
⑨ Centering Screw
⑩ Slit Tilt Stops
⑪ Slit Tilt Latch
⑫ Slit Width Control Knob
⑫-A Slit Width Control Scale
⑬ Microscope Arm
⑭ Joystick (Horizontal & Vertical direction control)
⑮ Illumination Control Knob
⑯ Pilot Light
⑰ Power Switch
⑱ Joystick Glide Plate

⑲ Lamp Housing Cover Retaining Nuts
⑳ Headrest
㉑ Focusing Rod
㉒ Angle Scale Ring
㉓ Angle Index Ring
㉔ Illumination Arm Lock
㉕ Microscope Arm Lock
㉖ Horizontal Motion Lock
㉗ Rack Cover
㉘ Control for Chinrest

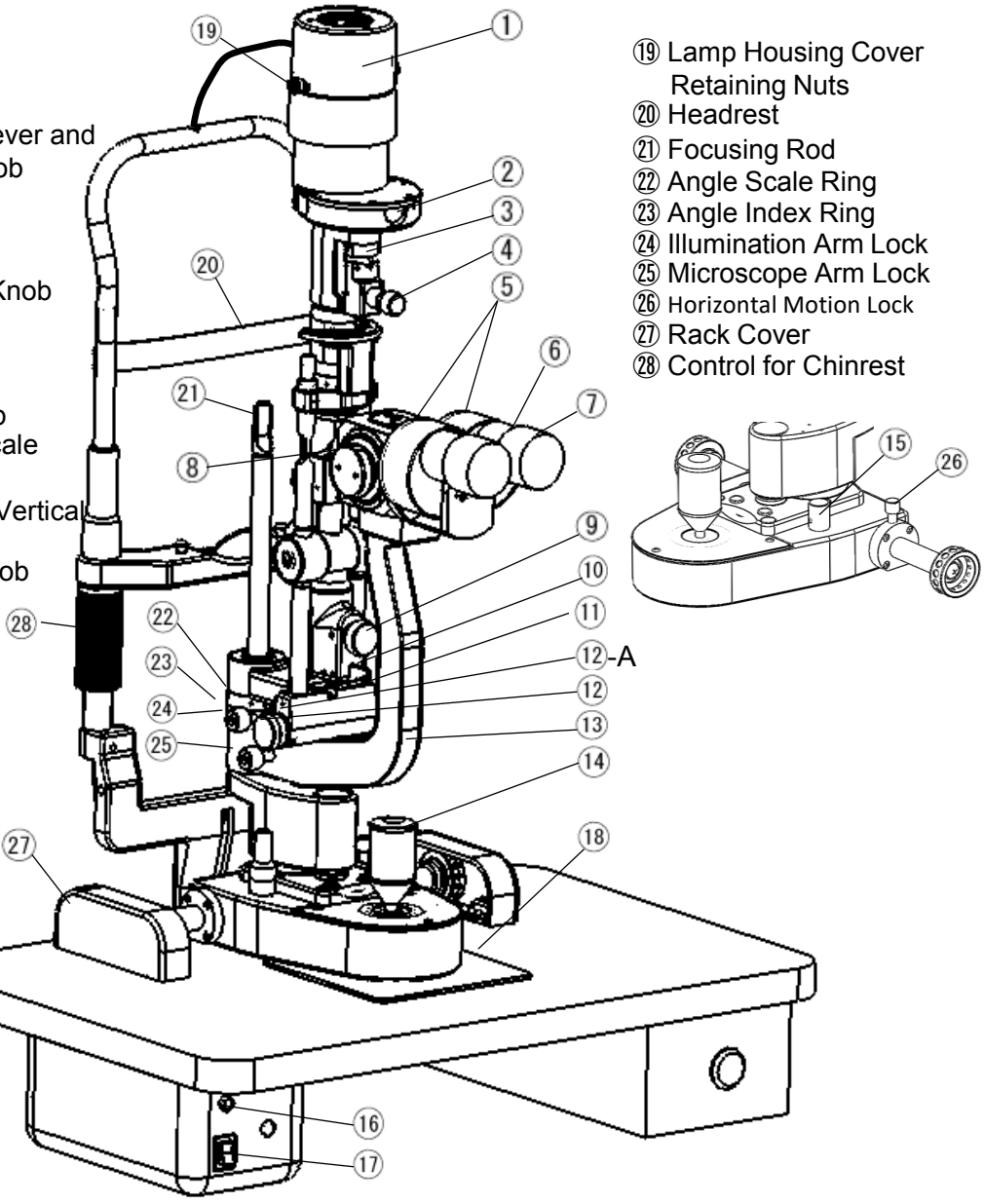


Fig.3

Specifications: L-0189

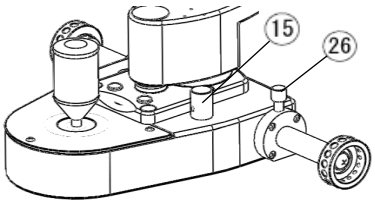
Parallel tube stereomicroscope	
Magnification	Eyepieces: Total Magnification: 12.5x, Variable magnification: 6x, 10x, 16x, 25x, 40x Working distance: 98mm, Diopter adjustment range: - 6D to + 6D
P.D.adjustment	53 - 83mm
Illumination system	
Slit	Slit length: 0.2, 1, 3, 4, 6, 10mm in steps / 0–10mm continuously variable Slit width: 0-10mm continuously variable, Slit image rotation: 0–180°, Slit tilt: 5, 10, 15, 20°
Filter	Unfiltered (Opened aperture), Cobalt blue, ND(T:50%), Heat absorbing, Red-free filter
Light source	12V/50W Halogen bulb (L0160H1) *prefocused
Optional accessories	
Applanation tonometer, Beam splitter module, Obserbation tube for image rotation, 35mm camera adaptor,35mm SLR camera body with automatic film advance,CCD TV Camera & adaptor	

4. L-0240 SLIT LAMP

INAMI L-0240 Slit Lamp microscope provides all the features required to perform a complete slit lamp examination for eye care professionals. L-0240 is designed based on experience of INAMI for over 90 years in designing, qualifying and manufacturing high quality ophthalmic instruments.

① Lamp Housing Cover
② Slit Length Scale
③ Filter Control Lever
④ Slit Rotation Control Lever and Slit Length Control Knob
⑤ Prism Housings
⑥ Eyepiece Focus Ring
⑦ Eyepiece
⑧ Magnification Control Knob
⑨ Centering Screw
⑩ Slit Tilt Stops
⑪ Slit Tilt Latch
⑫ Slit Width Control Knob
⑫-A, Slit Width Control Scale
⑬ Microscope Arm
⑭ Joystick (Horizontal & Vertical direction control)
⑮ Illumination Control Knob
⑯ Pilot Lamp
⑰ Power Switch
⑱ Joystick Glide Plate

⑲ Lamp Housing Cover Retaining Nuts
⑳ Headrest
㉑ Focusing Rod
㉒ Angle Scale Ring
㉓ Angle Index Ring
㉔ Illumination Arm Lock
㉕ Microscope Arm Lock
㉖ Horizontal Motion Lock
㉗ Rack Cover
㉘ Control for Chinrest



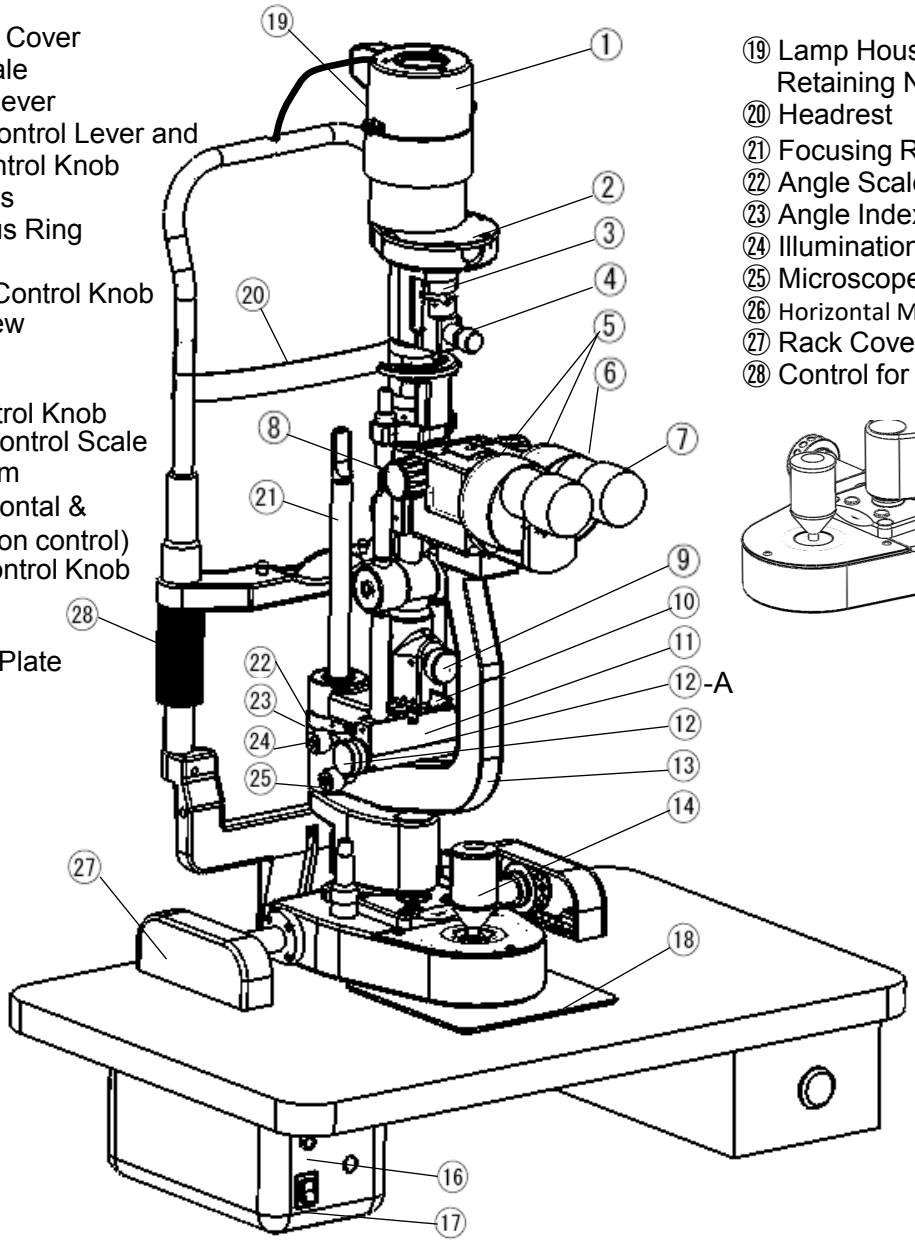


Fig.4

Specifications : L-0240

Parallel tube stereomicroscope	
Eyepieces	Eyepieces: 15x, Variable magnification: 11x – 33x , Working distance: 98mm, Diopter adjustment range: - 6D to + 6D
P.D.adjustment	53 - 83mm
Illumination system	
Slit	Slit length: 0.2, 1, 3, 4, 6, 10mm in steps / 0 – 10mm continuously variable Slit width: 0 – 10mm continuously variable Slit image rotation angle: 0 - 180°, Slit tilt: 5, 10, 15, 20°
Filter	Unfiltered (Opened aperture), Cobalt blue, ND(T:50%), Heat absorbing, Red-free filter
Light source	12V/50W Halogen bulb (L0160H1) *prefocused
Optional accessories:	
Applanation tonometer, Beam splitter module, Obserbation tube for image rotation, 35mm camera adaptor 35mm SLR camera body with automatic film advance, CCD TV Camera & adaptor	

5. Unpacking and Assembling

Unpacking

The whole package of INAMI Slit Lamp is consist of 3 stackable styrofoam hard containers.
They are covered with a durable sheet(Fig. 5).
Each box contains items as below.

Lower container (Fig. 6)
- Microscope with supporting arm
- Illumination unit with supporting arm
- Focusing rod
- 3 hexagonal wrenches for assembling

Middle container (Fig. 7)
- Headrest
- Fixation unit

Upper container (Fig. 8)
- Tabletop (Option)
- Power supply unit
- Accessory box including:
  Dust cover Chinrest papers
  Spare fuses Focusing rod

Assembling

Headrest on tabletop

1) Take out the tabletop and accessaries from the upper container.
2) Place the tabletop upside down on a table or other suitable workbench.
   The headrest side of the table top is made the lamp
   unit side.
3) Unscrew 2 hex socket screws from Headrest mounting bracket using with one of the supplied wrenches (Fig. 9).
4) Unscrew the thumbscrews from the wire retaining plastic plate (Fig. 10).
5) Assemble Headrest to Mounting plate.
   Make sure that the bottom of the plate engages the groove of Headrest. The wires should be in the the goove of the bracket (Fig. 11).
6) Cover with wire retaining plate and tighten with 2 thumbscrews (Fig. 12).

Handgrips (opition for patient use)

1) Screw and attach Handgrips to both side of Headrest (Fig. 13).

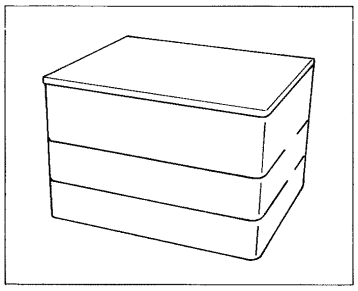


Fig. 5: Shipping container

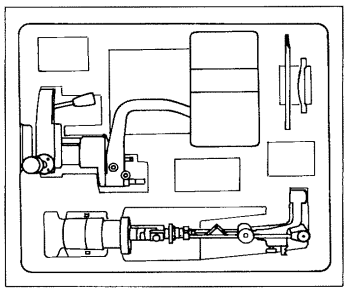


Fig .6: Lower container

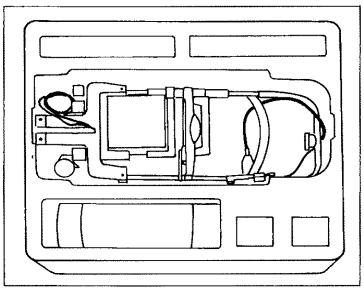


Fig. 7: Middle container

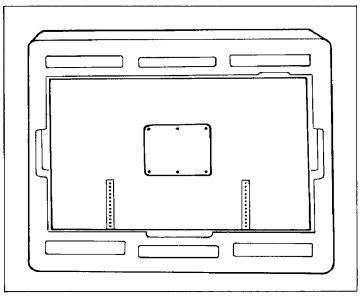


Fig. 8: Upper container

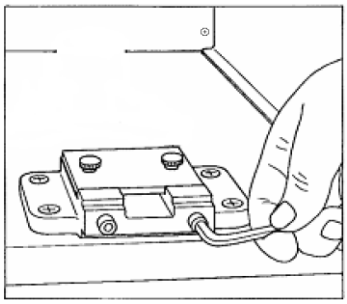


Fig. 9: Unscrewing hex screw from Mounting plate

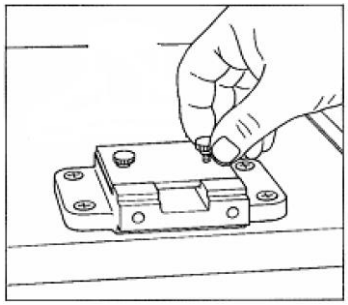


Fig. 10: Unscrewing thumbscrews from wire retaining plastic plate

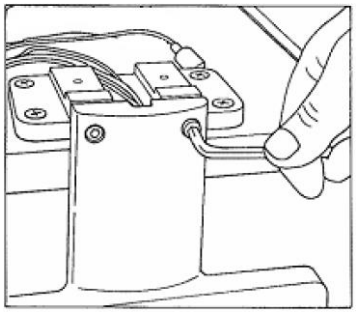


Fig. 11: Assembling Headrest to Mounting plate

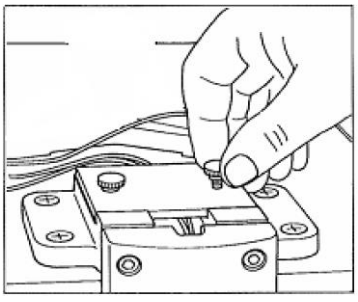


Fig. 12: Fixing Headrest with wire retaining plate and thumbscrews

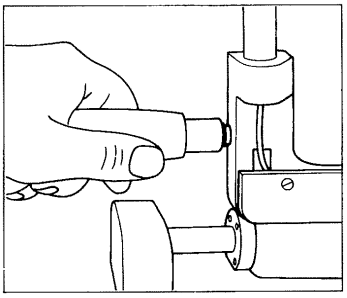


Fig. 13: Attaching Handgrips (option)

Assembling

Base, Microscope, Joystick

1) Place Base (Cross-slide base) and Microscope unit on tabletop. Engage the pinion to the rail. The rollers should engage the same pins on each tracks.
   Place the bottom of Joystick on the teflon plate.
2) Move Base (Cross-slide base) to forward / backward / left / right.
   Check the movement of Joystick and Base (Cross-slide base) is smooth.
3) Install each Rack Cover (Fig. 1-4(27)) by sliding it on the rail.
4) Attach Illumination unit to the shaft on the base sliding it carefully(Fig. 14.)
   Tighten Illumination unit with retaining screw using supplied hex wrench(Fig 15).

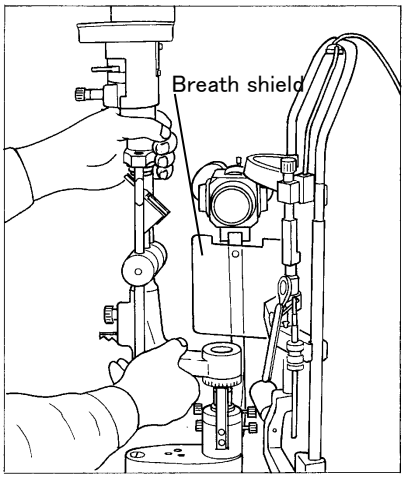


Fig. 14: Installing Illumination unit

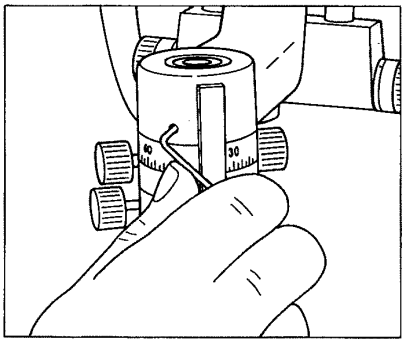


Fig. 15: Tightening Illumination unit with retaining screw

Connecting plugs toTransformer

1) Connect plugs to the receptacles at the back side of the transformer(Fig. 16).
   Plugs to be connected are; AC code, 8 cored cable for illumination adjustment, and banana connector.

- Connect the main power plug to the three pins on the lamp housing cover.
- Connect the lamp plugs (black and red) to the black and red receptacles according to color code.
- Connect the two-pin plug to receptacle No.2.
- Connect the slit lamp base to the tranceformer using the eight core cable.(When you use the digital camera attachment:L-0541DC, connect the cable to receptacle No.3)

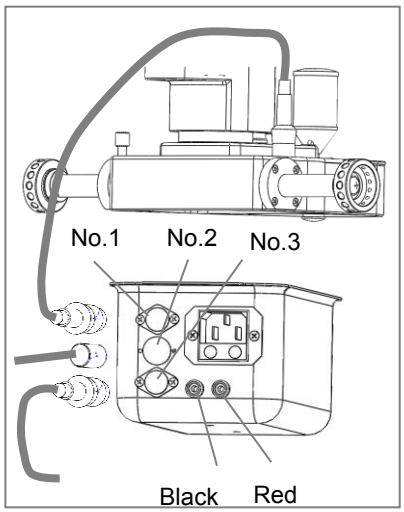


Fig. 16: Transformer case (Rear View)

Focusing

1) Insert the focusing rod in the pivot hole (Fig. 17). Make sure the flat surfece of the focusing rod should be perpendicular to the axis of the microscope.
2) Remove caps from the eyepieces and objective lenses.
3) Turn the instrument on.
4) Adjust the instrument to be in focus and the image become clear while watching a narrow slit image on the surface of the forcusing rod.

Breath shield

1) Attach breath shield to the microscope arm. (Fig. 14)

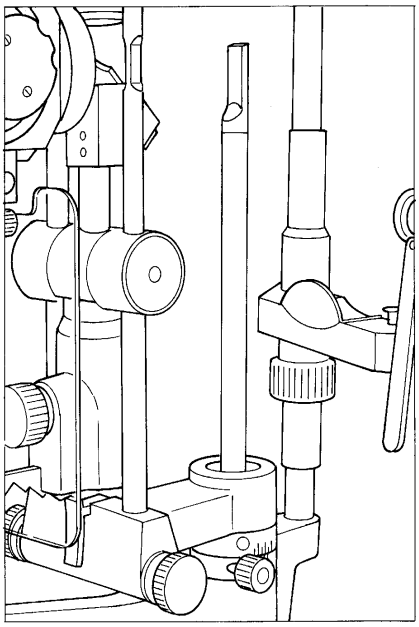


Fig. 17: Focusing rod

Base fixed

(1)Fixed to base
Attach the base to sturdy poles, supports, etc.

(2)Screw mounting
Securely fix with three screws (Fig. 18).

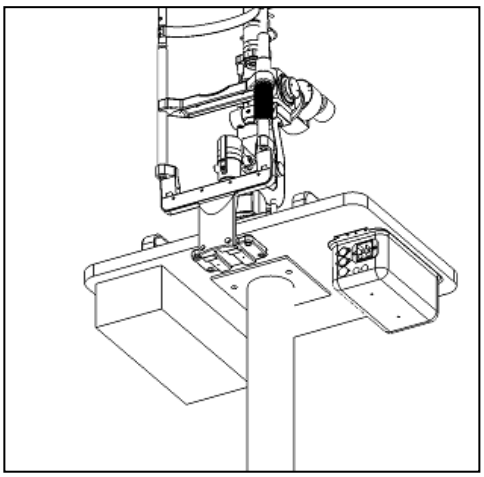


Fig. 18: fixed to base

Installation Environment

2.1Installation Environment

(1)Installation conditions
- Settheinstrumentin a placenotsubject to water.
- Setthe instrumentin aplacewhere there is no fear of adverse effect due to atmospheric pressure, temperature,humidity, ventilation, sunlight, dust, salt, air containing ions etc.
- Stable environment must be maintained avoiding inclination, vibration and impact etc.
- Do not setthe instrumentin a place where chemicals are stored or gas is generated.

(2)Environmental conditions
- The operating environmental conditions below must be required when installing the

i

Operating environment conditions	
Temperature	+10℃ — +35℃
Relative humidity	30% — 75%
Air pressure	800hPa – 1060hPa

6. OPERATION

Adjusting P.D

1) Adjust the eyepeices diopter and the pupillary distance before starting examination.
2) If user is emmetropic, or is wearing a diopter correction, focus the eyepieces at zero by rotating the focusing rings (Fig. 1-4(6)), until the index marks coincide with the 0 on the adjacent scales. If the operator is ametropic and is not wearing a correction, for each eye on the scale.
   If a significant amount of astigmatism is present, the user should wear the spectacles for correction to astigma.
   Adjust the interpupillary distance by graping the prism housings (Fig. 1-4(5)), and rotating them to the correct value according to the scale below the right eyepiece.
3) Seat the patient facing to the headrest.
   The patient lean forward, resting the forehead on the headrest.
4) Adjust the height of the instrument by turning Control for Chinrest(Fig. 1-4(14)).
   (Adjust the hight of the chair, if necessary.)
   The patient's eyes should be aligned with the canthus mark.
5) Adjust the instrument base to the appropriate position controlling with Joystick (Fig. 1-4(14)).
   You can move the lamp and microscope together in your required direction.
6) Press the main power swith to turn the Slit Lamp on. Check the pilot lamp indicates power is on(Fig. 19(F and E)).

Adjusting Illumination and Focus

1) Adjust the brightness of illumination by turning Illumination knob (Fig. 19(D)).
2) Mount the illumination unit and adjust focusing of the fixation lamp (Fig. 1-4(21)) to obtain the desired patient's gaze direction.
3) Adjust focusing until the slit image is is approximately nealy in focus to the naked eye.
   Adjust the focal point and the observing positon by looking through the microscope and controlling Joystick (Fig. 1-4(14)).

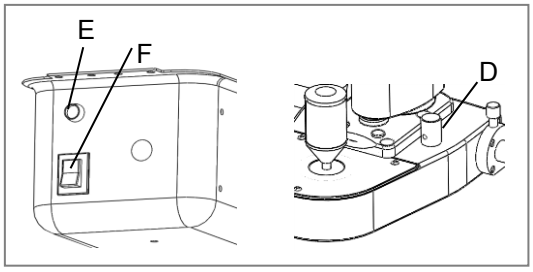


Fig. 19: Illumination Controls
D. Illumination Knob
E. Pilot Lamp
F. Main Power Switch

Adjusting Slit Width

1) Rotate either of Slit Width Control Knobs (the control knobs of slit width) to vary the slit width(Fig. 20(12)).
   These knobs are also used as handles to rotate the illumination system to the left or right.
   The angle between the microscope and the illumination system is adjustable from 0° to 90° on either side. This angle is indicated by Angle Scale Ring(Figs. 1-4(22)). The scale on the left side of Slit Width Control indicates Slit Width(Fig. 21(12-A)).

Adjusting Slit Rotation and Slit Length

The projected slit image is rotated continuously around the optical axis verticaly and horizontaly by the lever and the knob(Fig. 22(4)).
Click stops for slit angles is provided at 45°, 90° and 135°(Fig. 22(4)).

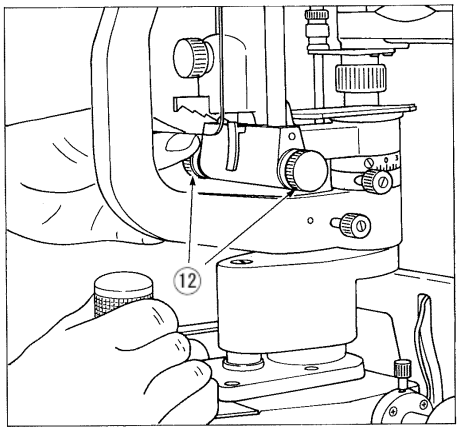


Fig.20: (12) Slit Width Control Knobs
(Knobs for controling slit width)

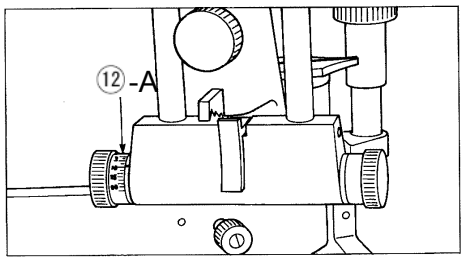


Fig. 21. (12-A) Slit Width Control Scale
Adjustable up to 20° in 5 steps

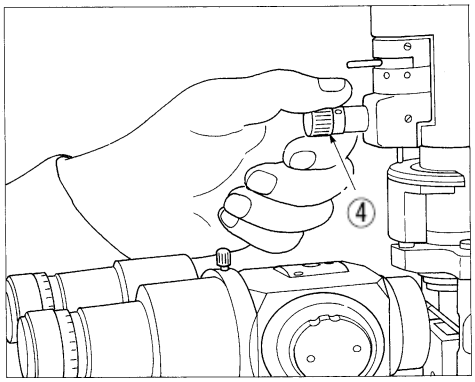


Fig. 22: (4) Slit Rotation Control Lever &
Slit Length Control Knob

Tilting Illumination System

By pressing down the latch, the illumination system is tilted down with the angle up to 20 in 5˚steps. (This is valuable in the examination using gonioscopy and the fundus examinations.)

1) Press down the latch and pull the illumination base toward the operator until the tilt reach to the appropriate tilt stop position (Fig.24).
2) Release the latch to fix the illumination at required tilt stop position.

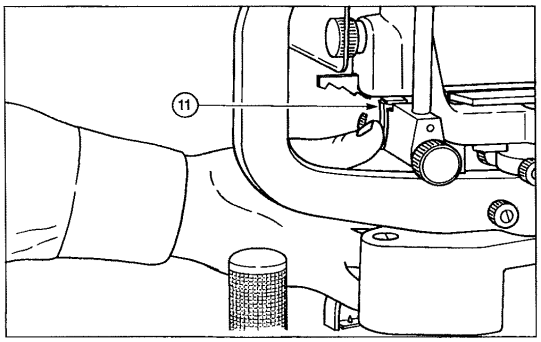


Fig. 23: (11) Latch

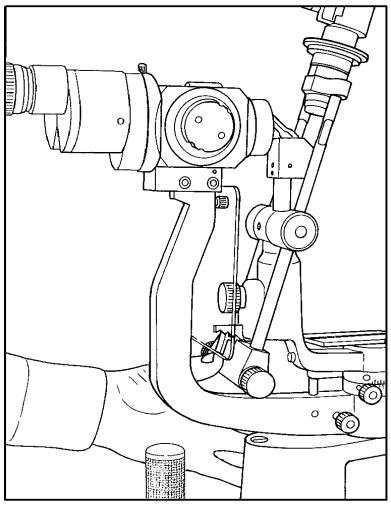


Fig. 24: Tilting the system

The illumination system also contains a filter disc and an aperture disc.

Filters

The filter disc is controlled by Filter Disc Lever(Fig. 25(3)). This disc contains filters and each filter is located in the following order : Cobalt blue filter (for fluorescein examinations), Unfiltered (Opened aperture), Heat absorbing filter, 50% neutral density filter and Red free filter.

Aperture for Adjusting Slit Length

The aperture disc is controlled by turning the knob for controling aperture disc (Fig. 25(4)).

Turn the knob to adjust the length of the projected slit image(Fig. 25(4)). Apertures with fixed diameters are provided in 10, 6, 4, 3, 1 and 0.2mm. The wedge-shaped diaphragm is controlled with Aperture Disc Control Knob (Fig. 25(4).) The Slit length is continuously variable from 0 to 10mm. The slit length is indicated by scale (Fig. 26(2)).

Types of Illuminations

Except for direct forcal illumination such as, retro-illumination, indirect illumination and lateral scanned illumination, it is easy to controll illumination system.

1) Loosen the Centering Screw(Fig. 27(9)).
2) Rotate the optical center of the illuminating system.

For normal use, the slit image is automatically back to the center by tightening the screw.

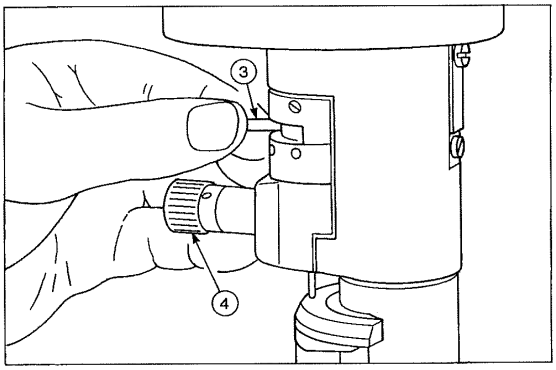


Fig. 25: Illumination System Controls
(3) Filter Disc Lever
(4) Aperture Disc Control Knob
(Knob for controling aperture disc)

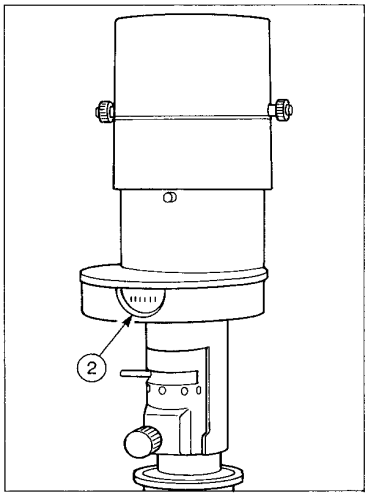


Fig. 26: (2)Slit Length Scale

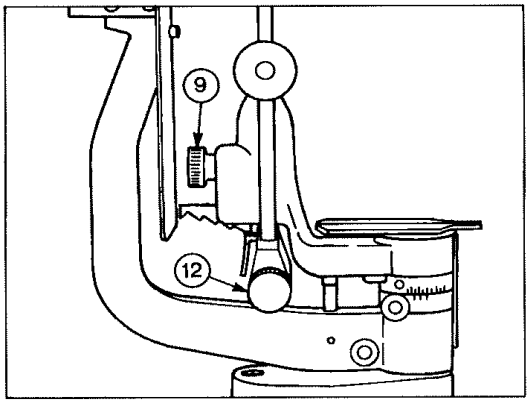
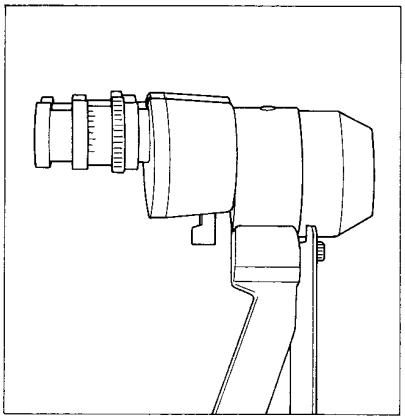


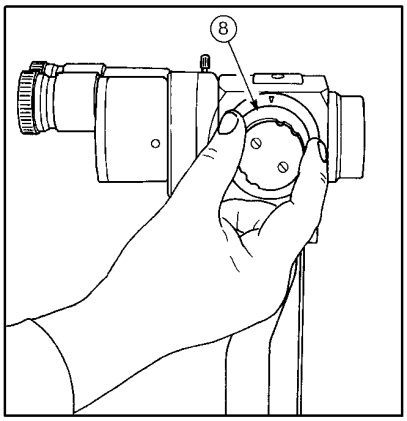
Fig. 27: (9) Centering Screw
(12) Slit Width Control Knob
(Knob for controling slit width)

Magnification Control



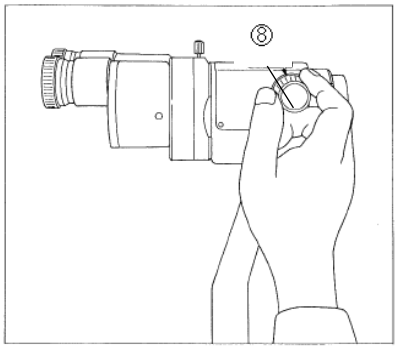
L-0185

Converting the eyepieces total magnifications with lever under tube
Total magnification rate: 10x,16x, 25x



L-0187

Converting magnification with
(8) Magnification Control Knob
L-0187: Total magnification rate: 10x,16x, 25x
L-0189: Total magnification rate: 6x,10x,16x,25x,40x



L-0240

Converting magnification with
(8) Magnification Control Knob
Total magnification rate: 10x - 30x continuous

The magnification is controlled by the knob (Fig. 28(8)). The objective lenses are parfocal and the working distance is constant for any magnification. As long as the microscope is focused at the highest magnification, it is also in focus at all lower magnifications.

Fig. 28: Magnification Control

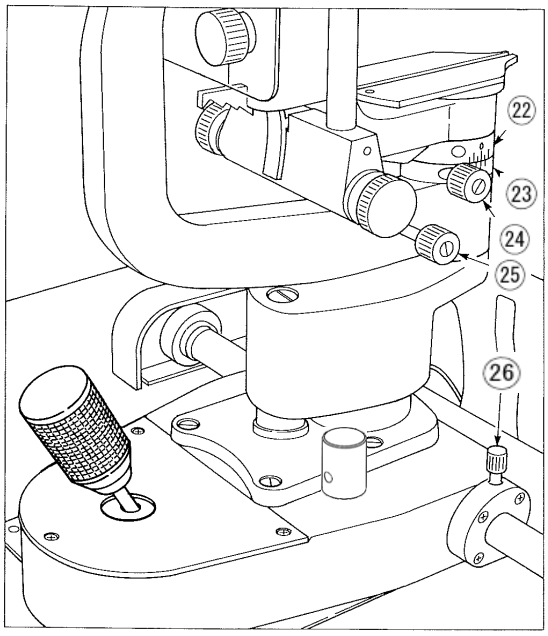


Fig. 29: Instrument Base
(22) Angle Scale Ring
(23) Angle Index Ring
(24) Illumination Arm Lock
(25) Microscope Arm Lock

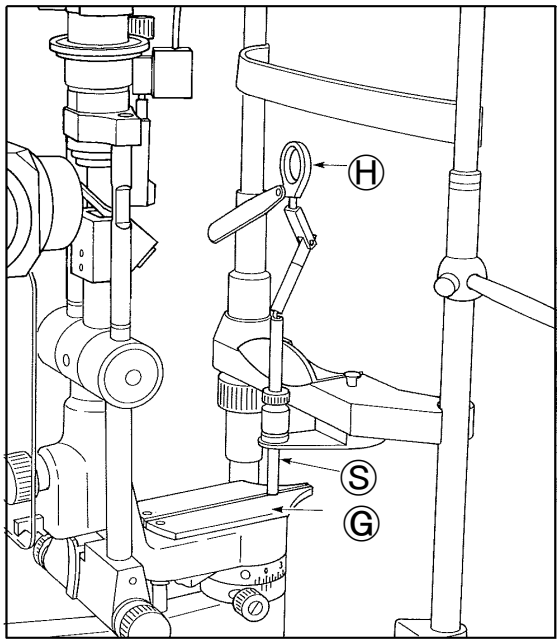


Fig. 30: Positioning the Hruby Lens
(H) Hruby Lens(option)
(S) Slide
(G) Guide Plate

Locking rotations

You can lock the lateral movement of the instrument base by tightening the screw (Fig. 29(26)).

The microscope and illumination system can be rotate independently or simultaneously on the vertical pivot axis.

- The two systems are moved together with at any fixed angle between them by tightening the knob for Illumination Arm Lock(Fig. 29(24)).
- To fix the rotating microscope system, tighten the knob for Microscope Arm Lock(Fig. 29(25)).
- If you want to rotate only the illumination system, tighten the knob for Microscope Arm Lock and loosen Illumination Arm Lock (Fig. 29(25 and 24)).

Angle between Micrscope & Illumination

Angle Scale Ring and Angle Index Ring indicate the angle between the micrscope and illumination systems (Fig. 29(25 and 24)).

Click stops are provided at 0°, 10° to the right and 10° to the left orientation.

Hruby Lens (Option)

Examinations of the posterior vitreous detachment and the fundus oculi can be performed either with the fundus contact lenses or with the Hruby Lens (option).

For the initial orientation, use relatively low magnification and low illumination. When using the optional Hruby Lens, Slide and Guide Plate are available(Fig. 30(S and G)).

The hruby lens will be followed to the every movement of the slit larnp accordingly.

The fine adjustment of the hruby lens is required during the examination.

Illumination intensity

Normally, the control of illumination is set for the appropriate slit illumination for the the examination.

- To mixmize the illumination intencity, keep pressing the right button on the base(Fig.31).
- To adjust the illumination intencity, turn the knob on the base.

7. MAINTENANCE

Cleaning

Mirror cleaning
Remove dust accumulation with a camel's hair brush. Then, remove fingerprints with cotton swab soaked in isopropyl alcohol. Dry the mirror with a soft facial tissue.

Eyepiece cleaning
Follow the same procedure as mirror cleaning to remove fingerprints on eyepiece. However, use as little alcohol as possible for cleaning the eyepieces.

Equipment surface cleaning
Clean the equipment surfaces, especially the joystick glide plate, by wiping with a soft dry cloth. Do not use comrnerical or household cleaners.

Replacement

Main lamp replacement
The main lamp is a tungsten or halogen lamp which have long lifetime without blackening of the glass envelope. When it is eventually needed to replace the lamp, follow the procedure below for the quick and easy replacement.

CAUTION

Allow sufficient time for the lamp to be cool before replacing. Metal and glass parts of the lamp could be too hot to burn the fingers even if the instrument has been used only for short period.

1) Loosen 2 retaining nuts for lamp housing cover (Fig. 33(19)).
2) Remove the lamp housing cover. (Fig. 34(1)).
3) Remove the old lamp and replace it with a new one (Fig. 35-36)
   The lamps are pre-focused and aligned.
4) Engage the notch of lamp base and the tab on the lamp housing (Fig. 36(35)).
5) Cover the lamp housing cover pressing down it againt the spring force.
   Tighten it with 2 retaing nuts.

Fixation Lamp (Option)
1) Remove the front part of the fixation unit by rotating it counterclockwise.
2) Unscrew 2 screws.
3) Rremove the old battry and replace it with a new one.
4) Reassemble the front part by pushing and turning it clockwise.

Chinrest paper replacement
1) Clean the chinrest with 70% ethanol for disinfection.
2) Replace the old chinrest paper with a new one.

Mirror replacement
1) Tilt the illumination system by releasing Latch (Fig. 23(11)).
2) Pull upward and pull out the mirror holding the narrow edge of the mirror. (Fig. 37).
3) Replace the old mirror with a new one.
4) Set back the tilt of the illumination system to the original position.

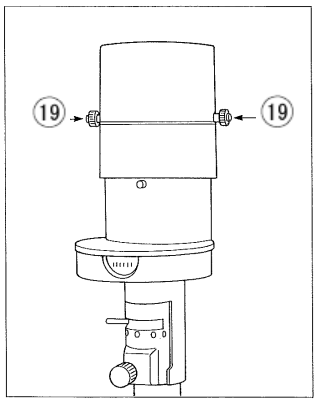


Fig. 33:
(19) Lamp Housing Cover Retaining Nuts

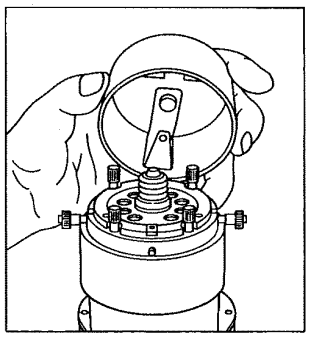


Fig. 34: Removing
(1) Lamp Housing Cover

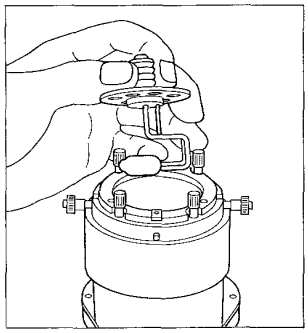


Fig. 35: Removing light bulb

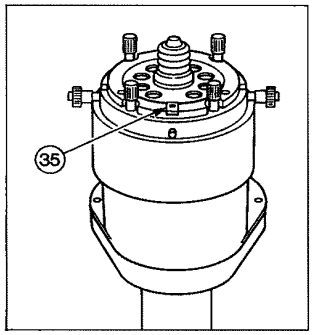


Fig. 36: Installing light

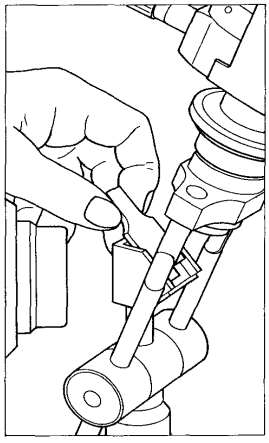


Fig. 37: Mirror replacement

Base Sheet Replacement

1) Unscrew 3 screws of the base and pull out the sheet under the plastic cover.
2) Turn over the sheet and set it back to the original positon on the base.
3) Put the plastic cover on the sheet and tighten it with screws.

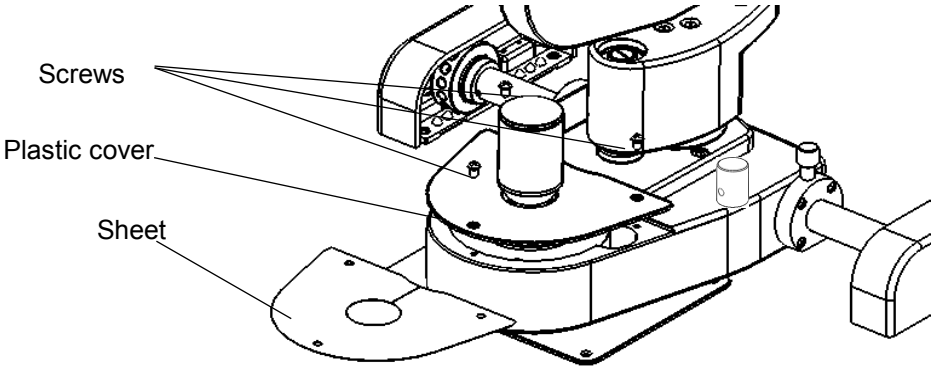
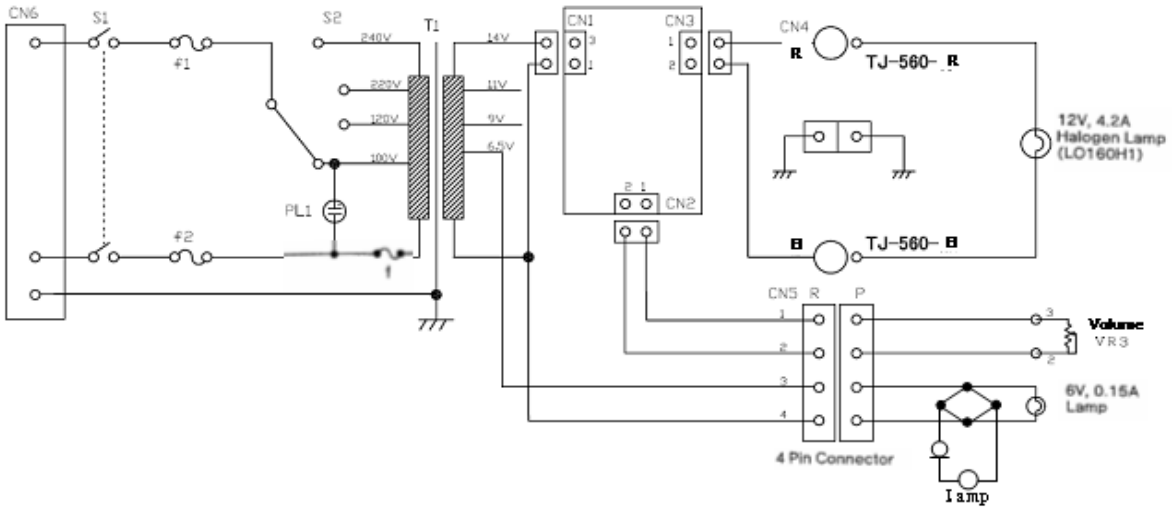


Fig. 38: Replacement of sheet

8. Electrical Wiring Diagrams



Inami & Co.,Ltd.
No.24-2, Hongo 3-chome,
Bunkyo-ku, Tokyo 113-0033, Japan
TEL.81-3-3814-5916 FAX.81-3-5684-2126

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