

Inami

DIGITAL SLIT LAMP

MANUAL



L-0229-E

VIEWLIGHT
POWERED BY INNOVATION

Before use this instrument, be sure to read this manual

EN




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1. Safety

1) SAFETY CONSIDERATIONS

For safer and more effective use of the apparatus, the reader is asked to observe the following points
General definitions of safety symbols are indicated below.

	Caution
	General mandatory action.
	No specific definition given. Denotes general ban or prohibition.

-  At no time attempt to remodel or disassemble this machine.(Damage to the machine or personal injury will result)
-  This machine is a precision optical unit, operations must be carried out at all times by experienced, authorized personnel. (Damage to the machine or personal injury will result.)
-  The power cord must be firmly connected to an electrical ground (safety ground) at the power outlet.(Personal injury may result from electric shock etc.)
-  Do not touch the optical parts. (Measurement accuracy will be affected.)
-  Always take great care when operating the unit. (Malfunction or damage to the equipment could occur.)
-  If the machine fails to work properly, the client should not try to repair the fault themselves, but consult their dealer immediately. (Damage to the equipment or personal injury will result. Consult your dealer, if repair work needs to be carried out.)
-  If a malfunction occurs during operation, immediately cut the power.(Damage to the equipment or personal injury will result. Consult your dealer, if repair work needs to be carried out.)
-  Never remove the plug from the outlet if your hands are wet. (Electric shock or personal injury could result.)
-  Make sure the power cord is not damaged. (Fire or electric shock may occur.)
-  If the machine is not to be used for some time, remove the plug. (Electric shock, leakage or fire may occur.)
-  Don't install the machine near from RF communication machine or other relative machines . It will occur the problem of normal operative function of the machine.



Caution



Avoid storage or use of the machine under the following conditions:

- 1) In an environment where the temperature falls below -10°C or exceeds $+40^{\circ}\text{C}$.
- 2) Where noxious gasses or air pollutants are present.
- 3) In steamy or moist environments, especially where condensation forms.
- 4) Where dust and grit may occur
- 5) Where oil fumes or greasy substances are emitted.
- 6) Where there are atmospheric concentrations of salt.
- 7) Near gas generation areas and places where dust accumulates.
- 8) Keep in a secure, stable situation. Do not expose to strong vibrations (areas of seismic activity) and sudden shocks (this includes transportation) etc.
- 9) Where there is an inclination of more than 10 degrees.
- 10) Where the voltage from the power source rises or falls sharply during loading.
- 11) Where fluctuations in the voltage of the power source occurs.
- 12) In direct contact with sunlight.



Avoid transportation of the machine under the following conditions:

- 1) Where dust and grit may occur.
- 2) Where oil fumes or greasy substances are emitted.
- 3) Keep in a secure, stable situation. Do not expose to strong vibrations and Sudden shocks, etc.



Make sure the indicator of the voltage selector on the transformer is same voltage from the power source.



Do not use the different fuse and make sure the power is off position and remove the plug from the outlet.





When not in use, the machine should be protected with the provided dust cover.

2) SAFEGUARD SUMMARY

	Caution
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For safer and more effective use of the apparatus, the reader is asked to observe the following points:

	<ol style="list-style-type: none">1) The power cord must be firmly connected to an electrical ground (safety ground) at the power outlet.2) If the machine is not to be used for some time, remove the plug.3) If a malfunction occurs during operation, immediately cut the power.4) Never remove the plug from the outlet if your hands are wet.5) Similarly, if the machine fails to work properly, the client should not try to repair the fault themselves, but consult their dealer immediately.6) This machine is a precision optical instrument. Handle with care at all times, making sure not to accidentally drop it.7) When cleaning the chin rest and head rest, use small amount of methyl alcohol on the cotton swab or soft cloth.8) When you replace AC cable or other parts including accessories stated in this manual, please use specified parts only.
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	<ol style="list-style-type: none">1) Make sure the cords are not damaged.2) This machine is a precision optical unit, operations must be carried out at all times by experienced. Authorized personnel.3) Do not touch the optical parts.4) At no time attempt to remodel or disassemble this machine.5) Do not touch area around lamp house while light is on or immediately after putting it off. It is extra hot.6) Do not remove the support racks and pinion covers on the T type base while in operation. Even when they are mounted, be careful not to have your fingers caught in.7) TV pictures may be disturbed by noise caused by this apparatus. Keep the two apart in such a case, or do not use them at the same time.8) Do not use portable, mobile phone and RF communication equipment in the vicinity of the equipment because the radio interference can cause the equipment to malfunction. The effects of radio interference on medical equipment depend on a number of various factors and are therefore entirely unforeseeable.9) Do not use this device adjacent to other medical devices.
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2. NOMENCLATURE OF L-0229-LED SLIT LAMP

The INAMI L-0229-LED Slit Lamp provides the practitioner with all the new features required to perform a complete slit lamp examination. It has been designed and built to INAMI traditionally high standards of quality.

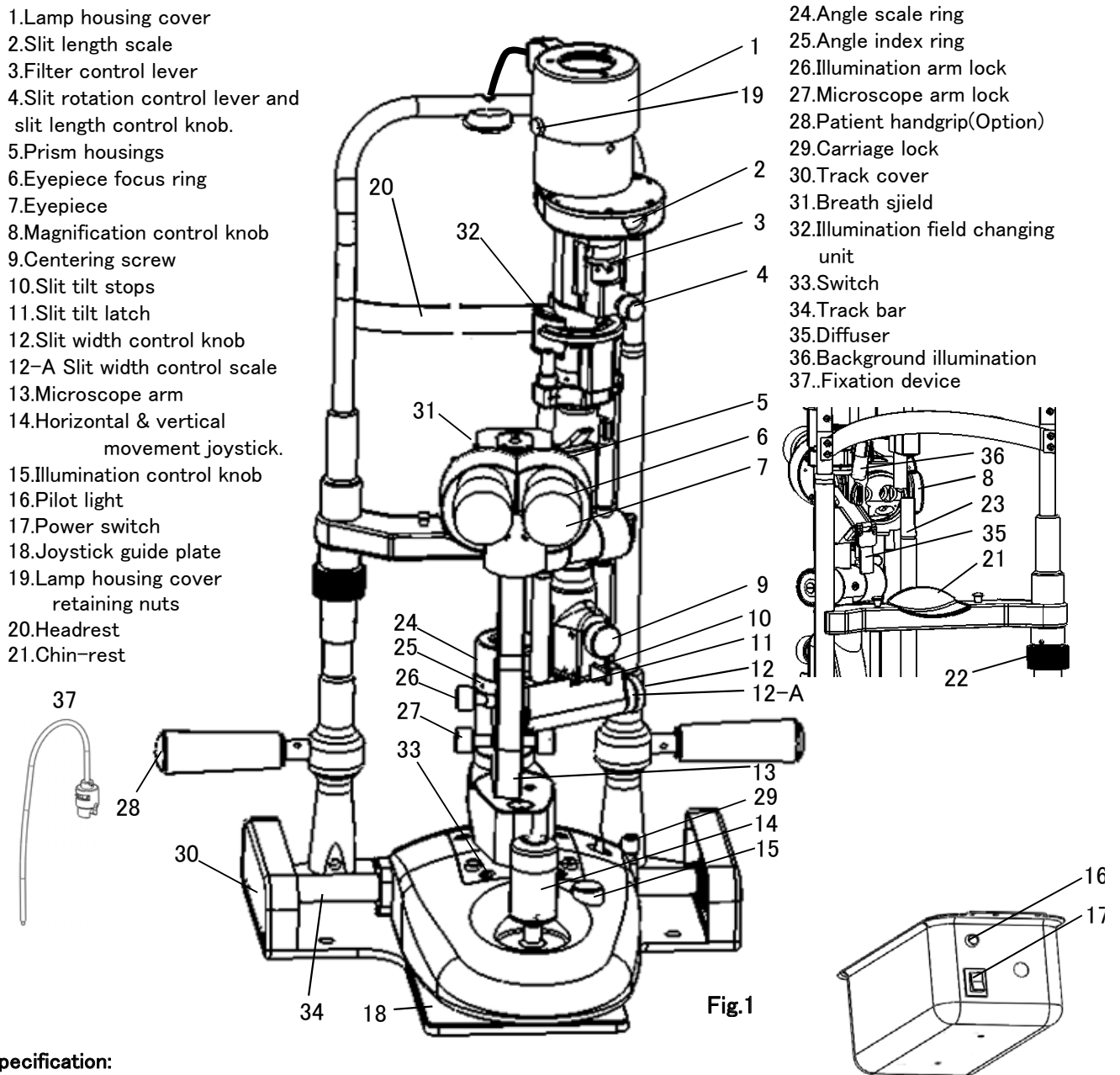


Fig.1

Specification:

·Parallel tube stereomicroscope

Eyepieces: 12.5X Variable magnification: 6X, 10X, 16X, 25X, and 40X Working distance: 98mm

Eyepiece focus adjustment: +6D to -6D P.D.adjustment: 48-78mm

·Illumination system

Slit length: position 1···0.3, 1.4, 4.2, 5.5, 8.3, 14mm and continuously variable 0.6-14mm

position 2···0.2, 0.8, 2.4, 3.2, 4.8, 8mm and continuously variable 0.3-8mm

Slit width: position 1···continuously variable from 0-14mm

position 2···continuously variable from 0-8mm

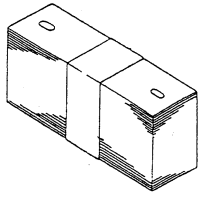
Slit image rotation: 0 - 180° Slit tilt: 5, 10, 15, and 20°

Filter disc: open, cobalt blue, orange, heat absorbing, red-free

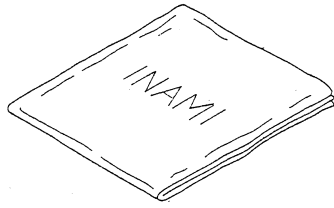
Lamp: 12V, 50W halogen, prefocused (L0160H1)

·Optional accessories: Applanation tonometer, Beam splitter module, Teaching tube with image rotation, 35mm camera adaptor, Digital video camera beam splitter, CCD TV Camera & adaptor, Patient handgrip.

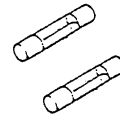
Accessories:



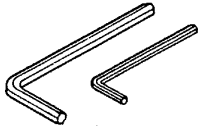
Chin-rest paper



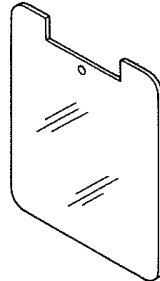
Dust



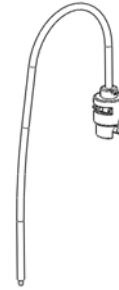
Fuse



Hexagon wrench



Breath Shield

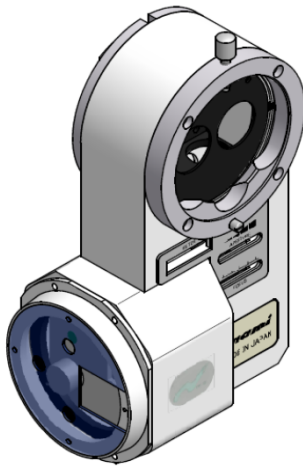


Fixation device

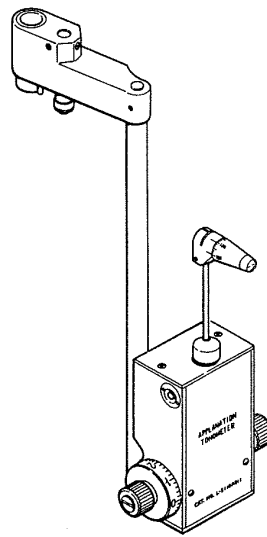


Calibration Bar

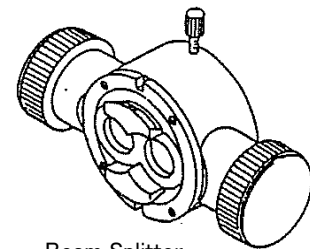
Option:



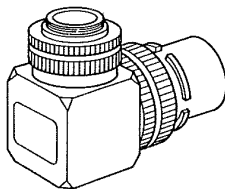
L-0541DC digital video camera beam



APPLANATION



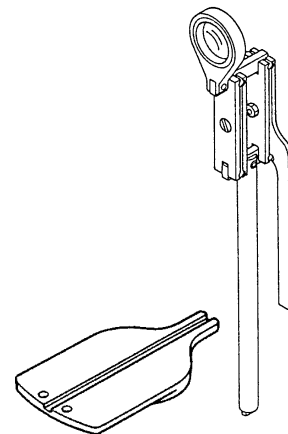
Beam Splitter



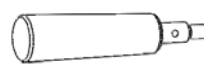
TV camera adapter



USB unit for L-0541DC



Hruby lens unit



Patient Handgrip

3. UNPACKING AND ASSEMBLY

INAMI Slit Lamp is over-packed with a sturdy corrugated cardboard carton.

The lower container holds the tabletop with the attached transformer and accessory drawer.

The accessory drawer contains the following items:

- Chinrest papers Dust cover Fixation device
- Spare fuses Breath shield Calibration Bar
- Hexagon wrench

The upper container holds the cross-slide instrument base with the microscope, the illumination and the T-type base. Screw the two patient hand grips(option) into the sockets as shown in Fig. 2.

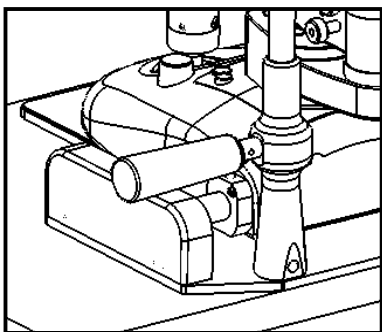


Fig.2 Attaching the Handgrips(option)

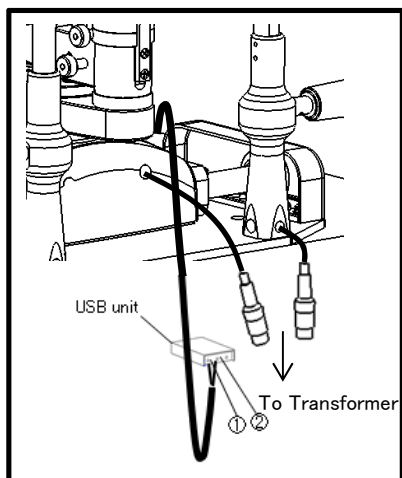
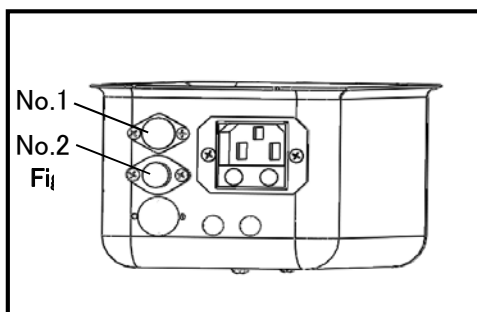


Fig.3 Connecting the camera cable(option)



Place the cross-slide instrument base and microscope unit on the T Type base so that the perforated rollers engage the pinned tracks on the T type base, and the joystick rests on the glide plate.

The rollers should engage the same pins on each track. Test the action of the joystick and cross-slide by operating the assembly through its full forward/backward and left/right travels.

Connect the camera cable to the USB unit as shown in Fig. 3. Install the track covers 30(Fig. 1) by sliding the cover tabs under the track.

Connect the slit lamp lead wire plugs to the receptacles at the back of the transformer case as shown in Fig. 4.

Connect the main power plug to the three pins on the lamp housing cover.

Connect the five pins plug to the receptacle No.1.

Connect the three pins plug to the receptacle No.2.

Place the focusing rod in the hole provided in the cross-slide assembly shaft with the flat side of the rod facing the microscope as shown in Fig.5. Set the illumination system and the microscope perpendicular to the flat surface as shown. Remove the eyepiece and objective lens caps. Turn the instrument on, and while observing a narrow slit image on the rod surface, check the instrument for proper focus and image centration.

Attach the breath shield 31 (Fig. 1) to the microscope arm.

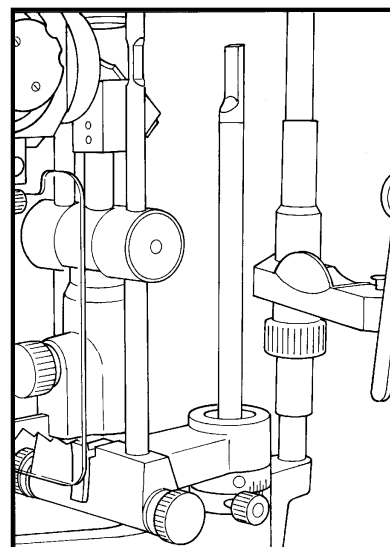


Fig.5 The Focusing Rod in place

4. OPERATION

Adjust the microscope before beginning the examination. If the user is emmetropic, or is wearing a distance correction, focus the eyepieces at zero by rotating the focusing rings, 6 (Fig. 1), until the index marks coincide with the 0 on the adjacent scales. If the operator is ametropic and is not wearing a correction, set the distance spherical equivalent of the correction for each eye on the scale. If a significant amount of astigmatism is present, the user should wear the distance correction. Adjust the interpupillary distance by grasping the prism housings, 5 (Fig. 1), and rotating them to the correct value according to the scale below the right eyepiece. Seat the patient facing the headrest and adjust the instrument and/or the chair height so that the patient and the operator are seated comfortably. Have the patient lean forward, resting the forehead on the headrest. Adjust the chinrest using control, so that the patient's eyes are aligned with the canthus mark. Move the instrument approximately to the correct position by grasping the joystick, 14(Fig.1), and moving the lamp and microscope together in the required directions. Turn the slit lamp on with the main power switch, 17 (Fig.6). The pilot light, 16, indicates power is on. Regulate the brightness of the illumination with knob 15(Fig.7). Continue to refine the alignment until the slit image is properly positioned, and is approximately in focus to the unaided eye, by tilting the joystick and rotating for the vertical movement, 14(Fig.1). Obtain final alignment and focus by observation through the microscope.

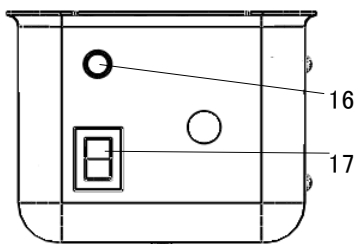


Fig.6 Transformer Pilot Light 16
Main Power Switch 17

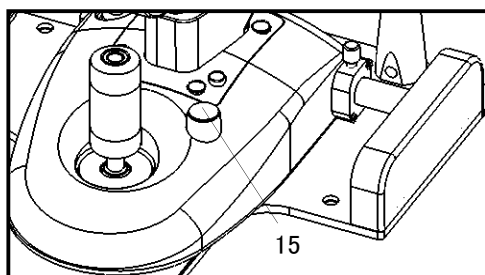


Fig.7 Illumination Controls Illumination Knob 15

Rotate the slit width control knobs, 12 (Fig. 8), to vary the slit width. 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 can be adjusted from 0° to 90° on either side. This angle is indicated by a scale, 24 (Fig. 1). The scale on the left side slit width control indicates the width of the slit, 12-A(Fig. 9).

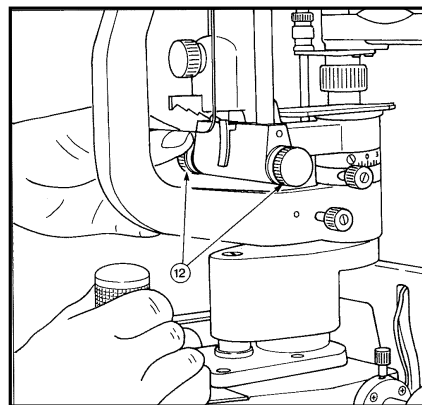


Fig.8 Slit Width Control Knobs 12

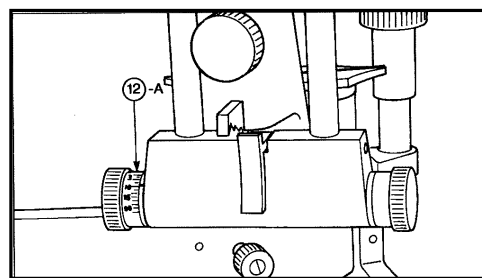


Fig.9 Slit Width Control Scale 12-A

The projected slit can be rotated about the optical axis continuously from vertical to horizontal by pushing the control, 4 (Fig. 10), to the left or right. Slit angles of 45°, 90° and 135° are indicated by click stops.

The illumination system can project an inclined slit image in 5° increments up to 20° below the horizontal. This is valuable in gonioscopy and fundus examination.

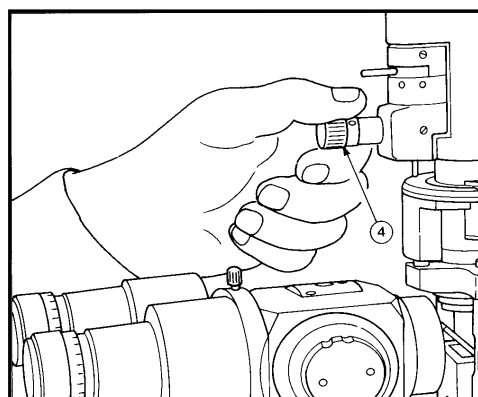


Fig.10 Slit Orientation Control 4

The system is tilted by depressing latch, 11 (Fig. 11), and pulling the base of the illumination system toward the operator, (Fig. 12). The latch is released to engage the desired tilt stop.

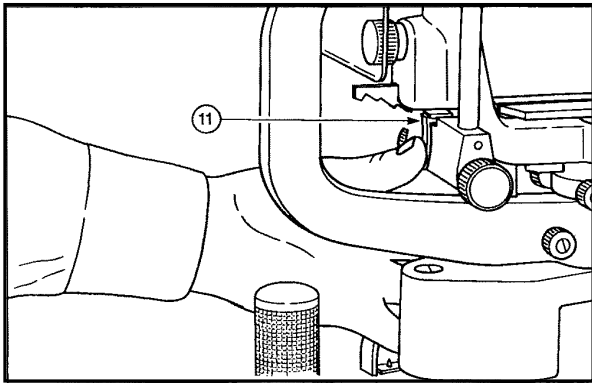


Fig.11 Tilt Control Latch 11

The illumination system also contains a filter disc and an aperture disc. The filter disc is controlled by lever 3, (Fig. 13). The filter disc contains filters in the following order: a yellow filter, an open aperture, a heat absorbing filter, a 50% neutral density filter and a red free filter.

The aperture disc is operated by turning the control knob, 4 (Fig. 14), to adjust the length of the projected slit. Fixed apertures are provided for 10, 6, 4, 3, 1 and 0.2. The aperture disc mount a cobalt filter. Continued rotation of control knob, 4, introduces a wedge-shaped diaphragm for producing continuously variable slit lengths in a range from 0 to 10. The length of the slit is indicated by scale, 2 (Fig. 14). Retrograde illumination, indirect illumination and lateral scanning of the slit can be accomplished by loosening the screw, 9 (Fig. 15), and rotating the illuminating system about its vertical axis. For normal use, the slit image is recentered automatically by tightening the screw.

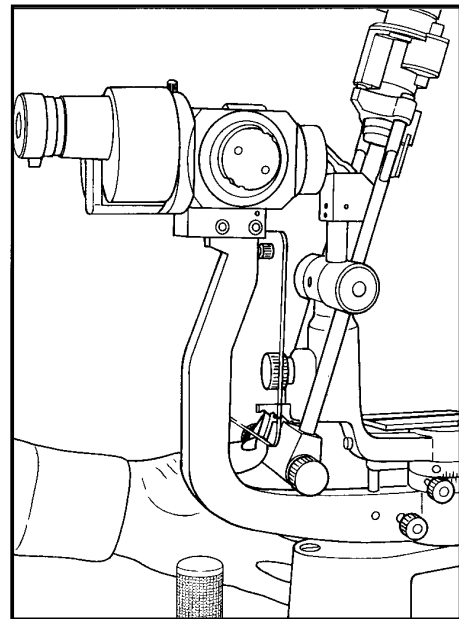
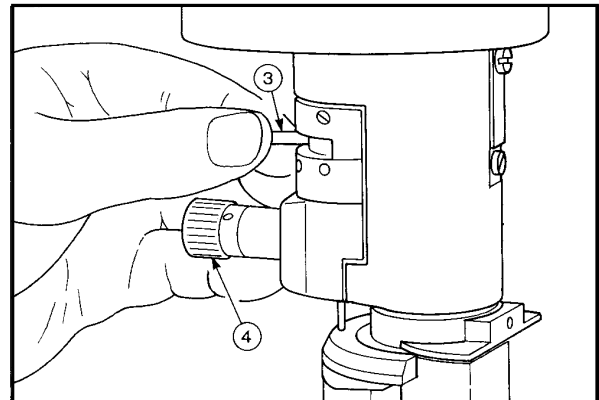


Fig.12 Tilting the System



**Fig. 13 Illumination System Controls
3. Filter Disc Lever
4. Aperture Disc Control Knob**

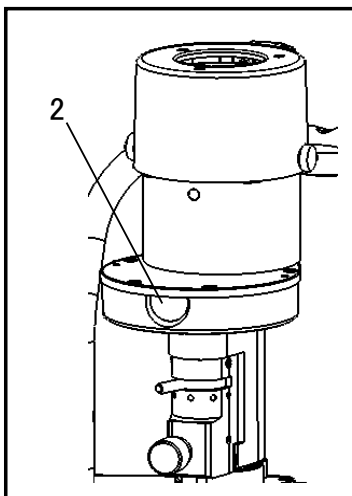
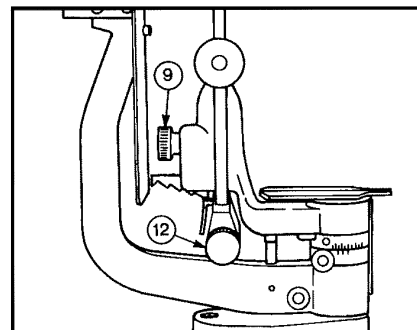


Fig. 14 Slit Length Scale, 2



**Fig.15 Centering Screw 9
Slit Width control knob 12**

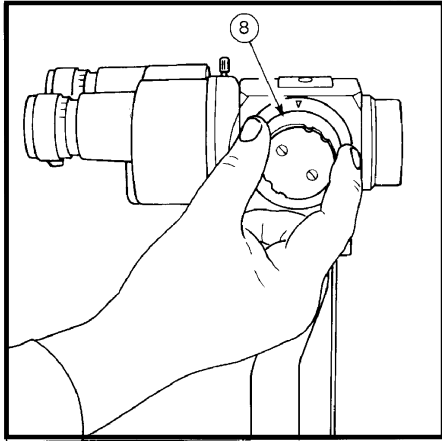


Fig.16 Magnification Contrd knob, 8

The microscope has objectives providing total magnifications of 6X, 10X,16X, 25X, and 40X.

The magnification is controlled by the knob, 8 (Fig. 16).

The working distance is constant for any magnification.

If the microscope is focused at a high magnification, all lower magnifications will also be in focus.

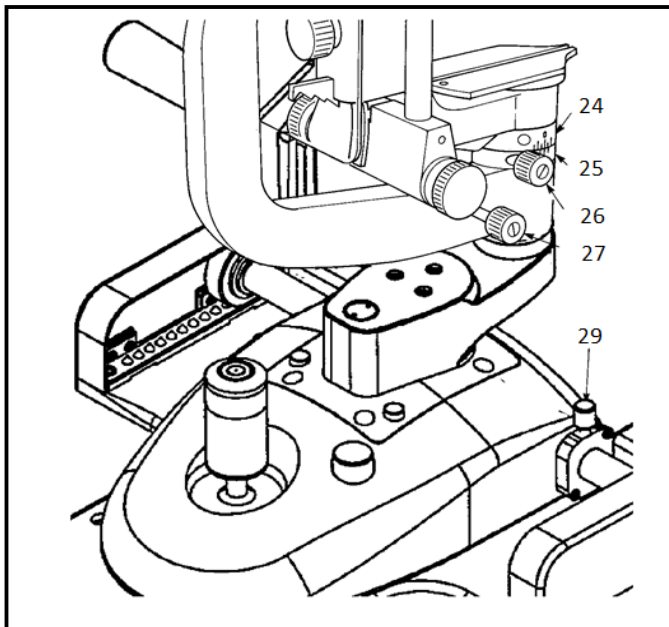


Fig. 17 Instrument Base

- | | |
|---------------------------------|-------------------------------|
| Scale Ring 24 | Microscope Arm Lock 27 |
| Index Ring 25 | Carriage Lock 29 |
| Illumination Arm Lock 26 | |

The lateral movement of the instrument base is locked by tightening screw, 29 (Fig. 17).

The microscope and illumination system can swing independently or together about the vertical pivot axis.

The two units will move together with any fixed angle between them when knob 26, (Fig. 17), is tightened.

The microscope rotation can be locked by tightening knob 27, and the illumination system is freed by loosening knob 26.

The index ring 26 and the scale ring 24 indicates the angle between the microscope and illumination systems. A detent is provided for the 0° , 10° right and 10° left positions.

Normally, the settings of the illumination control will provide suitable slit illumination for the examination.

Additional Function to Change the Diameter of the Illumination field

1). Change of the Illumination Field.

1-1. When the illumination field changing unit was moved to the click point. (Fig. 18)

Slit width : Continuously variable from 0-14mm

Slit length : 0.3, 1.4, 4.2, 5.5, 8.3, 14.0mm

and continuously variable 0.6-14mm

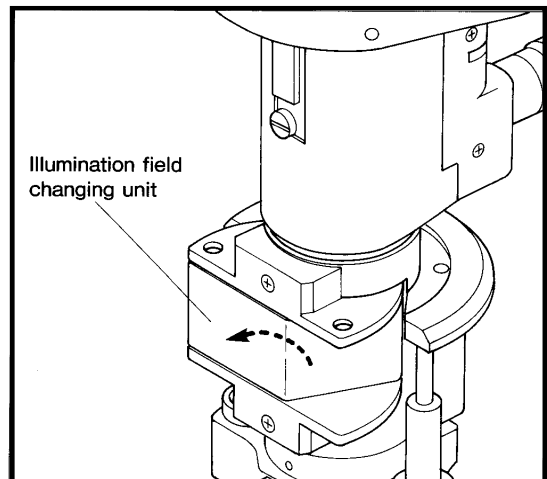


Fig. 18 Illumination field changing unit (Position 1)

1-2. When the illumination field Changing unit was moved to the other side of the click point (Fig. 19).

Slit width : Continuously variable from 0-8mm

Slit length : 0.2, 0.8, 2.4, 3.2, 4.8, 8mm and

continuously variable 0.3 - 8mm

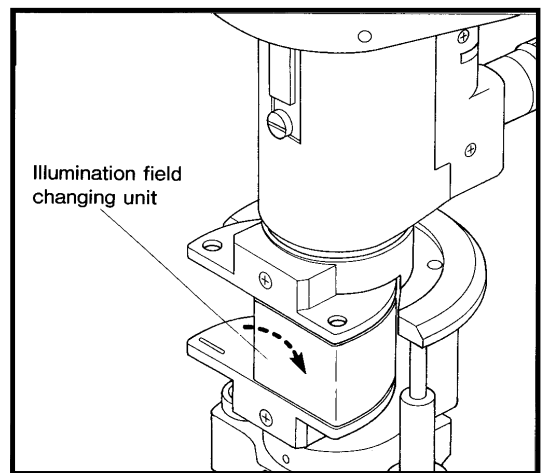


Fig. 19 Illumination field changing unit (Position 2)

2). Diffuser

The diffuser is mounted to make the observation for whole the anterior segment. Then the illumination has to be full-aperture (Fig. 20).

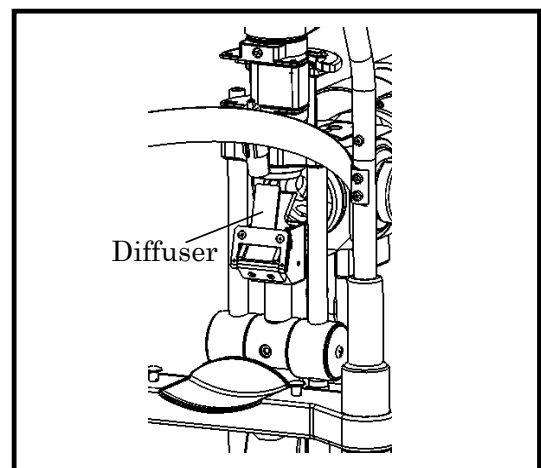


Fig. 20 Diffuser

5. Optional accessories

Digital Video Camera Beam Splitter

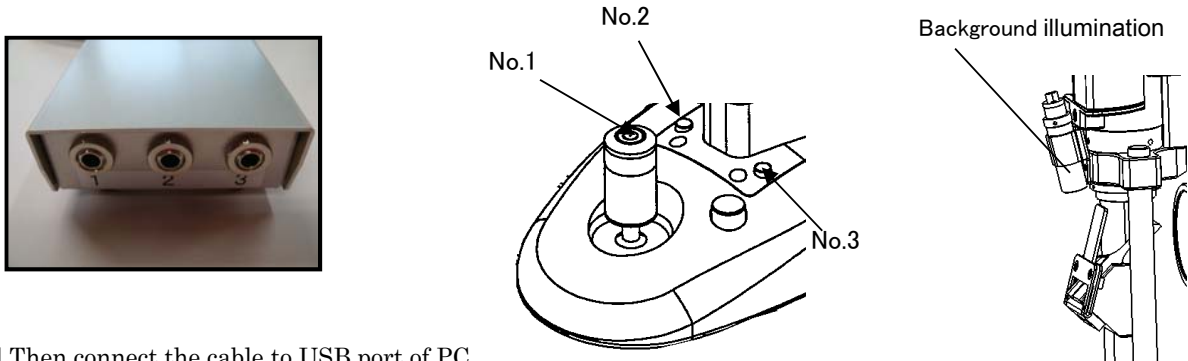


○Connection to PC (For L-0541DC-1.3)

Please connect the cable to USB port of PC. Electricity can be supplied to the camera automatically through the cable.

In case of using Inami image filing and capturing software “Pixel filer”.

In order to use switches on the base of L-0229-E as shutter and video camera buttons and then file the data with Pixel filer, 2 pins (No.1 and No.2) of L-0229-E have to be connected to jacks of USB cable provided according to the number.



And Then connect the cable to USB port of PC.

The background illumination is lighted when you push the switch No.3. Please push the switch once again if you want to turn off the background illumination.

In case of using other filing software

It is possible to use switches on the base of L-0229-E as trigger signals by connecting 2 pins to USB cable and PC. In this case the setting of each switch depends on software used. Please check the detail with the software.

6. MAINTENANCE

LED Replacement

It can use the LED for a long period of time.

When it is eventually necessary to replace the LED, it can be replaced by using the following Procedure.

CAUTION

Allow sufficient time for the lamp to cool before replacement. Metal add lamp house can be hot enough to burn the fingers even if the instrument has been in use for only a short time.

Loosen the two lamp housing cover retaining bolts 19, (Fig. 21). Remove the cover as shown in Fig. 22. Take the

bolts off the LED unit(Fig.22). Remove the old LED unit as shown in Fig. 23 and replace it with a new one.

Joint the connector of LED.(Fig.24)

Assemble the lamp housing cover and tighten the two retaining bolts.

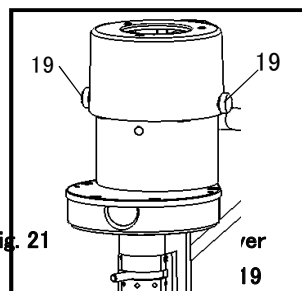


Fig. 21

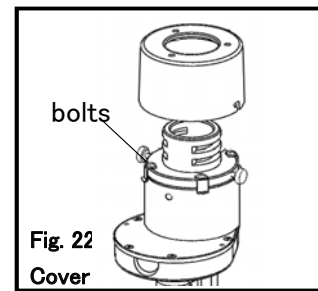


Fig. 22
Cover

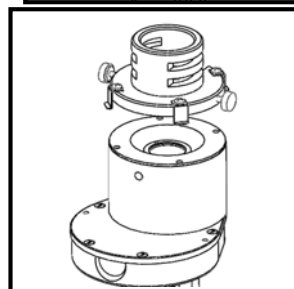


Fig. 23 LED Unit Removal

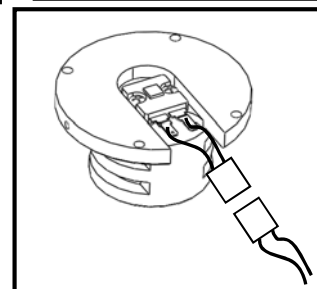


Fig. 24 Connect the LED
and the electric wire.

Mirror Replacement

Tilt the illumination system by releasing the latch 11, (Fig. 1). Grasp the narrow shank of the mirror by its edges and pull upward as shown in Fig. 25.

Mirror Cleaning

Remove dust accumulation with a soft cloth.

After brushing, finger marks can be removed, if necessary, with isopropyl alcohol and a cotton swab.

Dry with a facial tissue.

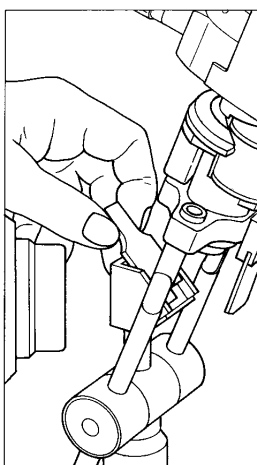


Fig. 25 Mirror Replacement

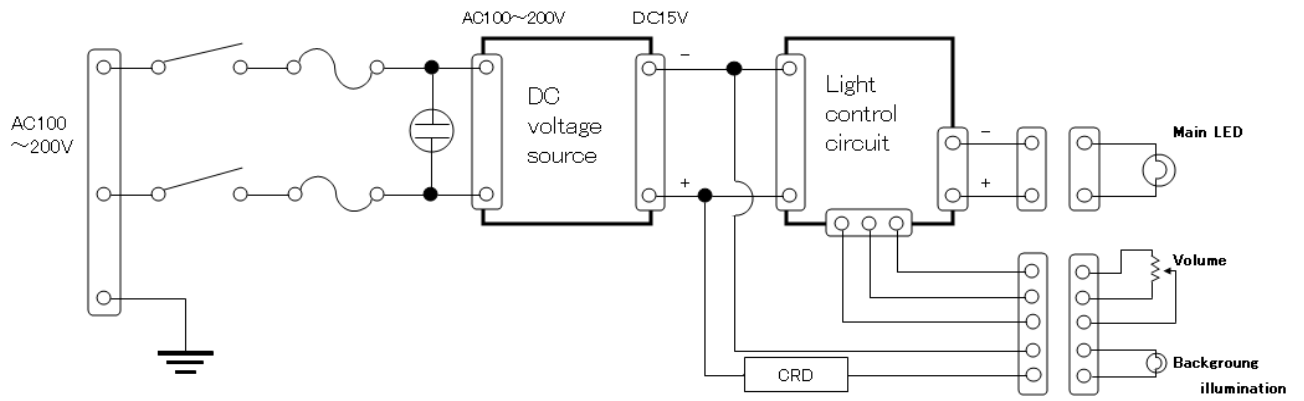
Eyepiece Lens Cleaning

Finger marks can be removed by the same method used for the mirror. A minimum of alcohol should be used in this case.

Exterior Surface Cleaning

Clean the exterior surfaces, especially the joystick glide plate, by wiping with a soft, dry cloth. Do not use chemical or household cleaners.

7. WIRING





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Printed in japan 2013.12 edition 3