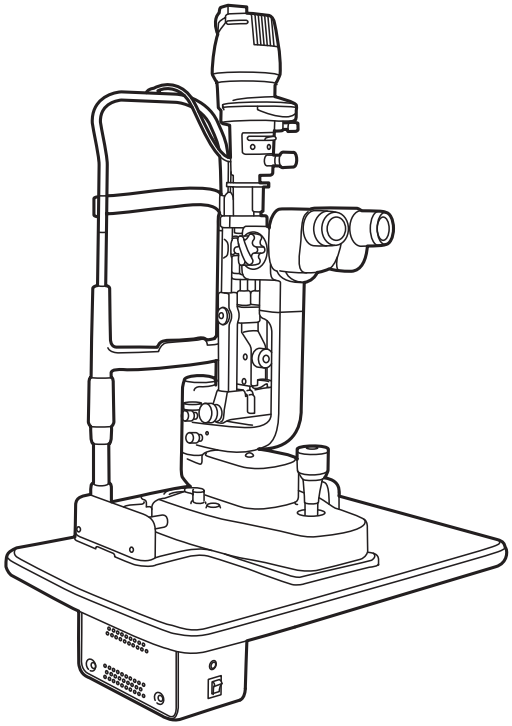
TOPCON



USER MANUAL
SLIT LAMP

SL-D701

INTRODUCTION

Thank you for purchasing the SLIT LAMP SL-D701.

INTENDED USE / INDICATIONS FOR USE

The Slit Lamp SL-D701 is an AC-powered slitlamp biomicroscope intended for use in eye examination of the anterior eye segment, from the cornea epithelium to the posterior capsule. It is used to aid in the diagnosis of diseases or trauma which affect the structural properties of the anterior eye segment.

FEATURES

This instrument has the following features:

- Various accessories to extend the system
- Ergonomic cable layout
- Clear fluorescent cornea observation and photography of cornea
- Clear eyeground observation and photography by color conversion filter
- Available with LED illumination or conventional halogen illumination

PURPOSE OF THIS MANUAL

To get the best usage from the instrument, please read "DISPLAYS FOR SAFE USE" and "GENERAL SAFETY INFORMATION".
Keep this Manual with the instrument for future reference.

CAUTION : Federal law restricts this device to sale by or on the order of a Physician or Practitioner(CFR 801.109(b)(1)).

1. No part of this manual may be copied or reprinted, in whole or in part, without prior written permission.
2. The contents of this manual are subject to change without prior notice and without legal obligation.
3. The contents of this manual are correct to the best of our knowledge. Please inform us of any ambiguous or erroneous descriptions, missing information, etc.
4. Original Instructions
   This instruction manual was originally written in English.

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CONTENTS

GENERAL SAFETY INFORMATION

⚠ CONTRAINDICATIONS

This instrument must not be used for the following patients:

- Patients who are hypersensitive to light
- Patients who recently underwent photodynamic therapy (PDT)
- Patients taking medication that causes photosensitivity.

⚠ WARNINGS

Ensuring the Safety of Patients and Operators

Use this instrument carefully on the following patients.

- Patients who have epidemic corneitis, conjunctivitis or any other infectious disease
- Patients who are taking medications that cause light hypersensitivity.

To avoid injury to the patient's eye and nose, pay particular attention while operating the instrument body. (The patient may be injured.)

The Topcon SL-D701 is a medical device. The software and hardware has been designed in accordance with U.S., European and other international medical device design and manufacturing standards. Unauthorized modification of the Topcon SL-D701 software or hardware, or any addition or deletion of any application in any way can jeopardize the safety of operators and patients, the performance of the instrument, and the integrity of patient data.

Because prolonged intense light exposure can damage the retina, the use of the device for ocular examination should not be unnecessarily prolonged, and the brightness setting should not exceed what is needed to provide clear visualization of the target structures.

The retinal exposure dose for a photochemical hazard is a product of the radiance and the exposure time. If the value of radiance were reduced in half, twice the time would be needed to reach the maximum exposure limit.

While no acute optical radiation hazards have been identified for direct or indirect ophthalmoscopes, it is recommended that the intensity of light directed into the patient's eye be limited to the minimum level which is necessary for diagnosis. Infants, aphakes and persons with diseased eyes will be at greater risk. The risk may also be increased if the person being examined has had any exposure to the same instrument or any other ophthalmic instrument using a visible light source during the previous 24 hours. This will apply particularly if the eye has been exposed to retinal photography.

Equipment is not suitable for use in the presence of a Flammable Anesthetic Mixture with Air, Oxygen, or Nitrous Oxide.

The Topcon SL-D701 has no special protection against harmful ingress of water or other liquids (classified IPX0). To avoid damage to the instrument and cause a safety hazard, the cleaning solutions, including water, should not be directly applied to the device. Using a dampened cloth (without dripping), is a good method to clean the exterior surface of the enclosure.

Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause birth detects or other reproductive harm. **Wash hands after handling.**

Preventing Electric Shock and Fire.
To avoid fire in the event of an instrument malfunction, immediately turn OFF the power switch (○) and disconnect the power cord from the instrument if you see smoke coming from the instrument, etc. Don't install the instrument where it is difficult to disconnect the power cord from the instrument. Ask your dealer for service.

⚠ CAUTIONS

Ensuring the Safety of Patients and Operators
Be careful not to let the patient touch this instrument. The patient's hand may be pinched by a movable part.
To avoid burns caused by heat, do not replace the lamp with a new one immediately after it goes off.
To avoid injury to the patient's head, incline the illumination unit slowly while holding the base unit.
When operating the base unit, please note the following: •Beware of catching fingers in the moving parts. •Avoid hitting the patient's eyes or nose.

Preventing Electric Shock and Burn
To avoid injury or fire caused by electric shock, turn off the power switch and unplug the power cord when not in use.
To avoid injury caused by electric shock, turn off the power switch when replacing the lamp.

Electromagnetic Compatibility (EMC)
This instrument has been tested (with 100/120/230V) and found to comply with IEC60601-1-2 Ed.3.0: 2007as class B(classified according to CISPR11). This instrument radiates radio frequency energy within standard and may affect other devices in the vicinity. If you have discovered that turning on/off the instrument affects other devices, we recommend you change its position, keep a proper distance from other devices, or plug it into a different outlet. Please consult your authorized dealer if you have any additional questions.

HOW TO USE THIS MANUAL

- Read the instructions on pages 1 to 9 before using the machine.
- If you would like an overview of the system, begin by reading "OPERATION PROCEDURE" (page 24).

GENERAL MAINTENANCE INFORMATION

USER MAINTENANCE

To maintain the safety and performance of the instrument, unless done by an authorized service engineer, never attempt to do maintenance of items other than those specified here in.
For details about maintenance, read the description of this manual.

Replacing the Illumination Lamp

The illumination lamp can be replaced if necessary. For specific instructions, see page 35.

DISCLAIMERS

- TOPCON is not responsible for damage due to fire, earthquakes, actions or inactions of third persons or other accidents, or damage due to negligence and misuse by the user and any use under unusual conditions.
- TOPCON is not responsible for damage derived from inability to properly use this equipment, such as loss of business profits and suspension of business.
- TOPCON is not responsible for damage caused by operations other than those described in this user manual.
- The device does not provide a diagnose of any condition or lack thereof or any recommendation for appropriate treatment. The relevant healthcare provider is fully responsible for all diagnose and treatment decisions and recommendations.

DISPLAYS AND SYMBOLS FOR SAFE USE

To encourage safe and proper use and to prevent injury to the operator and others or potential damage to property, important messages are put on the instrument body and inserted in the instruction manual.
We suggest that everyone understand the meaning of the following displays, icons and text before reading the "GENERAL SAFETY INFORMATION" and observe all listed instructions.

DISPLAYS

Display	Meaning
⚠ **CONTRAINDICATIONS**	Situations in which the device should not be used because the risk of use clearly outweighs any possible benefit.
⚠ **WARNINGS**	Incorrect handling by ignoring this display may lead to a risk of death or serious injury.
⚠ **CAUTIONS**	Incorrect handling by ignoring this display may lead to personal injury or physical damage.
NOTES	Useful functions to know. Paying attention to these will prevent the noted problems.

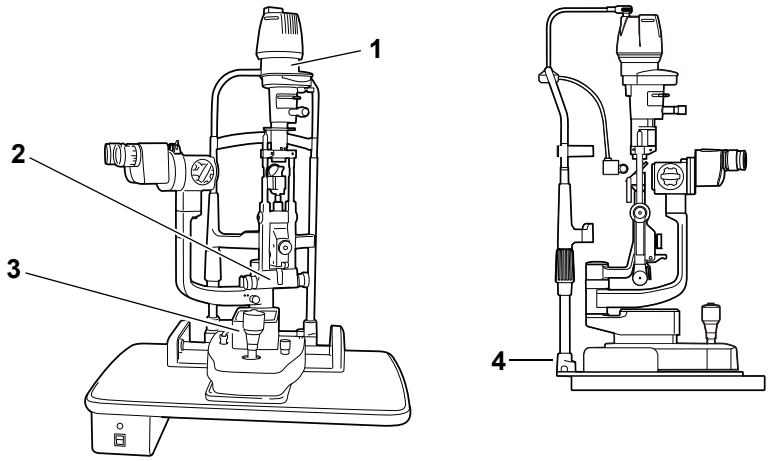
SYMBOLS

Symbol	IEC/ISO Publication	Description	Description (French)
	IEC 60417-5032	Alternating Current	Courant alternatif
	IEC 60417-5008	Off (power: disconnection from the main power supply)	Éteint (courant: coupure avec le secteur)
	IEC 60417-5007	On (power: connection to the main power supply)	Allumé (courant: raccordement sur le secteur)
	IEC 60878-02-02	Type B applied part	Partie appliquée du Type B
	ISO 7010-W001	General warning sign	Symbole d'avertissement général
	ISO 7010-M002	Refer to instruction manual/ booklet	Voir le manuel/la brochure

POSITIONS OF WARNING AND CAUTION INDICATIONS

To ensure safety, warning labels are provided on the instrument body.

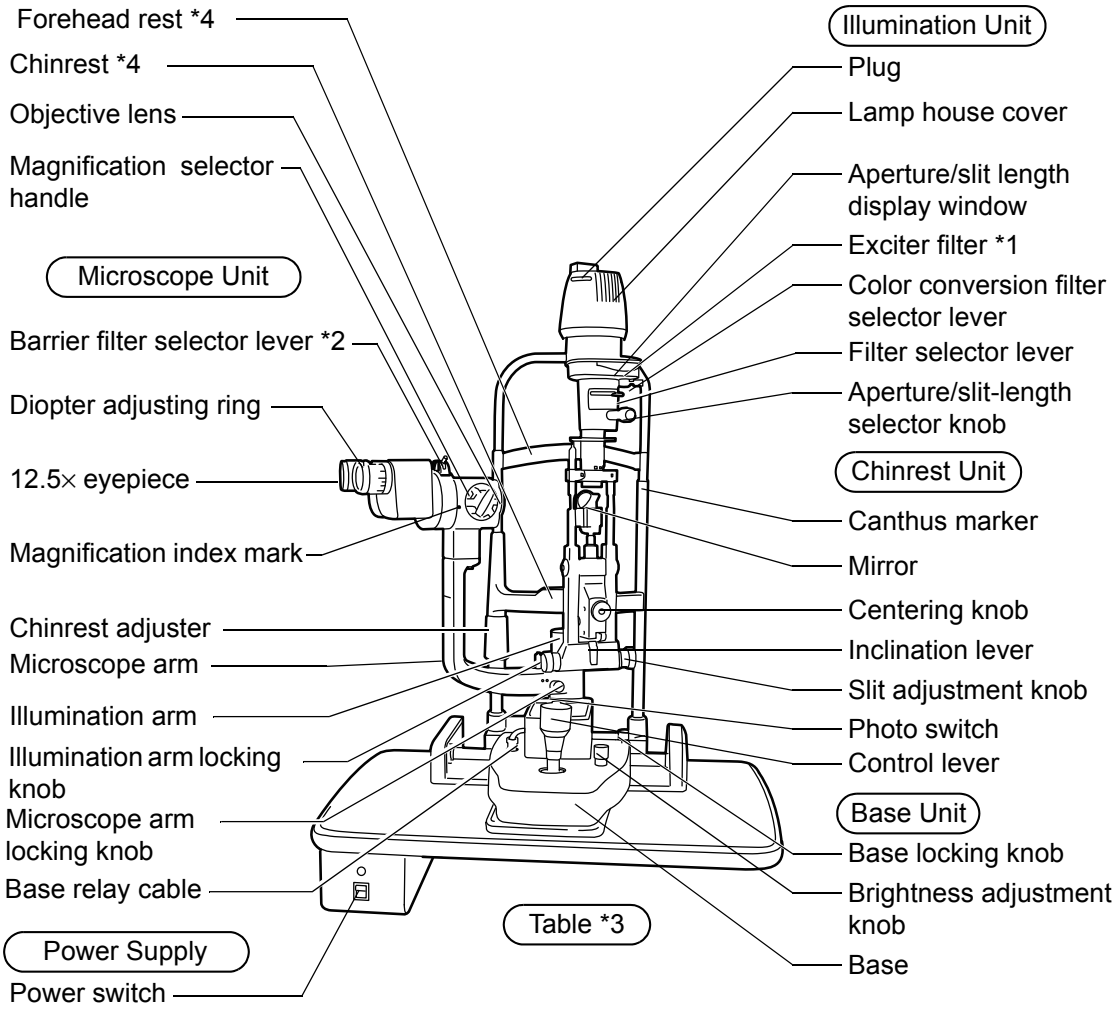
Use the instrument following these warning instructions. If any of the following labels are missing, contact your dealer or TOPCON (see the back cover).



No.	Label	Meaning	Signification
1		**CAUTION** • To prevent electric shocks, switch off the power supply and remove the power cable before replacing the lamp. • Do not replace the lamp immediately after switching it off: the high temperatures could cause burns.	**PRÉCAUTION** • Afin d'éviter les chocs électriques, coupez l'alimentation électrique et débranchez le câble d'alimentation avant de remplacer la lampe. • Ne pas remplacer la lampe immédiatement après l'avoir éteinte: la température élevée peut provoquer des brûlures.
2		**CAUTION** To avoid injury to the patient's head, incline the illumination unit slowly while holding the base unit.	**PRÉCAUTION** Afin d'éviter de blesser le patient à la tête, inclinez lentement l'élément lumineux tout en maintenant la base de l'appareil.
3		When operating the base unit, please note the following: • Beware of catching fingers in the moving parts. • Avoid hitting the patient's eyes or nose.	**PRÉCAUTION** Lorsque vous maniez la base de l'appareil, veuillez noter les points suivants: • Faites attention à ne pas vous coincer les doigts dans les parties en mouvement. • Évitez de heurter les yeux ou le nez du patient.
4		Degree of protection against electric shock : TYPE B APPLIED PART	Degré de protection contre les chocs électriques : TYPE B PARTIE D'APPLICATION

SYSTEM DIAGRAM

COMPONENT NAMES



*1,2 A model without exciter filter for slit lamp/barrier filter for slit lamp is also available.

*3 A model without table unit is also available.

*4 Contacting part (class B)

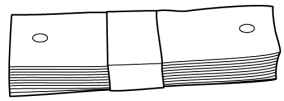
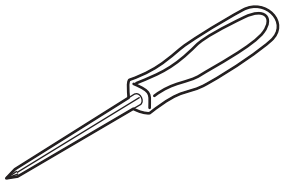
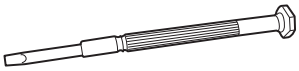
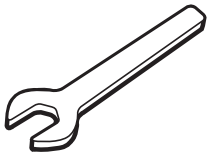
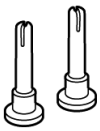
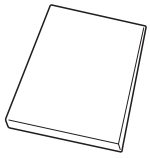
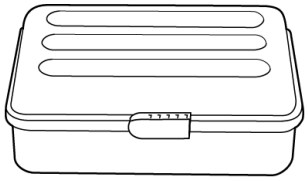
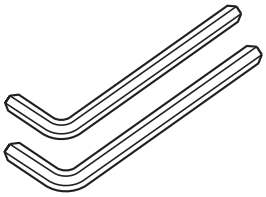
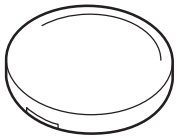
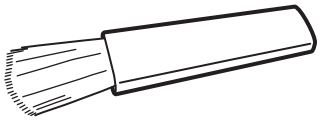
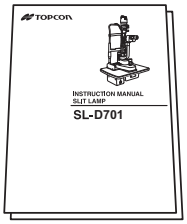
COMPOSITION OF PARTS THAT COME IN CONTACT WITH THE PATIENT

Forehead rest: Polyamide resin

Chinrest : Polyamide resin

STANDARD ACCESSORIES

Make sure that all the following standard accessories are included.
Figures in parentheses are the quantities.

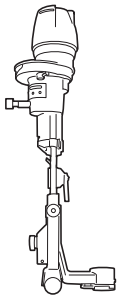
Chinrest tissue (1) 	Dust cover (1) 	Test rod (1) (This is not always included with the standard specifications.) 
Crosshead screwdriver (1) 	Screwdriver (1) 	Spanner (1) 
Spare chinrest tissue pin (2) 	Square mirror (1) 	Accessory case (1) 
Hexagon wrench (2) 	Cap (1) 	Cleaning brush (1) 
User manual (1), Instruction manual (1) 		

For optional accessories, see “Optional Accessories” on page 53.

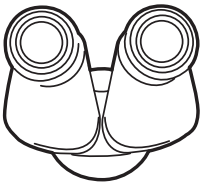
COMPONENTS

COMPONENTS

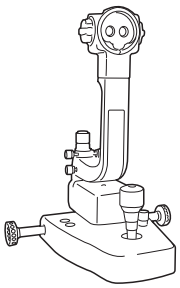
(1) Illumination unit



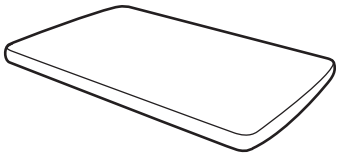
(2) Binocular tubes



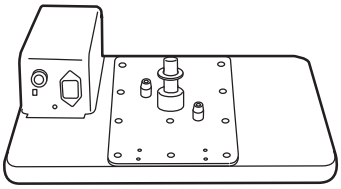
(3) Base unit



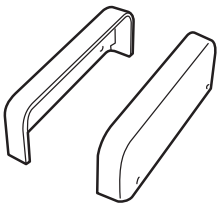
(4) Instrument type table top (w/power supply)



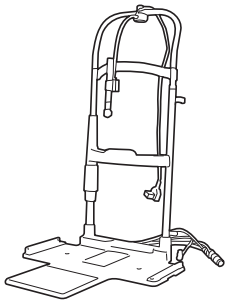
(4)' Unit type table top



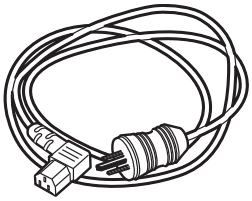
(5) Rail cover



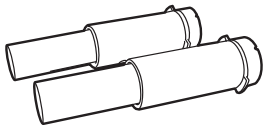
(6) Chinrest unit



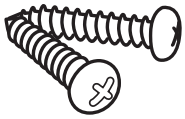
(7) Power cable



(8) Auxiliary spring



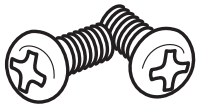
(9) Chinrest fixing screw



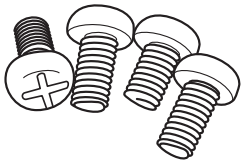
(10) Cable cover

* This component is unavailable in some regions.

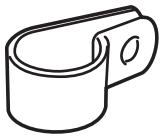
(11) Cable cover fixing screw



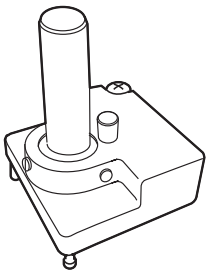
(12) Rail cover fixing screw



(13) Cable clip



(14) Tonometer maunt SO-TM1



Article name	Qty	Article name	Qty
(1) Illumination unit	1	(8) Auxiliary spring	2
(2) Binocular tubes	1	(9) Chinrest fixing screw	2
(3) Base unit	1	(10) Cable cover	1
(4) Instrument type table top (w/power supply)*	1	(11) Cable cover fixing screw	2
or (4)' Unit type table top*	1	(12) Rail cover fixing screw	4
(5) Rail cover	2	(13) Cable clip	3
(6) Chinrest unit*	1	(14) Tonometer maunt SO-TM1*	1
(7) Power cable	1		

* (4) or (4)' table top is not included, depending on the specifications.
* (6) Depending on chinrest and (14) Tonometer mount might not be included.

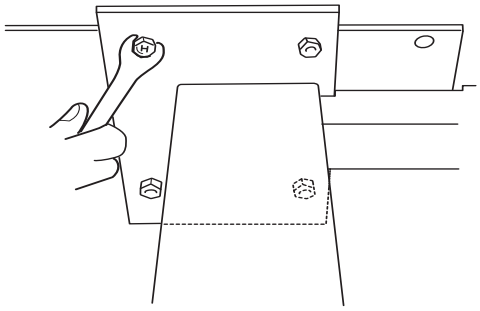
ASSEMBLY PROCEDURE

SECURING THE INSTRUMENT TYPE TABLE TOP

⚠CAUTION	To prevent falling during use and movement, secure each unit.

FITTING TO AUTOMATIC INSTRUMENT TABLE AIT-15/AIT-16

1 Place the tabletop on the instrument table, and secure it with the 4 bolts attached to the instrument table. To reverse the direction of the instrument table, remove the power supply from the bottom of the table top and secure it on the opposite side.

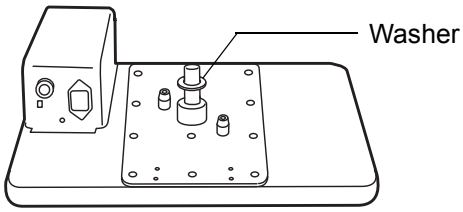


NOTE	Connect the power cable to the table outlet and power supply of the instrument table. Place the excess cable inside the cover, and attach the cover.

SECURING THE UNIT TYPE TABLE TOP

1 Remove the plastic washer from the unit type table top, which is taped to the shaft assembly.

2 Insert the plastic washer, together with the shaft, into the cavity for the ophthalmic unit arm.

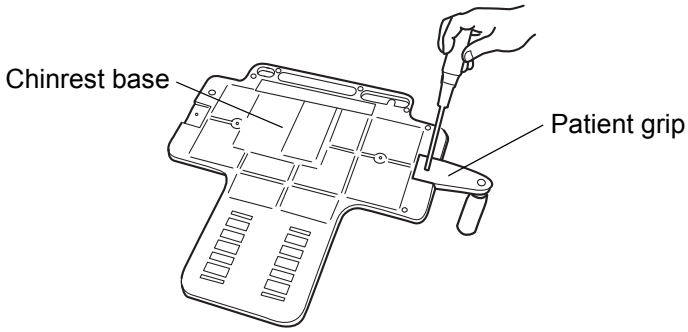


NOTE	In the unit type table top, the power supply is fitted to attach the ophthalmic unit on the right hand side. When attaching the ophthalmic unit on the left-hand side, remove the power supply and reattach it to the right hand side (with 4 screws).

SECURING THE PATIENT GRIP PG-1(OPTIONAL ACCESSORY)

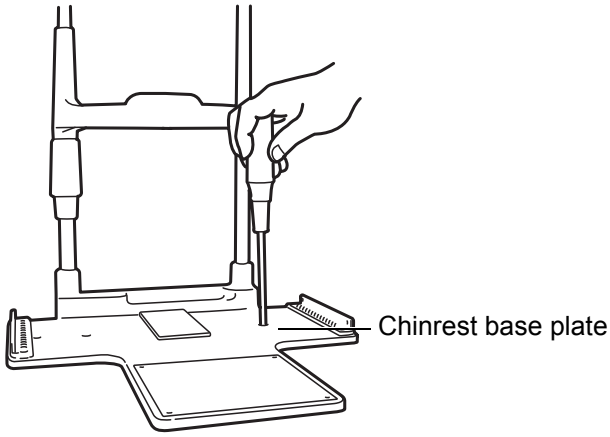
1 Align the patient grip with a groove on the rear of the chinrest base.

2 Fix the patient grip with screws.



SECURING the Chinrest Base Plate

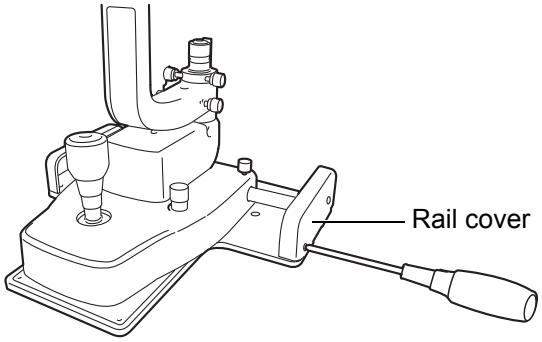
1 Secure the chinrest base plate to the unit type table top with 2 screws (9).



SECURING THE BASE UNIT AND RAIL COVER

1 Align the wheel of the base unit with the rail of the chinrest base plate.

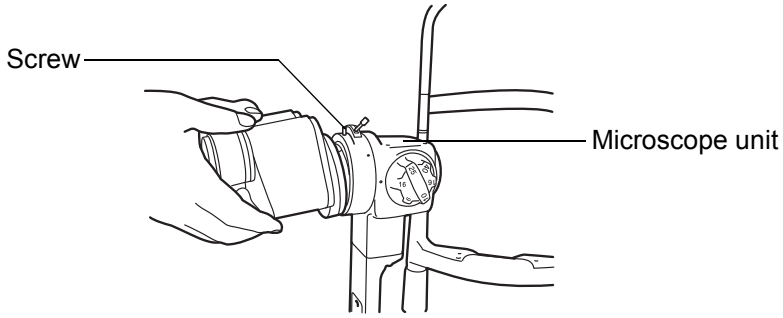
2 Insert the connection cable into the LAN output terminal of the instrument.



SECURING THE BINOCULAR TUBES

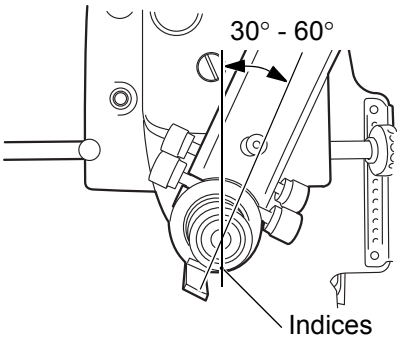
1 Align the pin of the microscope unit with the groove on the binocular tubes, and fit the screw with a hexagon wrench.
In the model without excitor/barrier filter, fit binocular tube with the fixing screw.

NOTES	Make sure you do not touch the lens surfaces.

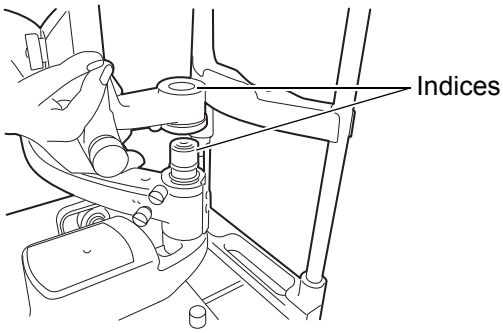


SECURING THE ILLUMINATION UNIT

Loosen the microscope arm locking-knob of the base unit, manually turn the shaft and tilt the guide rod-shaft index 30-60°, then refasten the microscope-arm locking-knob.

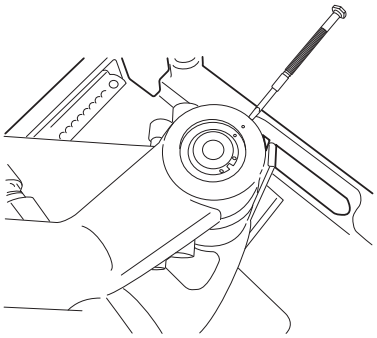


2 Loosen the fixing screw on the outside of the fitting cavity of the illumination unit with a screw-driver. Align indices and slowly lower the illumination unit onto the shaft of the base unit.



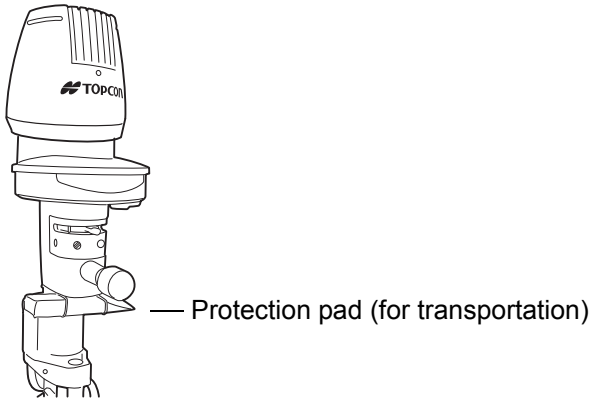
NOTES	While assembling the illumination unit, take care not to get your fingers caught.

3 Firmly tighten the fixing screw with a screwdriver.



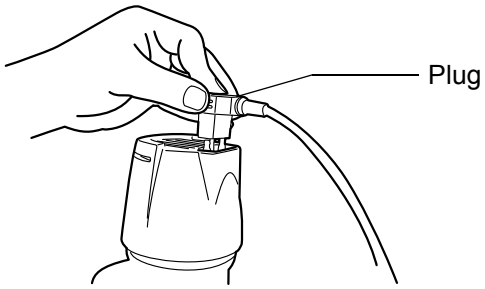
REMOVING THE ILLUMINATION UNIT PAD

1 Remove the rubber band and slowly withdraw the protection pad from the slit operation mechanism of the illumination unit.

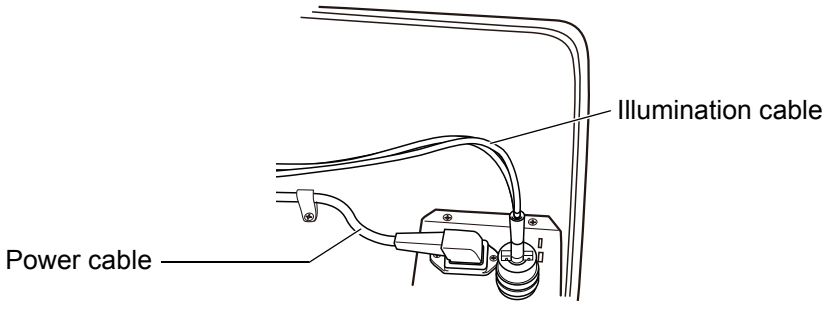


CONNECTING AND SECURING OF CABLES

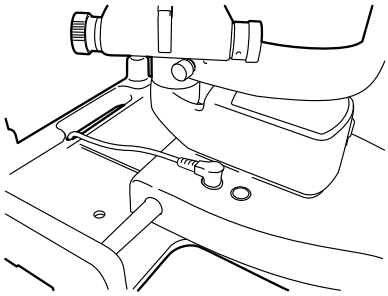
1 Remove the tape from the lamp house cover of the illumination unit. Plug the cable from the upper part of the chinrest into the illumination unit.



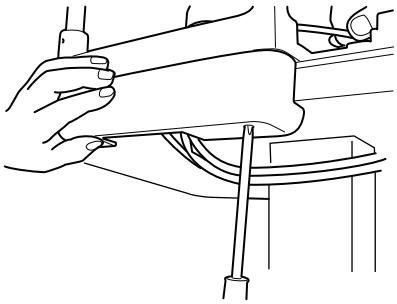
2 Connect the cable from the lower part of the chinrest unit and the power cable to the power supply.



3 Pass the 8 pin connector from the metal plug connected to the power supply through the hole of the chinrest and connect to the base unit.



4 Fit the cable cover with 2 screws (11).



5 Pull the base unit toward the side of the operator, then lock.
Attach the cables to the back of the table with the cable clip (13).

6 Move the base unit and illumination unit, and make sure there is enough cable to allow free movement of the base unit in all directions.

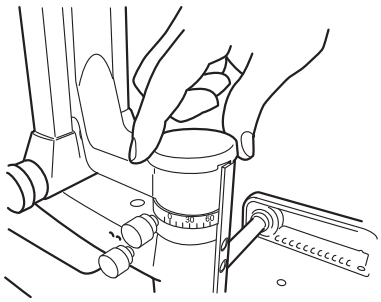
FITTING THE CHINREST TISSUE

1 Remove the chinrest tissue pins.

2 Take approximately one-fifth of the pad of chinrest tissues and secure this at each end with the pins.

FITTING THE CAP

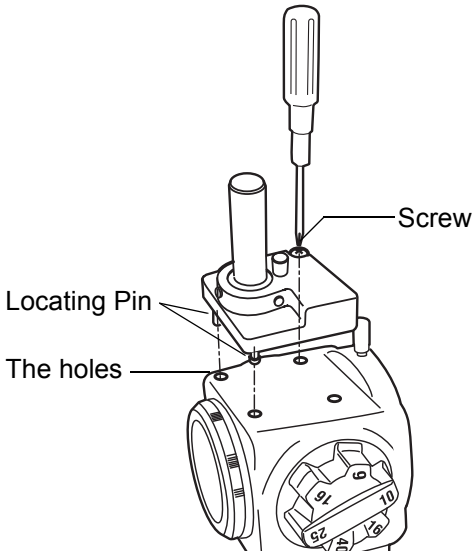
1 Fit the cap to the shaft aligning the guide rod with the groove in the cap.



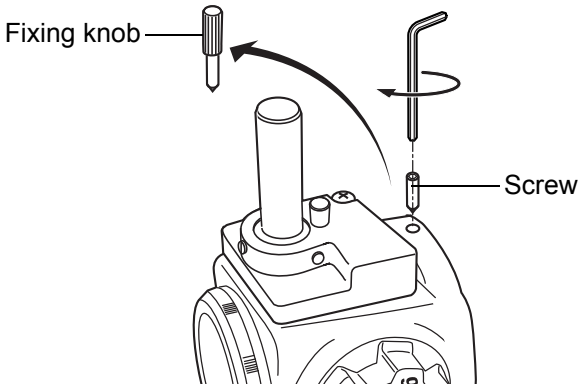
SECURING THE TONOMETER MOUNT SO-TM1 (OPTIONAL ACCESSORY)

Depending on specification, SO-TM1 may be included in standard accessories.

1 Align the locating pin of SO-TM1 into the holes of the microscope, and fasten the screw.



2 Remove the fixing knob of the microscope, and secure the eyepieceunit, etc with the packaged screw.



3 Applanation tonometer R900 type, Photokeratoscope attachment, etc could be mounted on SO-TM1.

COUNTER BALANCING THE VERTICAL MOVEMENT

When accessories, including the TV relay lens, are fitted to the main body, the vertical counter-balance movement may need to be adjusted. To correct this, auxiliary springs must be fitted.

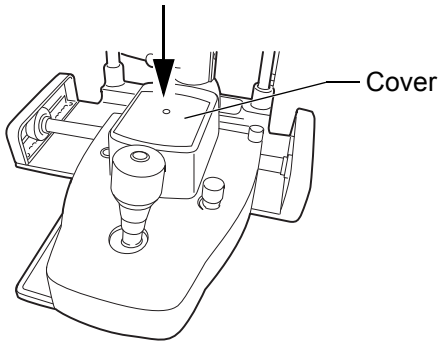
Major Combinations of Accessories and Necessary Auxiliary Springs

Accessories	Auxiliary Spring type	
	Tonometer is not fitted	Tonometer is fitted
TV relay lens TL-55 + SONY DXC-33 (DXC-390)	——	Standard auxiliary spring
Beam splitter + Observation tube	Standard auxiliary spring	Auxiliary spring SO-AS1

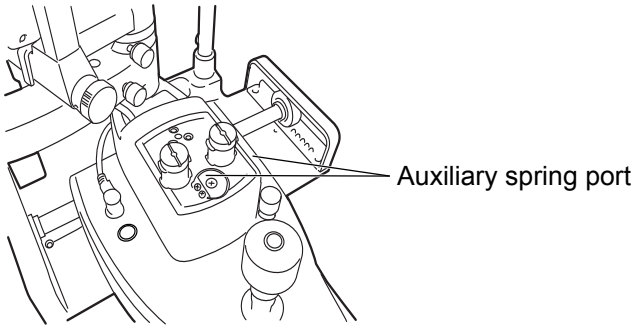
Each auxiliary spring consists of 2 identical springs.
Do not use different springs in a set.

COUNTER-BALANCE PROCEDURE

1 Turn the control lever clockwise and raise the base to the top position, remove the center screw and take off the cover.

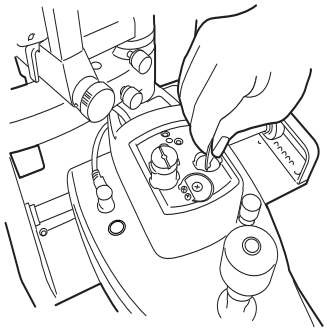


2 Insert the auxiliary spring unit vertically into the auxiliary spring port, with the flange face turned upwards. (Make sure that the spring is inserted into the groove in the bottom of the port.



3 Open the auxiliary spring unit with the auxiliary spring port, and lightly push the spring till it stops. (A large screwdriver, a flat sheet metal tool, a coin, etc. can be used to this end.)

4 With the auxiliary spring unit lightly touching the stopper, turn about 90° (in either direction), then release. The auxiliary spring locks into the positioning groove and assembly is complete. (To remove the auxiliary spring, lightly press it down to the stopper, rotate it 90° and remove from the port.)



PREPARATIONS

POWERING ON

⚠WARNING	To avoid fire and electric shock in case of leakage, be sure to use a grounded outlet. Do not connect to outlets that are not grounded.

1 Connect the power cable.

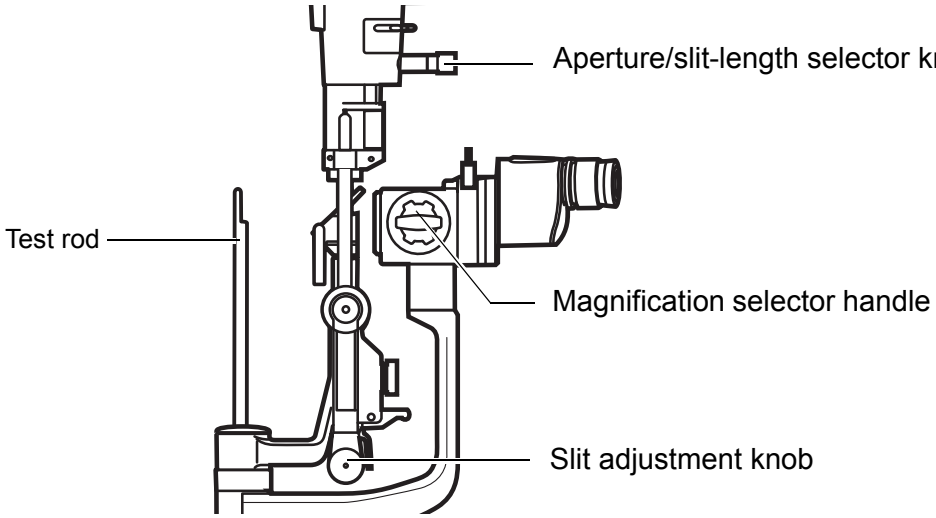
2 Turn ON the POWER switch.

ADJUSTING THE DIOPTER AND PUPILLARY DISTANCE (PD)

NOTE	• To ensure sharp observation of slit images, always carry out the diopter and PD adjustments. • The illumination light brightly shines for a moment immediately after powering on.

In case that no test rod is provided, set the diopter scale to your diopter by turning the diopter adjustment ring.

1 Insert the test rod into the rotation shaft cavity, and set the black face square with the microscope.



2 Set the eyepiece with scale to the non-dominant eye side.

3 Turn ON the POWER switch, and place the brightness adjustment knob in an intermediate position.

4 Adjust the illumination to ϕ10mm by adjusting the slit adjustment knob and aperture/slit-length selector knob.

5 Rotate the magnification selector handle to the minimum magnification (6x).

6 Turn the diopter adjusting ring of the eyepiece with scale (⊕) fully counter-clockwise.

7 Turn the diopter adjusting ring clockwise and stop when both the scale (⊕) and test rod can be clearly seen.

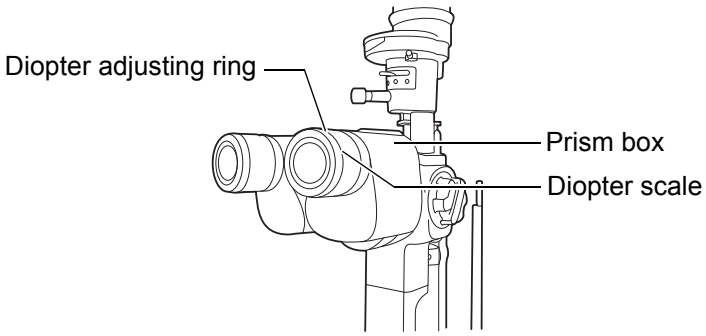
8 Read the value on the diopter scale of the stop position. The value shows the diopter (D).

9 Set the diopter scale of the other eyepiece to the read value.

10 Set the eyepiece with scale (⊕) to the dominant eye side, and adjust the diopter scale of the dominant eye as in steps 5 and 6.

11 After adjusting the diopter, turn the slit adjustment knob until the slit width is about 1mm, then check if the slit image projected on the test rod can be clearly seen with both right and left eyes.

12 Holding the prism box, look through the eyepiece with both eyes, and adjust the pupillary distance so that the image projected on the test rod can be seen without diplopia (double vision), and appears to be three dimensional.



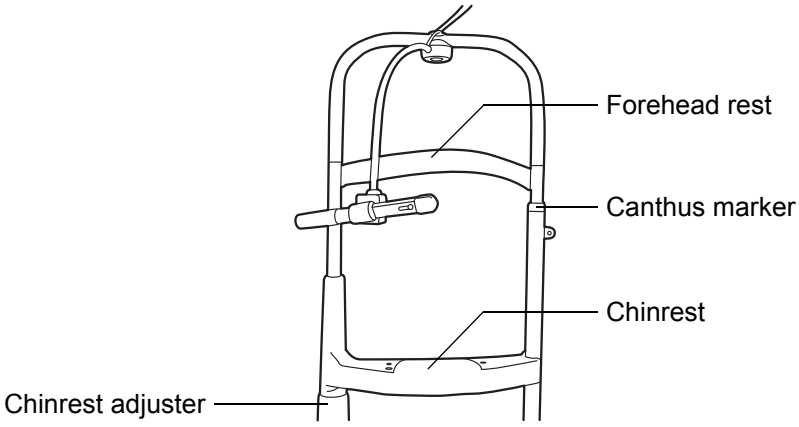
OPERATION PROCEDURE

FIXING THE PATIENT'S FACE AND FIXATION

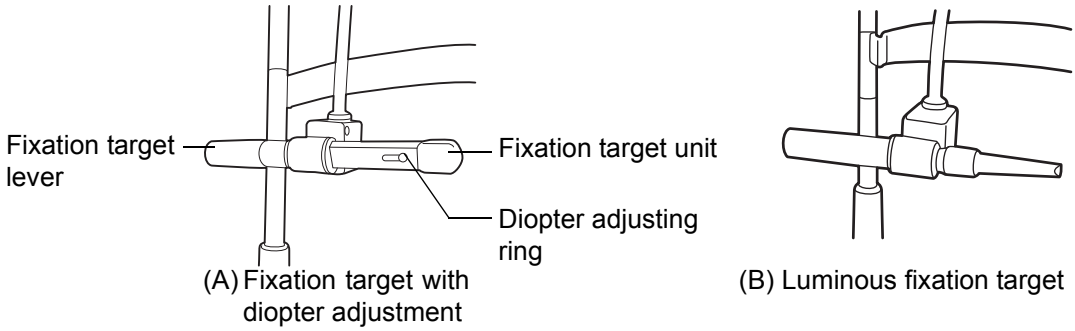
The model without a fixation target is also available.

1 Place the patient's chin on the chinrest with his forehead against the forehead rest.

2 By rotating the chinrest adjuster, align the patient's eye with the canthus marker on the chinrest frame.



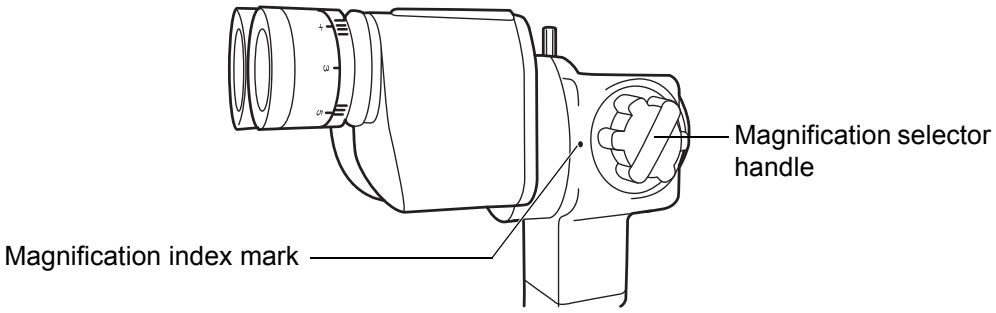
3 Ask the patient to look at the fixation target with the eye that is not being examined.To change the patient's fixation point, hold the fixation target at the end opposite to the target and adjust accordingly.



NOTE	• When using the fixation target with diopter adjustment (A), slide the diopter adjustment knob so that the patient can see the following target (◎). • The ring target can be adjusted within a range of -15D to +10D. • The luminous fixation target is used for myopia of -15D or more. • When replacing targets, remove the target by pulling gently whilst supporting the opposite end.

OPERATING THE MICROSCOPE UNIT

Turn the magnification selector to set a magnification value against the magnification index mark.



NOTE	For the overall magnification in conjunction with magnification marks of the magnification selector handle, see page 39.

OPERATING THE BASE AND FOCUSING

⚠CAUTION	• To avoid injury to the eye and nose whilst moving the base unit, make sure that you have a clear view of the slit lamp and the patient's face. • For the safety of the operator and the patient, do not place fingers between moving parts.

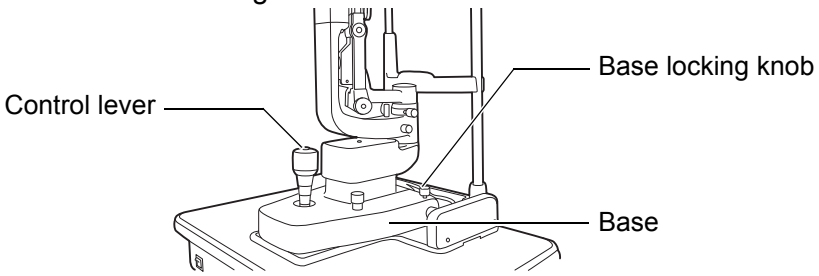
NOTE	To prevent dropping the base locking knob from the base, do not loosen the knob too much

1 For major horizontal movements, hold the control lever in the upright position and move the entire base.

2 For fine adjustments, move the control lever in the required direction.

3 The base can be raised by turning the control lever clockwise, and lowered by turning the control lever counter-clockwise.

4 To fix the base, fasten the base locking knob.



NOTE	• Rough focusing is carried out with major movements, following step 1-3. • Fine focusing is done with the microscope, following steps 2 and 3.

OPERATING THE ILLUMINATION UNIT

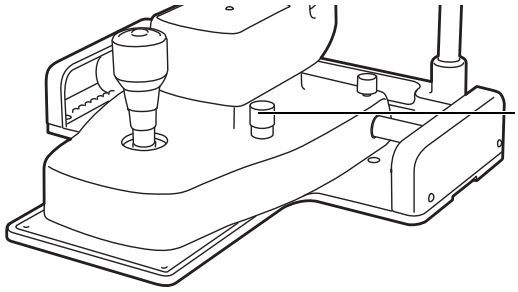
⚠CAUTION	• To avoid injury to the patient's head, incline the illumination unit holding the base unit. • To avoid causing discomfort to the patient or **any** damage to the patient's eye, keep the illumination at its minimum during adjustment.

NOTE	• Adjust the slit width according to the results of the investigation. • The slit-width scale should be used as a guideline. • When using the square mirror, incline the illumination unit at least 10º.

ADJUSTING THE BRIGHTNESS

Turn the brightness adjustment knob.

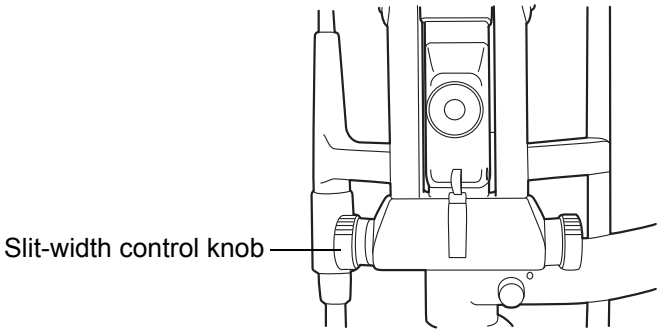
The brightness of the illumination light can be adjusted to the preferred illumination setting.



ADJUSTING THE SLIT WIDTH

Turn the slit-width control knob.

The slit width can be changed gradually between 0 and 14mm (14mm=circle).

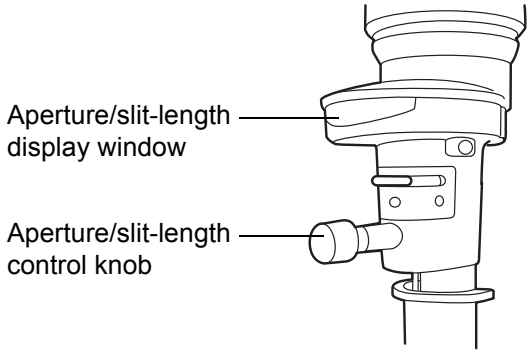


CHANGING THE APERTURE/SLIT LENGTH

Turn the aperture/slit-length control knob.

When the slit is fully opened, 6 types of spot illumination (ϕ14, ϕ10, ϕ5, ϕ2, ϕ1, ϕ0.2) are available. The slit width can be changed gradually from 1mm to 14mm.

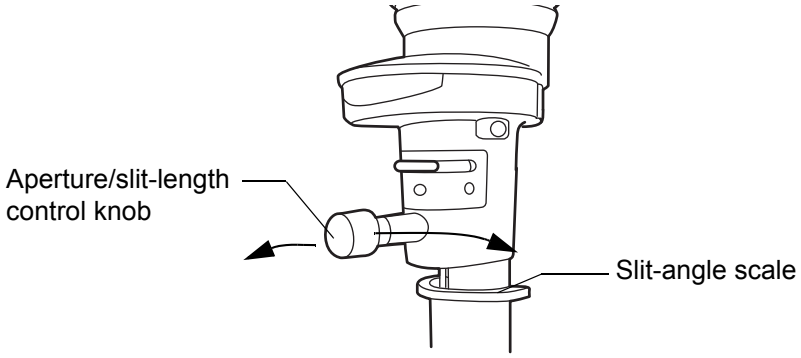
NOTE	The spot illumination size and slit length are displayed on the aperture/slit-length display window.



TURNING THE SLIT

Horizontally rotate the aperture/slit-length control knob.

This directly changes the slit image from vertical to horizontal. In this mode, the slit angle can be read off the angle scale.



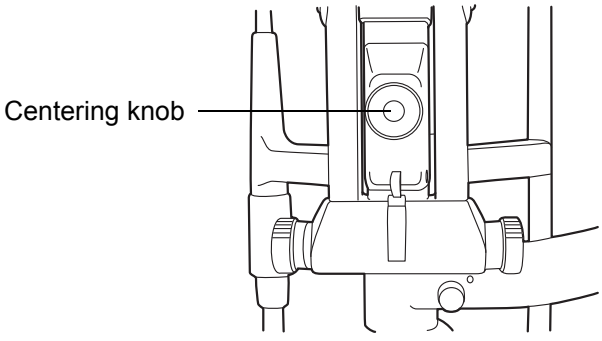
SWINGING THE SLIT SIDEWAYS

Loosen the centering knob and swing the illumination unit right and left.

This provides indirect illumination displacing the slit light from the microscope center.

By fastening the centering knob, the slit light returns to the center of the vision field.

NOTE	This function is used for scanning observation and observation with indirect illumination.

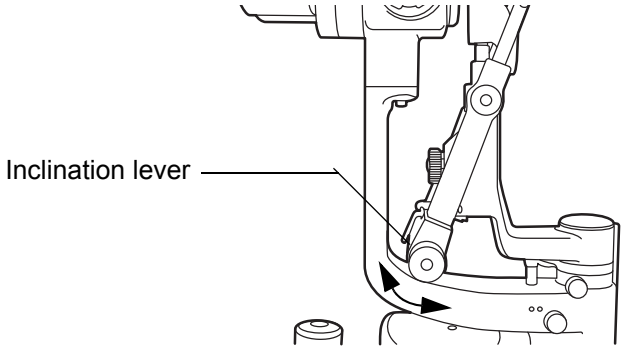


INCLINED ILLUMINATION

Press to unlock the inclination lever and pull.

The illumination unit is inclined for inclined illumination up to 20° in 5° steps.

NOTE	This function is used for observing a horizontal cross section, and for corner angle and fundus observation.

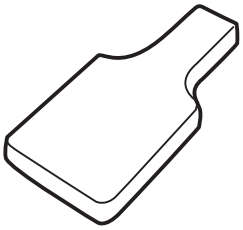


REFLECTION MIRROR

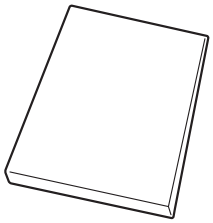
For this instrument, a battledore mirror and a square mirror are available. For normal observation, the battledore mirror is used.

However, if the arm angle scale, which represents the angle formed by the illumination arm and microscope arm, reads approx. 3° to 10° and the observation light flux is disturbed by the battledore mirror, then the square mirror should be used.

The square mirror is to be used when the arm angle is opened to more than 10°.



Battledore mirror



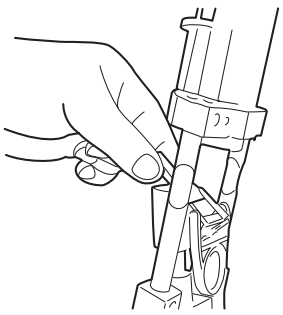
Square mirror

NOTE	The square mirror is standard accessory.

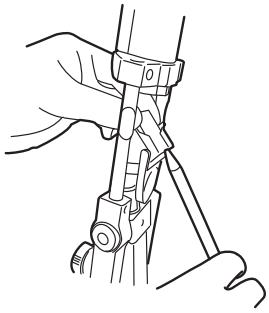
REPLACING REFLECTION MIRRORS

Replace mirrors as follows, taking care not to touch the mirror and lens surfaces:

- •Open the microscope arm and illumination arm 30° or more.
- •Incline the illumination unit 10° or more.
- •Pull out the battledore mirror, holding the slender part on both sides. To reinsert the battledore mirror, hold the slender part on both sides and insert.
- •Insert the square mirror from the side recessed on the back.
- •To pull out the square mirror, which has no handle, push the square mirror up as illustrated below.



Battledore mirror

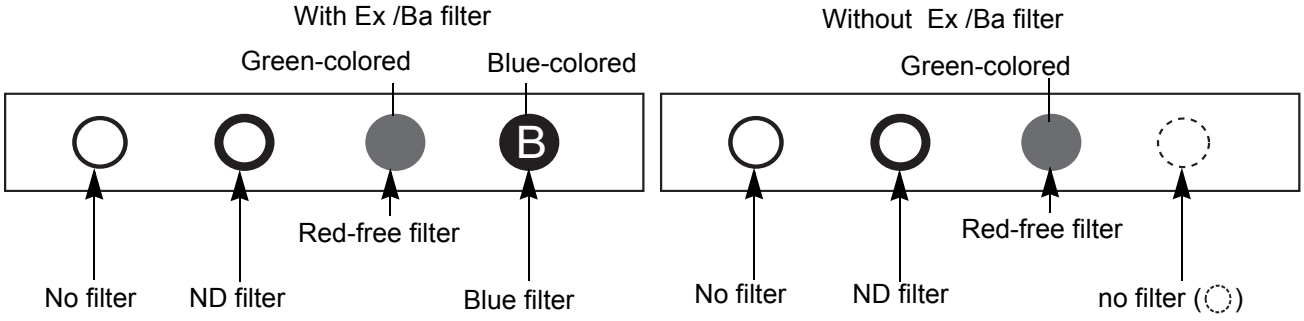


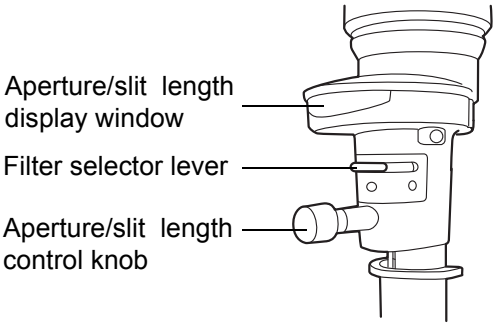
Square mirror

NOTE	If you touch the mirror or lens surface, please clean this according to the process on page 37 "Cleaning Lenses and Mirrors".

CHANGING FILTERS

Move the filter selector lever right and left to select the required filter from the 4 types.



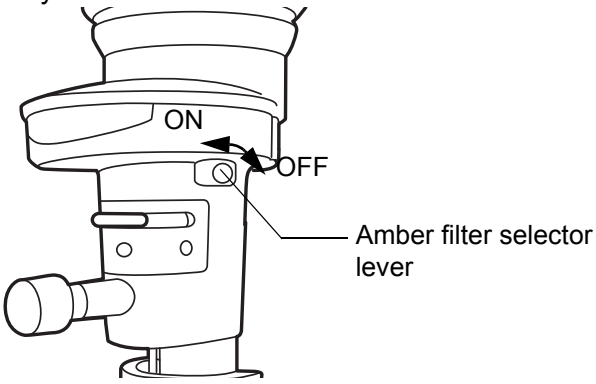


BLUE FILTER

For the SL-D701 without exciter/barrier type, rotate the Aperture/Slit-Length knob counter-clockwise until the blue circle appears in the aperture display window. The blue filter will be ready to use.

AMBER FILTER

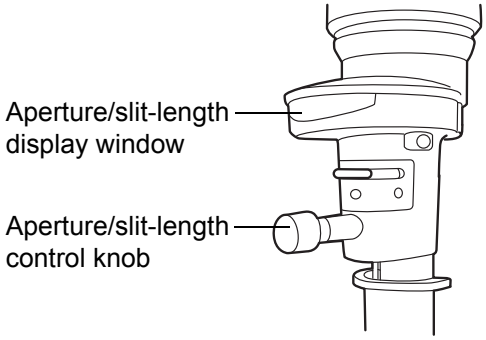
The amber filter is used to facilitate fundus observation.
The filter is inserted or removed by the amber filter selector lever.



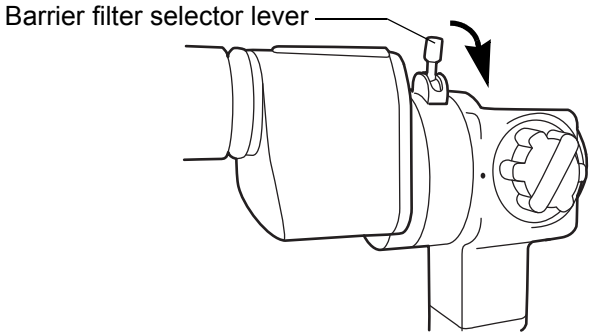
FLUORESCENCE OBSERVATION (EXCITER FILTER FOR SLIT LAMP/BARRIER FILTER FOR SLIT LAMP)

Fluorescence observation can be carried out using the exciter filter for slit lamp and barrier filter for slit lamp.

1 Turn the aperture/slit-length display window anti-clockwise until the blue circle appears, then insert the exciter filter for slit lamp into the illumination path.



2 Turn the barrier filter selector lever to the right and insert the barrier filter for slit lamp.

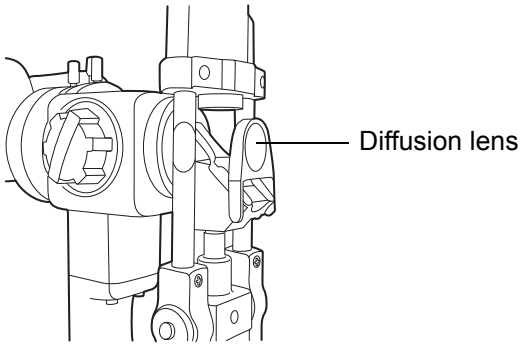


NOTE	This setting is availabel for users who have SL-D701 “with EX / Ba filter” type.

DIFFUSION LENS

When in use, the diffusion lens is set vertically in front of the reflection mirror.
When not in use, remove the lens from the light path.

NOTE	The diffusion lens is used for observing the entire object with a low magnification.



ENDING PROCEDURE

Turn OFF the Power switch.

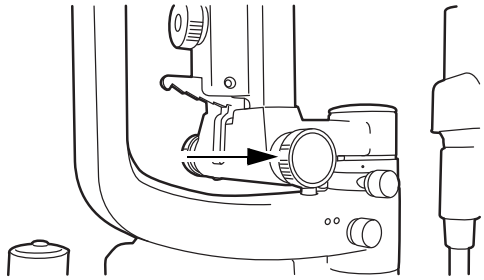
NOTE	The illumination light brightly shines for a moment when turning the power off.

MAINTENANCE AND CHECKUPS

MAINTAINING THE PRECISION

ADJUSTING THE SLIT WIDTH CONTROL KNOB TORQUE

•If the slit width narrows by itself due to a decrease in slit width control knob torque, adjust the torque as follows.



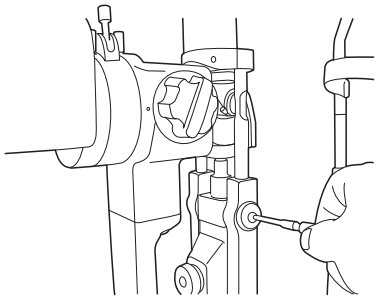
1 Using the attached hexagon wrench, loosen the slit width control knob.

2 Press the slit-width control knob on the left-hand side, and turn the right-hand side clockwise.

3 Fasten the slit width control knob on the right-hand side with the hexagon wrench.

ADJUSTING THE INCLINATION TORQUE

•If the inclination torque of the illumination unit is too low, fasten the arm inclination by tightening the screws clockwise on both sides of the arm.



PERIODIC MAINTENANCE

Before using, confirm the following:

•Adjust the diopter and eye width following "ADJUSTING THE DIOPTER AND PUPILLARY DISTANCE (PD)" on page 22 and turn the slit adjustment knob and make the slit width about 1mm: The slit image projected on the test rod is seen clearly.
•Move the base forward-backward and right-left: The base moves smoothly.
•Component parts, including the eyepiece unit, are fitted in place.
•The chinrest base is firmly fitted to the table.
•Cables and plugs are firmly connected.

DAILY CARE

•This instrument may be affected adversely by dust. Apply the dust cover when not using.

PLACING AN ORDER FOR CONSUMABLES

•When ordering consumable items, contact your dealer or TOPCON (see the back cover).
Specify the article name, product code and quantity.

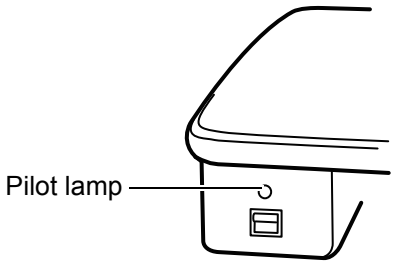
Article name		Product code
Light source	Halogen lamp	446802570
	Socket	446802590
Chinrest tissue		403104082

USER MAINTENANCE ITEMS

Item	Inspection time	Contents
Inspection	Before using	• Adjusting the diopter and pupillary distance • Focus of slit image • The base unit must move smoothly. • The components must be fitted in place correctly. • The chinrest unit must be fitted to the table unit correctly. • The cables and plugs must be connected correctly. • The objective lens, eyepiece and mirror must not be stained or damaged.
Cleaning	When the part is stained	• Objective lens • Eyepiece • Mirror • Sliding plate, rail and wheel shaft unit • Forehead rest and chinrest unit
Adjustment	As required	• Slit width control knob torque • Inclination torque of illumination unit
Replacement	As required	• Halogen lamp • Socket
Supply	As required	• Chinrest tissue

REPLACING ILLUMINATION LAMPS

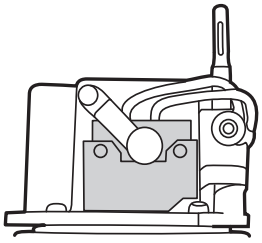
When a pilot lamp of a power supply box is blinking red under the power switch ON, it is necessary to replace the lamp.

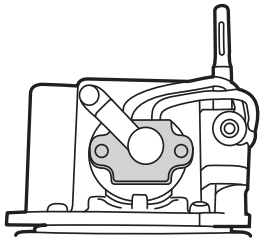


⚠CAUTION	• When attaching halogen lamp to ensure perfect illumination, make sure that the socket flange and notch are firmly fitted to the lamp house. • Beware of high temperatures when replacing the lamp immediately after switching it off: these could cause burns. • When using the background illumination BG-5, remove the "Power code" of BG-5 from the "Plug" before removing the plug to avoide damage to the "Power code" of BG-5.

CHECK THE TYPE OF ILLUMINATION LAMP

Remove the plug on top of the lamp house and remove the cover by turning and pulling up.
Check the shape of the illumination bulb socket to verify the type of bulb in use.
Refer to the drawings below to identify the bulb type: LED type or halogen type.


LED type

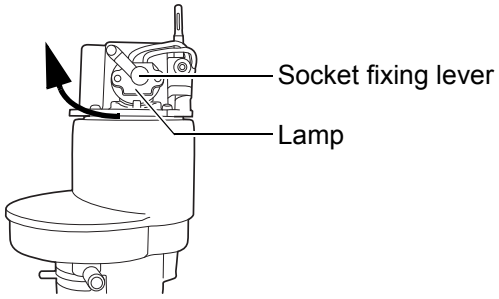

Halogen type

NOTE	• To ensure perfect illumination, make sure that the socket flange and notch are firmly fitted to the lamp house. • Use a soft cloth and do not touch the illumination lamp with bare fingers: fingerprints and stains may affect illumination and cause premature failure of the lamp.

1 Turn OFF the POWER switch and remove the cable plug.

2 Turn the lamp housing cover clockwise and remove upward.

3 Lightly pull the socket fixing lever and turn in the direction indicated by the arrow.



4 Remove the socket assembly with the lamp.

5 Remove the lamp from the socket.

6 Fit the new lamp in reverse order, making sure the direction of the illumination lamp and socket is correct.

REPLACING SOCKETS

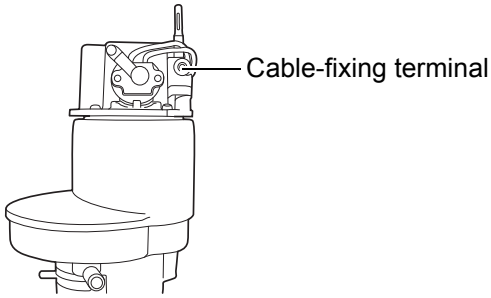
If a pilot lamp blinks red after replacing the lamp, the light source may not be set correctly. Please check the light source of lamp again.
If the pilot lamp blinks after replacing the lamp, please contact with the reference of the back cover.

NOTE	The socket may deteriorate due to the constant heat: therefore, it should be replaced after the lamps have been changed two or three times.

1 Remove the lamp following steps 1-4 of "Replacing Illumination Lamps".

2 Loosen the cable-fixing terminal, remove the cable, and replace the socket with a new one.

3 Fit the new socket in reverse order.



RESTOCKING CHINREST TISSUE

When the chinrest tissue supply is depleted, pull out the chinrest tissue pins and replace tissue.

DAILY CARE

⚠CAUTION	• Before carrying out daily care, remove the power cable (to avoid electric shocks) and wait until the lamp house has cooled (to avoid burns). • Do not touch parts inside the lamp house cover during operation and immediately after switching off the power supply: this could cause burns.

NOTE	• To prevent the chinrest, forehead rest and other plastic parts from discoloration and deterioration, do not use volatile solvents for cleaning, including benzine, thinner, ether, gasoline, etc. • Wipe parts with a cloth moistened with a tepid solution of neutral kitchen detergent.

CLEANING APPLIED PARTS

Wipe the forehead rest, the chinrest and the patient grip (if a pair of patient grip is used) with a cloth moistened with a tepid solution of neutral detergent for kitchenware.

CLEANING LENSES AND MIRRORS

REMOVING STAINS

NOTE	To prevent damaging lens surfaces, do not hold gauze with tweezers.

1 Prepare a solution of ethyl alcohol 20% and ether 80%.

2 Remove dust from lens and mirror surfaces with the cleaning brush, or a blower.

3 Using clean gauze or lint-free tissue, lightly clean with a rotating movement from the center of the lens/mirror outwards.

4 If the stain remains, repeat this 2 to 3 times.

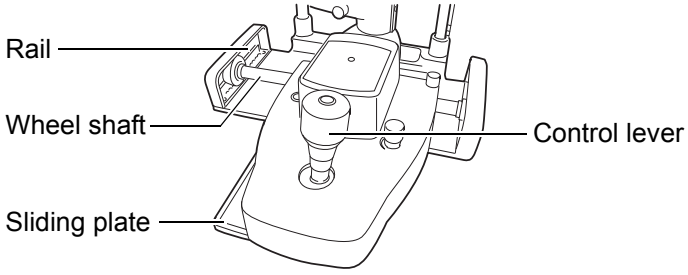
5 If stains are persistent, call your dealer or TOPCON (see the back cover).

CLEANING THE SLIDING PLATE, RAIL AND WHEEL SHAFT

NOTE	When stained, the movement of the sliding plate and rail of the tabletop and the wheel shaft of the base becomes less smooth. Clean them with a dry cloth.

1 Move the base right and left and wipe the wheel shaft clean with a dry cloth.

2 Hold up the control lever and clean the sliding plate with a dry cloth.



TROUBLESHOOTING

TROUBLESHOOTING GUIDE

⚠CAUTION	To avoid electric shocks, do not attempt overhauling, rebuilding or repairs. Ask your dealer for repair.

If you suspect a problem, check the possible cause by means of the check list below.
If the check list below does not solve the problem, or if the problem is not included in the list, contact your dealer or TOPCON (see the back cover).

Check List

Problem	Possible cause	Check	Page
Illumination lamp does not work	Cable connection is disconnected	Check cable connection.	17
	Base relay cable is switched off.	Connect the cable.	17
	Plug of lamp house cover is switched off	Insert plug.	17
	POWER switch is OFF	Turn ON POWER switch.	22
	Brightness adjustment knob is the minimum	Turn up brightness adjustment knob.	27
	Illumination lamp is broken	Replace it with a new illumination lamp.	35
	Socket has deteriorated	Replace it with a new socket.	36
	Slit width is the minimum	Rotate the slit adjustment knob	22
Illumination field is not uniform/is shady/ is dark	Filter selector lever is out of position	Click filter selector lever.	30
Slit width narrows by itself	Slit-adjustment knob torque has been decreased	Readjust slit-width control knob torque.	33

SPECIFICATIONS AND PERFORMANCE

Specifications and Performance

Microscope unit	
Type	Galileo type
Magnification	Drum, 5-step magnification
Magnification steps	6/10/16/25/40
Overall magnification (actual vision field)	6.37 (ϕ35.1mm) 9.94 (ϕ22.5mm) 15.87 (ϕ14.1mm) 25.37 (ϕ8.8mm) 39.62 (ϕ5.6mm)
Eyepiece lens	Magnification: 12.5x Diopter adjustment range: -5D to +5D
Binocular tubes	PD adjustment: 55 to 78mm
Illumination unit	
Illumination field	Slit width: 0 to14mm, can be altered gradually(14mm=circle) Slit length: 14 to1mm, can be altered gradually(14mm=circle) Aperture diameter: ϕ14, 10, 5, 2, 1, 0.2
Slit direction	Vertical to horizontal, can be altered gradually Inclination: 5/10/15/20 Side swing
Filter	Blue filter, red-free filter, amber filter, UV cut filter (normal use), IR cut filter (normal use), ND filter (13% transmission), exciter filter for slit lamp*1, barrier filter for slit lamp*2
Illumination lamp	Halogen type: 12V, 30W LED type: 3A, 10W
Base unit	
Forward-backward movement	90mm
Right-left movement	100mm
Vertical movement	30mm
Amount of movement in all directions	12mm
Chinrest unit	
Amount of vertical movement of chinrest	80mm
Fixation target*3	Fixation target with diopter adjustment Luminous fixation target
Fixation lamp	LED (Red)

*1, *2 A model without exciter filter for slit lamp/barrier filter for slit lamp is also available.
*3 A model without fixation target is also available.
• The specification and design of the product can be altered for improvements without prior notice.

Agency Compliance

The SL-D701 is designed to comply with the following agency standards:

- IEC 60601-1: 2005 Ed3.0
- EN60601-1: 2006/AC:2010
- IEC 60601-1-2 Ed3.0: 2007/EN60601-1-2:2007/AC:2010
- AAMI/ANSI ES60601-1:2005/A32:2010
- ISO 10939:2007
- ISO 15004-1:2006
- ISO 15004-2:2007
- EC Medical Device Directive 93/42/EEC
- CAN/CSA C22.2 No.60601-1:08

NOTE	The following statement is the "Essential performance" provided for by IEC60601-1. The illumination light is not to be turned off.

GENERAL INFORMATION ON USAGE AND MAINTENANCE

INTENDED PATIENT POPULATION

The patient who undergoes an examination by this instrument must maintain concentration for a few minutes and keep to the following instructions:

To fix the face to the chinrest, forehead rest.

To keep the eye open.

To understand and follow instructions when undergoing an examination.

INTENDED USER PROFILE

The SL-D701 SLIT LAMP is an electric instrument for medical use.

Use this instrument under a doctor's guidance.

ENVIRONMENTAL CONDITIONS FOR USE

Temperature : 10°C to 40°C

Humidity : 30% to 90% (without dew condensation)

Air pressure : 700hPa to 1060hPa

STORAGE, USAGE PERIOD

1. Environmental conditions (without package)

   * Temperature : 10°C to 40°C

   Humidity : 10% to 95% (without dew condensation)

   Air pressure : 700hPa to 1060hPa

   ***THIS INSTRUMENT DOES NOT MEET THE TEMPERATURE REQUIREMENTS OF ISO 15004-1 FOR STORAGE. DO NOT STORE THIS INSTRUMENT IN CONDITIONS WHERE THE TEMPERATURE MAY RISE ABOVE 40°C OR FALL BELOW 10°C.**

2. When storing the instrument, ensure that the following conditions are met:
   (1) The instrument must not be splashed with water.
   (2) Do not store the instrument in an environment where air pressure, temperature, humidity, ventilation, sunlight, dust, salty/sulfurous air, etc. could cause damage.
   (3) Do not store or transport the instrument on a slanted or uneven surface or in an area where it is subject to vibrations or instability.
   (4) Do not store the instrument where chemicals are stored or gas is generated.
3. Normal life span of the instrument:
   8 years from delivery providing regular maintenance is performed (according to the self-certification [TOPCON data])

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN STORAGE

Temperature : -20°C to 50°C
Humidity : 10% to 95%

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTAION

Temperature : -40°C to 70°C
Humidity : 10% to 95%

ELECTRIC RATING

Source voltage : AC100 - 240V
Frequency : 50 - 60Hz
Power input : 110 VA

DIMENSIONS AND WEIGHT

Dimensions, Weight	
Dimensions: w/Table	550mm(W) x 420mm(D) x 752 to 782mm(H)
w/ Unit Table	440mm(W) x 397mm(D) x 752 to 782mm(H)
w/o Table	329mm(W) x 396mm(D) x 652 to 682mm(H)
w/o Table and Chinrest	329mm(W) x 331(304)mm(D) x 652 to 682mm(H)
Weight: w/Table	19kg
w/ Unit Table	18kg
w/o Table	13kg
w/o Table and Chinrest	11.5kg
Table size	550mm x 370mm
Unit Table size	440mm x 350mm
Height from the top to patient's eye	375mm

SYSTEM CLASSIFICATION

- Type of protection against electric shocks: Class I equipment
  Class I equipment does not depend on basic insulation only for protection against electric shocks. It can also be earthed; therefore, the metal parts with which one comes into contact do not become conductive if the basic insulation fails.
- Degree of protection against electric shocks: Type B applied part
  Type B applied part is the applied part complying with the specified requirements of the Standard IEC 60601-1 to provide protection against electric shock, particularly regarding allowable LEAKAGE CURRENT.
- Degree of protection against harmful ingress of water: IPx0
  SL-D701 has no protection against ingress of water. (The degree of protection against harmful ingress of water defined in IEC 60529 is IPx0)
- Classification according to the methods of sterilization or disinfection recommended by the manufacture: not applicable.
  SL-D701 has no part to be sterilized or be disinfected.
- Not AP or APG equipment
- Classification according to the degree of safety of application in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide: Equipment not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide.
  SL-D701 should be used in environments where no flammable anesthetics and/or flammable gases are presents.
- Classification according to the mode of operation: Continuous operation.
  Continuos operation is the operation under normal load for an unlimited period, without the specified limits of temperature being exceeded.

OPERATION PRINCIPLES

Illuminates the observed part by the illumination light emitted from the illumination optical system and allows enlargement observation by binocular stereoscopic microscope.

CHECKPOINTS FOR MAINTENANCE

1. Regularly maintain and check the instrument and its parts.
2. When using the instrument after a prolonged period of inactivity, confirm normal and safe operation beforehand.
3. To take a good picture, be careful not to stain the objective lens with fingerprints or dust.
4. When this instrument is not in use, cap the objective lens and cover the instrument with the dust cover.
5. When the objective lens is stained, clean it according to "Cleaning Lenses and Mirrors" in this manual.

DISPOSAL

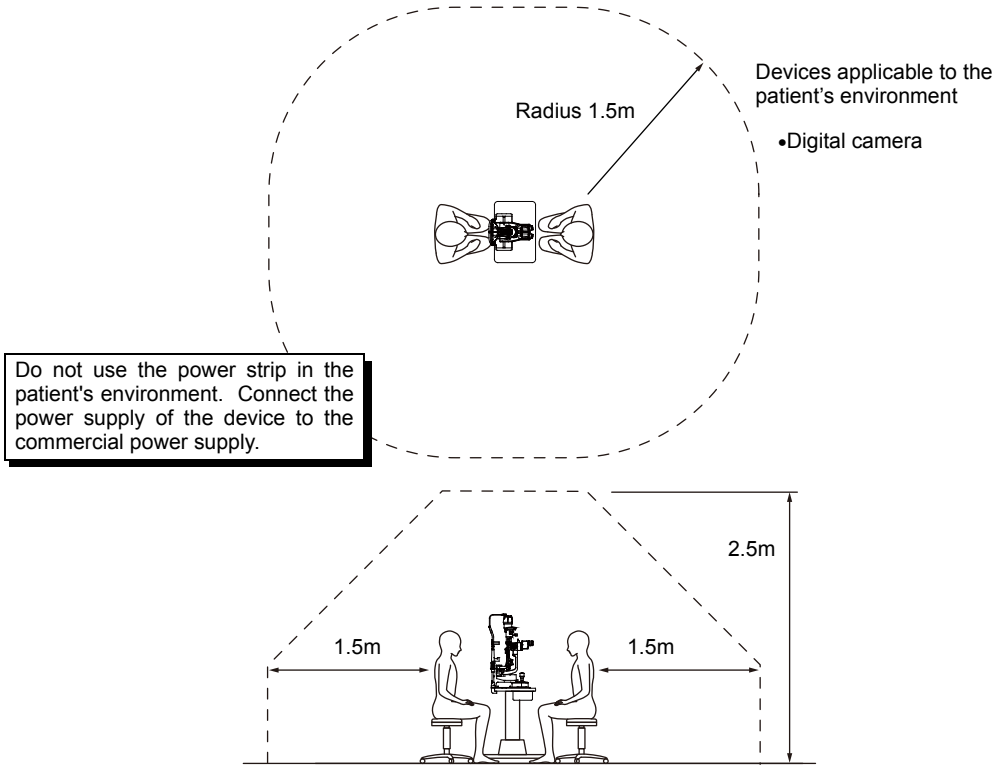
⚠CAUTION	The base contains strong springs. Do not attempt to disassemble or burn the base, as the springs could cause injury by shooting out of it.

- When disposing of SL-D701 parts, follow the local regulations for disposal and recycling.

NOTES	 This symbol is applicable for EU member countries only. To avoid potential damage to the environment and possibly human health, this instrument should be disposed of (i) for EU member countries - in accordance with WEEE (Directive on Waste Electrical and Electronic Equipment), or (ii) for all other countries, in accordance with local disposal and recycling laws.

PATIENT'S ENVIRONMENT

When the patient or inspector may touch the devices (including the connecting devices) or when the patient or inspector may touch the person that comes into contact with the devices (including the connecting devices), the patient's environment is shown below.
In the patient's environment, use the device conforming to IEC60601-1. If you are compelled to use any device not conforming to IEC60601-1, use an insulation transformer or the common protective earth system.



Requirements for the EXTERNAL DEVICE

The external device connected to the analog and digital interfaces must comply with the respective IEC or ISO standards (e.g. IEC 60950 for data processing equipment and IEC 60601-1 for medical equipment).
Anybody connecting additional equipment to medical electrical equipment configures a medical system and is therefore responsible that the system complies with the requirements for medial electrical systems. Attention is drawn to the fact that local laws take priority over the above mentioned requirements. If in doubt, contact your dealer or TOPCON (see the back cover).

ELECTROMAGNETIC COMPATIBILITY

This product conforms to the EMC standard (IEC 60601-1-2 Ed.3: 2007).

a) MEDICAL ELECTRICAL EQUIPMENT needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the ACCOMPANYING DOCUMENTS.
b) Portable and mobile RF communications equipment can affect MEDICAL ELECTRICAL EQUIPMENT.
c) The use of ACCESSORIES, transducers and cables other than those specified, with the exception of transducers and cables sold by the manufacturer of the EQUIPMENT or SYSTEM as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of the EQUIPMENT or SYSTEM.
d) The EQUIPMENT or SYSTEM should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the EQUIPMENT or SYSTEM should be observed to verify normal operation in the configuration in which it will be used.
e) The use of the ACCESSORY, transducer or cable with EQUIPMENT and SYSTEMS other than those specified may result in increased EMISSION or decreased IMMUNITY of the EQUIPMENT or SYSTEM.

Item	Article code	Cable shield	Ferrite core	Length(m)
ACCESSORIES				
BACKGROUND ILLUMINATION BG-5	44797 9025	-	-	-
CABLES				
AC Power cord (for SLIT LAMP)	44804 7015	Not Used	Not Used	1.5
ILLUMINATION cable	44701 4510	Used	Used	0.6

Guidance and manufacturer's declaration - electromagnetic emissions		
The SL-D701 is intended for use in the electromagnetic environment specified below. The customer or the user of the SL-D701 should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment - guidance**
RF emissions CISPR 11	Group 1	The SL-D701 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The SL-D701 is suitable for use in all establishments including domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC61000-3-3	Complies	

Guidance and manufacturer's declaration - electromagnetic immunity			
The SL-D701 is intended for use in the electromagnetic environment specified below. The customer or the user of the SL-D701 should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Main power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Main power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and Voltage variations on power supply input lines IEC 61000-4-11	<5% U_t (>95% dip in U_t) for 0.5 cycle 40% U_t (60% dip in U_t) for 5 cycles 70% U_t (30% dip in U_t) for 25 cycles <5% U_t (>95% dip in U_t) for 5 sec	<5% U_t (>95% dip in U_t) for 0.5 cycle 40% U_t (60% dip in U_t) for 5 cycles 70% U_t (30% dip in U_t) for 25 cycles <5% U_t (>95% dip in U_t) for 5 sec	Main power quality should be that of a typical commercial or hospital environment. If the user or the SL-D701 requires continued operation during main power interruptions, it is recommended that the SL-D701 be powered from an uninterruptible power supply or battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_t is the a.c. main voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic immunity			
The SL-D701 is intended for use in the electromagnetic environment specified below. The customer or the user of the SL-D701 should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150kHz to 80MHz 3 V/m 80MHz to 2.5GHz	3 V 3 V/m	Portable and mobile RF communications equipment should be used no closer to any part of the SL-D701, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80MHz to 800MHz $d = 2.3\sqrt{P}$ 800MHz to 2.5GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be less than the compliance level in each frequency range. [b] Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1	At 80 MHz and 800 MHz, the higher frequency range applies.		
NOTE 2	These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.		

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the SL-D701 is used exceeds the applicable RF compliance level above, the SL-D701 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the SL-D701.

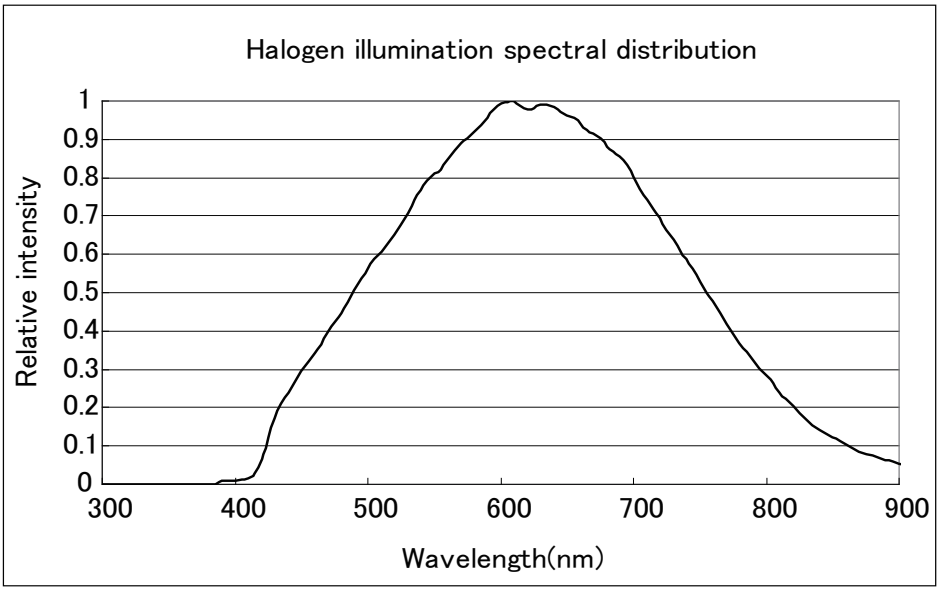
b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

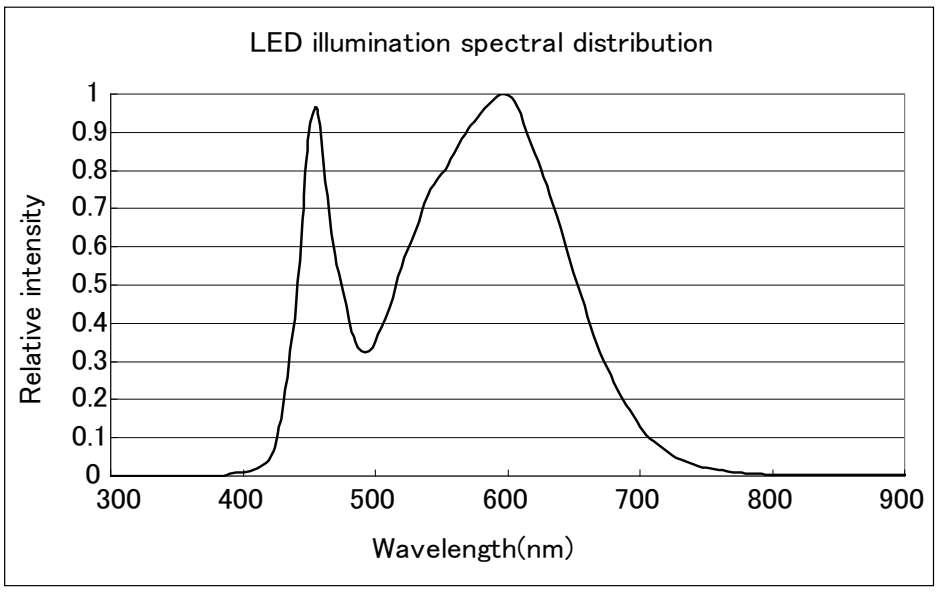
Recommended separation distance between portable and mobile RF communications equipment and the SL-D701			
The SL-D701 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the SL-D701 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the SL-D701 as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter m**		
	150kHz to 80MHz $d = 1.2\sqrt{P}$	**80MHz to 800MHz** $d = 1.2\sqrt{P}$	**800MHz to 2.5GHz** $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1	At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.		
NOTE 2	These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.		

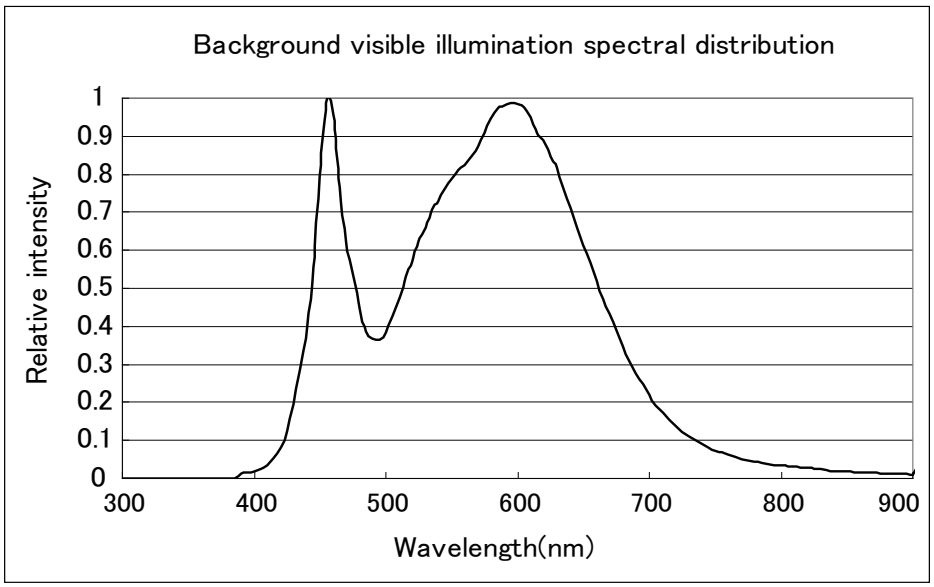
OPTICAL RADIATION HAZARD

⚠CAUTION	• The light radiated from the instrument is potentially hazardous. The longer the exposure time is, the higher the risk of causing disorder to the eye is. • When operating with the maximum intensity, the light radiation reaches values exceeding the safety guideline in about 75sec with LED slit illumination,125sec with Halogen slit illumination, 63sec with both LED slit and background illumination, or 95sec with both Halogen slit and background illumination.

RELATIVE SPECTRAL DISTRIBUTION OF ILLUMINATION LIGHT







Because prolonged intense light exposure can damage the retina, the use of the device for ocular examination should not be unnecessarily prolonged, and the brightness setting should not exceed what is needed to provide clear visualization of the target structures.

The retinal exposure dose for a photochemical hazard is a product of the radiance and the exposure time. If the value of radiance were reduced in half, twice the time would be needed to reach the maximum exposure limit.

While no acute optical radiation hazards have been identified for slit lamps, it is recommended that the intensity of light directed into the patient's eye be limited to the minimum level which is necessary for diagnosis. Infants, aphakes and persons with diseased eyes will be at greater risk. The risk may also be increased if the person being examined has had any exposure with the same instrument or any other ophthalmic instrument using a visible light source during the previous 24 hours. This will apply particularly if the eye has been exposed to retinal photography.

TYPE OF PLUG

Country	Voltage/frequency	Type of plug
Mexico	110V/50Hz	Type C&E
Argentina	220V/60Hz	Type A
Peru	220V/60Hz	Type A
Venezuela	110V/50Hz	Type C&E
Bolivia & Paraguay	220V/60Hz	Type A (Most common) Type H (Infrequently)
Chile	220V/60Hz	Type A
Colombia	110V/50Hz	Type C
Brazil	220V/60Hz 127V/60Hz	Type A Type C
Ecuador	110V/50Hz	Type C&E
USA	120V/60Hz	Type A (Hospital Grade)
Canada	120V/60Hz	Type A (Hospital Grade)

OPTIONAL ACCESSORIES

TOPCON SLIT LAMP SL-D701 provides the following optional accessories for imaging.
For inquiries, please call your dealer or TOPCON (see the back cover)

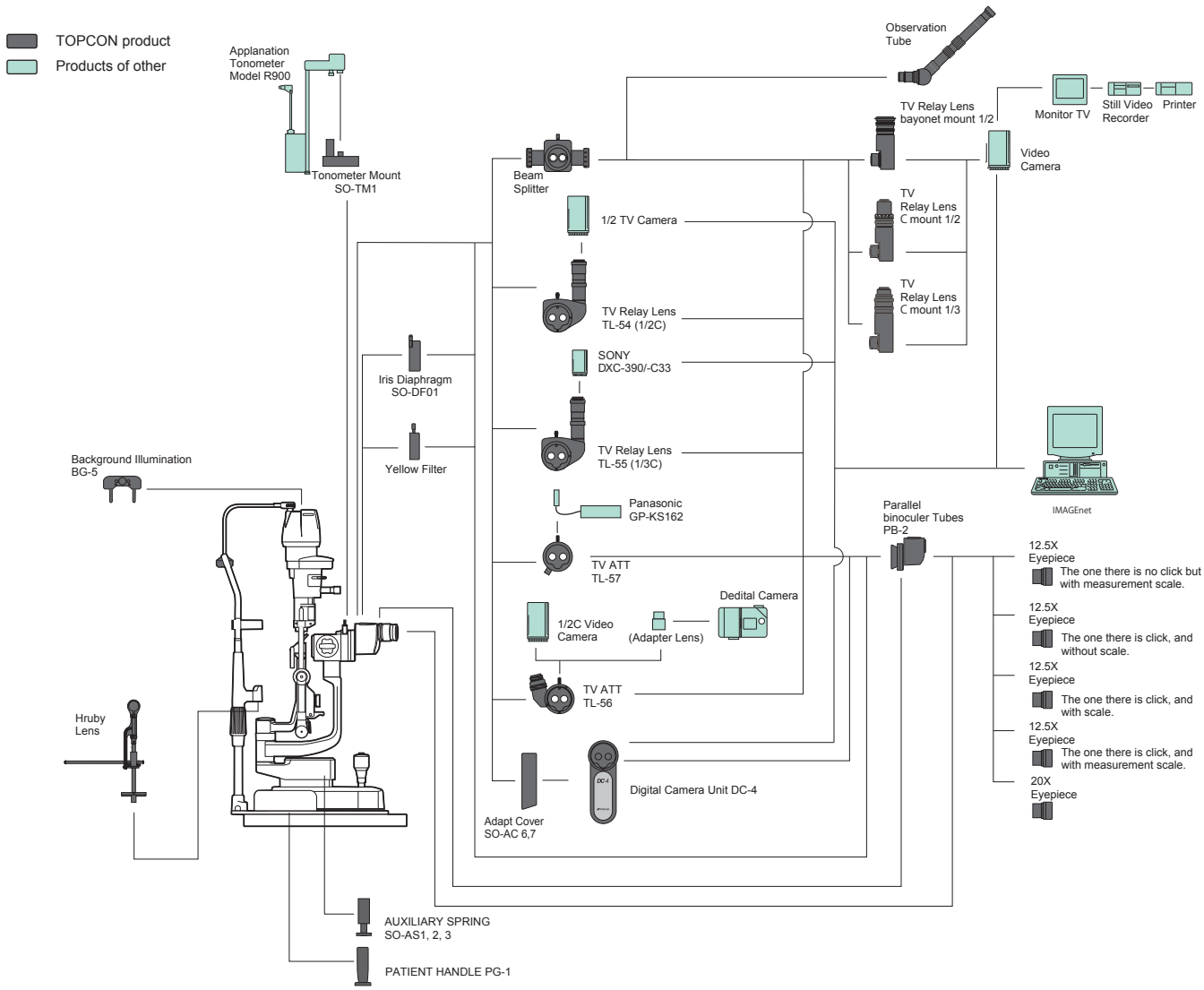
⚠CAUTIONS	To prevent falling during use and movement, secure optional accessories.

•For details, please refer to the instruction manuals of each product.

SYSTEM CONFIGURATION

⚠CAUTIONS	To avoid electric shock, do not touch the external connection terminal and the patient at the same time.

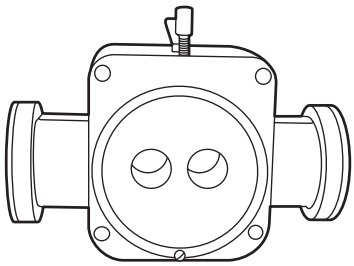
System Chart



BEAM SPLITTER

FEATURES

- Used to attach the TV relay lens and observation tube.
- The TV relay lens and observation tube can be attached to either side.
- The beam splitter division ratio is TV 50% : operator 50%.

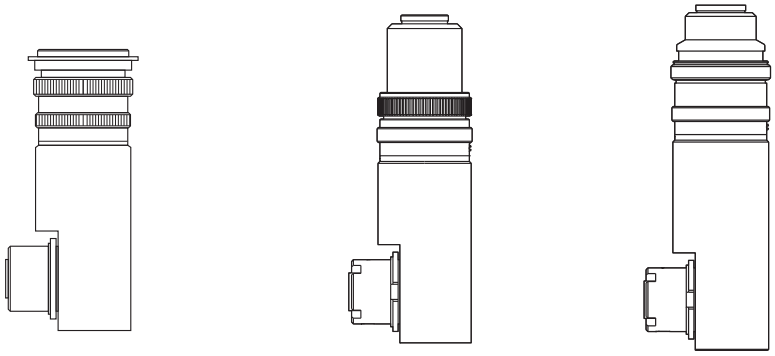


TV RELAY LENS

- Three types of TV relay lens are prepared for different TV camera types to be used (C mount 1/2 type, C mount 1/3 type and bayonet mount 1/2 type).

FEATURES

- Used with the beam splitter.
- Can connect a TV camera to carry out monitor observation and photographing of still images.

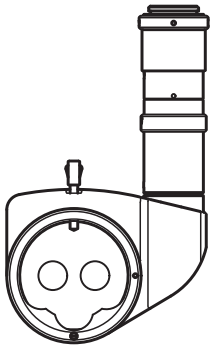


TV RELAY LENS TL-54/55

- Two types of TV relay lenses differ according to the type of TV camera to be used.
  For C mount 1/2 type TV camera: TL-54
  For C mount 1/3 type TV camera: TL-55

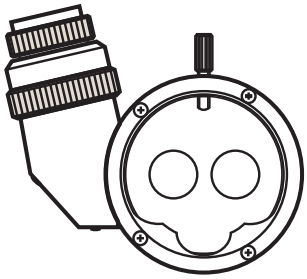
FEATURES

- Incorporated with the beam splitter.
- Can connect a TV camera to carry out monitor observation and photographing of still images.
- The beam splitter IN/OUT can be selected.
- The beam splitter division ratio is TV 50%: operator 50%.

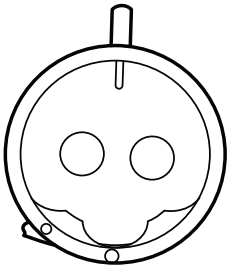


TV ATTACHMENT TL-56

FEATURES
- Used to connect a digital camera.
- Combined with beam splitter.
- The beam splitter division ratio is TV 50%: operator 50%.

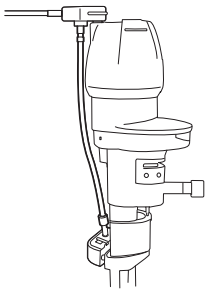


TV ATTACHMENT TL-57



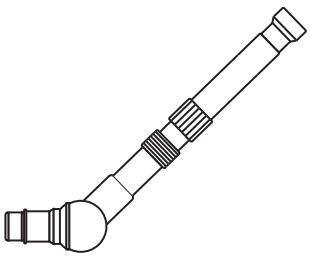
FEATURES
- Used to connect a digital camera.
- Combined with beam splitter.
- The beam splitter division ratio is TV 50%: operator 50%.

BACKGROUND ILLUMINATION BG-5



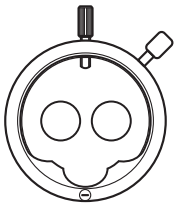
FEATURES
- Used for background illumination.
- The light volume differs according to the illumination light volume of the slit lamp.
- Equipped with 3-step visible observation illumination function.

OBSERVATION TUBE



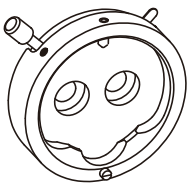
FEATURES
- Used in combination with a beam splitter.
- Used for observation together with the operator.
- Can be inclined to facilitate observation.

YELLOW FILTER UNIT



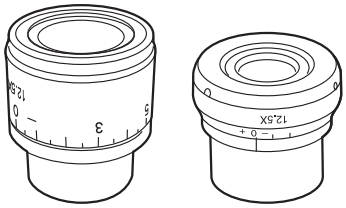
FEATURES
- Combines with the blue filter prepared in the main body for a high-contrast fluorescence observation.
- Easy switching between filter insertion & removal.

IRIS DIAPHRAGM SO-DF01



FEATURES
- When taking picture, you can adjust the light intensity and the depth according to the need.

12.5x Eyepiece

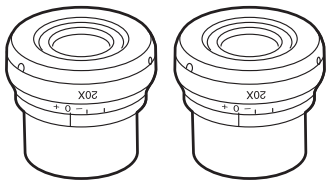


FEATURES

There are four types as below:

- One with internal measurement scale and no click stops.
- One without internal scale and click stops on each adjustment step.
- One with internal scale and click stops on each adjustment step.
- One with internal measurement scale and click stops on each adjustment step.

20X EYEPIECE



FEATURES

- Replaces the normal eyepiece for high magnification observation.

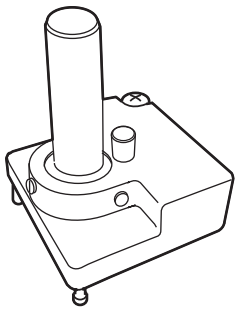
TONOMETER MOUNT SO-TM1

FEATURES

- For the measuring of the intraocular pressure, models R900 type and T900 type, Haag-Streit, are available.

* If the R900 type is being used for the SL-D701, the tonometer mount SO-TM1 is required.
(Depending on specification, SO-TM1 may be included in standard accessories.)

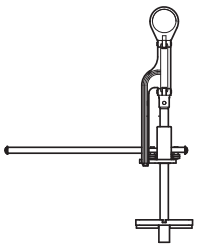
* If the T900 type is in use, the tonometer guide plate (for T-900 type) is required.



HRUBY LENS

FEATURES

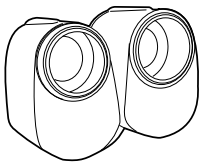
Normally, observation is possible only up to the anterior vitreous body due to the refractive power of the cornea and lens. With the Hruby lens, the posterior vitreous body and the retina can be observed..



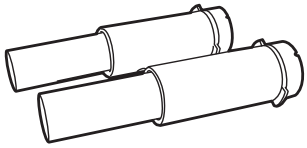
PARALLEL BINOCULAR TUBE PB-2

FEATURES

- Can observe a parallel view of the object.



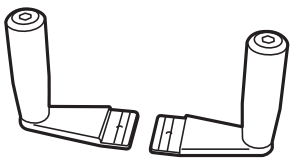
AUXILIARY SPRING SO-AS 1,2,3



FEATURES

- Used to counter-balance vertical movement when attaching accessories, such as a photography unit.

PATIENT HANDLE PG-1



FEATURES

- A grip for patient confort to hold during diagnosis and photographing.
- Can be attached to the chinrest base.

Please provide the following information when contacting us regarding questions about this instrument:

- Model name: SL-D701
- Serial No.: This is printed on the rating nameplate on the right side of the power supply unit.
- Period of use: Please inform us of the date of purchase.
- Defective condition: Please provide us with as much detail as possible on the problem.

SLIT LAMP
SL-D701

USER MANUAL
The 2013 version (2013.09-100TH⓪)
Date of issue: Sep 24, 2013

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SLIT LAMP

SL-D701

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