

**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.

CLINICAL BENEFITS

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:

- 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.

SERIOUS INCIDENT REPORTING

In case any serious incident occurs in relation to the device, please report it to the manufacturer, authorized representative and the competent authority in which the user and/or patient is established.



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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 correct to the best of our knowledge. Please inform us of any ambiguous or erroneous descriptions, missing information, etc.
 3. Original Instructions
This manual was originally written in English.
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


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 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.

DISPLAY

Display	Meaning
 WARNING	Incorrect handling by ignoring this display may lead to a risk of death or serious injury.
 CAUTION	Incorrect handling by ignoring this display may lead to personal injury or physical damage.
 NOTE	Useful functions to know. Paying attention to these will prevent the noted problems.

SYMBOL

Symbol	Description	Description (French)
	Alternating Current	Courant alternatif
	Off (power: disconnection from the main power supply)	Éteint (courant: coupure avec le secteur)
	On (power: connection to the main power supply)	Allumé (courant: raccordement sur le secteur)
	Type B applied part	Partie appliquée du Type B
	General warning sign	Symbole d'avertissement général
	Refer to instruction manual/booklet	Voir le manuel/la brochure
	Date of manufacture	Date de fabrication
	Serial number	Numéro de série
	Manufacturer	Fabricant
	Authorised Representative in the European Community	Représentant autorité pour l'Union européenne
	Authorised Representative (Responsible Person) in the United Kingdom.	Représentant autorité (Personne responsable) pour le Royaume-Uni.
	Medical Devices	Équipement médical

Symbol	Description	Description (French)
	Unique Device Identification (UDI)	Identification unique des dispositifs (IUD)
	Humidity limitation	Limitation d'humidité
	Atmospheric pressure limitation	Limitation de la pression atmosphérique
	Temperature limit	Température limite
	Keep away from sunlight	Tenir à l'abri du soleil
	Fragile, handle with care	Fragile manipuler avec soin
	Keep dry	Garder au sec
	This way up	De cette façon jusqu'à
	General symbol for recovery/recyclable. (for the package)	Symbole général pour la récupération / recyclable. (pour le package)
	Recycling symbol for plastic in the package. Low density polyethylene	Symbole de recyclage du plastique dans l'emballage. Polyéthylène basse densité
		
	Recycling symbol for plastic in the package. Polystyrene	Symbole de recyclage du plastique dans l'emballage. Polystyrène
		
	Indicates that the product conforms to the requirements of the Medical Device Regulation (EU) 2017/745 and of the other applicable Union legislation	Indique que le produit est conforme aux exigences du Règlement (UE) 2017/745 relatif aux dispositifs médicaux et des autres lois applicables de l'Union Européenne
	Indicates that the product conforms to the requirements of the Part II of UK Medical Devices Regulation 2002, and of the other applicable legislations.	Indique que le produit est conforme aux exigences de la Partie II de la Réglementation britannique modifiée de 2002 sur les dispositifs médicaux (UK MDR 2002), et des autres législations applicables.
	CSA listing mark	Marque de cotation CSA

GENERAL SAFETY INFORMATION

WARNING

Ensuring the Safety of Patients and Operators

Use this instrument carefully on the following patients.

- Patients who have epidemic keratitis, 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.

Preventing Electric Shock and Fire.

To avoid fire and electric shock, install the instrument in a place free of water and other liquids.

To avoid fire and electric shock, do not put cups or vessels containing liquids near the instrument.

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.

To avoid electric shock and fire, do not disassemble, modify or repair the equipment. Ask your dealer for repairs.

Preventing Electric Shock and Fire.

Be sure to connect the power plug to an AC 3-pin receptacle equipped with grounding. Connection to a receptacle without grounding may cause fire and electric shock in the case of shortcircuiting.

CAUTION

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 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.

Do not replace the lamp immediately after switching it off: the high temperatures could cause burns.

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

- 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.

- To avoid causing discomfort to the patient or any damage to the patient's eye, keep the illumination at its minimum during adjustment.

- 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 cord of BG-5 from the plug before removing the plug to avoid damage to the power cord of BG-5.

- Before carrying out daily care, remove the power cord (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.

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.

- 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.

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

Preventing Electric Shock

To avoid injury by electric shock, do not remove the cover.

To avoid electric shocks, do not insert metal objects into the instrument body through the vent holes or gaps.

To prevent electric shocks, switch off the power supply and remove the power cord before replacing the lamp.

- To avoid electric shocks, do not handle the power plug with wet fingers.
- Use the power cord applicable to the voltage of the commercial power supply being used. Using a power cord improper to the commercial power supply may cause the instrument to malfunction.
- The power cord in standard accessories for this instrument cannot use besides this instrument.

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

Electromagnetic Compatibility (EMC)

This instrument has been tested (with 100V/120V/230V) and found to comply with IEC 60601-1-2:2014+AMD1:2020 (Ed.4.1).

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 28).

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 38.

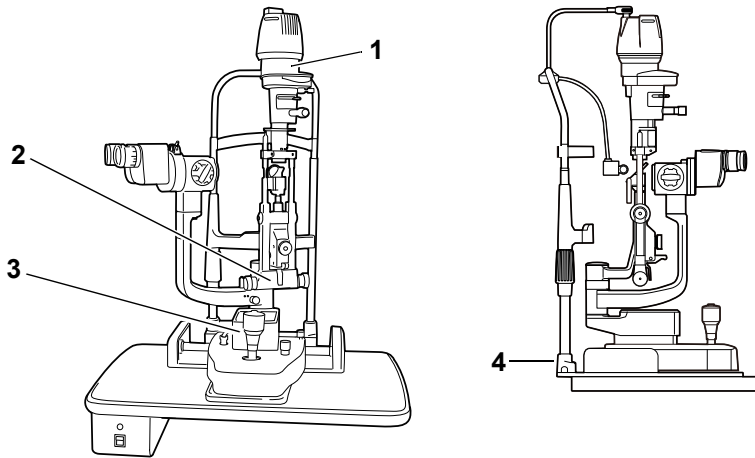
DISCLAIMERS








- 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 manual.
- TOPCON is not responsible for any damage caused by unauthorized access from outside, malware or viruses.
- 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.

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).

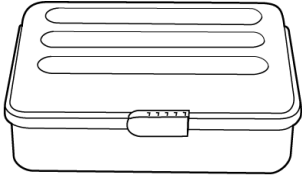


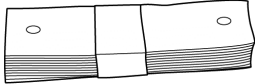
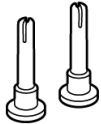
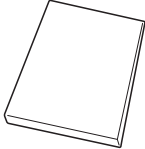
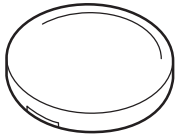
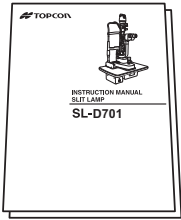


No.	Label	Meaning	Signification
1	 	<p>CAUTION</p> <ul style="list-style-type: none"> To prevent electric shocks, switch off the power supply and remove the power cord before replacing the lamp. Do not replace the lamp immediately after switching it off: the high temperatures could cause burns. 	<p>PRÉCAUTION</p> <ul style="list-style-type: none"> 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	 	<p>CAUTION</p> <p>To avoid injury to the patient's head, incline the illumination unit slowly while holding the base unit.</p>	<p>PRÉCAUTION</p> <p>Afin d'éviter de blesser le patient à la tête, inclinez lentement l'élément lumineux tout en maintenant la base de l'appareil.</p>
3	 	<p>CAUTION</p> <p>When operating the base unit, please note the following:</p> <ul style="list-style-type: none"> Beware of catching fingers in the moving parts. Avoid hitting the patient's eyes or nose. 	<p>PRÉCAUTION</p> <p>Lorsque vous maniez la base de l'appareil, veuillez noter les points suivants:</p> <ul style="list-style-type: none"> 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		<p>Degree of protection against electric shock : TYPE B APPLIED PART</p>	<p>Degré de protection contre les chocs électriques : TYPE B PARTIE D'APPLICATION</p>

STANDARD ACCESSORIES

Make sure that all the following standard accessories are included.

Figures in parentheses are the quantities.

<p>Accessory case (1)</p> 	<p>Dust cover (1)</p> 	<p>Test rod (1) (This is not always included with the standard specifications.)</p> 
<p>Chinrest tissue (1) *1</p> 	<p>Spare chinrest tissue pin (2) *2</p> 	<p>Square mirror (1)</p> 
<p>Cap (1)</p> 	<p>User manual (1), Instruction manual (1) *3</p> 	

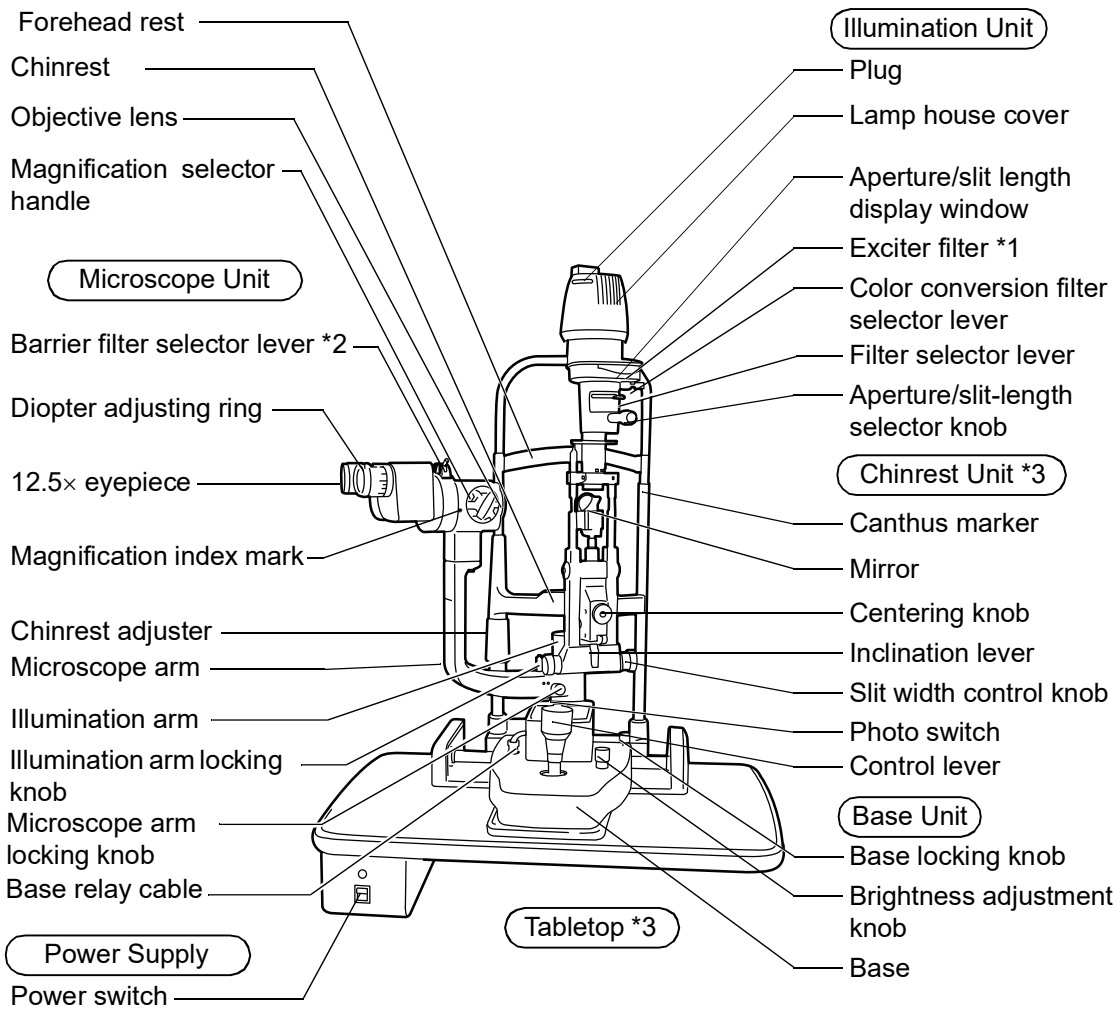
*1,2 The chinrest tissue and the spare chinrest tissue pin are not included with the model without the chinrest.

*3 Depending on the destination, this is not attached.

For optional accessories, see "Optional Accessories" on page 54.

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 the chinrest unit and the tabletop is also available.

COMPOSITION OF PARTS THAT COME IN CONTACT WITH THE PATIENT

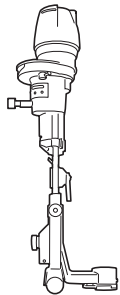
Forehead rest: Polyamide resin

Chinrest : Polyamide resin

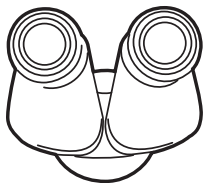
COMPONENTS

COMPONENTS

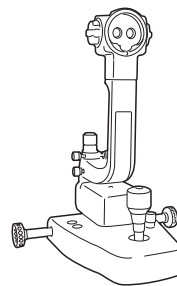
(1) Illumination unit



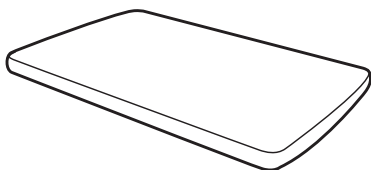
(2) Binocular tubes



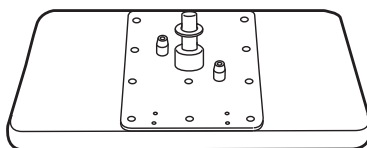
(3) Base unit



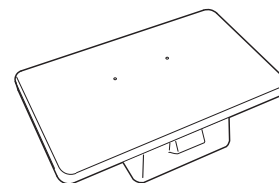
(4) Tabletop SO-TABLE04*1



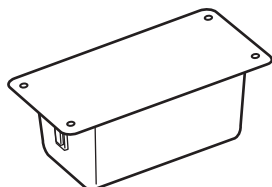
(4)' Tabletop SO-TABLE05*1



(4)'' Tabletop SO-TABLE10*1



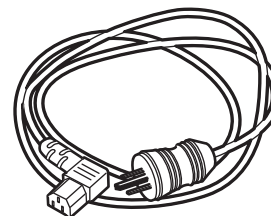
(5) Power supply



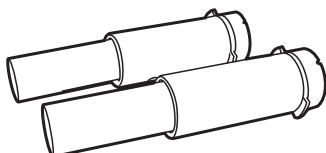
(6) Power supply fixing screw



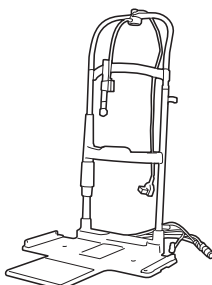
(7) Power cord *2



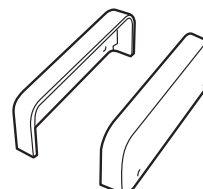
(8) Auxiliary spring



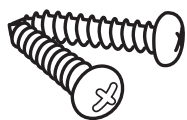
(9) Chinrest unit*3



(10) Rail cover*3



(11) Chinrest fixing screw*3



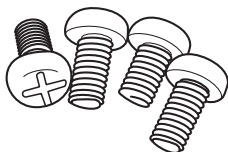
(12) Cable cover*3



(13) Cable cover fixing screw*3



(14) Rail cover fixing screw*3



Article name	Qty	Article name	Qty
(1) Illumination unit	1	(7) Power cord ^{*2}	1
(2) Binocular tubes	1	(8) Auxiliary spring	2
(3) Base unit	1	(9) Chinrest unit ^{*3}	1
(4) Tabletop SO-TABLE04 ^{*1}	1	(10) Rail cover ^{*3}	2
or (4)' Tabletop SO-TABLE05 ^{*1}	1	(11) Chinrest fixing screw ^{*3}	2
or (4)'' Tabletop SO-TABLE10 ^{*1}	1	(12) Cable cover ^{*3}	1
(5) Power supply	1	(13) Cable cover fixing screw ^{*3}	2
(6) Power supply fixing screw	4	(14) Rail cover fixing screw ^{*3}	4

*1 The chinrest unit and the tabletop are optional accessory.

*2 More than one power cord can be included on certain occasions.

*3 The components marked as *3 are not included with the model without the chinrest unit.

ASSEMBLY PROCEDURE



CAUTION

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

ASSEMBLY TOOLS

The assembly tools are not packaged with the instrument.

Please prepare the following tools.

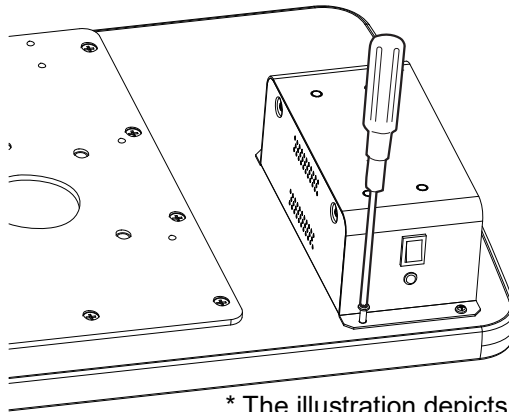
- Crosshead screwdriver Phillips #2
- Slotted screwdriver 4mm width
- Spanner^{*1} 13mm
- Hexagonal wrench^{*2} 2mm

^{*1}If the tabletop SO-TABLE04 is used.

^{*2}If the barrier filter is used.

SECURING THE POWER UNIT

- 1** Affix the power supply to the back of the tabletop with 4 screws.

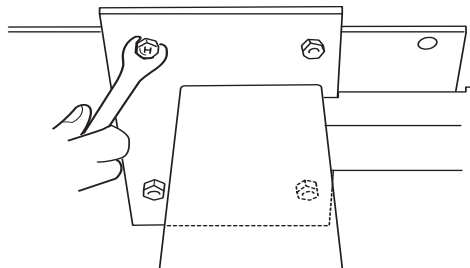


* The illustration depicts the tabletop SO-TABLE04.

SECURING THE TABLETOP SO-TABLE04

FITTING TO AUTOMATIC INSTRUMENT AIT TABLE

- 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 tabletop and secure it on the opposite side.

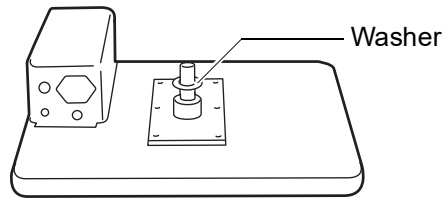


NOTE

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

SECURING THE TABLETOP SO-TABLE05

- 1** Remove the plastic washer from the unit type tabletop, which is taped to the shaft assembly.
- 2** Insert the plastic washer, together with the shaft, into the cavity for the ophthalmic unit arm.



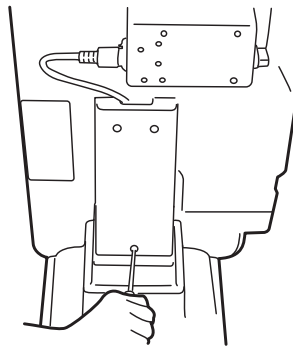
NOTE

In the tabletop SO-TABLE05, 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).

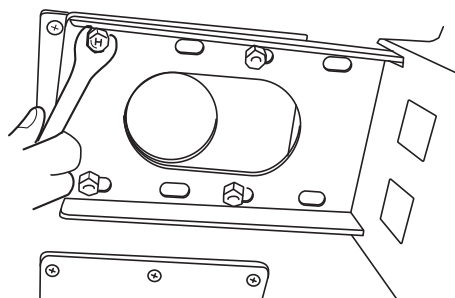
SECURING THE TABLETOP SO-TABLE10

FITTING TO AUTOMATIC INSTRUMENT TABLE AIT-20

- 1** Remove the cover of the instrument table. Remove the 3 screws of the cover.
(For details, refer to the instruction manual of AIT-20.)



- 2** 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.

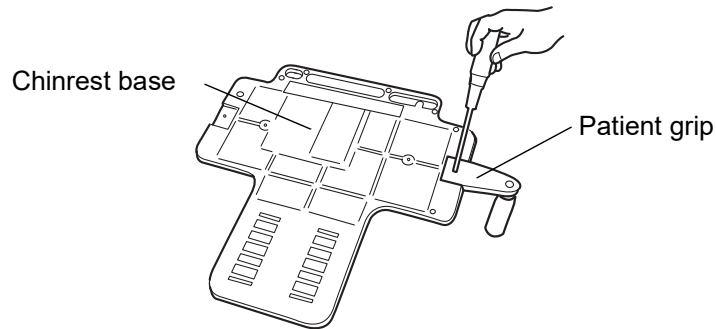


NOTE

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

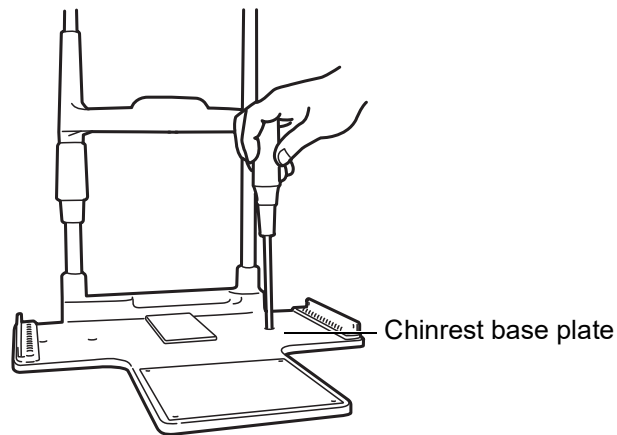
SECURING THE PATIENT GRIP PG-1(OPTIONAL ACCESSORY)

- 1** Align the patient grip with a groove on the rear of the chinrest base.
- 2** Fix the patient grip with screws.



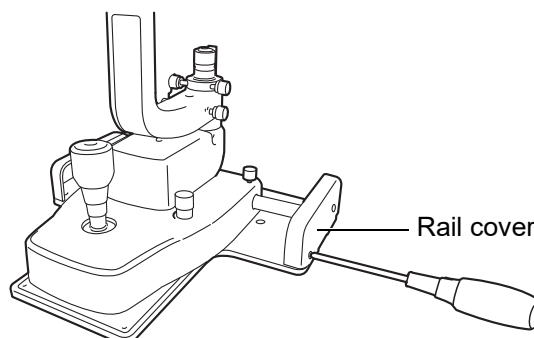
SECURING THE CHINREST BASE PLATE

- 1** Secure the chinrest base plate to the tabletop with 2 screws.



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

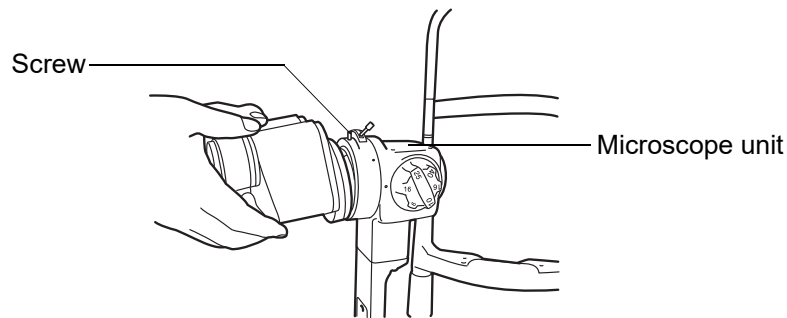
- 1** Align the pin of the microscope unit with the groove on the binocular tubes, and fit the screw with a hexagonal wrench.

In the model without excitor/barrier filter, fit binocular tube with the fixing screw.



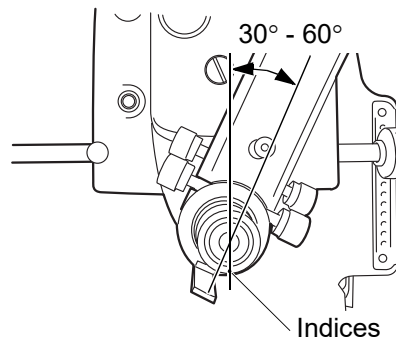
NOTE

Make sure you do not touch the lens surfaces.

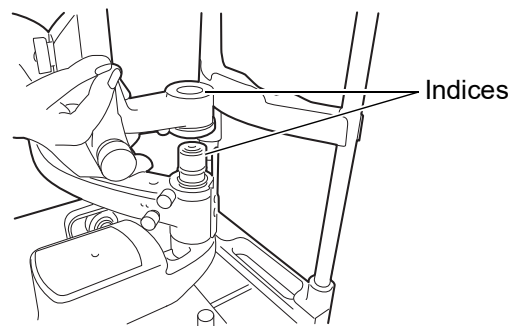


SECURING THE ILLUMINATION UNIT

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.



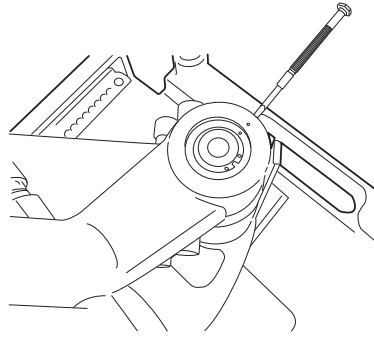
- 2** Loosen the fixing screw on the outside of the fitting cavity of the illumination unit with a screwdriver. Align indices and slowly lower the illumination unit onto the shaft of the base unit.



NOTE

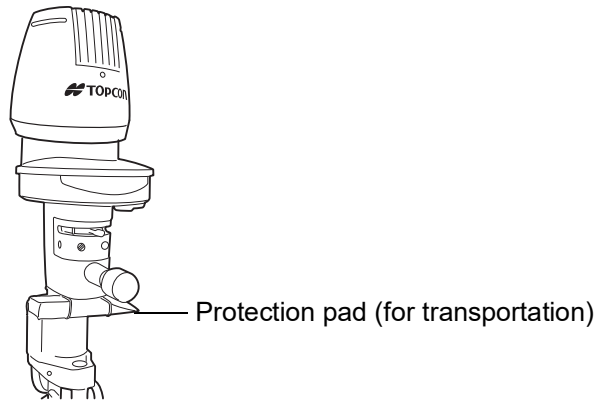
While assembling the illumination unit, take care not to get your fingers caught.

- 3** Firmly tighten the fixing screw with a screwdriver.



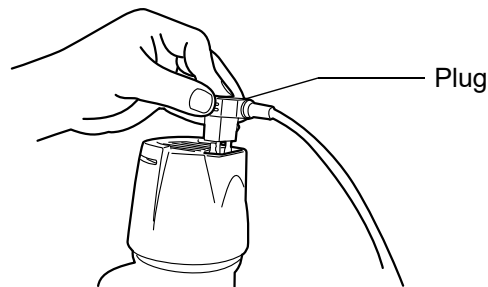
REMOVING THE ILLUMINATION UNIT PAD

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

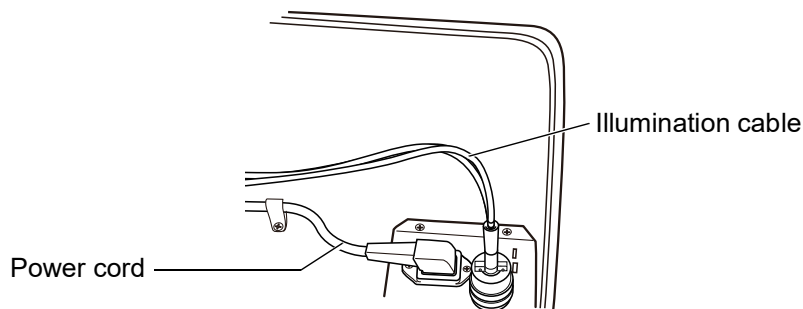


CONNECTING AND SECURING OF CABLES

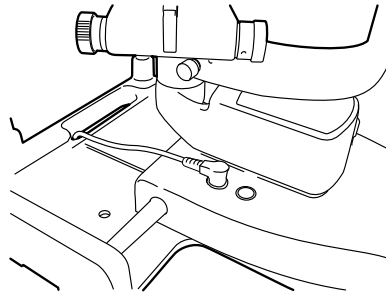
- 1** Remove the tape from the lamp house cover of the illumination unit. Plug the cable from the upper part of the chinrest into the illumination unit.



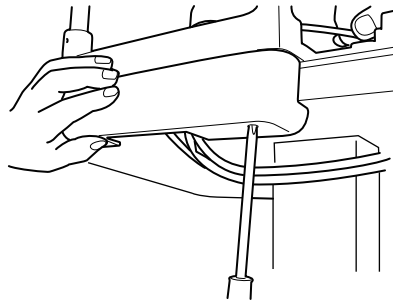
- 2** Connect the cable from the lower part of the chinrest unit and the power cord to the power supply.



- 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 tabletop with the cable clip (13).

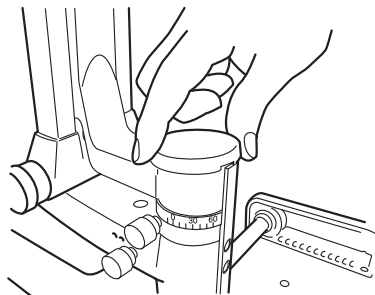
- 6 Move the base unit and illumination unit, and make sure there is enough cable to allow free movement of the base unit in all directions.

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

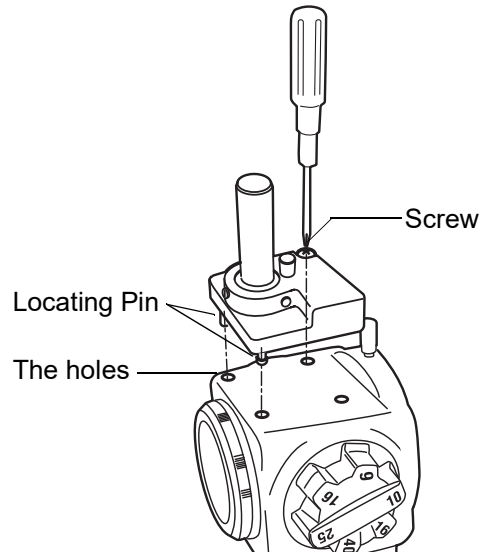
- 1 Fit the cap to the shaft aligning the guide rod with the groove in the cap.



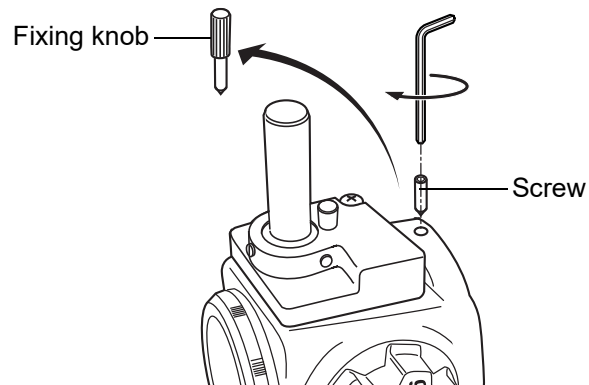
SECURING THE TONOMETER MOUNT SO-TM1 (OPTIONAL ACCESSORY)

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 eyepiece unit, 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.

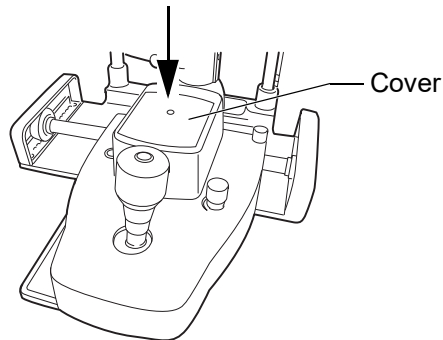
Major Combinations of Accessories and Necessary Auxiliary Springs

Accessories	Auxiliary Spring type	
	Tonometer is not fitted	Tonometer is fitted
Digital Camera unit DC-4	—	Standard auxiliary spring
TV relay lens TL-55 + SONY DXC-33 (DXC-390)		
Beam splitter + Observation tube	Standard auxiliary spring	Auxiliary spring SO-AS1

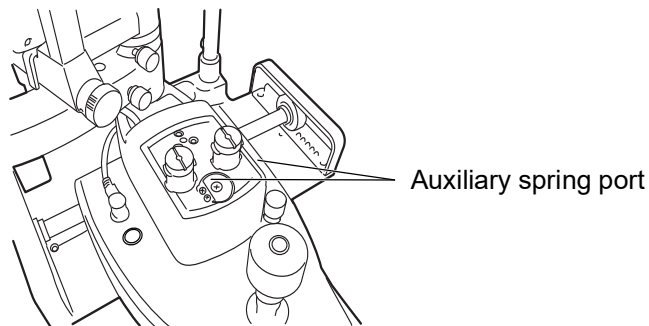
Each auxiliary spring consists of 2 identical springs.
Do not use different springs in a set.

COUNTER-BALANCE PROCEDURE

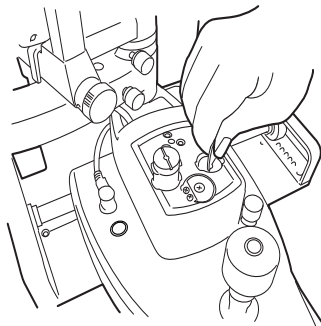
- 1** Turn the control lever clockwise and raise the base to the top position, remove the center screw and take off the cover.



- 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

Be sure to connect the power plug to an AC 3-pin receptacle equipped with grounding. Connection to a receptacle without grounding may cause fire and electric shock in the case of shortcircuiting.



CAUTION

- To avoid electric shocks, do not handle the power plug with wet fingers.
- Use the power cord applicable to the voltage of the commercial power supply being used. Using a power cord improper to the commercial power supply may cause the instrument to malfunction.
- The power cord in standard accessories for this instrument cannot use besides this instrument.

- 1** Connect the power cord.
- 2** Turn ON the POWER switch.

ADJUSTING THE DIOPTRER AND PUPILLARY DISTANCE (PD)

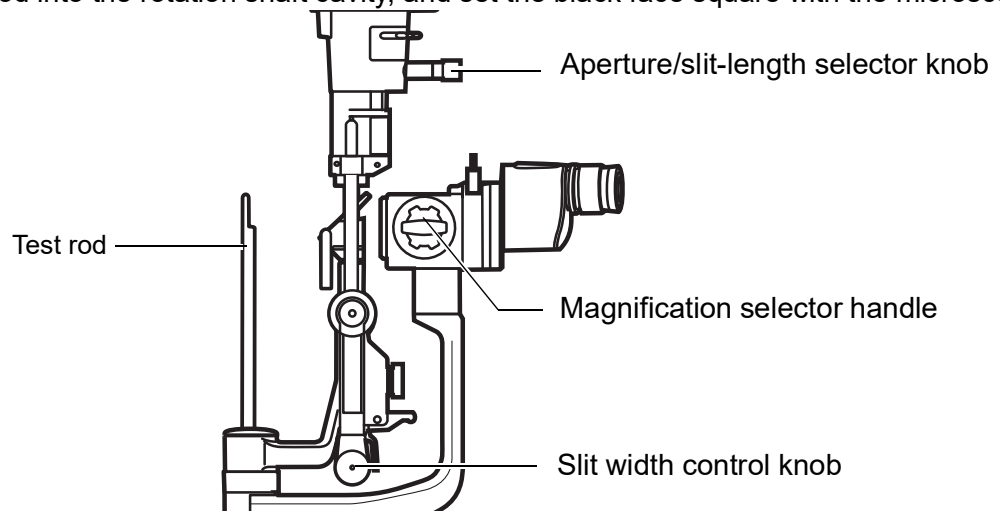


NOTE

- To ensure sharp observation of slit images, always carry out the diopter and PD adjustments.

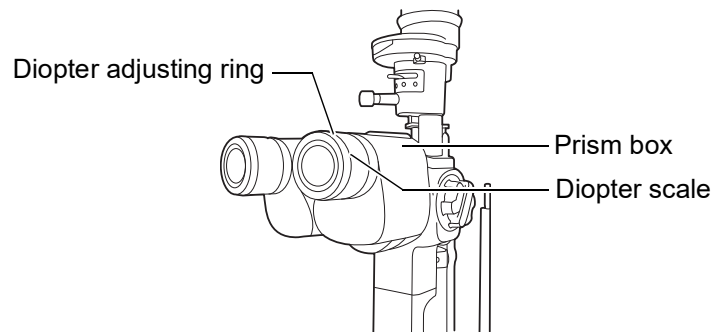
In case that no test rod is provided, set the diopter scale to your diopter by turning the diopter adjustment ring.

- 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 $\phi 10\text{mm}$ by adjusting the Slit width control 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 width control 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.



HOW TO RECOVER FROM THE POWER SAVING STATE

Slit lamp is into the power saving state when approximately 30 minutes have passed since the slit lamp was last used, and the slit illumination light becomes darker. The pilot lamp is blinking during the power saving mode.

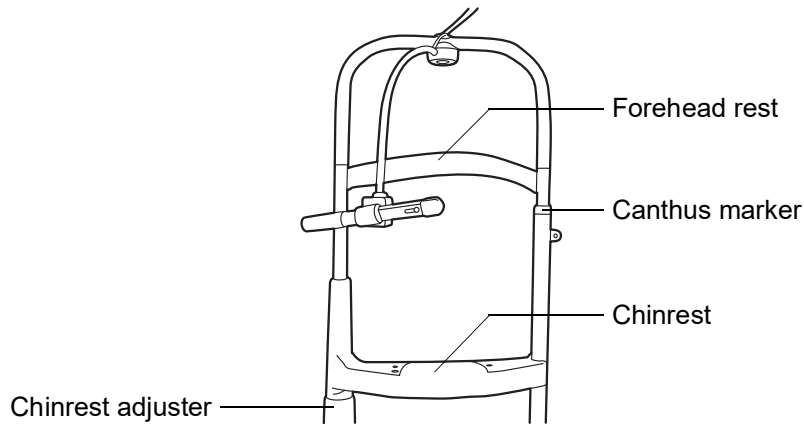
- 1** Press the photo switch or swing the stand widely from side to side.
- 2** Check that the illumination light is lighted by rotating the brightness adjustment knob.

OPERATION PROCEDURE

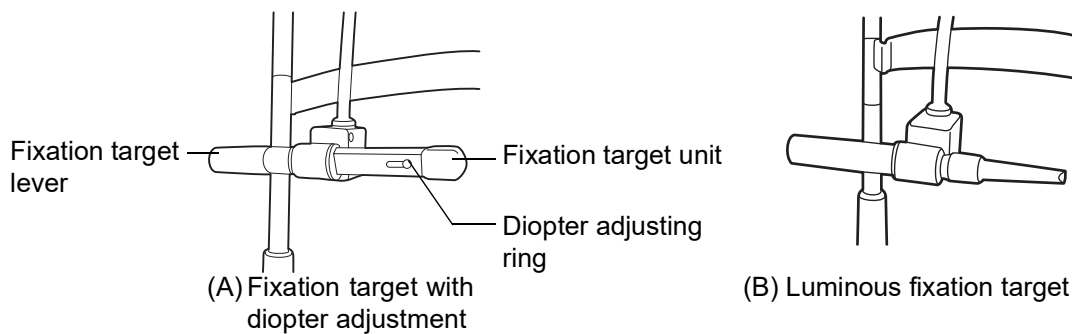
FIXING THE PATIENT'S FACE AND FIXATION

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.

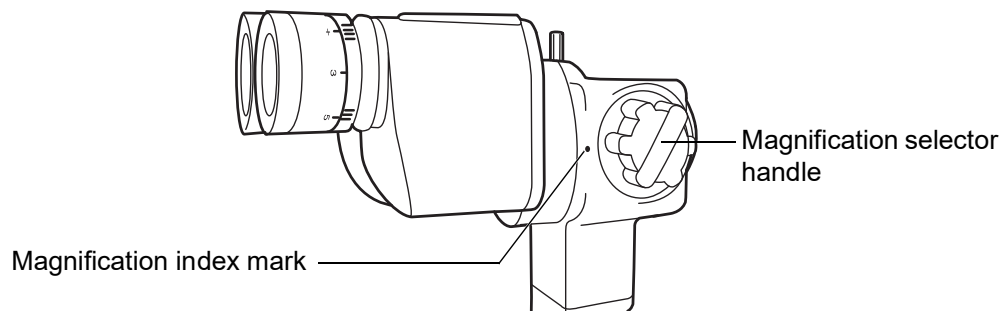


NOTE

- When using the fixation target with dioptric 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 42.

OPERATING THE BASE AND FOCUSING



CAUTION

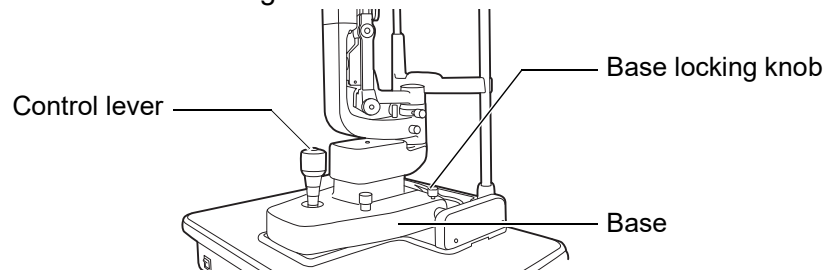
- To avoid injury to the eye and nose whilst moving the base unit, make sure that you have a clear view of the slit lamp and the patient's face.
- For the safety of the operator and the patient, do not place fingers between moving parts.



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.



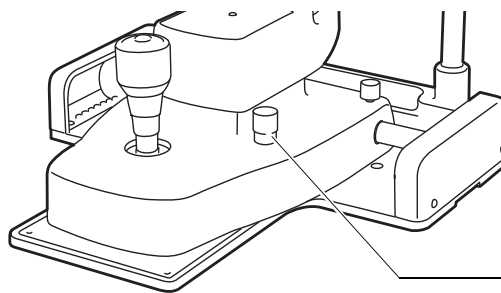
NOTE

- 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 10°.

ADJUSTING THE BRIGHTNESS

Turn the brightness adjustment knob.

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

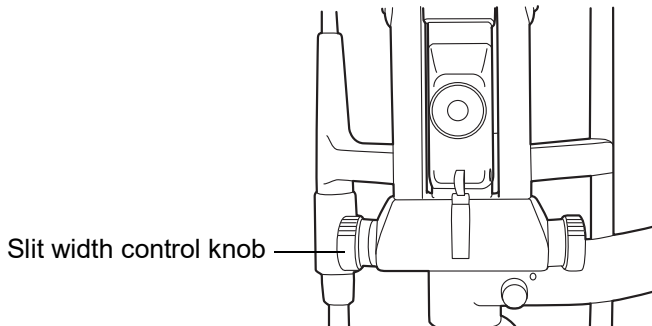


Brightness adjustment knob

ADJUSTING THE SLIT WIDTH

Turn the slit width control knob.

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



Slit width control knob

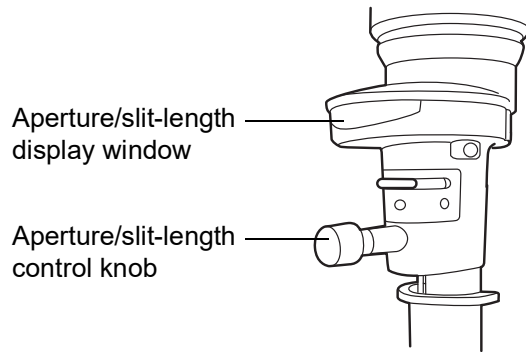
CHANGING THE APERTURE/SLIT LENGTH

Turn the aperture/slit-length control knob.

When the slit is fully opened, 6 types of spot illumination ($\phi 14$, $\phi 10$, $\phi 5$, $\phi 2$, $\phi 1$, $\phi 0.2$) are available. The slit width can be changed gradually from 1mm to 14mm.



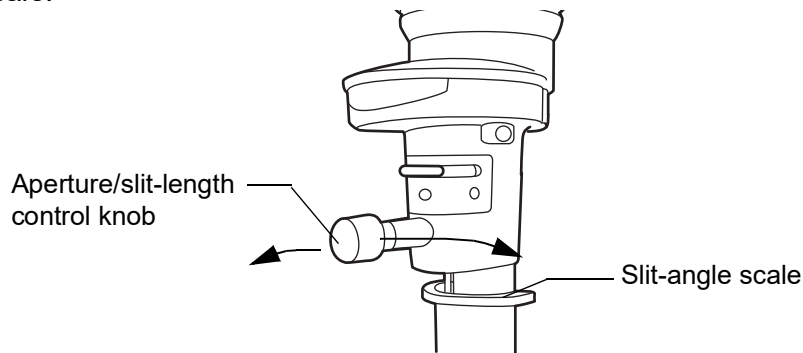
The spot illumination size and slit length are displayed on the aperture/slit-length display window.



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

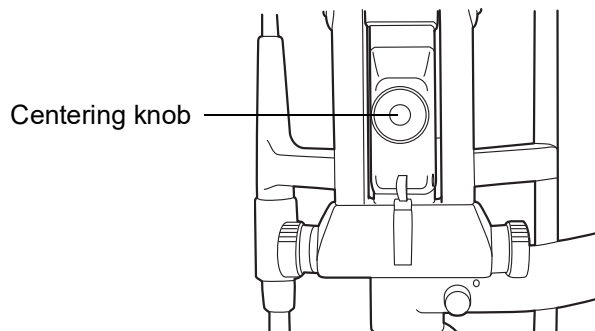
Loosen the centering knob and swing the illumination unit right and left.

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.



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



INCLINED ILLUMINATION

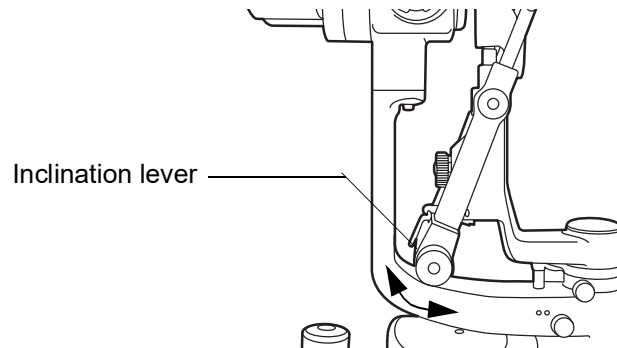
Press to unlock the inclination lever and pull.

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.

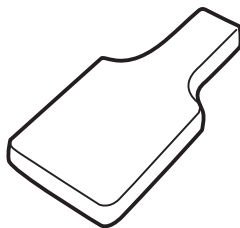


REFLECTION MIRROR

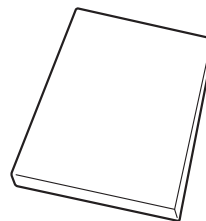
For this instrument, a battledore mirror and a square mirror are available. For normal observation, the battledore mirror is used.

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



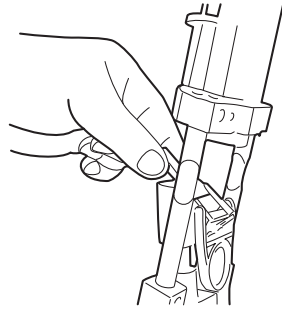
NOTE

The square mirror is standard accessory.

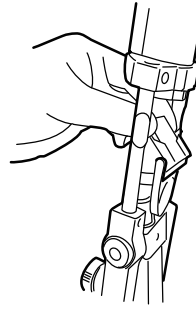
REPLACING REFLECTION MIRRORS

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, as illustrated below.



Battledore mirror



Square mirror

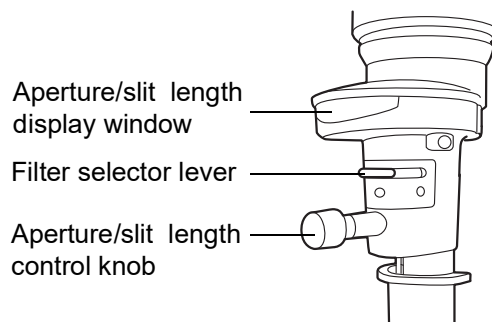
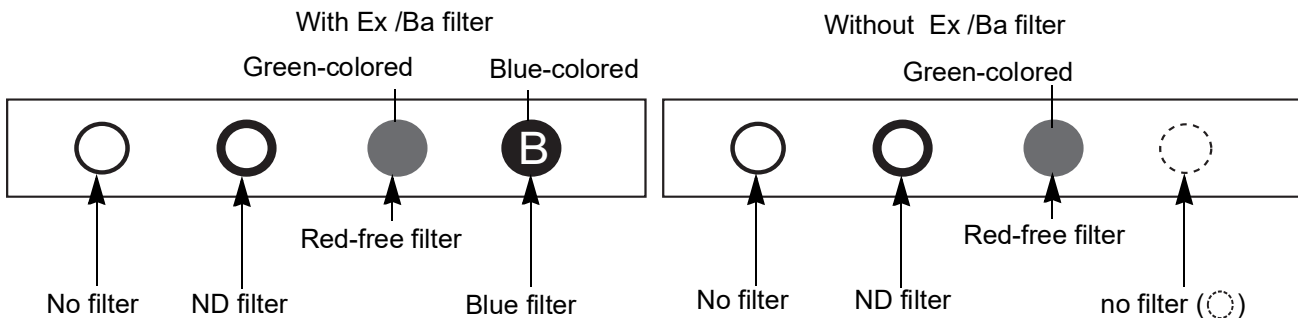


NOTE

If you touch the mirror or lens surface, please clean this according to the process on page 40 "Cleaning Lenses and Mirrors".

CHANGING FILTERS

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



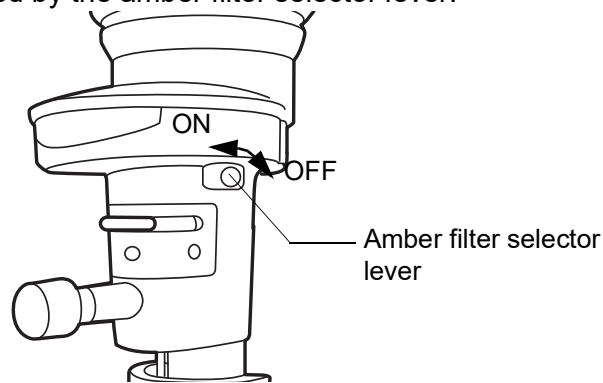
BLUE FILTER

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.

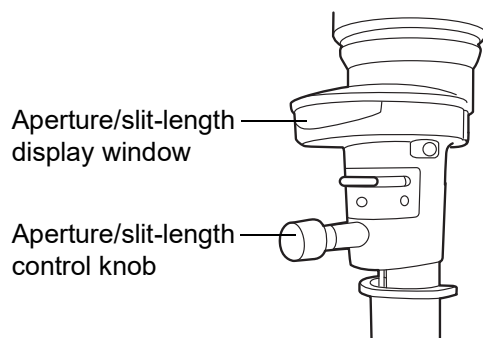
The filter is inserted or removed by the amber filter selector lever.



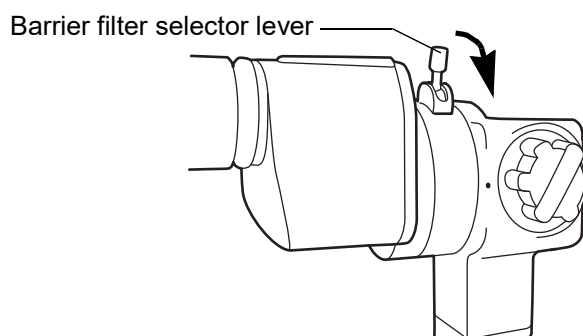
FLUORESCENCE OBSERVATION (EXCITER FILTER FOR SLIT LAMP/BARRIER FILTER FOR SLIT LAMP)

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 available for users who have SL-D701 "with EX / Ba filter" type.

DIFFUSION LENS

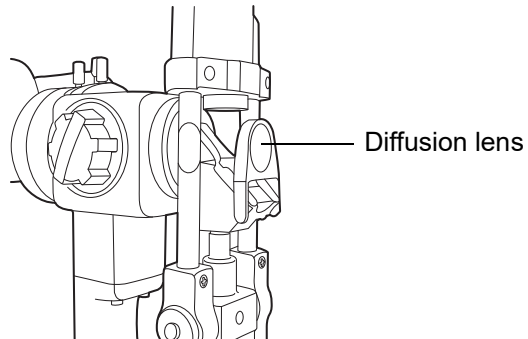
When in use, the diffusion lens is set vertically in front of the reflection mirror.

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.

MAINTENANCE AND CHECKUPS

PERIODIC MAINTENANCE

Before using, confirm the following:

- 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 tabletop.
- Cables and plugs are firmly connected.
- Adjust the diopter and eye width following "ADJUSTING THE DIOPTER AND PUPILLARY DISTANCE (PD)" on page 26 and turn the slit width control knob and make the slit width about 1mm: The slit image projected on the test rod is seen clearly.
- The slit width shall not be changed by disengaging a hand from the "Slit width control knob" after setting the scale to 10 and 20.
- The illumination unit smoothly swings.

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
Halogen lamp	446802570
Socket	446802590
Chinrest tissue	403104082

USER MAINTENANCE ITEMS

For user maintenance items, please carry out the following table.

Item	Inspection time	Contents
Inspection	Before using	<ul style="list-style-type: none">• 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 tabletop 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	<ul style="list-style-type: none">• Objective lens• Eyepiece• Mirror• Sliding plate, rail and wheel shaft unit• Forehead rest and chinrest unit
Replacement	As required	<ul style="list-style-type: none">• Halogen lamp• Socket
Supply	As required	<ul style="list-style-type: none">• Chinrest tissue

DEALER MAINTENANCE ITEMS

For dealer maintenance items, please carry out the following table.

Item	Inspection time	Contents
Adjustment	Within 12 months from the last maintenance	<ul style="list-style-type: none">• Slit width control knob torque• Inclination torque of illumination unit

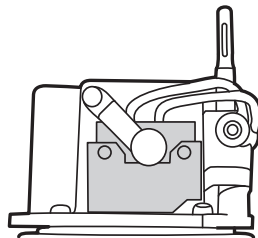
REPLACING ILLUMINATION LAMPS

CAUTION

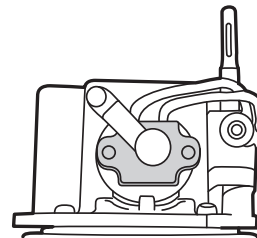
- When attaching halogen lamp to ensure perfect illumination, make sure that the socket flange and notch are firmly fitted to the lamp house.
- Beware of high temperatures when replacing the lamp immediately after switching it off: these could cause burns.
- When using the background illumination BG-5,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

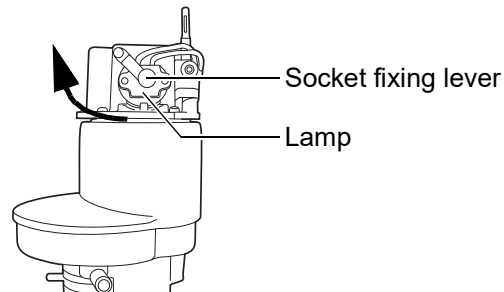


Halogen type

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.

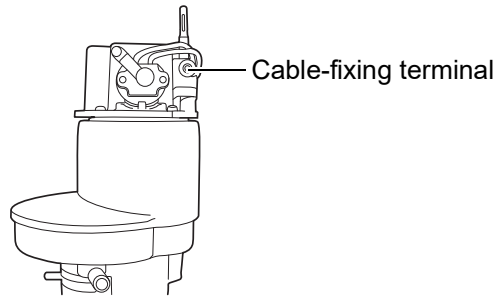
REPLACING SOCKETS



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.

CLEANING



CAUTION

- Before carrying out daily care, remove the power cord (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 benzene, 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 ethyl alcohol.
- 2** Remove dust from lens and mirror surfaces with the blower for camera of commercial product.
- 3** Using clean gauze or lint-free tissue wetted with ethyl alcohol, 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).

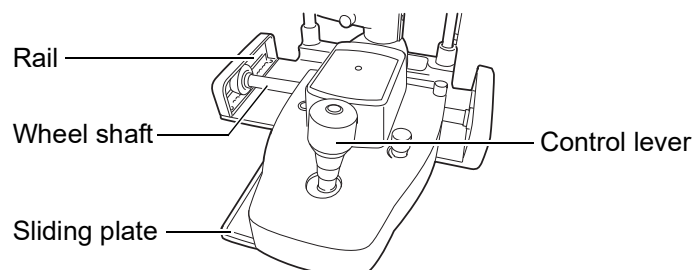
CLEANING THE SLIDING PLATE, RAIL AND WHEEL SHAFT



NOTE

When stained, the movement of the sliding plate and rail 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



WARNING

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.	21
	Base relay cable is switched off.	Connect the cable.	21
	Plug of lamp house cover is switched off	Insert plug.	21
	POWER switch is OFF	Turn ON POWER switch.	26
	Brightness adjustment knob is the minimum	Turn up brightness adjustment knob.	31
	Illumination lamp is broken	Replace it with a new illumination lamp.	38
	Pilot lamp of a power supply box is blinking red. (Illumination lamp has deteriorated)	Replace it with a new illumination lamp.	38
	Socket has deteriorated	Replace it with a new socket.	39
	Slit width is the minimum	Rotate the slit width control knob	31
	Slit lamp is into a power saving state.	Recover from power saving state by pressing the Photo switch or swinging the base from side to side.	27
Illumination field is not uniform/is shady/is dark	Filter selector lever is out of position	Click filter selector lever.	34

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
PD adjustment range	55 to 78mm
Barrier filter	Available for use IN/OUT the sight (A model, with or without barrier filter, is available. The model with barrier filter houses the Illumination Unit with exciter filter.)
Illumination unit	
Illumination field	Slit width: 0 to14mm, can be altered gradually(14mm=circle) Slit length: 1 to14mm, can be altered gradually(14mm=circle)
Aperture diameter	φ14, 10, 5, 2, 1, 0.2mm
Slit direction	Vertical to horizontal, can be altered gradually
Inclination	5°, 10°, 15°, 20° from below Available for use side swing
Filter	Blue filter, red-free filter, ND filter (13% transmission), amber filter, UV cut filter (normal use), IR cut filter (normal use), exciter filter (A model, with or without exciter filter, is available. The model with exciter filter houses the Microscope Unit with barrier filter.)
Illumination lamp	Halogen type: 12V 30W Halogen lamp LED type: 3A 10W LED
Base unit	
Forward-backward movement length	90mm
Right-left movement length	100mm
Vertical movement length	30mm
Fine adjustment in all directions length	12mm
Chinrest unit	
Adjustable range of the vertical direction	80mm
Fixation target*1	Fixation target with diopter adjustment Light source for fixation target: LED

*1, A model without fixation target is also available.

Agency Compliance
ISO 10939:2007

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)

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)

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%
Pressure : 700hPa to 1060hPa

ENVIRONMENTAL CONDITIONS FOR PACKAGING IN TRANSPORTAION

Temperature : -40°C to 70°C
Humidity : 10% to 95%
Pressure : 700hPa to 1060hPa

ELECTRIC RATING

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

DIMENSIONS AND WEIGHT

Dimensions, Weight	
Dimensions: w/Tabletop SO-TABLE04 or SO-TABLE10	550mm(W) x 420mm(D) x 752 to 782mm(H)
w/Tabletop SO-TABLE05	440mm(W) x 397mm(D) x 752 to 782mm(H)
w/o Tabletop	329mm(W) x 396mm(D) x 652 to 682mm(H)
w/o Tabletop and Chinrest unit	329mm(W) x 331(304)mm(D) x 652 to 682mm(H)
Weight: w/Tabletop SO-TABLE04 or SO-TABLE10	19kg
w/Tabletop SO-TABLE05	18kg
w/o Tabletop	13kg
w/o Tabletop and Chinrest unit	11.5kg
Size of tabletop SO-TABLE04 or SO-TABLE10	550mm x 370mm
Size of tabletop SO-TABLE05	440mm x 350mm
Height from the tabletop 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 manufacturer: 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.
Continuous 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.

1. Please follow your national or regional law for environmentally safe disposal of electrical and electronic equipment.
2. For customers in EU member states, please comply with WEEE requirements:
 - Do not dispose this device or any part of it as unsorted municipal waste;
 - Dispose the device at the municipal collection centers or using the available alternative collection schemes and keep a proof of evidence of the disposal; or
 - Contact your dealer or Topcon European Representative.



NOTE

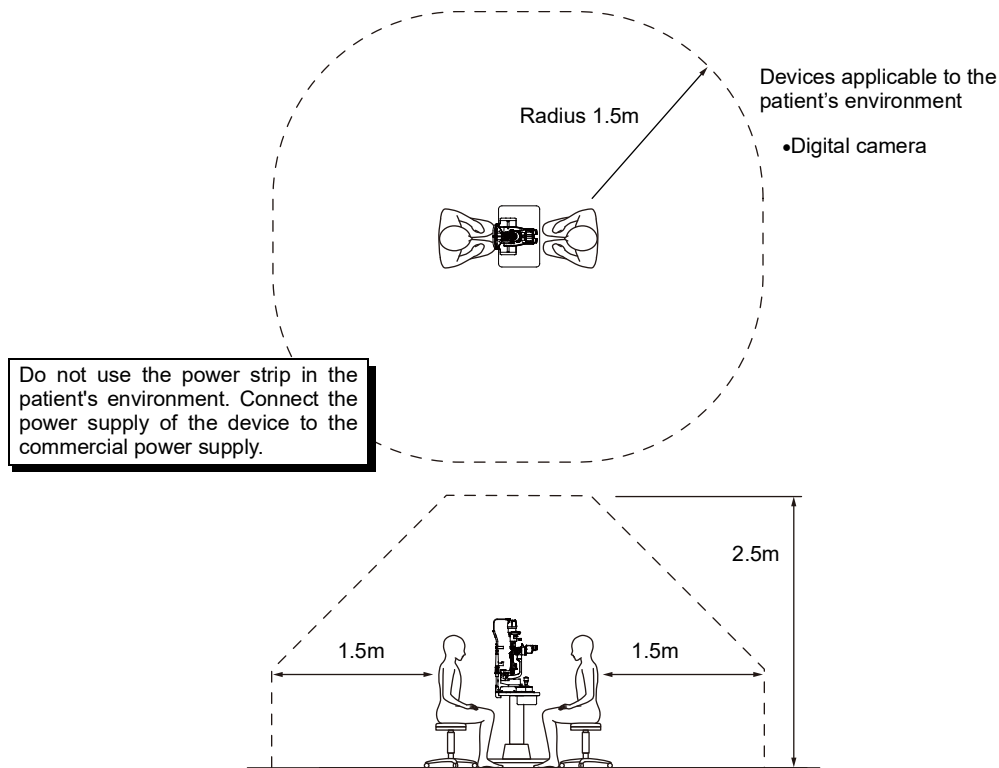


This symbol is applicable for EU member countries only.
To avoid potential damage to the environment and possibly human health, this instrument should be disposed of (i) for EU member countries - in accordance with WEEE (Directive on Waste Electrical and Electronic Equipment), or (ii) for all other countries,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



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. IEC62368-1 for data processing equipment and IEC60601-1 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 medical 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: 2014+AMD1:2020 (Ed.4.1).

The expected electromagnetic environment for the whole life cycle is home medical treatment environment.

- 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.
- f) Do not use the devices generating electromagnetic waves within 30cm from all the parts of the instrument and system. Those devices may have influence on this instrument.

Item	Length(m)	Shield	Ferrite core
BGI power cord (BACKGROUND ILLUMINATION BG-5)	0.2	No	No
ILLUMINATION cable	1.3	Yes	No
External Fixation cable	0.4	No	No
PS cable	0.6	Yes	No
LAN cable	3.0	Yes	Yes
PS cable	0.41	Yes	No
USB cable	2.0	Yes	No
AC power cord for Power Supply Unit (AC100/120V)	1.5	No	No
AC power cord for Power Supply Unit (AC230/240V)	3.0	No	No
AC power cord for Personal Computer	2.0	No	No
Display cable	1.8	Yes	Yes
AC power cord for Display	1.9	No	No
Keyboard cable	1.8	Yes	No
Mouse cable	1.8	Yes	No
DIGITAL CAMERA UNIT (DC-4)	-	-	-
BACKGROUND ILLUMINATION (BG-5)	-	-	-
External Fixation Target	-	-	-
Chin rest	-	-	-

Power Supply Unit (PS-110)	-	-	-
Personal Computer	-	-	-
Display	-	-	-
Keyboard	-	-	-
Mouse	-	-	-

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. 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.
RF emissions CISPR 11	Class B	
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	Test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 8 kV contact ± 15 kV air	± 8 kV contact ± 15 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 Repetition frequency 100kHz	± 2 kV for power supply lines ± 1 kV for input/output lines Repetition frequency 100kHz	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	0% U_T for 0.5 cycle (with phase angle 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°) 0% U_T for 1 cycle 0° 70% U_T for 25/30 cycles 0° 0% U_T for 250/300 cycles	0% U_T for 0.5 cycle (with phase angle 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°) 0% U_T for 1 cycle 0° 70% U_T for 25/30 cycles 0° 0% U_T for 250/300 cycles	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	30 A/m	30 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	Test level	Compliance level	Electromagnetic environment guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150kHz to 80MHz</p> <p>6 Vrms Within ISM band and amateur radio band of 150kHz to 80MHz</p> <p>10 V/m 80MHz to 2.7GHz Proximity electromagnetic field from radio communication equipment ^{a)}</p>	<p>3 Vrms 150kHz to 80MHz</p> <p>6 Vrms Within ISM band and amateur radio band of 150kHz to 80MHz</p> <p>10 V/m 80MHz to 2.7GHz Proximity electromagnetic field from radio communication equipment ^{a)}</p>	<p>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</p> $d = \frac{6}{E} \sqrt{P}$ <p>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer, d is the recommended separation distance in meters (m), and E is the radiation electromagnetic field level in volt/meter (V/m).</p>
<p>Proximity magnetic fields IEC 61000-4-39</p>	<p>30kHz CW 8A/m</p> <p>134.2kHz PM2.1kHz 50% 65A/m</p> <p>13.56MHz PM50kHz 50% 7.5A/m</p>	<p>30kHz CW 8A/m</p> <p>134.2kHz PM2.1kHz 50% 65A/m</p> <p>13.56MHz PM50kHz 50% 7.5A/m</p>	<p>The exterior surface of the SL-D701 should be kept at least 0.15m from RF emitters such as RFID readers.</p>

NOTE These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a) The table below shows the proximity electromagnetic field from radio communication equipment.

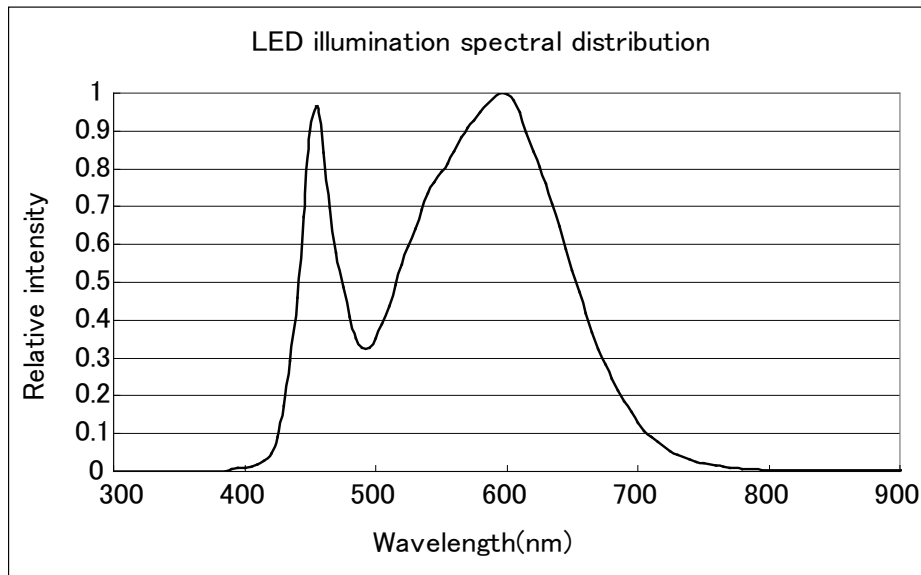
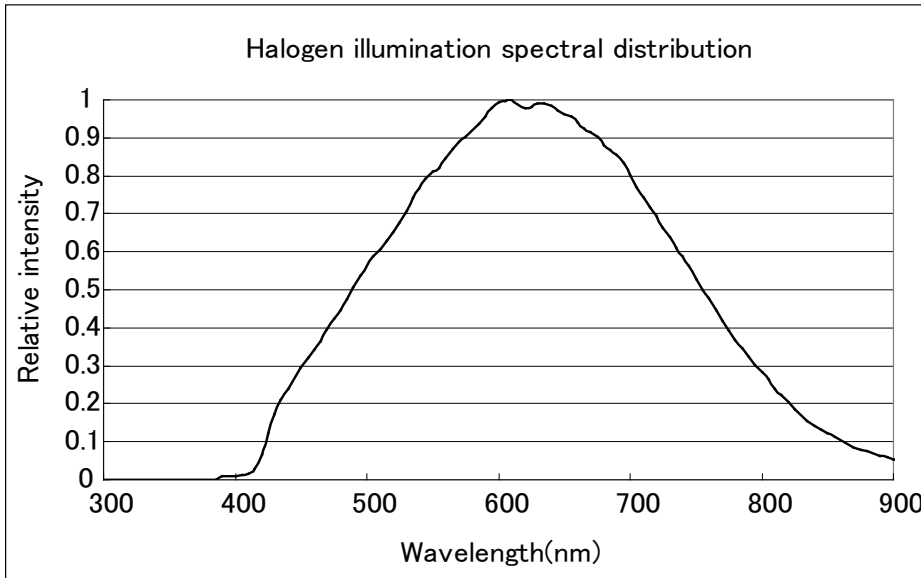
Test frequency [MHz]	Band [MHz]	Equipment	Modulation	Maximum output (W)	Distance (m)	Immunity test value [V/m]
385	380-390	TETRA 400	Pulse modulation 18Hz	1.8	0.3	27
450	430-470	GMRS 460 FRS 460	FM ±5kHz 1kHz sine	2	0.3	28
710	704-787	LTE Band 13, 17	Pulse modulation 217Hz	0.2	0.3	9
745						
780						
810	800-960	GSM 800/900 TETRA 800 iDEN820 CDMA850 LTE Band 5	Pulse modulation 18Hz	2	0.3	28
870						
930						
1720	1700-1990	GSM 1800 CDMA1900 GSM 1900 DECT LTE Band 1,3,4,25 UMTS	Pulse modulation 217Hz	2	0.3	28
1845						
1970						
2450	2400-2570	Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE Band7	Pulse modulation 217Hz	2	0.3	28
5240	5100-5800	WLAN 802.11 a/n	Pulse modulation 217Hz	0.2	0.3	9
5500						
5785						

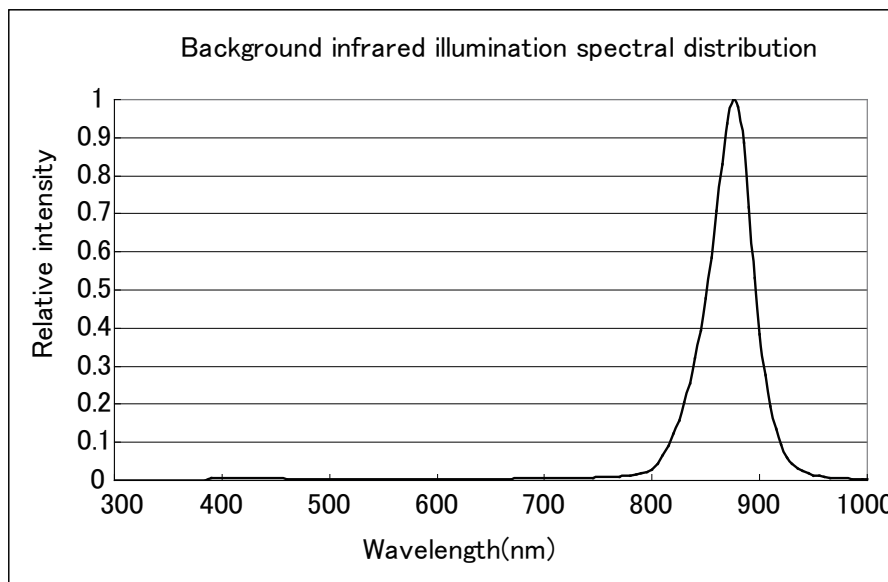
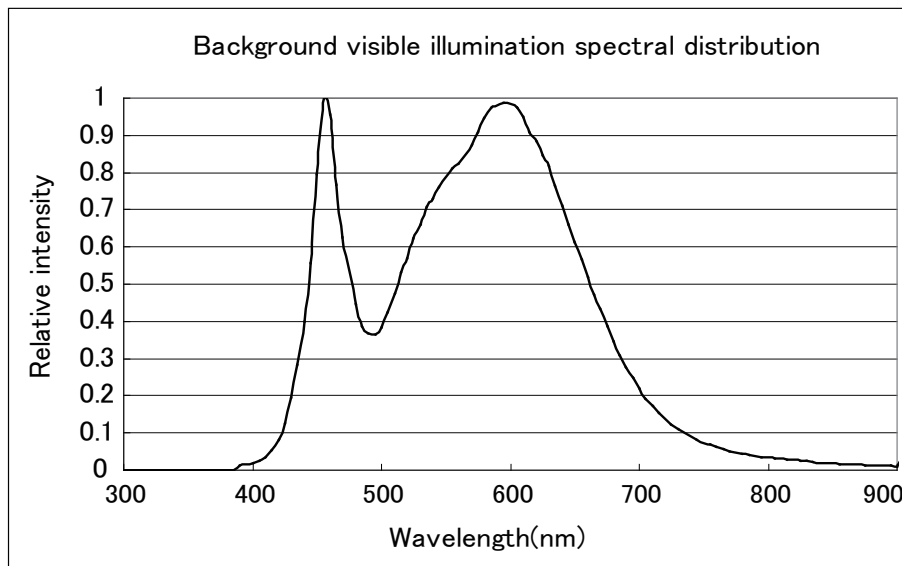
OPTICAL RADIATION HAZARD



- 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





The patient's eye is illuminated by visible light radiation emitted by the Slit Lamp Illumination unit (halogen lamp/ LED).


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.


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)

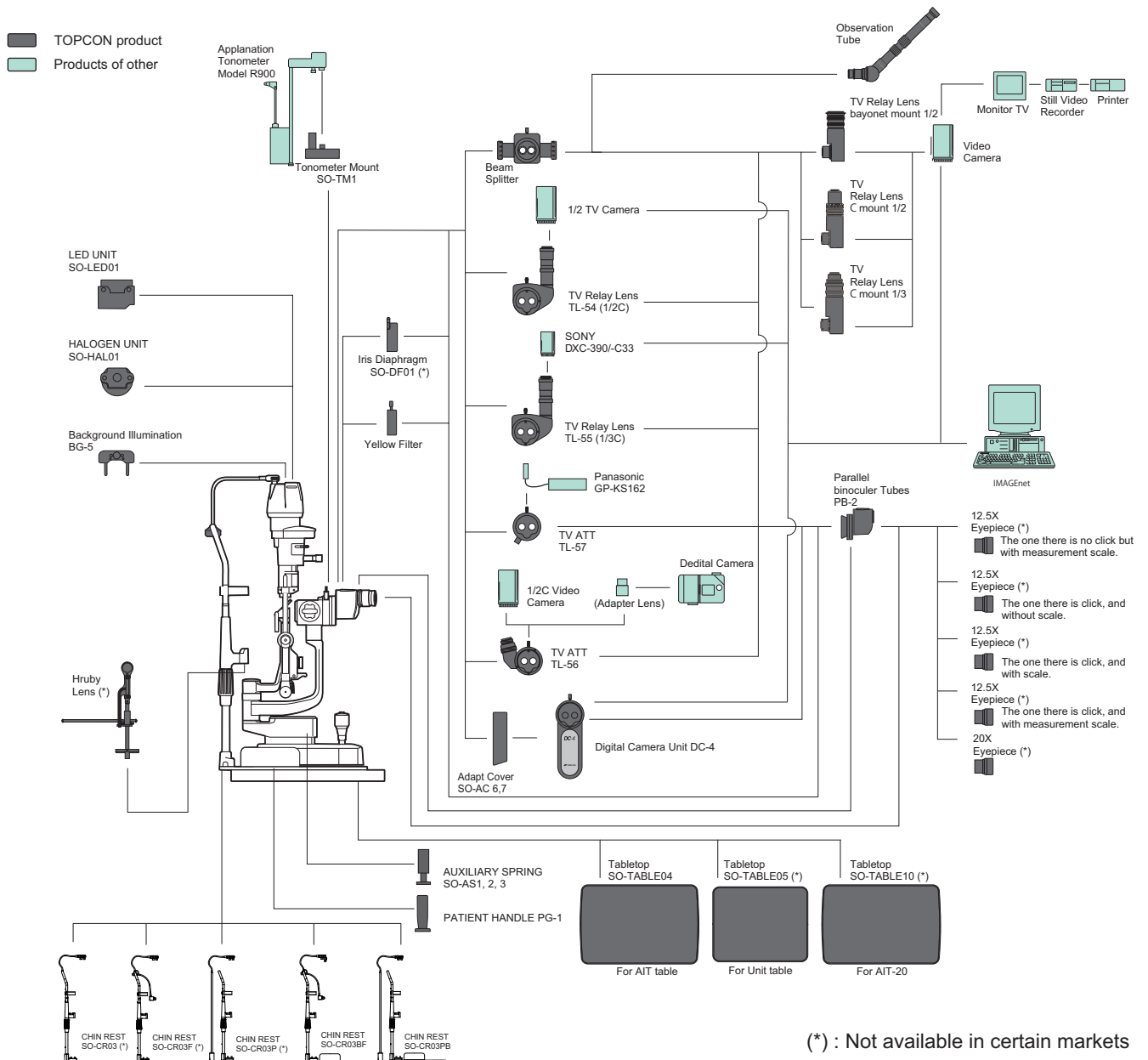
 CAUTION	To prevent falling during use and movement, secure optional accessories.
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•For details, please refer to the instruction manuals of each product.

SYSTEM CONFIGURATION

 CAUTION	To avoid electric shock, do not touch the external connection terminal and the patient at the same time.
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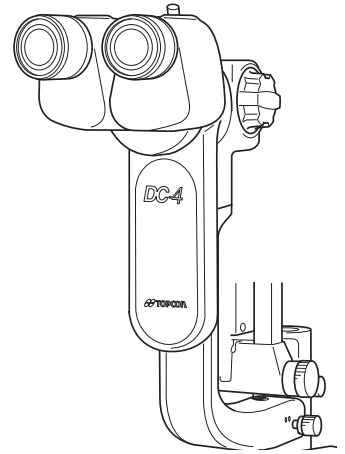
System Chart



DIGITAL CAMERA UNIT DC-4

FEATURES

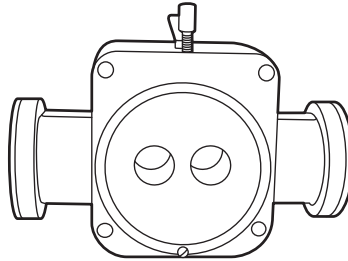
- Simple operation and high-quality digital image.
- Optimized functions for slit lamp photography.
- Compact body and internal cabling for a neat look.
- All DC-4 functions are software driven.
- Photography with infrared light can be performed in combination with background illumination BG-5.



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%.

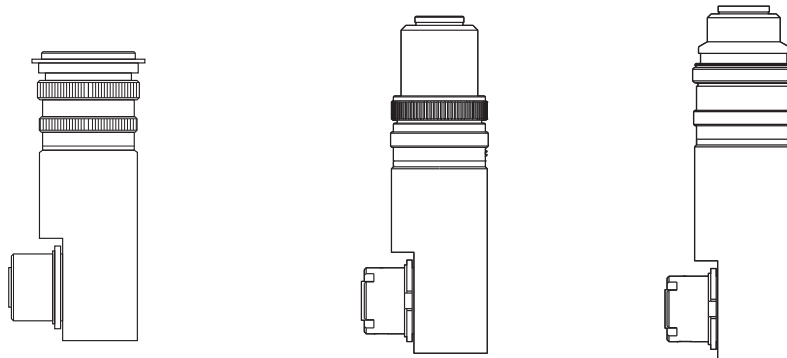


TV RELAY LENS

- 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.

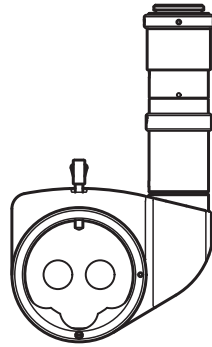


TV RELAY LENS TL-54/55

- 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

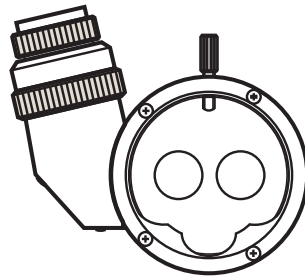
- Incorporated with the beam splitter.
- Can connect a TV camera to carry out monitor observation and photographing of still images.
- The beam splitter IN/OUT can be selected.
- The beam splitter division ratio is TV 50%: operator 50%.



TV ATTACHMENT TL-56

FEATURES

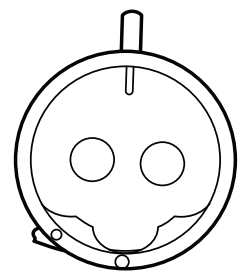
- Used to connect a digital camera.
- Combined with beam splitter.
- The beam splitter division ratio is TV 50%: operator 50%.



TV ATTACHMENT TL-57

FEATURES

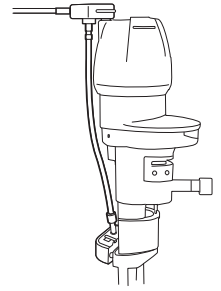
- Used to connect a digital camera.
- Combined with beam splitter.
- The beam splitter division ratio is TV 50%: operator 50%.



BACKGROUND ILLUMINATION BG-5

FEATURES

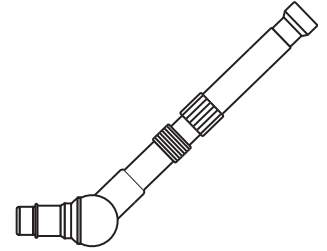
- Used for background illumination.
- The light volume differs according to the illumination light volume of the slit lamp.
- Equipped with 3-step visible observation illumination function and infrared observation illumination switching.



OBSERVATION TUBE

FEATURES

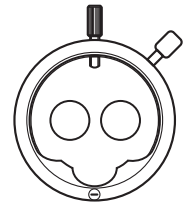
- Used in combination with a beam splitter.
- Used for observation together with the operator.
- Can be inclined to facilitate observation.



YELLOW FILTER UNIT

FEATURES

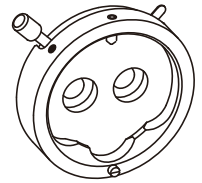
- Combines with the blue filter prepared in the main body for a high-contrast fluorescence observation.
- Easy switching between filter insertion & removal.



IRIS DIAPHRAGM SO-DF01

FEATURES

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

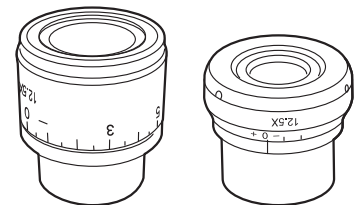


12.5x Eyepiece

FEATURES

There are four types as below:

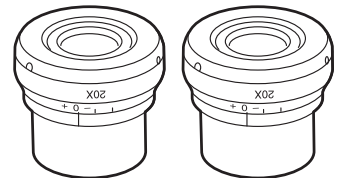
- One with internal measurement scale and no click stops.
- One without internal scale and click stops on each adjustment step.
- One with internal scale and click stops on each adjustment step.
- One with internal measurement scale and click stops on each adjustment step.



20X EYEPIECE

FEATURES

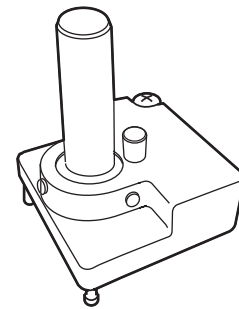
- Replaces the normal eyepiece for high magnification observation.



TONOMETER MOUNT SO-TM1

FEATURES

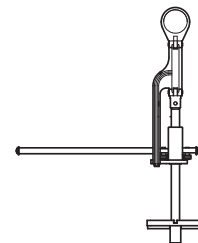
- For the measuring of the intraocular pressure, models R900 type and T900 type, Haag-Streit, are available.
- * If the R900 type is being used for the SL-D701, the tonometer mount SO-TM1 is required.
(Depending on specification, SO-TM1 may be included in standard accessories.)
- * If the T900 type is in use, the tonometer guide plate (for T-900 type) is required.



HRUBY LENS

FEATURES

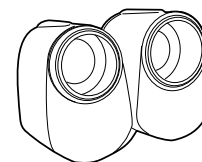
Normally, observation is possible only up to the anterior vitreous body due to the refractive power of the cornea and lens. With the Hruby lens, the posterior vitreous body and the retina can be observed.



PARALLEL BINOCULAR TUBE PB-2

FEATURES

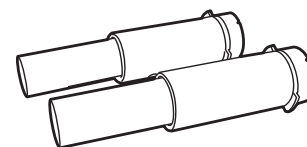
- Can observe a parallel view of the object.



AUXILIARY SPRING SO-AS 1,2,3

FEATURES

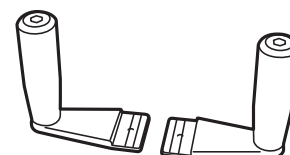
- Used to counter-balance vertical movement when attaching accessories, such as a photography unit.



PATIENT HANDLE PG-1

FEATURES

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



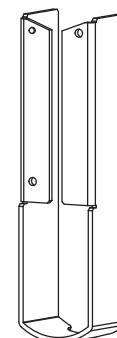
ADAPT COVER SO-AC6, 7

FEATURES

Used to cover the gaps with the microscope arm and hide cables when attaching the digital camera unit DC-4.

SO-AC6: For SL-D701 + DC-4 + barrier filter

SO-AC7: For SL-D701 + DC-4 +SO-DF01

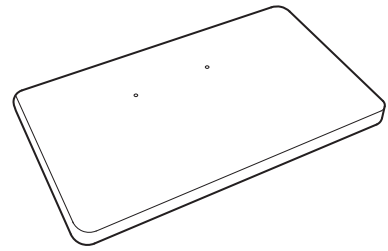


TABLETOP SO-TABLE 04, 05, 10

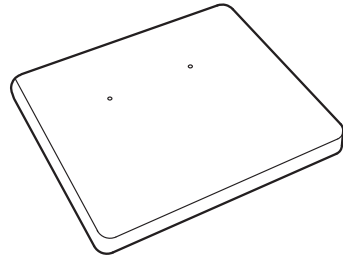
FEATURES

The tabletop to support the base unit, the chinrest unit and the power supply.

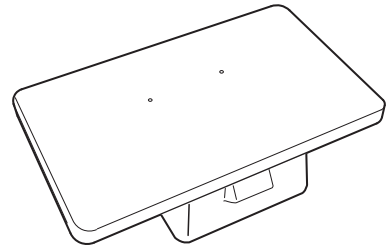
SO-TABLE04 : For AIT table



SO-TABLE05 : For Unit table



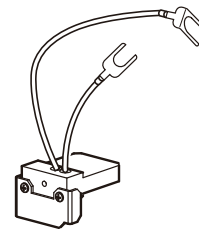
SO-TABLE10 : For AIT-20



LED UNIT SO-LED01

FEATURES

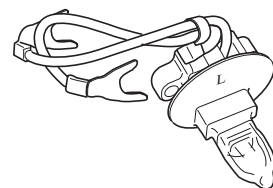
This device is the LED unit using the LED lamp. It is used as the light source of the slit lamp.



HALOGEN UNIT SO-HAL01

FEATURES

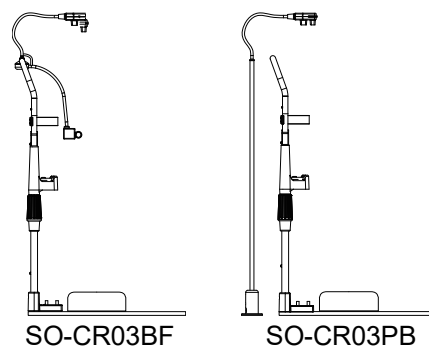
This device is the halogen unit using the halogen lamp. It is used as the light source of the slit lamp.



CHINREST SO-CR03BF, SO-CR03PB

FEATURES

The chinrest unit is used to hold and fix the head of the patient.



REFERENCE MATERIAL

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
United States	120V/60Hz	Type A (Hospital Grade)
Canada	120V/60Hz	Type A (Hospital Grade)

Mains Plugs Used in Europe Member states

Country	Voltage/frequency	Type of plug
Austria	230V/50Hz	Type C / F
Belgium	230V/50Hz	Type C / E
Bulgaria	230V/50Hz	Type C / F
Croatia	230V/50Hz	Type C / F
Cyprus	230V/50Hz	Type G
Czech Republic	230V/50Hz	Type C / E
Denmark	230V/50Hz	Type C / E / F / K
Estonia	230V/50Hz	Type C / F
Finland	230V/50Hz	Type C / F
France	230V/50Hz	Type C / E
Germany	230V/50Hz	Type C / F
Greece	230V/50Hz	Type C / F
Hungary	230V/50Hz	Type C / F
Ireland	230V/50Hz	Type G
Italy	230V/50Hz	Type C / F / L
Latvia	230V/50Hz	Type C / F
Lithuania	230V/50Hz	Type C / F
Luxembourg	230V/50Hz	Type C / F
Malta	230V/50Hz	Type G
Netherlands	230V/50Hz	Type C / F

Country	Voltage/frequency	Type of plug
Poland	230V/50Hz	Type C / E
Portugal	230V/50Hz	Type C / F
Romania	230V/50Hz	Type C / F
Slovakia	230V/50Hz	Type C / E
Slovenia	230V/50Hz	Type C / F
Spain	230V/50Hz	Type C / F
Sweden	230V/50Hz	Type C / F
United Kingdom	230V/50Hz	Type G

ABOUT THE BARCODE AND THE QR CODE OF THE BACK COVER

The barcode and the QR code of the back cover indicates the parts management code of the manual.



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

Revision 8

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SLIT LAMP

SL-D701

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