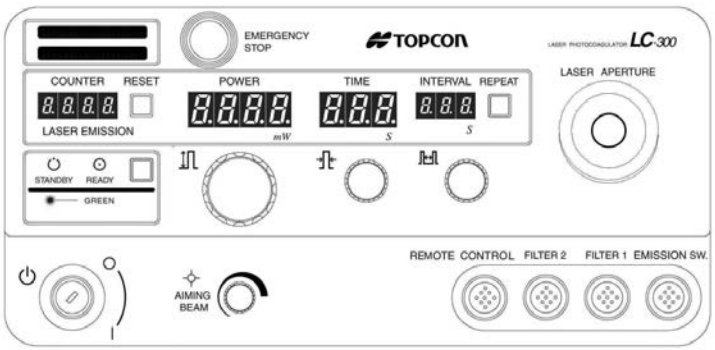
TOPCON



INSTRUCTION MANUAL
LASER PHOTOCOAGULATOR

LC-300G

INTRODUCTION

Thank you for purchasing the TOPCON Laser Photocoagulator LC-300G.

This instrument should be used for treatment of eye diseases such as eyeground disease, glaucoma, etc.

This Instruction Manual describes the TOPCON Laser Photocoagulator LC-300G, including outline, basic operations, troubleshooting, checking, maintenance and cleaning.
To get the best use of the instrument, read the Safety Displays and Safety Cautions.
Keep this Manual for future reference.

Laser Photocoagulator LC-300G

[CONTRAINDICATION AND PROHIBITION]
When you emit the laser beam of this instrument to the human organic tissues, the following symptoms may occur. Always be careful about the purpose position of the aiming laser. Don't emit the laser beam to others except the treatment position.
Symptom of eyes: Injury in cornea and others or loss of sight
Symptom of skin : Pain or burn
[Human organic tissues may be damaged.]
During operation, let the people around the instrument wear the goggles (applied to 532nm, OD4 or more) suitable for the laser wavelength. Even when you wear the goggles, do not watch the laser beam directly.
[Your eyes may be injured.]
Use the components specified by TOPCON.
[If you use the instrument wrongly, it may malfunction.]

Laser Slit Lamp SL-10L G

[WARNING]
When operating the instrument, be careful not to hit the eyes or nose of the patient by it.
[The patient may be injured.]

Slit Lamp Attachment for Laser Photocoagulator SA-1G

[WARNING]
When the arm of the slit lamp attachment for laser photocoagulator is retreated, do not emit the laser.
[The eyes and skin may be burned or injured by the laser beam.]

CAUTIONS FOR USE

Before using this instrument, read the instruction manual. Fully understand the cautions for safety and the use method.

Caution for use (Don't apply the instrument to the following patients.)

Patients whose treatment tissues cannot be properly checked (cloudy cornea, cataract, cloudy crystalline lens)

Important basic cautions

Give a detailed explanation to the patient about the expected effects and harmful symptoms before operation.

Tell the patient not to move his/her body (especially, head) carelessly during operation.

Handling

Don't use this instrument where there are a combustible anesthetic, oxygen gas or other mixed gases.
[Explosion may occur.]

When the instrument is under observation or other conditions except laser emission, set it in the standby mode.
[It may emit the laser beam wrongly.]

Keep your place at the instrument during operation. If the operator must leave the instrument, set the key switch to "OFF", remove the key from the instrument and store it in a proper place.
[Others except the operator may use the instrument to cause an accident.]

Before emitting the laser, make sure that there is no reflective matter in its optical path.
[The laser beam may be emitted in an unexpected direction.]

In the inspection before using the instrument, make sure that the optical axis of the aiming beam is fit to that of the treatment beam.
[The laser beam may not be emitted correctly.]

Be careful not to damage the optical components and soil them with fingerprint, dust, etc.
[The laser emission function may be deteriorated.]

When moving the chinrest up and down, be careful not to catch the patient's hand.
[The patient may be injured.]

Cautions for transportation/movement

- In transportation and installation, be very careful not to give a hard vibration or shock to the instrument.
- Don't pull the power cable whether the instrument is moved or not.

Disposal

When you dispose of the instrument, follow the regulations of each local government about disposal/recycling.

ENVIRONMENT FOR USE

Temperature: 10~40°C
Humidity : 30~85% (without dew condensation)
Air pressure : 700~1060 hPa

STORAGE, USE PERIOD AND OTHERS

1. Environmental conditions
   Temperature: 10~40°C
   Humidity : 30~85% (without dew condensation)
   Air pressure : 700~1060 hPa
2. Use period
   8 years since delivery only when the regular maintenance/inspection is performed [according to the self-certification (data of TOPCON)]

CAUTIONS FOR MAINTENANCE AND INSPECTION

Don't put any substance hindering ventilation around the instrument.
Connect the power cable to the ground outlet of single phase AC100V, 120V, 220V or 240V.
Make sure that the instrument is correctly connected to the power supply (including the protective grounding).
Make sure that the instrument is correctly connected to the proper accessories.
Make sure that the power of the instrument is OFF and all the indicator lamps are OFF.
Remove the key from the instrument and store the key to prohibit any person without permission from using it.
Inspect the instrument and its components periodically.
When you use the instrument after long-period storage, make sure beforehand that it operates safely and normally.

SAFETY DISPLAYS

In order to encourage safe use of the instrument and avoid danger to the operator and others as well as damage to properties, warnings are described in the Instruction Manual and marked on the instrument body.
Before reading Safety Cautions and the text, thoroughly understand the meaning of the following displays/icons.

DISPLAY

Display	Meaning
⚠ **WARNING**	Improper handling or ignoring this display may lead to the danger of death or serious injury.
⚠ **CAUTION**	Improper handling or ignoring this display may cause personal injury or physical damage.

- Injury means hurt, burn, electric shock, etc.
- Physical damage means extensive damage that may involve building, peripheral equipment and furniture.

ICONS

Icon	Meaning
	Indicates prohibition. Specific contents are shown with words or illustrations in or near the icon.
	Indicates a mandatory action. Specific contents are shown with words or illustrations in or near the icon.
	Indicates a warning. Specific contents are shown with words or illustrations in or near the icon.

SAFETY CAUTIONS

⚠ WARNINGS

Icons	Prevention item	Page
Prohibition	The endoprobe is a sterilized disposable product. Do not use it if the sterilizing outer package gets wet (even once) or damaged, or if the sealing is damaged.	**32**
Prohibition	Do not use the endoprobe if its validity time has expired.	**32**
Prohibition	When using the endoprobe, do not rebuild it in any way.	**32**
Prohibition	Both the beam and diffused beam are dangerous. Do not look at/ touch these.	**34, 38**
Mandatory Action	During operation, let the people around the instrument wear the goggles (applied to 532nm, OD4 or more) suitable for the laser wavelength. The laser beam may damage their eyes.	**34, 38, 74**
Mandatory Action	First, make sure that the slit lamp attachment for laser photocoagulator is at the specified position and then turn on the power of the instrument. If it is not at the specified position, it may cause exposure to laser beams and resultant burns and loss of sight.	**34**
Mandatory Action	Firmly fasten screws and avoid death/injury due to falling.	**49**
Mandatory Action	Fix the protect filter between microscope body and the binocular tube, and protect the eye from laser beams.	**49**
Prohibition	Do not open covers to avoid the danger of electric shocks. Ask a service engineer for repairs.	**52**
Prohibition	Repairs/adjustments should always be done by the service engineer. Electric shocks due to careless handling may cause death or serious burns, and exposure to laser emission may cause burns and loss of sight.	**52**
Mandatory Action	When changing fuses, shut down the power supply and pull off the power cable. Removing the fuse cover without removing the power cable may cause electric shocks.	**57, 59**
Mandatory Action	Be sure to use the attached fuse. Using another fuse may lead to fire in case of a failure.	**57**
Mandatory Action	Let the observers whose microscopes (for assistant) have no protect filters wear goggles (applied to 532nm, OD4 or more) suitable for the laser wavelength. The laser beam may damage their eyes.	**74**

⚠ CAUTION

Icons	Prevention item	Page
 Mandatory Action	For installation, prepare a power supply system satisfying the rating of AC 100V, 120V, 220V or 240V and a capacity of 550VA and larger. Use with a voltage other than the displayed voltage may cause injury by electric shocks and fire.	**28**
 Mandatory Action	For installation, prepare a power supply system allowing protective grounding, and surely arrange protective grounding. Leaks without protective grounding may lead to fire and electric shocks.	**28**
 Prohibition	When the remote interlock is released, the laser beam is emitted. Both the beam and diffused beam are dangerous. Do not look at/ touch these.	**29**
 Prohibition	Do not touch the endoprobe end.	**32**
 Mandatory Action	Install the remote controller in a stable place to prevent injury by falling off.	**33**
 Prohibition	The laser beam is emitted from the laser beam outlet. Keep your face off the outlet as the beam may burn your eyes and skin.	**34, 38**
 Mandatory Action	Use this instrument following the procedure described in the Manual. Controls and/or adjustments by procedures other than those described here may cause exposure to laser beams and resultant burns and loss of sight.	**34**
 Prohibition	Place the Footswitch in a position where it is not in the way. To avoid stumbling/injury to your foot, do not step too deep into the switch.	**34, 38, 74**
 Mandatory Action	Before using, surely adjust the diopter and interpupillary distance. Incorrect adjustments will lead to improper treatment.	**38, 44, 47, 74**
 Mandatory Action	Before using, surely adjust the focus and position of the aiming beam. Incorrect adjustments will lead to improper treatment.	**38**
 Mandatory Action	When operating the main unit, watch the space between the moving parts and protect your fingers.	**45**
 Mandatory Action	When operating the main unit, watch the patient's face and protect the eyes and nose from the instrument.	**45**
 Prohibition	Set the illumination for a proper brightness. An excessive brightness will not only bother the patient but may cause damage to the eye.	**46**
 Prohibition	Don't use the test rod for focus adjustment. Focus is not fit when treatment is done for a patient. Correct treatment is not possible.	**48**
 Prohibition	Do not use chemicals for cleaning, such as caustic cleansers to avoid exfoliation of nameplates and damage to letters.	**57**
 Mandatory Action	When changing lamp units, shut off the Power switch and pull off the power cable to avoid electric shocks.	**58**

⚠ CAUTION

Icons	Prevention item	Page
Mandatory Action	When inevitably changing lamp units immediately after putting off, beware of the high temperature to avoid burns.	**58**
Mandatory Action	Surely fix accessories to avoid falling during operation.	**69**

USAGE AND MAINTENANCE

Usage:
- Since the TOPCON Laser Photocoagulator is an electronic instrument for medical purposes, it should be operated only by a doctor who received training and is experienced in the instrument. Do not use the instrument for purposes other than ophthalmic treatments.
- Do not use the instrument by connecting equipment other than the accessories mentioned in this Manual.

USER MAINTENANCE

To maintain safety and the performance of the instrument, never attempt to do maintenance except for the items specified here. However, to let the instrument exert its performance correctly, the following items should be done by the user.

CLEANING OF EXTERIOR COVER:

The exterior cover of LC-300G can be cleaned. For details, see "CLEANING THE EXTERIOR COVER" on page 57.

CHANGING THE FUSE:

For LC-300G and SL-10L G, fuse change is possible.
For LC-300G, see "CHANGING THE FUSE" on page 57.
For SL-10L G, see "CHANGING THE FUSE" on page 59.

LAMP CHANGE:

For SL-10L G, Lamp change is possible. For details, see "CHANGING THE ILLUMINATION LAMP" on page 58.

CLEANING OF LENS, MIRROR AND FILTER:

The lens, mirror and filter of the slit lamp SL-10L G and the slit lamp attachment for laser photocoagulator SA-1G can be cleaned. For SL-10L G, refer to "CLEANING OF LENS AND MIRROR" on page 60 and, for SA-1G, refer to "HOW TO CLEAN" on page 61.

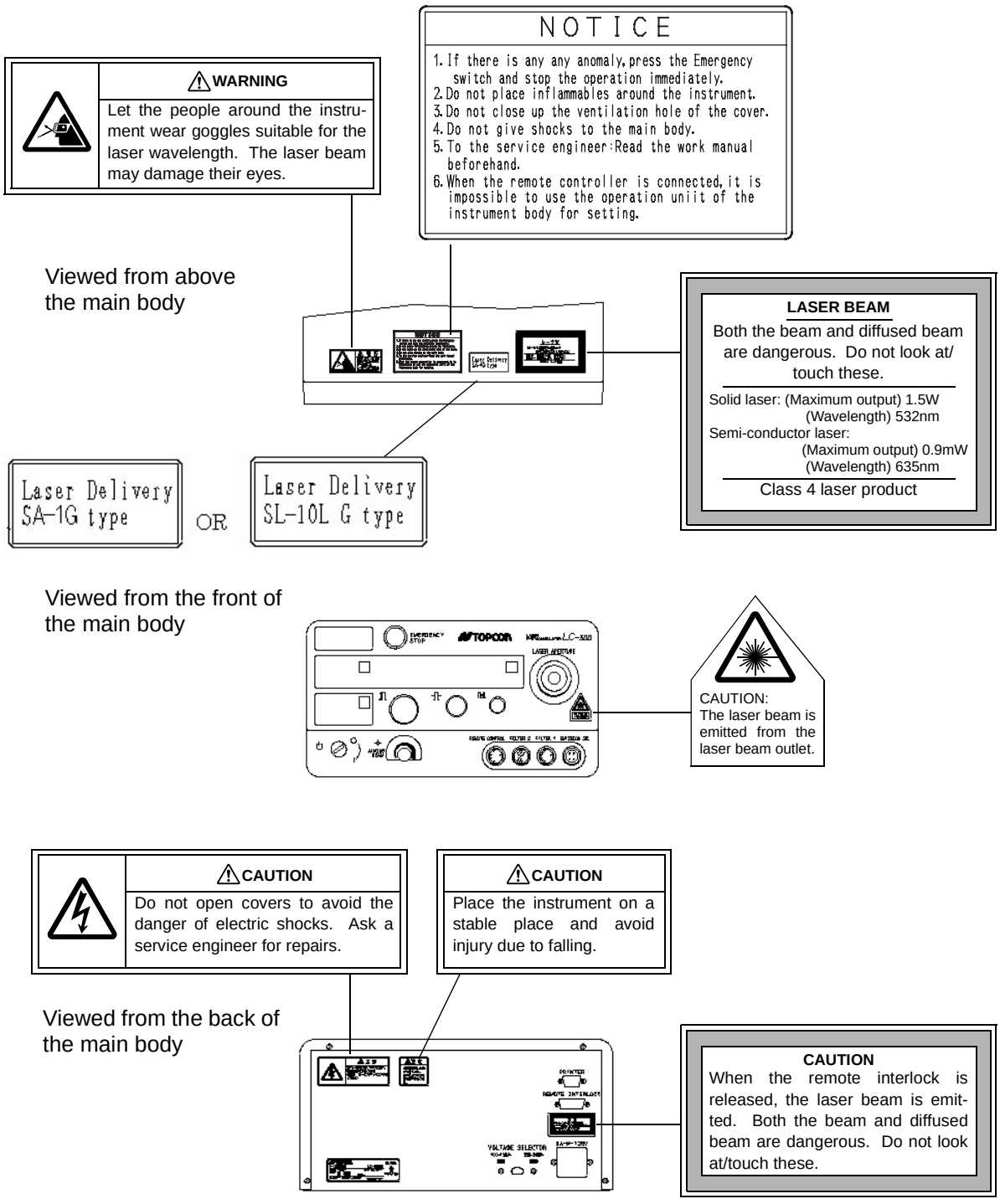
ESCAPE CLAUSE

- TOPCON shall not take any responsibility for damage due to fire, earthquakes, actions by third parsons and other accidents, negligence and misuse of the user and use under unusual conditions.
- TOPCON shall not take any responsibility for damage derived from the use or unavailability of this instrument, such as loss of business profit, suspension of business, etc.
- TOPCON shall not take any responsibility for damage caused by usage other than that described in this Instruction Manual.
- TOPCON shall not take any responsibility for adjustments and repairs done by the user and matters occurring in relation to these.
- TOPCON shall not take any responsibility for the result of diagnosis using this instrument.

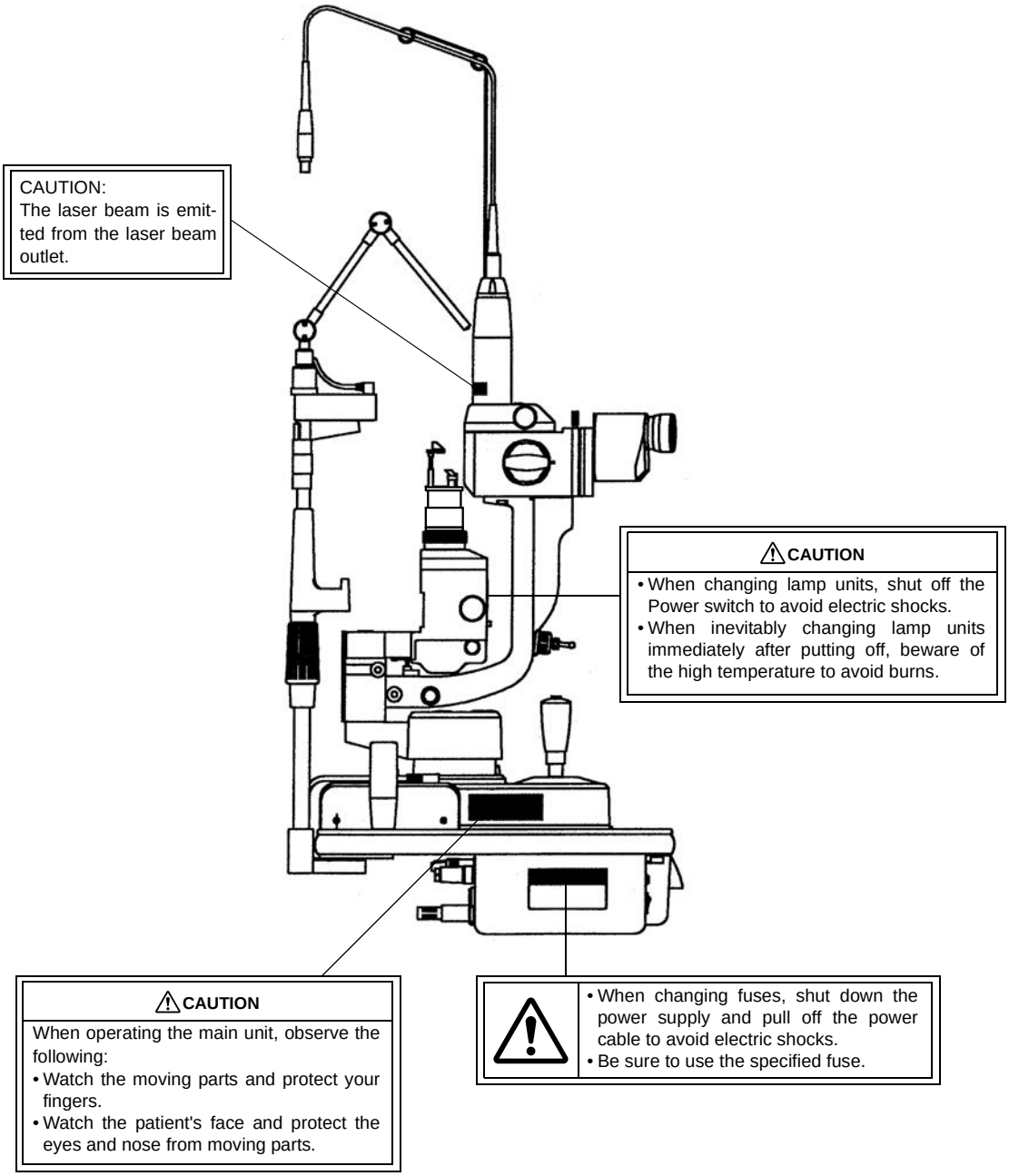
WARNING INDICATIONS AND POSITIONS

To secure the safe use of LC-300G, warnings are labeled.
Use the instrument correctly by following these instructions. If any of the following labels are missing, contact your dealer or TOPCON at the address shown on the back cover.

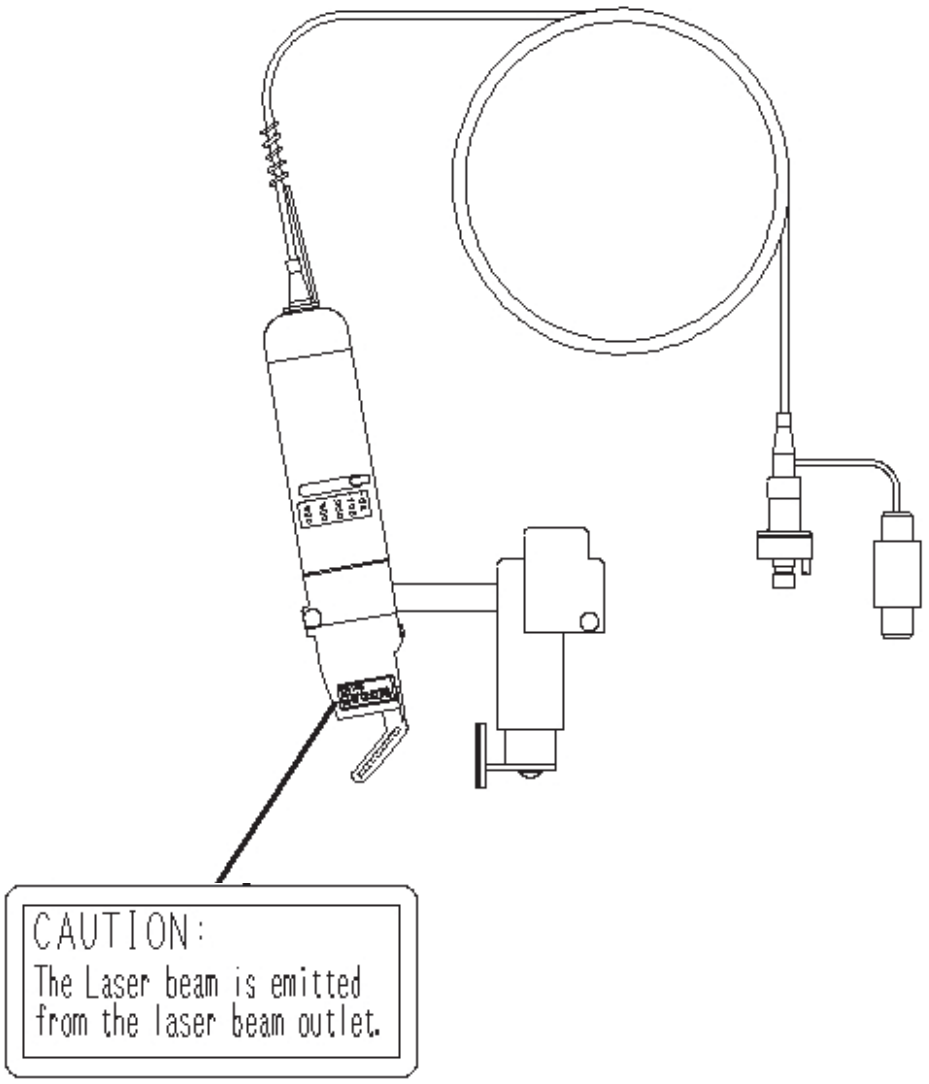
LASER PHOTOCOAGULATOR LC-300G (MAIN BODY)



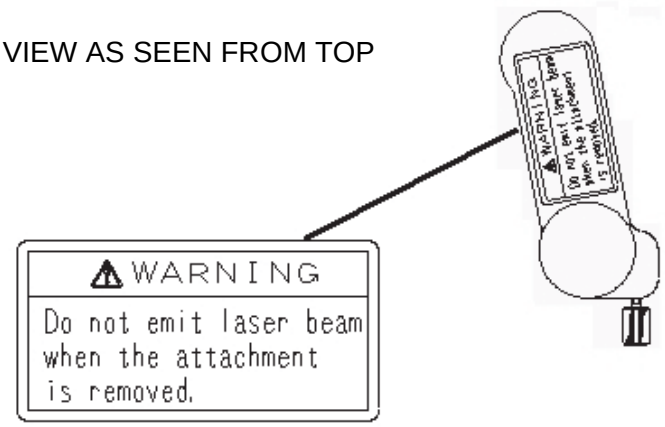
LASER SLIT LAMP SL-10L G



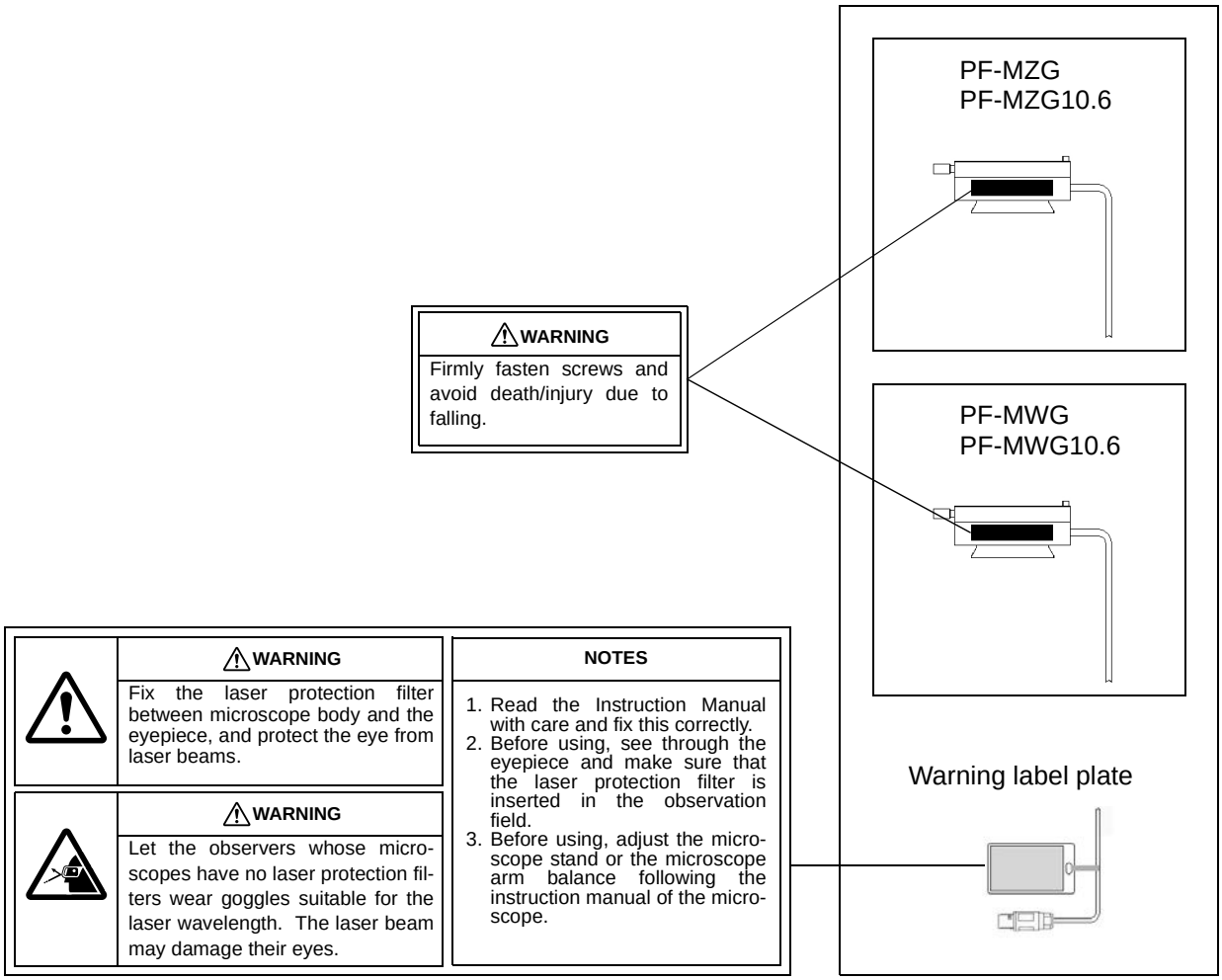
SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G



VIEW AS SEEN FROM TOP



PROTECT FILTER PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6 FOR MICROSCOPE



⚠WARNING

Firmly fasten screws and avoid death/injury due to falling.

⚠WARNING

Fix the laser protection filter between microscope body and the eyepiece, and protect the eye from laser beams.

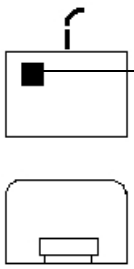
⚠WARNING

Let the observers whose microscopes have no laser protection filters wear goggles suitable for the laser wavelength. The laser beam may damage their eyes.

NOTES

1. Read the Instruction Manual with care and fix this correctly.
2. Before using, see through the eyepiece and make sure that the laser protection filter is inserted in the observation field.
3. Before using, adjust the microscope stand or the microscope arm balance following the instruction manual of the microscope.

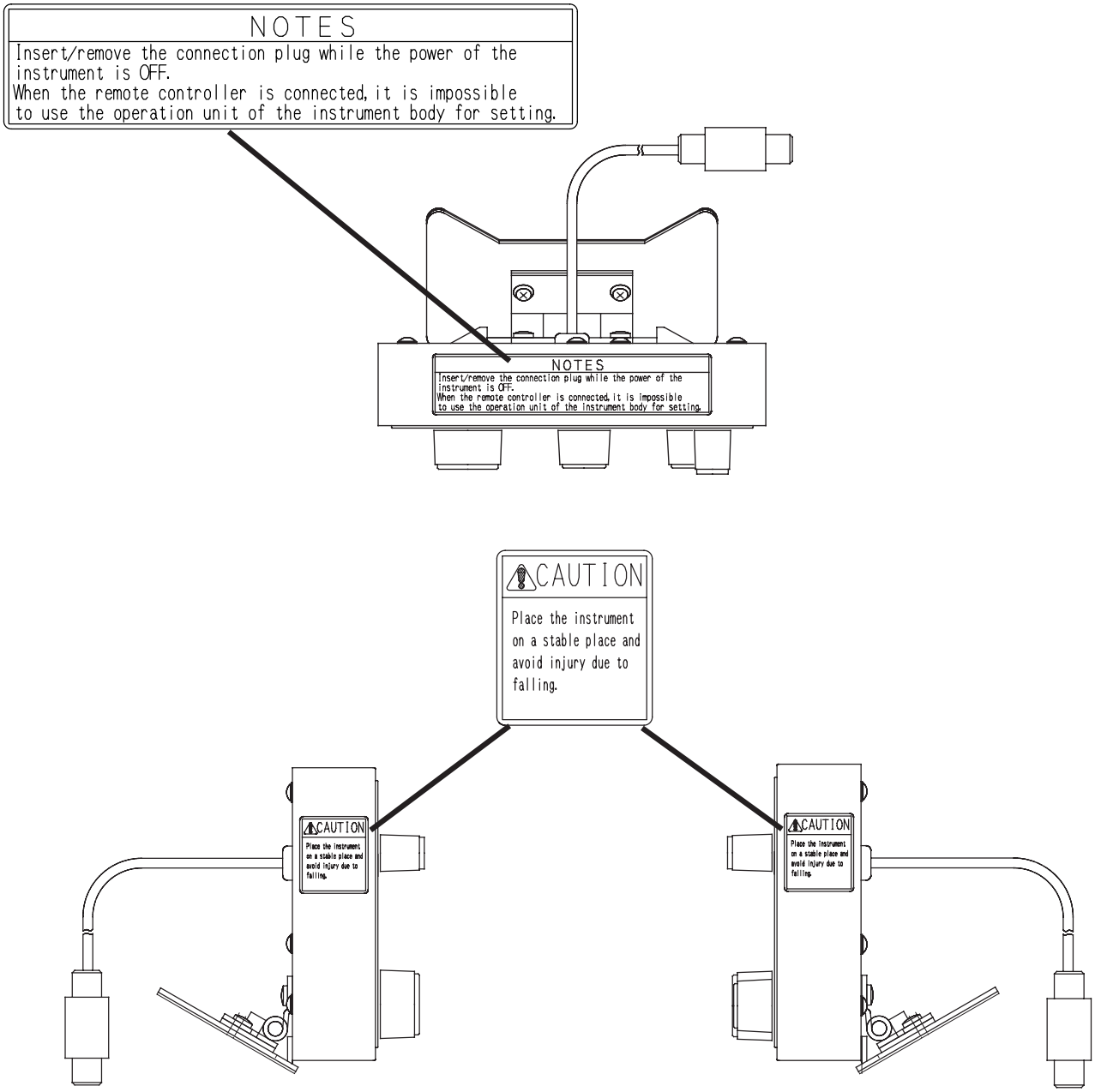
FOOTSWITCH FS-HG/FS-LG



⚠CAUTION

Place the Footswitch in a position where it is not in the way and avoid stumbling/injury to your foot.

REMOTE CONTROLLER RE-1G



CONTENTS

INTRODUCTION 1
CONTRAINDICATION AND PROHIBITION 1
WARNING 1
CAUTIONS FOR USE 2
ENVIRONMENT FOR USE 2
STORAGE, USE PERIOD AND OTHERS 2
CAUTIONS FOR MAINTENANCE AND INSPECTION 3
SAFETY DISPLAYS 3
SAFETY CAUTIONS 4
USAGE AND MAINTENANCE 6
ESCAPE CLAUSE 6
WARNING INDICATIONS AND POSITIONS 7

PRODUCT CONFIGURATION

PRODUCT CONFIGULATION WHEN USING LASER SLIT LAMP SL-10L G 15
PRODUCT CONFIGURATION WHEN USING SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G 16
PRODUCT CONFIGURATION WHEN USING ENDOPROBE 17
STANDARD ACCESSORIES OF LC-300G 18
OPTIONAL ACCESSORIES OF LC-300G 18

COMPONENT NAMES

LC-300G OPERATION UNIT 19
LC-300G DISPLAY UNIT 20
LC-300G EXTERNAL CONNECTION PORT 20
LASER SLIT LAMP SL-10L G COMPONENTS 21
MATERIALS OF PARTS TO CONTACT WITH LASER SLIT LAMP SL10-L G 22
SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G COMPONENTS 23
PROTECT FILTER PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6 24
FOOTSWITCH FS-HG/FS-LG COMPONENTS 24
REMOTE CONTROLLER RE-1G OPERATION UNIT 25
REMOTE CONTROLLER RE-1G DISPLAY UNIT 26
REMOTE CONTROLLER RE-1G COMPONENTS 26
CABLE SUPPORT CP-1 COMPONENTS 27
EXTENSION SHAFT EH-1 COMPONENTS 27

PREPARATIONS

INSTALLING THE LC-300G MAIN BODY 29
CONNECTING THE LASER SLIT LAMP SL-10L G 30
CONNECTION WITH SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G 31
CONNECTING THE ENDOPROBE 32
CONNECTING THE REMOTE CONTROLLER RE-1G 33
POWER SUPPLY SYSTEM 33
SPACE 33

BASIC OPERATIONS

PREPARATION BEFORE TREATMENT 35
TURNING ON THE POWER SWITCH 35

OPERATIONS IMMEDIATELY BEFORE USING 36
CONFIRMATION IMMEDIATELY BEFORE USING 37
WARNINGS 37
OBSERVATION 38
OPERATIONS FOR LASER EMISSION 38
LASER EMISSION FOR TREATMENT (SL-10L G) 39
LASER EMISSION FOR TREATMENT (SA-1G) 40
LIST OF FACTORS TO BE ADJUSTED DURING USING 42
DIFFERENCE IN EMISSION BY EMISSION INTERVALS SETTING 42
STOPPING OPERATIONS AFTER USING 43

INDIVIDUAL OPERATIONS (SL-10L G)

DIOPTER ADJUSTMENT AND INTERPUPILLARY DISTANCE ADJUSTMENT OF LASER SLIT LAMP SL-10L G 44
FIXING THE PATIENT'S FACE AND FIXATION 44
OPERATING THE BASE (FOCUSING) 45
SELECTING THE OBSERVATION MAGNIFICATION 45
OPERATING THE ILLUMINATION UNIT 46
MOVEMENT OF SPOT POSITION BY MANIPULATOR 46
FIXING OF SPOT CENTER POSITION 46

INDIVIDUAL OPERATIONS (SA-1G)

INSTALLATION OF SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G 47
ADJUSTMENT OF DIOPTER AND INTERPUPILLARY DISTANCE FOR SLIT LAMP 47
FOCUS AND POSITION ADJUSTMENT OF AIMING BEAM FOR SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G 48
FIXING THE PATIENT'S FACE AND FIXATION 48

INDIVIDUAL OPERATIONS (PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6)

FIXING PROCEDURE OF PROTECT FILTER 49
CONNECTION OF PROTECT FILTER (PF-MZG10.6/PF-MWG10.6) AND RELAY CABLE 49

INDIVIDUAL OPERATIONS (RE-1G)

OPERATIONS IMMEDIATELY BEFORE USING 50

INDIVIDUAL OPERATIONS (CP-1)

INSTALLATION OF CABLE SUPPORT 51

INDIVIDUAL OPERATIONS (EH-1)

INSTALLATION OF EXTENSION SHAFT 51

BEFORE REQUESTING SERVICE

TROUBLESHOOTING 52

MAINTENANCE AND CHECKING (LC-300G)

DAILY STORAGE 55
LONG-TERM STORAGE 55
MOVEMENT 55
ORDERING CONSUMABLE ITEMS 56
CHECKING BY USER 56
CHECKS BEFORE STARTING AND FINISHING 56

CHANGING THE FUSE 57
CHANGING OTHER PARTS 57
PERIODICAL CHECK 57
CLEANING 57

MAINTENANCE AND CHECKING (SL-10L G)

DAILY CHECKUPS 58
ORDERING CONSUMABLE ITEMS 58
CHANGING THE ILLUMINATION LAMP 58
CHANGING THE SOCKET 59
CHANGING THE FUSE 59
SUPPLY OF CHINREST PAPER 60
CLEANING 60

MAINTENANCE AND CHECKING (SA-1G)

DAILY MAINTENANCE 61
HOW TO CLEAN 61

SPECIFICATION AND PERFORMANCE

SPECIFICATION OF LASER PHOTOCOAGULATOR LC-300G 62
SPECIFICATION OF LASER SLIT LAMP SL-10L G 64
SPECIFICATION OF SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G 65
SPECIFICATION OF PROTECT FILTER PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6 65
SPECIFICATION OF ENDOPROBE 66
SPECIFICATION OF FOOTSWITCH FS-HG/FS-LG 66
SPECIFICATION OF REMOTE CONTROLLER RE-1G 67
SPECIFICATION OF CABLE SUPPORT CP-1 67
SPECIFICATION OF EXTENSION SHAFT EH-1 67
PERFORMANCE 68

OPTIONAL ACCESSORIES

LASER SLIT LAMP SL-10L G 69
SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G 70
PROTECT FILTER PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6 70
ENDOPROBE 70
FOOTSWITCH FS-HG/FS-LG 70
REMOTE CONTROLLER RE-1G 71
CABLE SUPPORT CP-1 71
EXTENSION SHAFT EH-1 71

REFERENCE MATERIALS

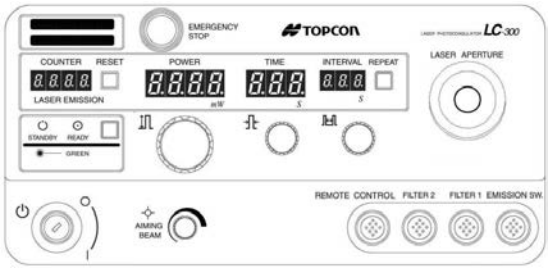
PRINCIPLE OF OPERATION 72
ILLUSTRATIONS: SETTING THE PROTECT FILTER 73
<Setting to TOPCON operation microscope OMS-75/OMS-85/OMS-90/OMS-110> ... 73
<Setting to TOPCON operation microscope OMS-600> 73
<Setting to TOPCON operation microscope OMS-610> 74
USING THE PROTECT FILTER 74
ILLUSTRATIONS: SETTING THE CABLE SUPPORT CP-1 75
ILLUSTRATIONS: SETTING THE EXTENSION SHAFT EH-1 75

PRODUCT CONFIGURATION

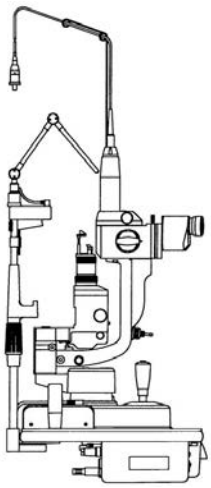
Product configurations of systems using a slit lamp, using a slit lamp attachment and using an endoprobe are shown below.

PRODUCT CONFIGULATION WHEN USING LASER SLIT LAMP SL-10L G

LASER PHOTOCOAGULATOR LC-300G (LASER DELIVERY SL-10L G TYPE)

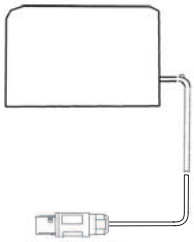


LASER SLIT LAMP SL-10L G (OPTION)

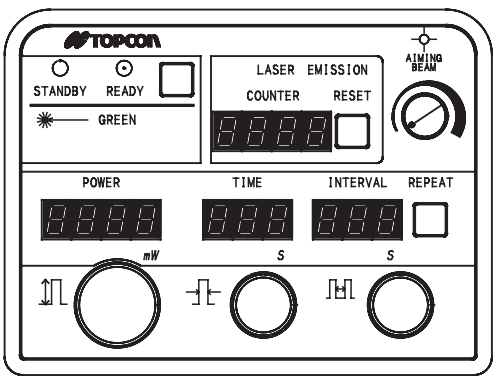


FOOTSWITCH FS-HG/FS-LG (OPTION)

Two types of footswitches, with different stepping force, are prepared for your choice.



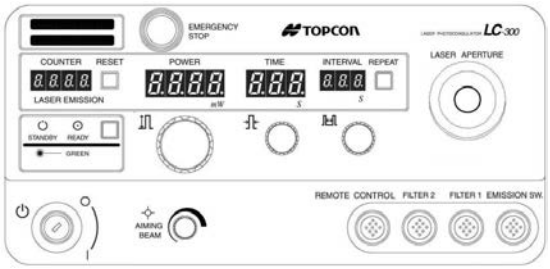
REMOTE CONTROLLER RE-1G (OPTION)



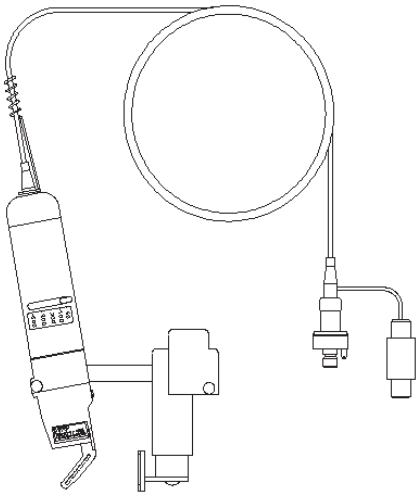
When laser emission is done by using the Emission switch provided at the handle part of SL-10L G, the Footswitch is not necessary.

PRODUCT CONFIGURATION WHEN USING SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G

LASER PHOTOCOAGULATOR LC-300G (LASER DELIVERY SA-1G TYPE)



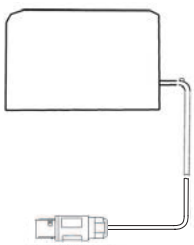
SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G (OPTION)



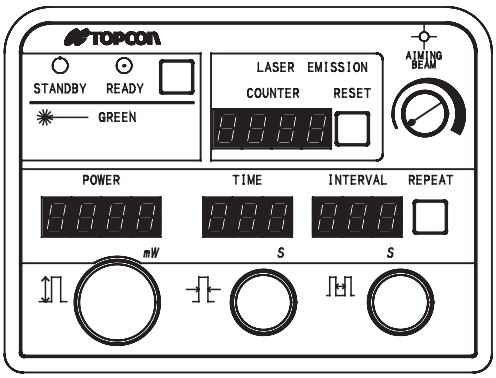
For the slit lamp which can be installed, refer to "SPECIFICATION OF SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G" on page 74.

FOOTSWITCH FS-HG/FS-LG (OPTION)

Two types of footswitches, with different stepping force, are prepared for your choice.

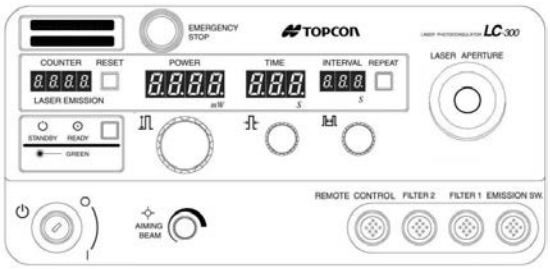


REMOTE CONTROLLER RE-1G (OPTION)

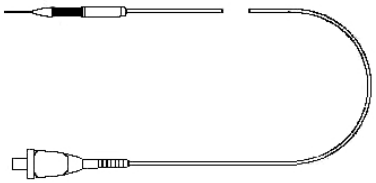


PRODUCT CONFIGURATION WHEN USING ENDOPROBE

LASER PHOTOCOAGULATOR LC-300G
(COMMON TO LASER DELIVERY SL-10L G TYPE AND LASER DELIVERY SA-1G TYPE.)



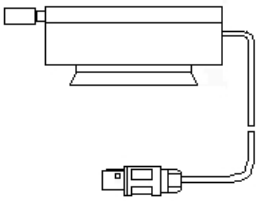
ENDOPROBE



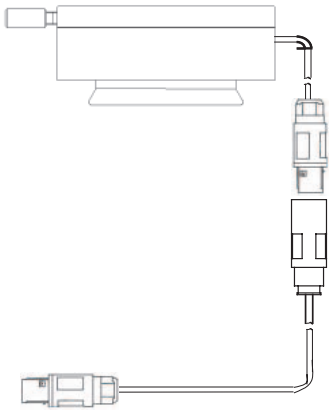
* When purchasing the endoprobe, ask our sales offices on the back cover of this manual about a proper one.

PROTECT FILTER PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6 FOR OPERATION MICROSCOPE (OPTION)

PF-MZG/PF-MWG

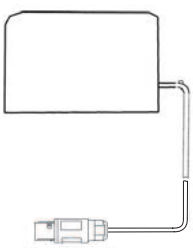


PF-MZG10.6/PF-MWG10.6

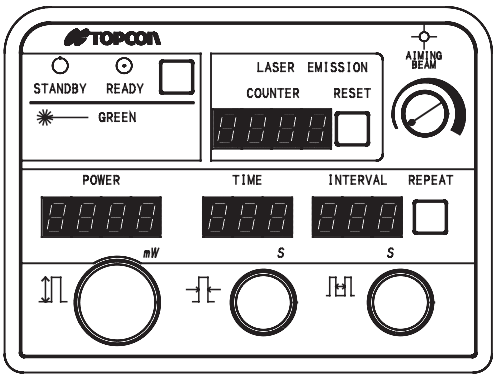


FOOTSWITCH FS-HG/FS-LG (OPTION)

Two types of footswitches, with different stepping force, are prepared for your choice.



REMOTE CONTROLLER RE-1G (OPTION)



STANDARD ACCESSORIES OF LC-300G

Standard accessories are shown below. Make sure that all are in the set delivered. Figures in parentheses show the quantity.

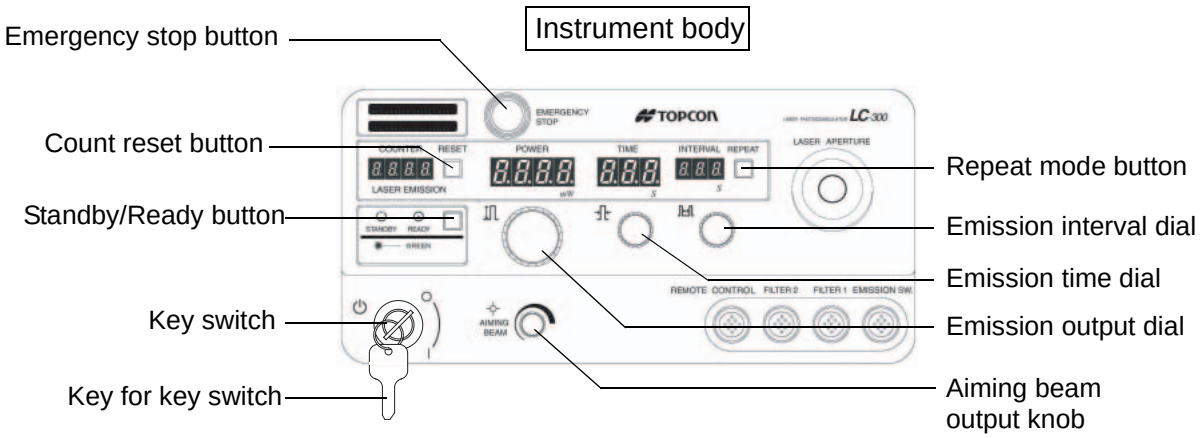
Name	Quantity
Power cable	(1)
Key for Key switch	(2)
Remote interlock connector	(1)
Dust cover	(1)
Spare fuse	(2)
Instruction Manual	(1)

OPTIONAL ACCESSORIES OF LC-300G

- Laser Slit Lamp SL-10L G
  Is a laser slit lamp for use with the Laser Photocoagulator LC-300G (Laser Delivery SL-10L G type).
- Slit lamp attachment for laser photocoagulator SA-1G
  Is a slit lamp attachment for laser used by combining with the Laser Photocoagulator LC-300G (Laser Delivery SA-1G type). Attach it to the slit lamp for use.
- Protect Filter PF-MZG, PF-MZG10.6
  Is a protect filter for use with a microscope for operation.
  The mount shape is the ZEISS type.
- Protect Filter PF-MWG, PF-MWG10.6
  Is a protect filter for use with a microscope for operation.
  The mount shape is the Leica type.
- Endoprobe
  * When purchasing the endoprobe, ask our sales offices on the back cover of this manual about a proper one.
- Footswitch FS-HG
  Is a footswitch with a high stepping force.
- Footswitch FS-LG
  Is a footswitch with a low stepping force.
- Remote controller RE-1G
  Is a remote controller for use by connecting to the Laser Photocoagulator LC-300G.
- Cable support CP-1
  Is a cable support to hold the fiber when using SL-10L G or SA-1G.
- Extension shaft EH-1
  Is an extension shaft for magnification selection knob. This is used when installing the slit lamp attachment for laser photocoagulator SA-1G to the Topcon photo slit lamp SL-7F or slit lamp SL-D7.

COMPONENT NAMES

LC-300G OPERATION UNIT



Key switch ..... Is a switch to turn ON/OFF the main power supply of the main body. The key can be removed in the OFF position.

Emission output dial ..... Is a dial to set the laser beam emission output for treatment. The set value is shown on the Emission output display window located above the dial.

Emission time dial ..... Is a dial to set the laser beam emission time for treatment. The set value is shown on the Emission time display window located above the dial.

Repeat mode button..... Is used for switching between Single mode (single shot) and Repeat mode (continuous emission). When Repeat mode is set, the Repeat mode indicator turns on at the upper part of the button, and the previously set interval time is shown on the Emission interval display window (on the left side of the button).

Emission interval dial..... Is a dial to set the laser beam emission interval for treatment. The set value is shown on the Emission interval display window located above the dial.

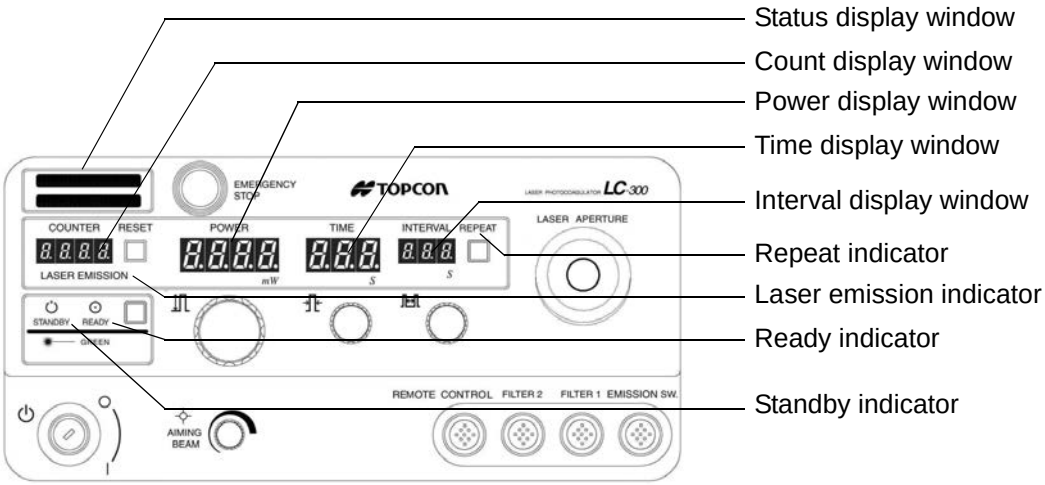
Aiming beam output knob..... Is a knob to adjust the brightness of aiming beam.

Count reset button..... Pressing the button resets the treatment laser emission count of the Count display window to zero.

Standby/Ready button..... Is used for switching between ready (treatment) and standby (waiting).

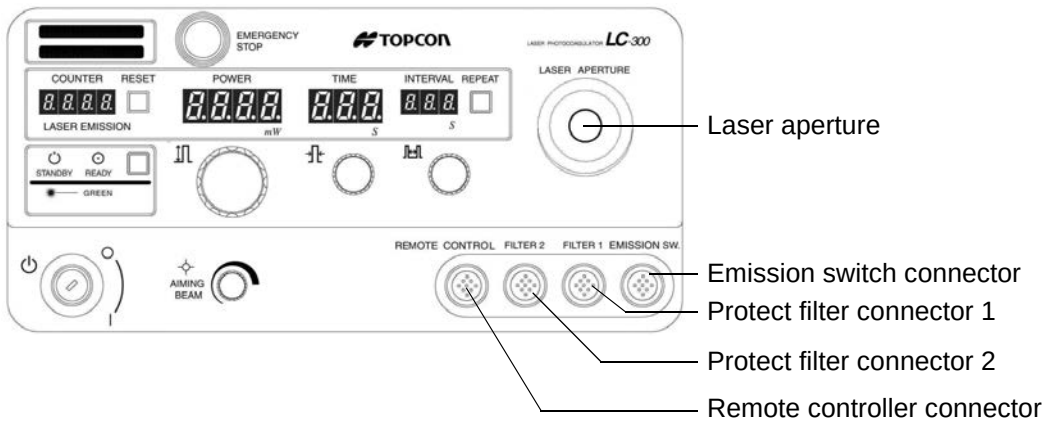
Emergency stop button ..... When the Emergency stop button is pressed, all functions related to laser emission of the main body are stopped. To reset the function stop status, turn OFF the main power supply by the Key switch, and turn it ON again.

LC-300G DISPLAY UNIT

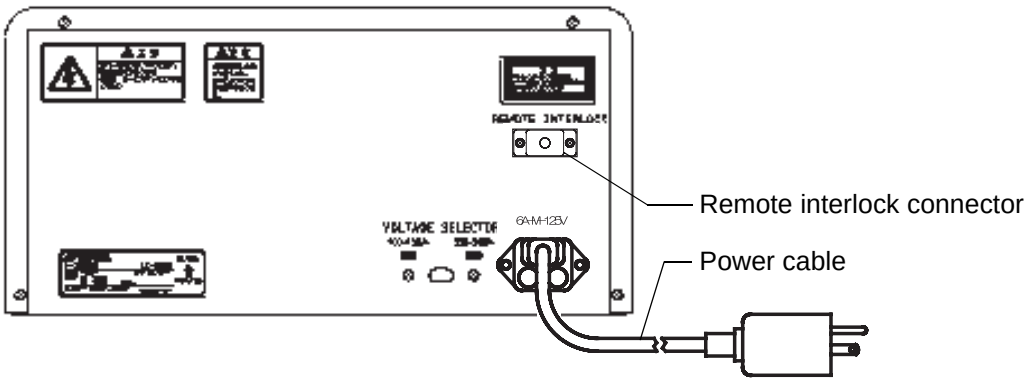


Status display window ..... Shows the connected delivery system information and errors.
Count display window..... Shows the laser beam emission count for treatment up to 4 digits.
Power display window..... Shows the laser beam emission output for treatment set by the Emission output dial. The display shows up to 4 digits in "mW" unit. The display value indicates the emission output on the cornea.
Time display window ..... Shows the treatment laser beam emission time set by the Emission time dial. The display shows up to 3 digits in "s" unit.
Interval display window ..... When Repeat mode is set, the emission interval time set by the Emission interval dial is displayed. The display shows up to 3 digits in "s" unit.
Repeat indicator ..... When Repeat mode is set, this turns on together with the emission interval display.
Laser emission indicator..... Turns on when the laser beam (for treatment/aiming) is emitted.
Standby indicator..... Turns on when the system reaches the standby status. When the power supply is turned ON, the main body is always in the standby status.
Ready indicator ..... Turns on when the system is ready. The main body comes to ready states by operating the Standby/Ready button.

LC-300G EXTERNAL CONNECTION PORT

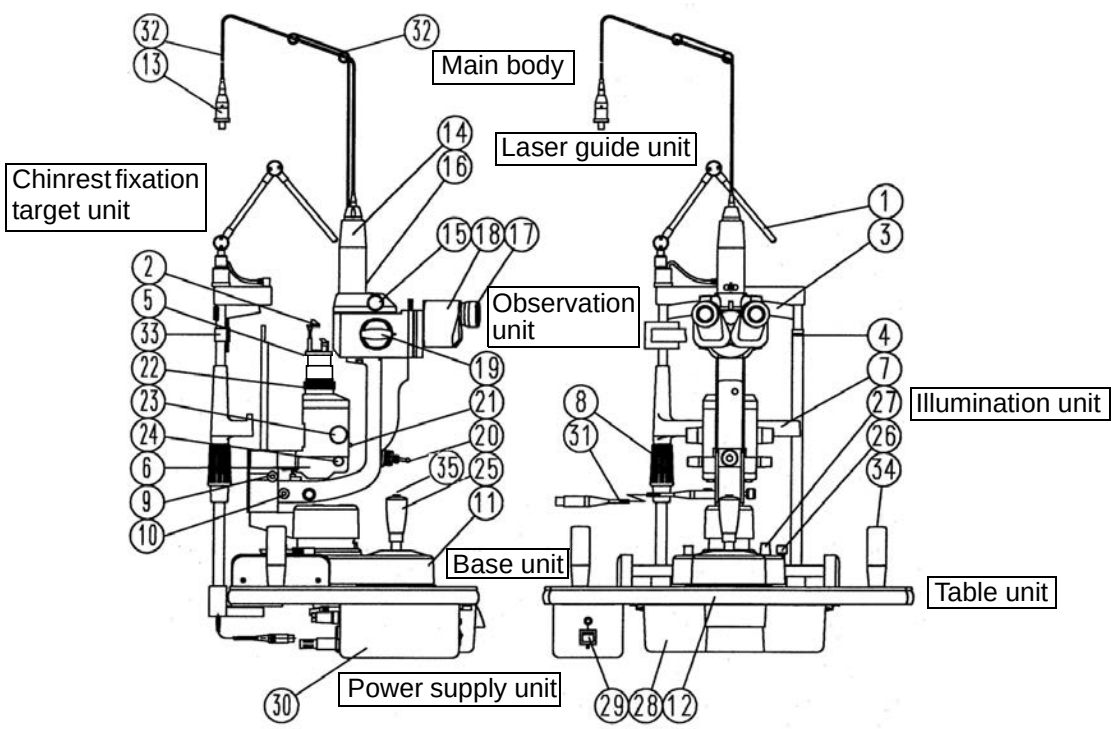


Laser aperture.....Plug in the laser beam fiber here.
Emission switch connector.....Plug in the Emission switch or the Footswitch.
Protect filter connector 1 .....Plug in the protect filter.
Protect filter connector 2 .....Plug in the protect filter.
Remote controller connector .....Plug in the remote controller.



Remote interlock connector.. Connects the remote interlock switch.
Power cable

LASER SLIT LAMP SL-10L G COMPONENTS



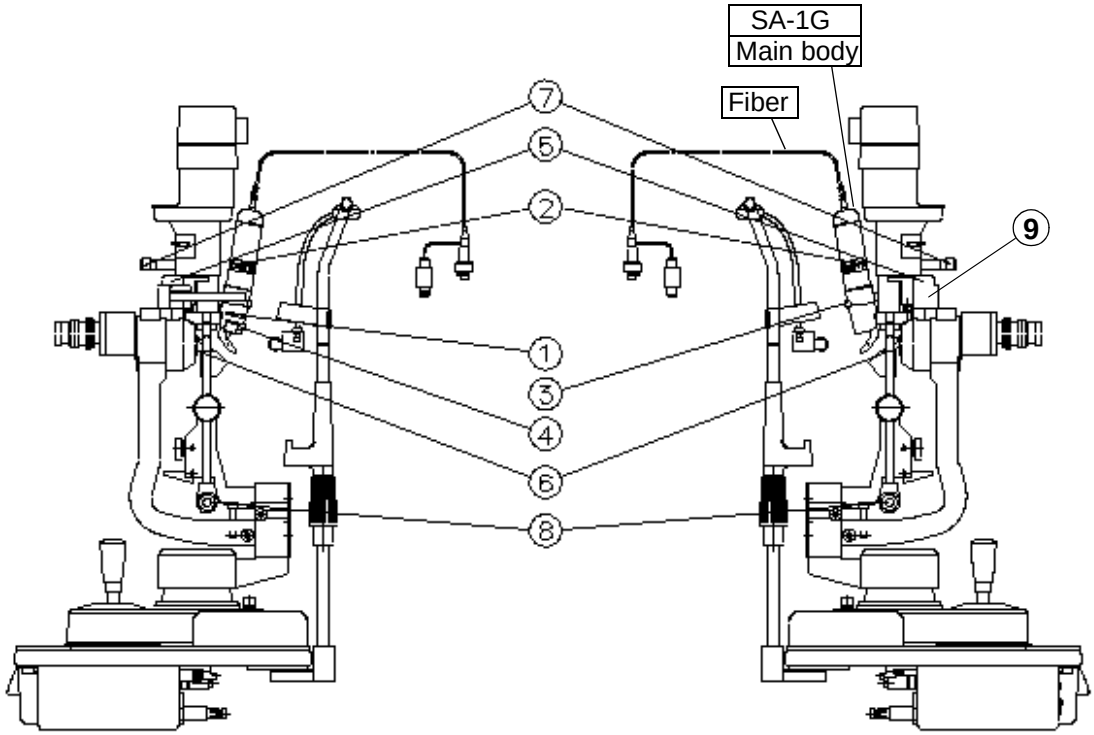
Number	Name	Description
1	Fixation target	
2	Illumination mirror	Is divided into upper and lower halves, and the laser beam passes between these.
3	Forehead rest	
4	Height mark	Indicates the middle height of vertical movement of horizontal optical axis of the microscope.
5	Aperture diaphragm	When you wish to decrease flare, insert the aperture diaphragm.
6	Lamp house cover	Is removed to change illumination lamps.
7	Chinrest	
8	Chinrest vertical handle	
9	Illumination arm locking knob	Locks the illumination arm to fix it to the microscope arm, so that the microscope unit and the illumination unit rotate horizontally in a unit.

10	Microscope arm locking knob	Locks the microscope arm from its horizontal rotation.
11	Stand	
12	Table	
13	Fiber connection plug	Is connected to the laser aperture of the laser unit.
14	Telescope	Contains an optical system to guide the laser beam.
15	Spot size adjustment knob	By turning the knob, select the laser beam spot size from the ϕ50-1000µm range.
16	Spot size indicator	Shows the spot size in "µm" unit.
17	Eyepiece	Diopter setting is important for doing correct treatment. Surely do the diopter adjustment described in the operation method (P.52).
18	Binocular tube	
19	Magnification selection knob	
20	Manipulator	Is used to move the position of laser emission. Loosen the cap at the base and release it, then the position moves to the center automatically. By tightening the cap, the manipulator can be fixed to secure the center position.
21	Filter changing turret	Two types of filters can be inserted into the illumination light path. • Orange mark..... Color temperature changing filter • White mark..... No filter • Green mark..... Red-free filter
22	Slit turn ring	Can turn the slit ±90 degrees from the vertical position.
23	Slit width control knob	Can adjust the slit width in the 0-8mm range.
24	Diaphragm change knob	Can select the diaphragm diameter from 5 types of ϕ0.3, 1, 3, 5, and 8mm and change the slit length continuously in the 8-1mm range.
25	Control lever	Is used to move the base. Coarse movement : Set up and move the lever. Fine movement : Incline and move the lever toward the desired direction. Vertical movement : Turn the lever.
26	Base brake knob	
27	Illumination volume adjustment knob	Can adjust the brightness of illumination continuously.
28	Drawer	
29	Power switch	When the switch is turned ON, the switch part shines and the lamp power supply becomes available.
30	Illumination power supply	
31	Protect filter cable	Connect the cable to the FILTER1/FILTER2 connector of the Laser Phtocoagulator LC-300G.
32	Fiber guide	
33	Headband	
34	Handle	
35	Emission switch	

MATERIALS OF PARTS TO CONTACT WITH LASER SLIT LAMP SL10-L G

Forehead rest : Polyamide resin
Chinrest : Polyamide resin
Head band : Cloth

SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G COMPONENTS

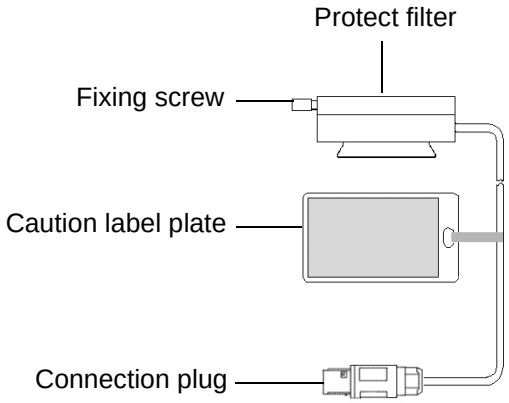


Number	Name	Description
1	Focus adjustment knob	Move the knob right and left to adjust focus.
2	Spot size adjustment knob	Move the knob right and left to select the spot size of laser beam within ϕ50 ~ 500μm.
3	Horizontal control knob	Move the laser emitting position horizontally.
4	Vertical control knob	Move the laser emitting position vertically.
5	Slit lamp mount	Install the slit lamp to the accessory mount.
6	Protect filter	Move the filter into the visual field when SA-1G is used. Move it to the outside of the visual field when SA-1G is not used.
7	Diaphragm change knob	Adjust the diaphragm diameter.
8	Slit width control knob	Adjust the slit width.
9	Attachment fixing screw	Fix the attachment onto the mount.

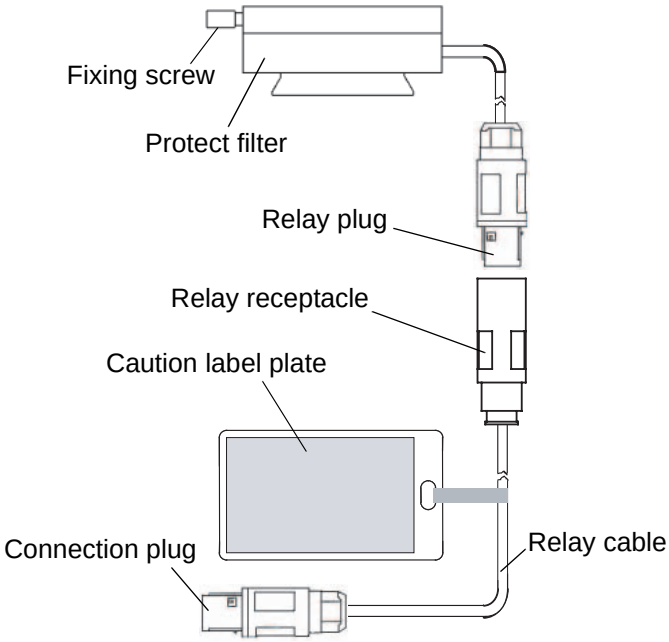
* For the operation of the slit lamp, refer to its instruction manual.

PROTECT FILTER PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6

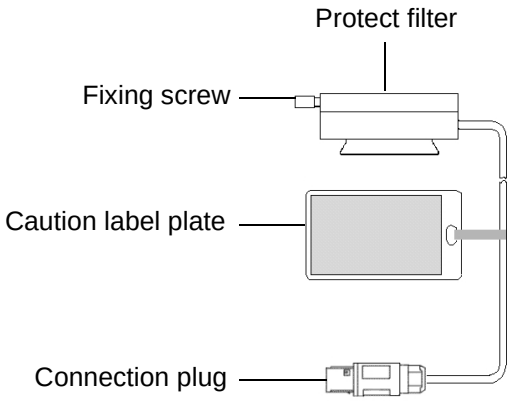
PF-MZG



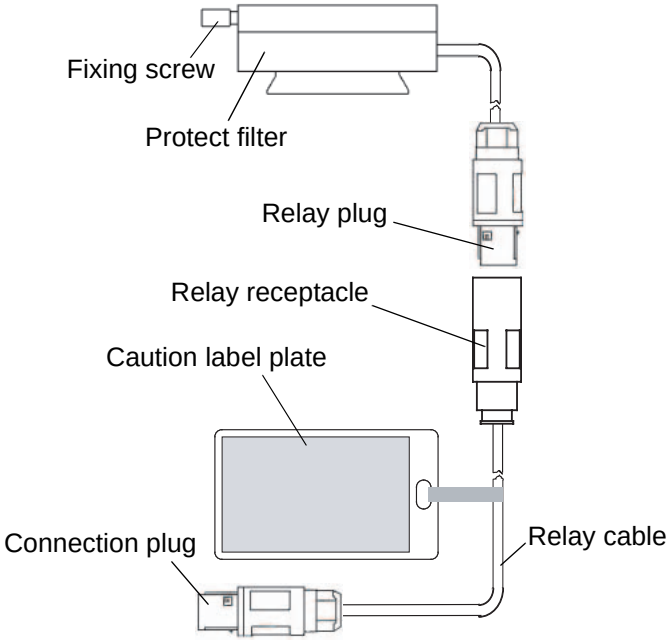
PF-MZG10.6



PF-MWG

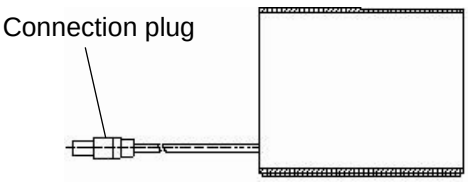


PF-MWG10.6

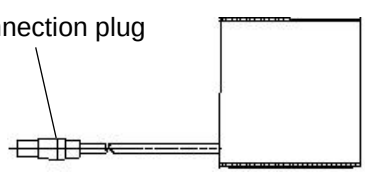


FOOTSWITCH FS-HG/FS-LG COMPONENTS

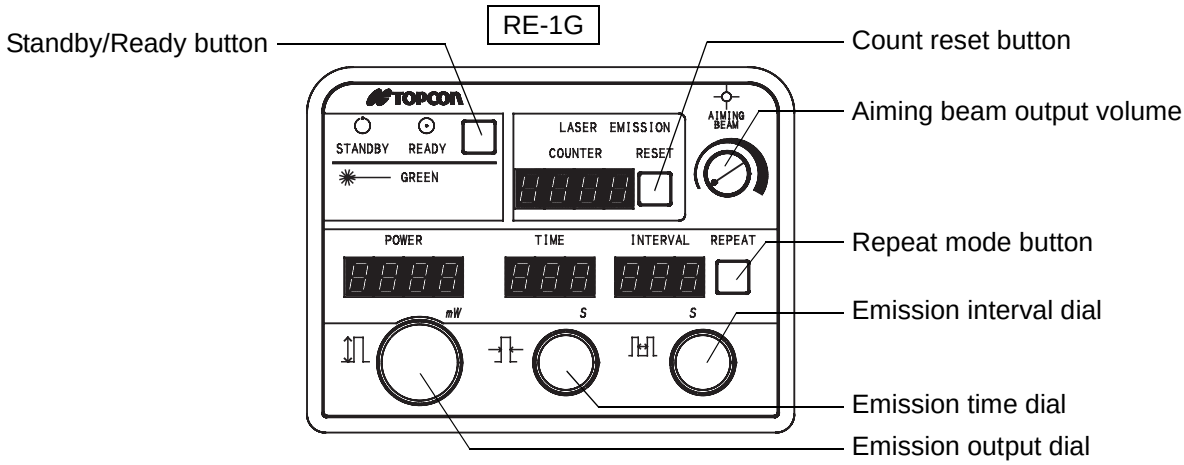
FS-HG



FS-LG



REMOTE CONTROLLER RE-1G OPERATION UNIT



Standby/Ready button..... Is used for switching between ready (treatment) and standby (waiting).

Count reset button ..... Pressing the button resets the treatment laser emission count of the Count display window to zero.

Aiming beam output volume ..... Is used to adjust the brightness of the aiming beam.

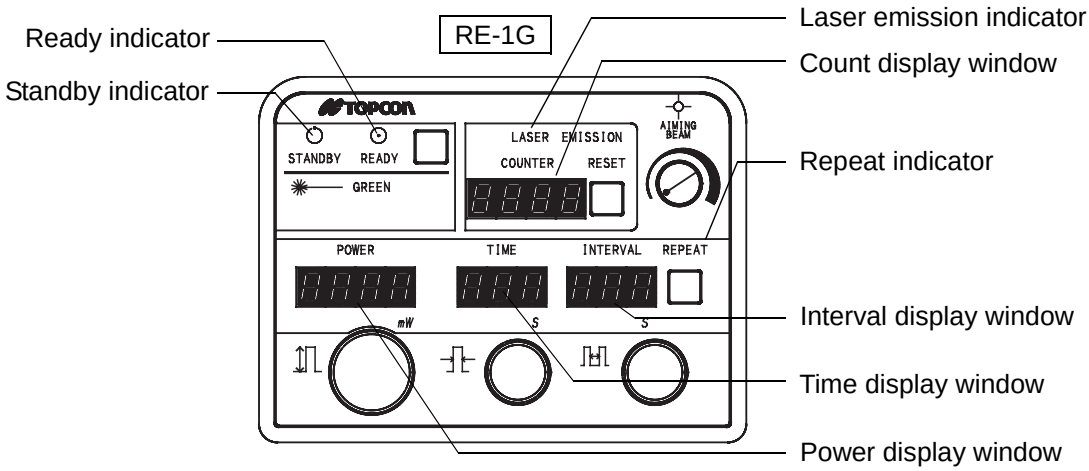
Emission interval dial ..... Is a dial to set the laser beam emission interval for treatment. The set value is shown on the Emission interval display window located above the dial.

Emission time dial..... Is a dial to set the laser beam emission time for treatment. The set value is shown on the Emission time display window located above the dial.

Emission output dial..... Is a dial to set the laser beam emission output for treatment. The set value is shown on the Emission output display window located above the dial.

Repeat mode button ..... Is used for switching between Single mode (single shot) and Repeat mode (continuous emission). When Repeat mode is set, the Repeat mode indicator turns on at the upper part of the button, and the previously set interval time is shown on the Emission interval display window (on the left side of the button).

REMOTE CONTROLLER RE-1G DISPLAY UNIT



Ready indicator ..... Turns on when the system is ready. The main body comes to ready status by operating the Standby/Ready button.

Standby indicator ..... Turns on when the system reaches the standby status. When the power supply is turned ON, the main body is always in the standby status.

Laser emission indicator ..... Turns on when the laser beam (for treatment/aiming) is emitted.

Count display window ..... Shows the laser beam emission count for treatment up to 4 digits.

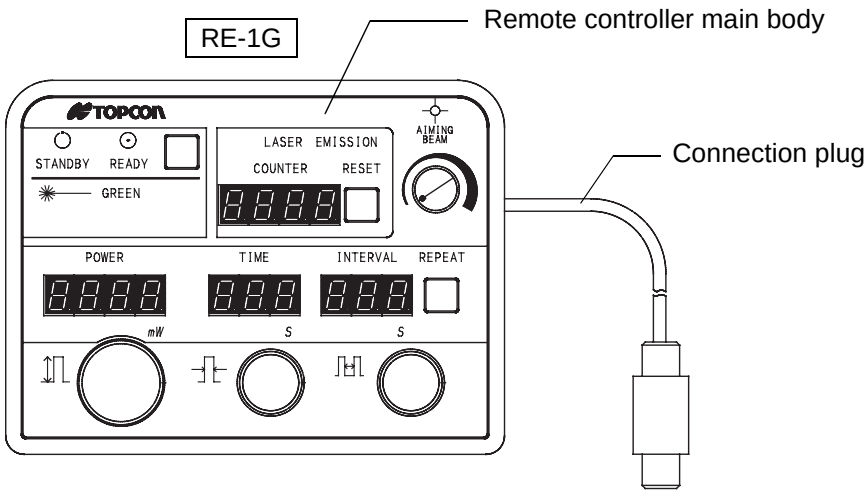
Repeat indicator..... When Repeat mode is set, this turns on together with the emission interval display.

Power display window..... Shows the laser beam emission output for treatment set by the Emission output dial. The display shows up to 4 digits in "mW" unit. The display value indicates the emission output on the cornea.

Time display window..... Shows the treatment laser beam emission time set by the Emission time dial. The display shows up to 3 digits in "s" unit.

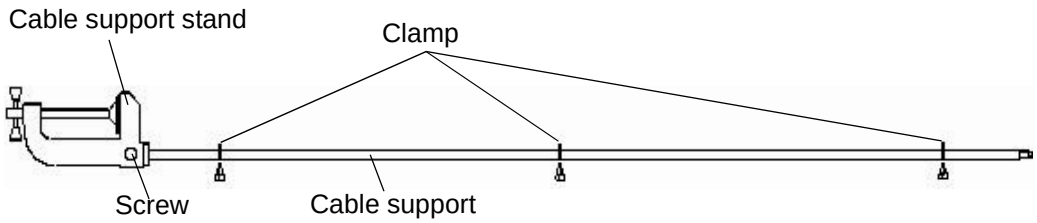
Interval display window..... When Repeat mode is set, the emission interval time set by the Emission interval dial is displayed. The display shows up to 3 digits in "s" unit.

REMOTE CONTROLLER RE-1G COMPONENTS



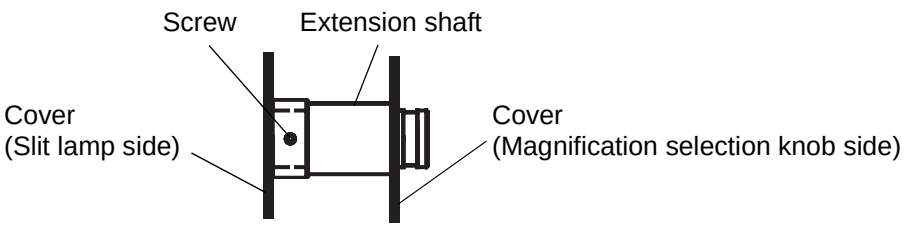
CABLE SUPPORT CP-1 COMPONENTS

CP-1



EXTENSION SHAFT EH-1 COMPONENTS

EH-1



PREPARATIONS

For installation, we recommend operation checks by our service engineer.

⚠ **CAUTION**	For installation, prepare a power supply system satisfying the rating of AC 100V, 120V, 220V or 240V and a capacity of 550VA and larger. Use with a voltage other than the displayed voltage may cause injury by electric shocks and fire.
	For installation, prepare a power supply system allowing protective grounding, and surely arrange protective grounding. Leaks without protective grounding may lead to fire and electric shocks.

MEMO	Since this instrument is a precision machine, install it in a place controlled at normal living temperatures (10-40°C), humidities (30-85%) and atmospheric pressures (700-1060hPa), and avoid direct exposure to the sunlight.
	Since this instrument is a precision machine, handle it with particular care and do not give hard vibrations and shocks during conveyance and installation. Hard vibrations and shocks may adversely affect the laser and lower the laser output.
	Install this instrument in an independent room, or if not possible, provide a shield absorbing laser beams, using a shield board or a thick curtain. Since the instrument emits strong laser beams, diffused beams as well as direct laser beams may cause burns and loss of sight.
	For shielding, use an incombustible shield board or thick curtain. Since the instrument emits strong laser beams, shielding by inflammable materials may cause fire.
	Do not place inflammables around the instrument to avoid fire due to strong laser beams.
	When installing this instrument, to avoid fire and failures due to overheating, place it so the ventilation port of the cover is not shut up.
	When lifting this instrument, hold it at the frame near the bottom center on both sides of the main body.
	Do not lift this instrument by holding handles.
	When installing this instrument, provide a door switch, connect it to the remote interlock connector of the main body and control entry to the room. (For the remote interlock connector, ask your dealer or our sales office mentioned on the back cover of this Manual.)
	To the service engineer: Read the "Installation & Inspection manual" beforehand and follow the instructions. Operations by procedures other than those described "Installation & Inspection manual" may cause exposure to laser beams and electric shocks.

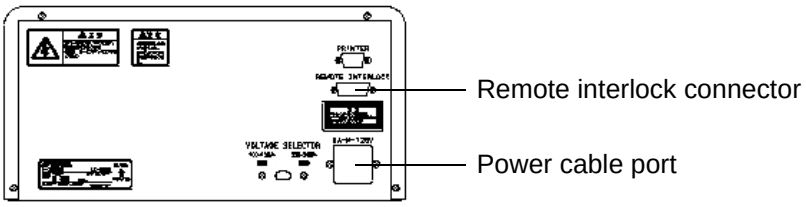
INSTALLING THE LC-300G MAIN BODY

⚠ **CAUTION**	When the remote interlock is released, the laser beam is emitted. Both the beam and diffused beam are dangerous. Do not look at/touch these.

1 Hold the instrument by both hands securely and install it on the instrument table, etc.

2 Make sure that the Key switch is at the OFF position, and plug in the power cable to an AC outlet (3-pin with grounding).

3 When the Remote interlock switch is used, connect it to the remote interlock connector, which is provided at the rear panel of the main body.



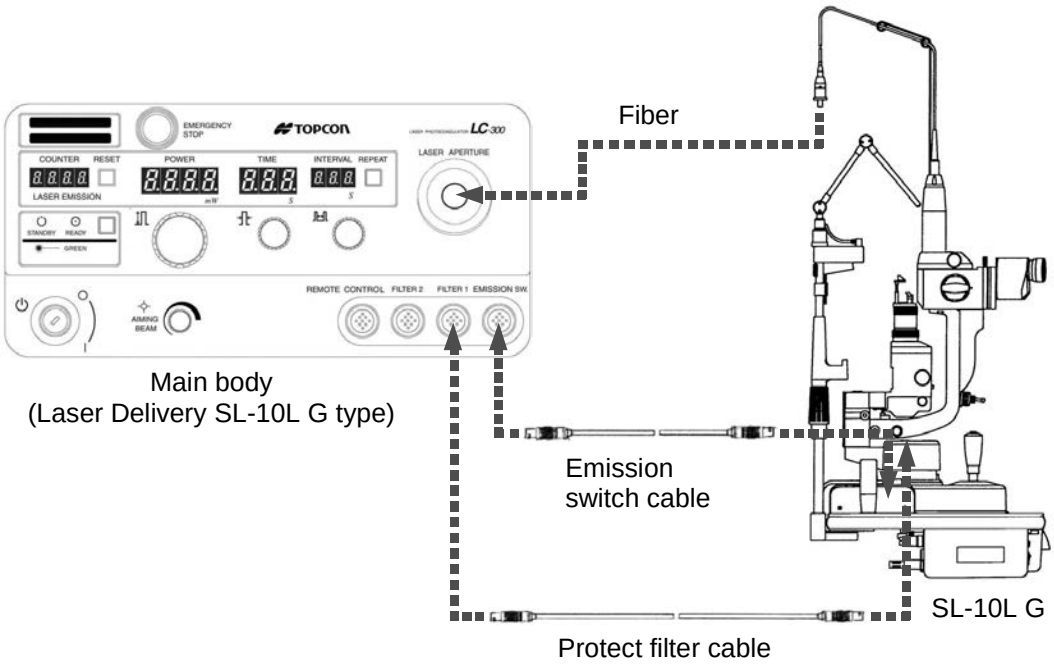
CONNECTING THE LASER SLIT LAMP SL-10L G

MEMO	Surely insert the fiber connection plug into the laser aperture till the stop is reached.
	Since the optical fiber is easily broken structurally, handle it with particular care and do not forcedly bend, pull, twist or apply an excessive pressure.

1 Plug in the Emission switch cable from the laser slit lamp SL-10L G to the emission switch connector of the main body (Laser Delivery SL-10L G type).

2 Insert the fiber connection plug from SL-10L G into the laser aperture of the main body front panel.

3 Plug in the protect filter cable from the laser slit lamp to the FILTER1/FILTER2 connector of the main body front panel.



For connection with LC-300G, necessary cables are attached to SL-10L G as standard accessories:

- Fiber.....Is an optical fiber cable to guide the laser beam emitted from LC-300G to SL-10L G.
- Electric protect filter cable....Is used to connect the electric protect filter built in SL-10L G to LC-300G.
- Emission switch cable.....Is used to emit laser beams for treatment by the Emission switch built in the SL-10L G control lever.

Instead of the Emission switch of the SL-10L G control lever, it is possible to connect the optional Footswitch (FS-HG/FS-LG).

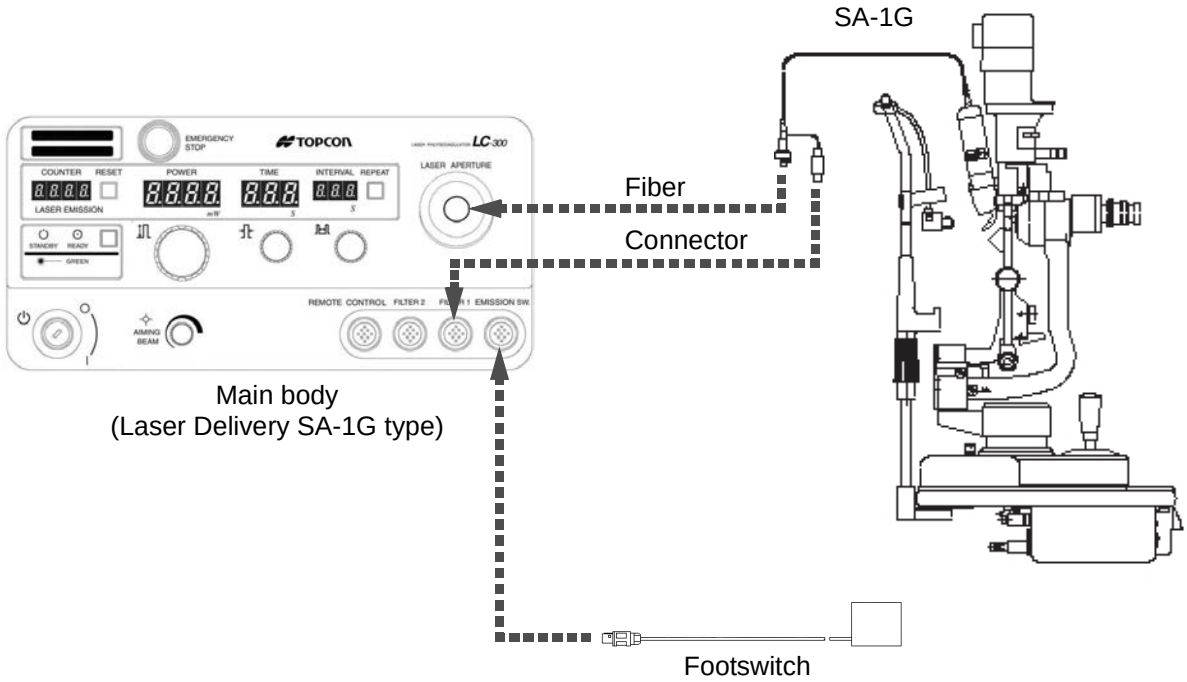
CONNECTION WITH SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G

MEMO	Surely insert the fiber connecting plug into the laser aperture till the stop is reached.
	Since the optical fiber is easily broken structurally, handle it with particular care and do not forcedly bend, pull, twist or apply an excessive pressure.

1 Connect the footswitch plug to the emission switch connector of the main body (Laser Delivery SA-1G type).

2 Insert the fiber connecting plug from SA-1G into the laser aperture on the front panel of the main body.

3 Connect the connector, which is attached to the fiber connecting plug, to the FILTER1 connector or FILTER2 connector on the front panel of the main body.



4 Turn SA-1G counterclockwise to where click occurs.

When installing the slit lamp attachment for laser photocoagulator SA-1G to the Topcon photo slit lamp SL-7F or slit lamp SL-D7, the extension shaft EH-1 is necessary.

CONNECTING THE ENDOPROBE

WARNING	The endoprobe is a sterilized disposable product. Do not use it if the sterilizing outer package gets wet (even once) or damaged, or if the sealing is damaged.
	Do not use the endoprobe if its validity time has expired.
	When using the endoprobe, do not rebuild it in any way.

CAUTION	Do not touch the endoprobe end.

MEMO	Surely insert the fiber plug of endoprobe into the laser aperture till the stop is reached.
	Since the endoprobe is easily broken structurally, handle it with particular care and do not forcedly bend, pull, twist or apply an excessive pressure.

1 Plug in protect filter, which is attached to the operator's observation system of the microscope, to the FILTER1 connector on the front panel of the main body (Common to Laser Delivery SL-10L G type/Laser Delivery SA-1G type).

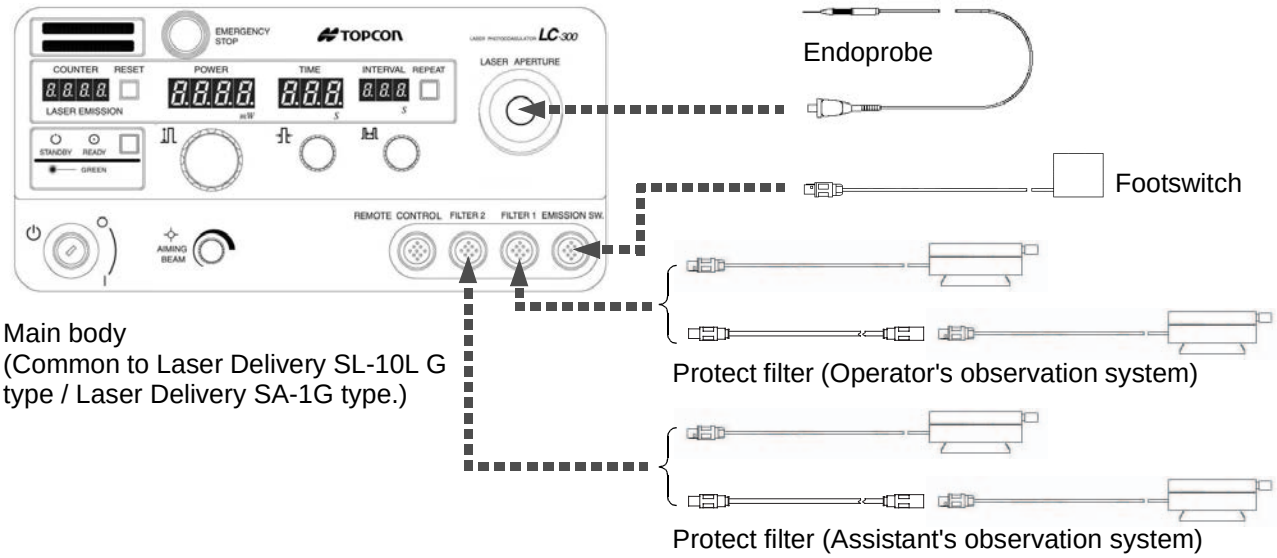
2 When the protect filter is also attached to the assistant's observation system of the microscope, plug it into the FILTER2 connector on the front panel of the main body.

For LC-300G, up to two protect filters can be connected.

When using the protect filter PF-MZG10.6/PF-MWG10.6, plug the relay cable into the FILTER 1/2 connector on the front panel of the main body.

3 Connect the Footswitch connection cable to the Emission switch connector of the main body.

4 Insert the optical fiber plug of the endoprobe into the laser aperture of the main body front panel.



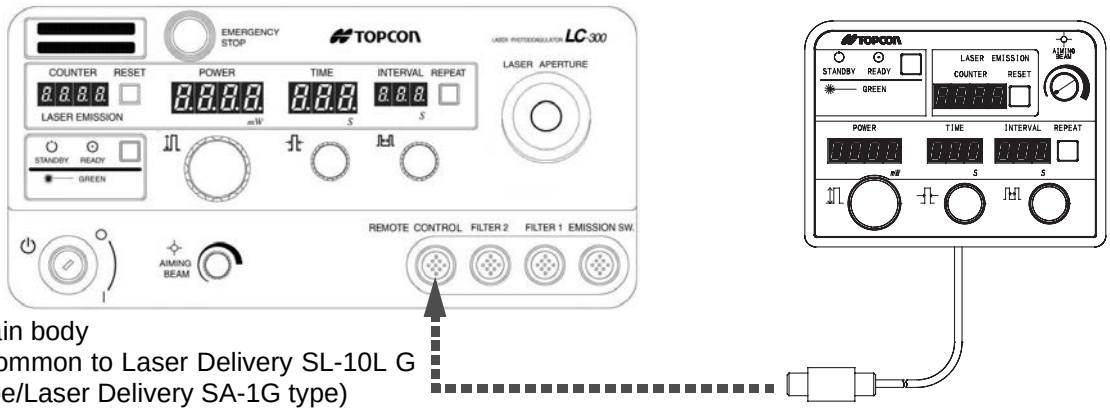
When purchasing the endoprobe, ask our sales offices on the back cover of this manual about a proper one.

CONNECTING THE REMOTE CONTROLLER RE-1G

⚠ **CAUTION**	Install the remote controller in a stable place to prevent injury by falling off.

MEMO	Insert/remove the connection plug while the power of the instrument is OFF.

1 Plug the remote controller into the remote controller connector on the front panel of the main body.



Main body
(Common to Laser Delivery SL-10L G type/Laser Delivery SA-1G type)

POWER SUPPLY SYSTEM

Before installation, to ensure the safe, correct operation of the machine, prepare a power supply system satisfying the following conditions:

- Power supply voltage: AC 100, 120, 220 and 240V ±10%
- Power supply capacity: 550VA and larger
- Power supply frequency: 50/60Hz (Fluctuation: 1Hz or less)
- Power supply system allowing protective grounding for the instrument

SPACE

Before installation, to ensure the safe, correct operation of the machine, make sure that the following space can be secured for installation:

- The space that the main body itself occupies is 345 (width) × 467 (depth) × 187 (height) mm.
- For a standard arrangement including a slit lamp, an area of around 1,800 x 1,300 mm is necessary, and the height should be 1,500mm and more.
- In addition to the above, secure a space of 500mm and larger around the main body.

BASIC OPERATIONS

⚠ **WARNING**	Both the beam and diffused beam are dangerous. Do not look at/touch these.
	During operation, let the people around the instrument wear the goggles (applied to 532nm, OD4 or more) suitable for the laser wavelength. The laser beam may damage their eyes.
	First, make sure that the slit lamp attachment for laser photocoagulator is at the specified position and then turn on the power of the instrument. If it is not at the specified position, it may cause exposure to laser beams and resultant burns and loss of sight.

⚠ **CAUTION**	The laser beam is emitted from the laser beam outlet. Keep your face off the outlet as the beam may burn your eyes and skin.
	Use this instrument following the procedure described in the Manual. Controls and/or adjustments by procedures other than those described here may cause exposure to laser beams and resultant burns and loss of sight.
	Place the Footswitch in a position where it is not in the way. To avoid stumbling/injury to your foot, do not step too deep into the switch.

MEMO	If there is any anomaly, press the Emergency switch and stop the operation immediately.
	Since the optical fiber is easily broken structurally, handle it with particular care and do not bend it forcedly.
	When not in use, the key of the Key switch should be removed and kept by the responsible manager.
	Do not attempt to disassemble/rebuild the instrument by yourself.
	Before emitting the laser beam, make sure that the instrument detects the connected delivery units correctly. If it does not detect them correctly, do not emit the laser beam. The instrument may emit the laser beam exceeding the set value and it is very dangerous.

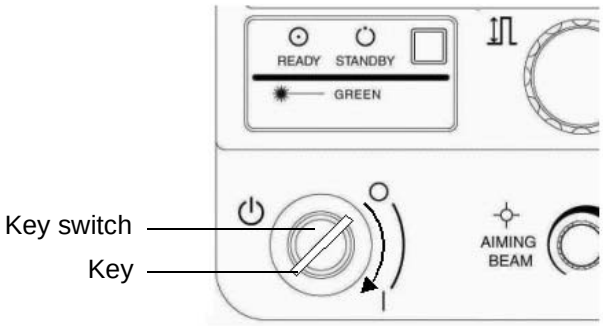
* Before using, refer to descriptions about installation and make sure again that SL-10L G and other accessories are connected correctly with the main body.

PREPARATION BEFORE TREATMENT

TURNING ON THE POWER SWITCH

1 Make sure again that SL-10L G and other accessories are connected correctly with the main body. For connections, see "PREPARATIONS" (page 28 and on).

2 Insert the key to the Key switch on the front panel of the main body and turn it clockwise to turn ON the main power supply.



When the main body is activated, "Self Test..." is shown on the Status display window and the self-check function works, turning on display windows in order.
If there is any anomaly in the main body or connection is incorrect, the error message and error code are shown on the Status display window.

When the system is under a high/low temperature condition, Heating mode/Cooling mode sets in automatically till it is replaced by Standby mode when the temperature reaches the proper temperature range.

3 The safety shutter opens: Make sure that the aiming beam is emitted.
Also, make sure that display windows of the main body front panel turn on.

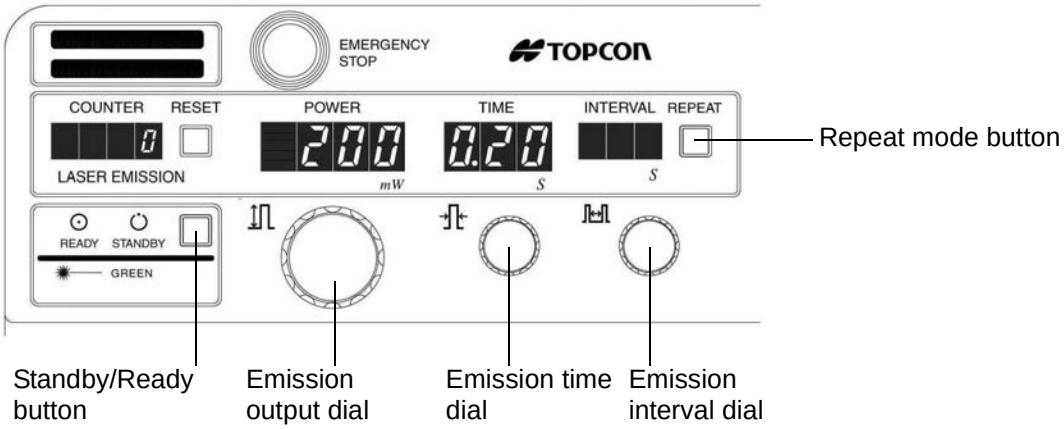
Only in Ready mode, the aiming beam may be emitted according to the set conditions of LC-300G.

Display windows show current settings:
Immediately after power on, settings and displays are as shown below:

- Power display window ..... Shows the set value immediately before power off.
- Time display window..... Shows the set value immediately before power off.
- Interval display window.... Since Single mode is set, the display shows nothing.
- Count display window..... Shows zero. (The emission count is reset.)
- Status display window..... Shows the currently connected delivery.

OPERATIONS IMMEDIATELY BEFORE USING

When using the remote controller RE-1G, refer to "INDIVIDUAL OPERATIONS (RE-1G)". When the remote controller is connected, it is impossible to set the laser emission on the LC-300G main body.



1 Set the emission output.
Setting is done by the Emission output dial.

The set value is shown on the Power display window located above the dial.
The display value increases by turning the dial clockwise and decreases by turning the dial counterclockwise.

2 Set the emission time.
Setting is done by the Emission time dial.

The set value is shown on the Time display window located above the dial.
The display value increases by turning the dial clockwise and decreases by turning the dial counterclockwise.

3 Set the emission interval, as necessary.
(By stepping the Footswitch continuously, laser beam emission for treatment is repeated automatically with the set emission time and emission interval.)

3-1 Press the Repeat mode button and set Repeat mode.

3-2 The Repeat mode indicator turns on and the previously set interval time is displayed on the Emission interval display window.

3-3 Set the emission interval by the Emission interval dial.

The set value is shown on the Interval display window located above the dial.
The display value increases by turning the dial clockwise and decreases by turning the dial counterclockwise.

The interval of treatment laser beam emission can be set only when Repeat mode is set by the Repeat mode button.
When Single mode is set, it is not possible to set the emission interval.

4 Switch to Ready mode (treatment).
Press the Standby/Ready button and set Ready mode.

CONFIRMATION IMMEDIATELY BEFORE USING

This instrument becomes ready for use after the self-check after activation is finished.
Now the instrument can be used for treatment, but to prevent the treatment from being interrupted due to anomalies, check the condition for the following items:

1 Are the names of the connected delivery units displayed in the status display window correctly?

The instrument detects the connected delivery units automatically.
Make sure that the names of the connected delivery units are displayed.

Correspondence table

Connected delivery unit	Display (in the status display window)
SL-10L G	SL-10L G
SA-1G	SA-1G
Endoprobe	Endophoto

If a different unit name is displayed, do not emit the laser beam but contact with your dealer or our sales office mentioned on the back cover of this manual.

2 Is the aiming beam emitted from the connected SA-1G, SL-10L G, or endoprobe?

3 Are displays of emission output, emission time and emission interval normal?

4 Is the setting of emission output proper for the treatment?

Be sure to confirm that the output setting will not endanger the patient during the treatment to be done.

5 Is the setting of emission time and emission interval proper for treatment?

The sequence of setting is shown in "OPERATIONS IMMEDIATELY BEFORE USING," but the order of setting may be changed and it will not affect the operation. However, to avoid careless emission, press the Standby/Ready button to set Ready mode (treatment) only after setting other items.
The laser beam is not emitted under Standby mode (waiting).

6 If the SL-10L G or SA-1G is connected, is the spot size adjustment unit in the spot size set position for the initial use?

For the method of spot size setting, see item 2 of "LASER EMISSION FOR TREATMENT (SL-10L G)" on page 39 when using SL-10L G, and item 2 of "LASER EMISSION FOR TREATMENT (SA-1G)" on page 41 when using SA-1G.

7 Is the laser emission count shown on the Count display window zero?

8 Is no error shown on the Status display window?

WARNINGS

Error displays shown on the controller are described in the check list of "BEFORE REQUESTING SERVICE" on page 52.
If any error is displayed during checks before starting, see the description about the error and contact your dealer or our sales office mentioned on the back cover of this Manual.

OBSERVATION

⚠ **CAUTION**	Before using, surely adjust the diopter and interpupillary distance. Incorrect adjustments will lead to improper treatment.
	Before using, surely adjust the focus and position of the aiming beam. Incorrect adjustments will lead to improper treatment. (When the slit lamp attachment for laser photocoagulator is connected)

For the operation method of observation using SL-10L G, see "INDIVIDUAL OPERATIONS (SL-10L G)" from page 44 and on.
For the operation method of observation using SA-1G, see "INDIVIDUAL OPERATIONS (SA-1G)" from page 47 and on.

OPERATIONS FOR LASER EMISSION

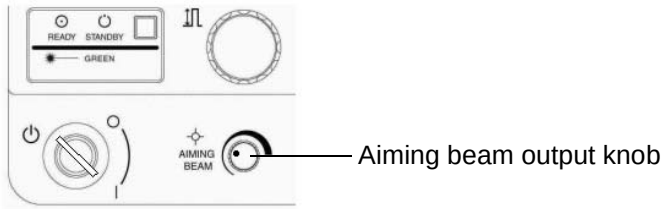
⚠ **WARNING**	Both the beam and diffused beam are dangerous. Do not look at/touch these.
	During operation, let the people around the instrument wear the goggles (applied to 532nm, OD4 or more) suitable for the laser wavelength. The laser beam may damage their eyes.

⚠ **CAUTION**	The laser beam is emitted from the laser beam outlet. Keep your face off the outlet as the beam may burn your eyes and skin.
	Place the Footswitch in a position where it is not in the way. To avoid stumbling/injury to your foot, do not step too deep into the switch.

MEMO	Since the optical fiber is easily broken structurally, handle it with particular care and do not bend it forcedly.
	If there is any anomaly, press the Emergency switch and stop the operation immediately.

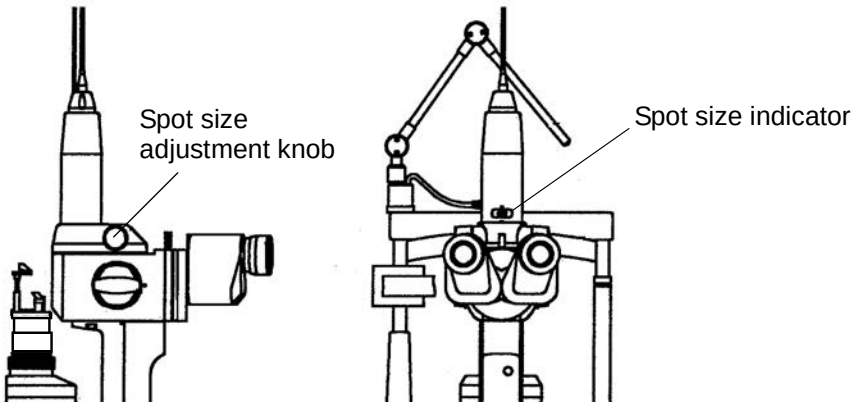
LASER EMISSION FOR TREATMENT (SL-10L G)

1 Adjust the aiming light volume by the Aiming beam output knob, as necessary.



The light volume increases by turning the knob clockwise and decreases by turning the knob counterclockwise.
The black spot mark shows the currently set light volume.

2 Turn the Spot size adjustment knob of SL-10L G and get a laser beam spot size suitable for the purpose.



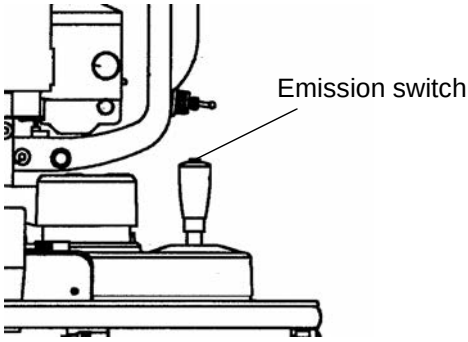
If the aiming beam is not in focus, the spot size (coagulation spot) does not follow the display.

The value shown by the spot size indicator of SL-10L G is in "µm" unit.
As this is continuously variable, an intermediate spot size without the figure can also be available.

3 Move SL-10L G forward and backward, right and left and up and down by the control lever to align its position and focus with the treatment position.

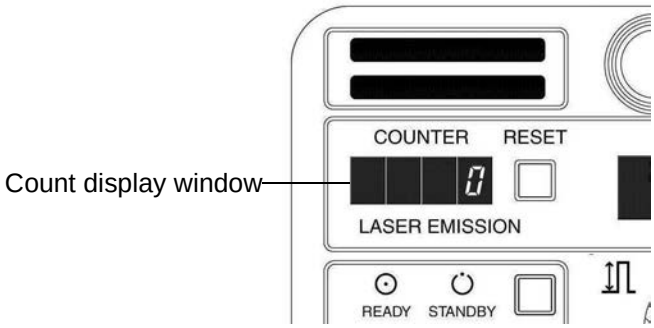
When using the manipulator of SL-10L G, see “MOVEMENT OF SPOT POSITION BY MANIPULATOR” on page 46.

4 Press the Emission switch of SL-10L G and emit the laser beam for treatment.



When using the Footswitch, the the laser beam for treatment is emitted by stepping the Footswitch.

5 When the laser beam for treatment is emitted, the emission count is added to on the count display window each time. Repeat laser emissions for the necessary count.

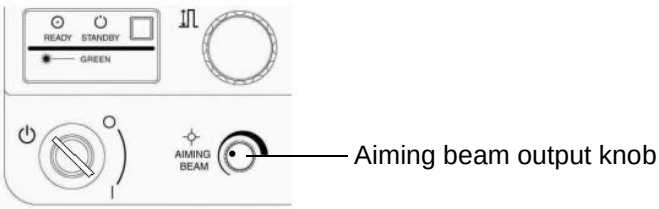


Even when the Emission switch is released in the middle of emission, it is counted as one emission count.

6 When treatment is finished, press the Standby/Ready button and set Standby mode.

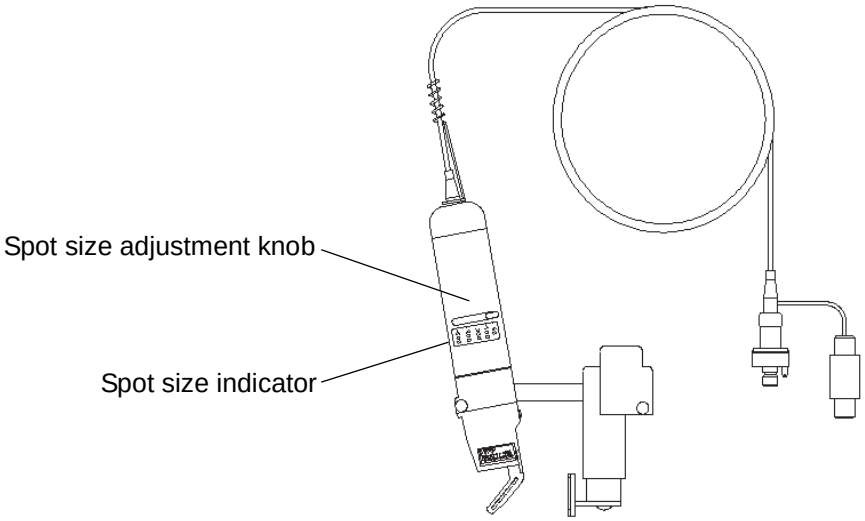
LASER EMISSION FOR TREATMENT (SA-1G)

1 Adjust the aiming light volume by the Aiming beam output knob, as necessary.



The light volume increases by turning the knob clockwise and decreases by turning the knob counterclockwise.
The black spot mark shows the currently set light volume.

2 Move the spot size adjustment knob of SA-1G to adjust the spot size of laser beam according to your purpose.



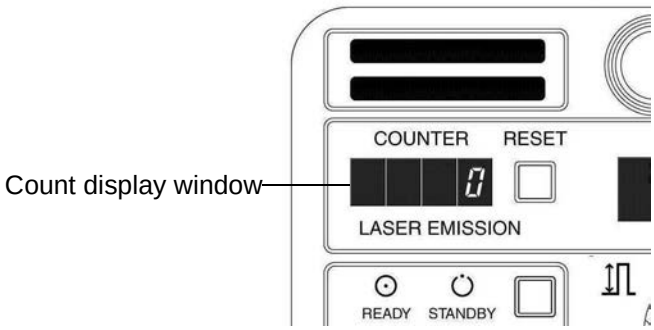
If the aiming beam is not in focus, the spot size (coagulation spot) does not follow the display.

The value shown by the spot size indicator of SA-1G is in "µm" unit. As this is continuously variable, an intermediate spot size without the figure can also be available.

3 Fix the treatment position by the aiming beam.

4 Step on the footswitch, and the instrument emits the laser beam for treatment to the treatment position.

5 When the laser beam for treatment is emitted, the emission count is added to on the count display window each time. Repeat laser emissions for the necessary count.



Even when the Emission switch is released in the middle of emission, it is counted as one emission count.

6 When treatment is finished, press the Standby/Ready button and set Standby mode.

LIST OF FACTORS TO BE ADJUSTED DURING USING

Setting items that can be adjusted when using LC-300G are shown below. Since it would endanger the patient if the laser beam is emitted by setting the emission output and emission time for excessively large values, surely set these for proper values for treatment.

- Emission output
- Emission time
- Emission interval
- Aiming beam output
- Spot size

DIFFERENCE IN EMISSION BY EMISSION INTERVALS SETTING

<Emitting operation by changing settings using Repeat button>

- Single mode setting
  When the Emission switch is pressed, the treatment laser beam is emitted once for the set emission time.
- Repeat mode setting
  While the Emission switch is pressed, the treatment laser beam is emitted for the set emission time at the set intervals.

<Emitting operation setting by using Emission output dial>

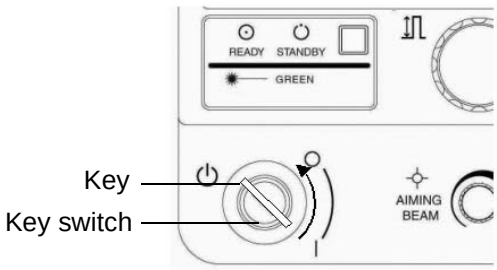
- Continuous emission setting
  The treatment laser beam is emitted while the emission switch is pressed.
  Emission time and interval settings are invalidated.

Setting method of continuous emission and display
Fully turn the Emission time dial clockwise. Continuous emission is set when the Time display window shows "——".
When continuous emission is set, repeat mode is invalidated.

STOPPING OPERATIONS AFTER USING

MEMO	Since the optical fiber is easily broken structurally, handle it with particular care and do not forcedly bend, pull, twist or apply an excessive pressure.

1 Turn OFF the main power supply by turning the key of the Key switch on the front panel of the main body fully counterclockwise.
To prevent use by others than the permitted person, pull off and keep the key.



The key cannot be removed unless it is in the OFF position.

2 When SL-10L G is used, turn OFF its power supply.
When SA-1G is used, turn OFF the power supply of the slit lamp biomicroscope.

3 Clean the main body, SL-10L G and others.

For the method of cleaning, refer to the following pages.
LC-300G instrument: "MAINTENANCE AND CHECKING (LC-300G)” on page 55
SL-10L G: "MAINTENANCE AND CHECKING (SL-10L G)” on page 58
SA-1G: "MAINTENANCE AND CHECKING (SA-1G)” on page 61

4 For accessories which are not used for the next operation, to prevent these from being damaged, remove them from the laser slit lamp and others and keep them at the specified place.

5 When using the endoprobe, which is a sterilized disposable product, dispose of it after using it once.

INDIVIDUAL OPERATIONS (SL-10L G)

DIOPTER ADJUSTMENT AND INTERPUPILLARY DISTANCE ADJUSTMENT OF LASER SLIT LAMP SL-10L G

⚠ **CAUTION**	Before using, surely adjust the diopter and interpupillary distance. Incorrect adjustments will lead to improper treatment.

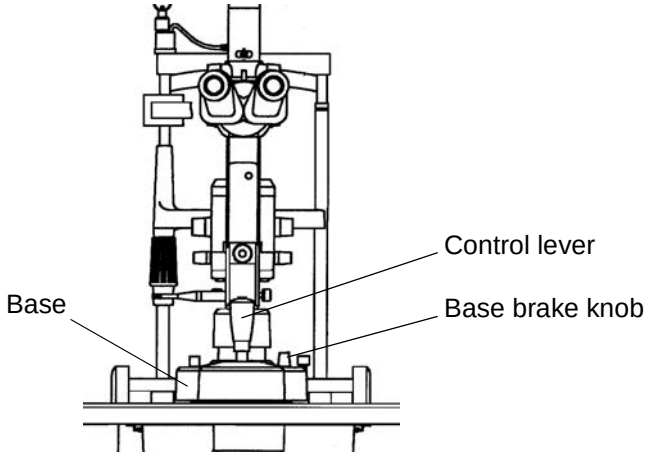
1. Insert the test rod into the rotary shaft, and set the black face vertically to the microscope.
2. Turn ON the Power switch, and bring the Illumination volume adjustment knob to the middle position.
3. Turn the Slit width control knob and set the illumination to ϕ8mm.
4. Turn the Diopter scale ring of the eyepiece counterclockwise till it stops.
5. Turn the ring clockwise and stop when the scale is clearly seen.
6. Read the scale where it stops. The value shows the diopter.
7. Change the eyepiece (which is equipped with scale) right and left to each other. Then, adjust the diopter of another eye in the same way as above.
8. After adjustment, turn the slit width control knob to set the slit width to about 1mm. Make sure that the slit image is clearly seen with both eyes on the test rod.
9. Holding the eyepiece tube, look into the eyepieces with both eyes. Adjust the interpupillary distance unitl the image on the test rod becomes fit and is seen solidly with both eyes.
10. At last, emitting the aiming beam by operating the laser unit, turn the Spot size adjustment knob and set the spot size to ϕ50µm, and make sure that the spot image is not blurred.

FIXING THE PATIENT'S FACE AND FIXATION

1. Fixing the patient's face
   Place the patient's face on the chinrest and press the forehead towards the forehead rest, and bring the patient's eyes to the level of the height mark by turning the Chinrest vertical handle.
2. Fixation of the patient's eyes
   To fix the patient's visual line, let the patient gaze at the top end of the fixation target with the eye which the operator is not observing.
   To change direction, hold the fixation target arm and adjust the position of fixation target.

OPERATING THE BASE (FOCUSING)

⚠ **CAUTION**	When operating the main unit, watch the space between the moving parts and protect your fingers.
	When operating the main unit, watch the patient's face and protect the eyes and nose from moving parts.



1 Horizontal coarse movement
For a coarse movement, back and forth or laterally, hold the Control lever vertically and move the entire base.

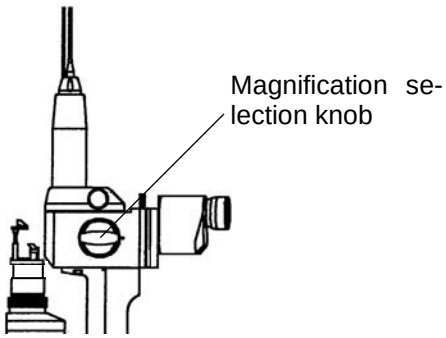
2 Horizontal fine movement
For a fine movement for alignment and focusing, incline and move the lever toward the desired direction.

3 Vertical movement
Turn the Control lever clockwise to raise the base, or counterclockwise to lower the base.

4 Fixing the base
To fix the base, fasten the Base brake knob.

5 Focusing
Move the Base for focusing by operations 1 to 3. When giving a treatment, make sure that the aiming beam spot is not blurred.

SELECTING THE OBSERVATION MAGNIFICATION



The magnification of observation can be selected in 5 steps by turning the Magnification selection knob. Select the total magnification for observation according to the indication around the knob.

OPERATING THE ILLUMINATION UNIT

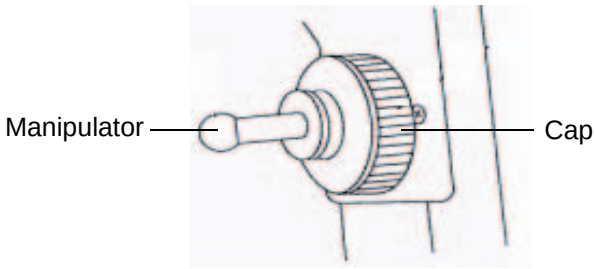
⚠ **CAUTION**	Set the illumination for a proper brightness. An excessive brightness will not only bother the patient but may cause damage to the eye.

MEMO	Turn the illumination arm within 10 degrees right and left. If the laser beam hits internal metal parts, the actual laser output may lower below the set value.

1 Adjusting the illumination field
Adjust the illumination to get a slit width/length or a spot suitable for the purpose of observation by adjusting the Slit width control knob and Diaphragm change knob.
Select an illumination color suitable for the purpose by turning the Filter changing turret.

2 Adjusting the direction of illumination
Adjust the illumination direction suitably for the treated part by adjusting the illumination arm and Slit turn ring.

MOVEMENT OF SPOT POSITION BY MANIPULATOR



1 To release the manipulator, turn the cap counterclockwise.

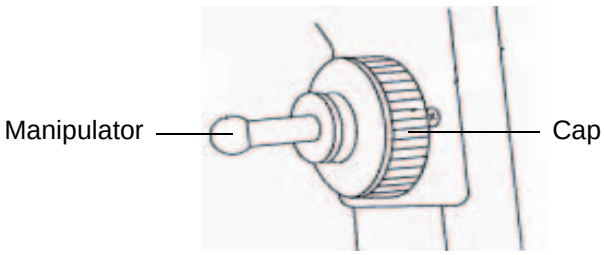
When released, the manipulator springs out and it can be moved in all directions.

Don't loosen the cap excessively, or it will fall off.

2 By operating the manipulator, move the spot position of the aiming beam.

FIXING OF SPOT CENTER POSITION

With the spot of aiming beam at the center position, turn the cap clockwise to tighten it. The manipulator is fixed and the spot of the aiming beam is fixed at the center position.



INDIVIDUAL OPERATIONS (SA-1G)

INSTALLATION OF SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G

MEMO	When installing the slit lamp attachment, use the accessory mount.

When installing the slit lamp attachment for laser photocoagulator SA-1G to the Topcon photo slit lamp SL-7F or slit lamp SL-D7, the extension shaft EH-1 is necessary.
See "INDIVIDUAL OPERATIONS (EH-1)" on page 51.

1. Move the illumination unit of slit lamp biomicroscope to the left in 30° or more from the microscope.
2. Replace the illumination mirror of slit lamp biomicroscope with the mirror (battledore shape) of SA-1G.
3. Set the accessory mount to the slit lamp biomicroscope.
4. Install SA-1G to the accessory mount and tighten the screws.

ADJUSTMENT OF DIOPTER AND INTERPUPILLARY DISTANCE FOR SLIT LAMP

CAUTION	Before using, surely adjust the diopter and interpupillary distance. Incorrect adjustments will lead to improper treatment.

1. Turn the arm unit of SA-1G clockwise to retreat it.
2. Insert the test rod into the rotary shaft and set the black face vertically to the microscope.
3. Turn on the power switch and bring the illumination volume adjustment knob to the medium position.
4. Turn the slit width control knob to set the slit width to 2 ~ 5mm.
5. Turn the diopter scale ring of the eyepiece (which is equipped with scale) counterclockwise till it stops.
6. Turn the ring clockwise and stop it where the scale is clearly seen.
7. Read the scale where it stops. The value shows the diopter.
8. Change the eyepiece (which is equipped with scale) right and left to each other. Then, adjust the diopter of another eye in the same way as above.
9. After adjustment, turn the slit width control knob to set the slit width to about 1mm. Make sure that the slit image is clearly seen with both eyes on the test rod.
10. Holding the binocular tube, look into the eyepieces with both eyes. Adjust the interpupillary distance unitl the image on the test rod becomes fit and is seen solidly with both eyes.

FOCUS AND POSITION ADJUSTMENT OF AIMING BEAM FOR SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G

⚠ **CAUTION**	Don't use the test rod for focus adjustment. Focus is not fit when treatment is done for a patient. Correct treatment is not possible.

1. Set the light of slit lamp biomicroscope toward the fixation lamp.
2. Set the observation magnification of the slit lamp biomicroscope to the maximum.
3. Set the slit width to the minimum. Adjust the slit lamp biomicroscope position to become focused.
4. Turn on the power of the instrument to emit the aiming beam.
5. Set the spot size of SA-1G to 50µm.
6. Adjust the spot size to the minimum by the focus adjustment knob.
7. Set the slit vertical.
8. Adjust the positions of slit and aiming beam by the horizontal control knob of SA-1G.
9. Set the slit horizontal.
10. Adjust the positions of slit and aiming beam by the vertical control knob of SA-1G.

FIXING THE PATIENT'S FACE AND FIXATION

1. Fixing the patient's face
   Place the patient's face on the chinrest and press the forehead towards the forehead rest, and bring the patient's eyes to the level of the height mark by turning the Chinrest vertical handle.
2. Fixation of the patient's eyes
   To fix the patient's visual line, let the patient gaze at the top end of the fixation target with the eye which the operator is not observing.
   To change direction, hold the fixation target arm and adjust the position of fixation target.

INDIVIDUAL OPERATIONS (PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6)

FIXING PROCEDURE OF PROTECT FILTER

⚠ WARNING	Firmly fasten screws and avoid death/injury due to falling.
	Fix the protect filter between microscope body and the binocular tube, and protect the eye from laser beams.

MEMO	Read this Manual and assemble the product correctly.
	Before using, adjust the balance of the microscope stand or microscope arm following the instruction manual of the microscope.
	When removing a cable, do not apply unreasonable force as to pull it off by holding the cable part.
	Since this instrument is a precision machine, install it in a place controlled at normal living temperature and humidity conditions, and avoid direct exposure to the sunlight.

1 Lock the operation microscope to become immovable by following the instruction manual of the operation microscope.

2 Remove the binocular tube by following the instruction manual of the operation microscope. (When a beam splitter is attached, remove the beam splitter together with the binocular tube.)

3 After removing the binocular tube or the beam splitter, set the protect filter, replace the fixing screw of the operation microscope with the accessory fixing screw and fasten it.

4 Set the removed binocular tube[*1] or beam splitter[*2] to the protect filter and fasten the fixing screw of the protect filter.

5 Adjust the operation microscope stand or operation microscope arm by following the instruction manual of the operation microscope.

6 Plug in the set protect filter to (the relay cable when using PF-MZG10.6/PF-MWG10.6) the protect filter connector of the Laser Photocoagulator LC-300G.

For connection with TOPCON operation microscopes of the OMS series, see the "ILLUSTRATIONS: SETTING THE PROTECT FILTER" on page 73.

CONNECTION OF PROTECT FILTER (PF-MZG10.6/PF-MWG10.6) AND RELAY CABLE

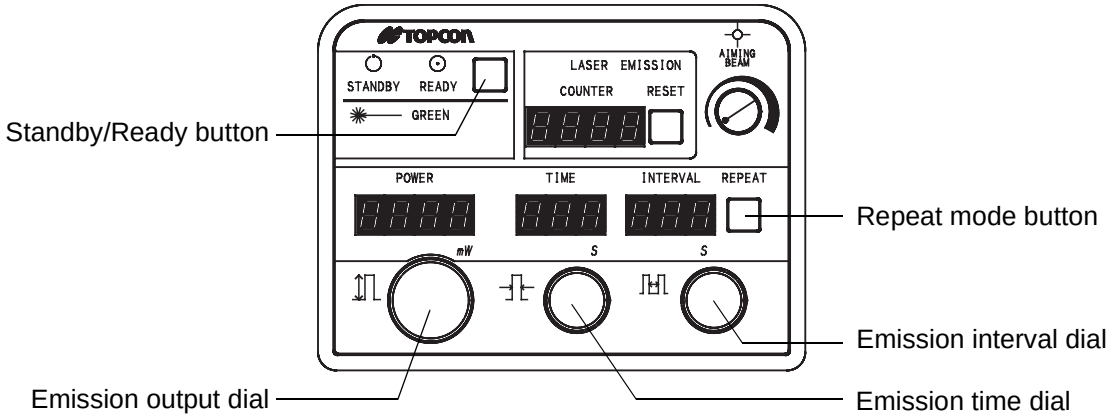
1 Connect the relay plug of the protect filter (PF-MZG10.6/PF-MWG10.6) to the relay receptacle of the relay cable.

*1. Only protect filter connected binocular tube can be protected from emitted laser beam.
*2. In case the protect filter connected binocular tube incorporates the beam splitter, the entire observation optical system including not only the binocular tube but also the optical item(s) mounted on the beam splitter is protected from emitted laser beam.

INDIVIDUAL OPERATIONS (RE-1G)

OPERATIONS IMMEDIATELY BEFORE USING

When the remote controller is connected, it is impossible to set the laser emission on the LC-300G main body.



1 Set the emission output.
Setting is done by the Emission output dial.

The set value is shown on the Power display window located above the dial.
The display value increases by turning the dial clockwise and decreases by turning the dial counterclockwise.

2 Set the emission time.
Setting is done by the Emission time dial.

The set value is shown on the Time display window located above the dial.
The display value increases by turning the dial clockwise and decreases by turning the dial counterclockwise.

3 Set the emission interval, as necessary.
(By stepping the Footswitch continuously, laser beam emission for treatment is repeated automatically with the set emission time and emission interval.)

3-1 Press the Repeat mode button and set Repeat mode.
3-2 The Repeat indicator turns on and the previously set interval time is displayed on the Emission interval display window.
3-3 Set the emission interval by the Emission interval dial.

The set value is shown on the Interval display window located above the dial.
The display value increases by turning the dial clockwise and decreases by turning the dial counterclockwise.

The interval of treatment laser beam emission can be set only when Repeat mode is set by the Repeat mode button.
When Single mode is set, it is not possible to set the emission interval.

4 Switch to Ready mode (treatment).
Press the Standby/Ready button and set Ready mode.

INDIVIDUAL OPERATIONS (CP-1)

INSTALLATION OF CABLE SUPPORT

1. Set the cable support stand onto the table.
2. Insert the cable support into the cable support stand.
3. Fix the cable support with screw.
4. Set the fiber to the cable support with clamps.

See "ILLUSTRATIONS: SETTING THE CABLE SUPPORT CP-1" on page 75.

INDIVIDUAL OPERATIONS (EH-1)

INSTALLATION OF EXTENSION SHAFT

Only when installing the slit lamp attachment for laser photocoagulator SA-1G to the Topcon photo slit lamp SL-7F or slit lamp SL-D7, it is necessary to install the extension shaft.

1. There is a screw between "16×" and "40×" on the magnification selection knob. Loosen the screw with the hexagonal wrench which is a standard accessory and remove the magnification selection knob.
2. Set the cover to the magnification shaft of slit lamp.
3. Set the extension shaft to the slit lamp and fix it with screw.
4. Set the cover to the extension shaft.
5. Set the magnification selection knob to the extension shaft and fix the screw between "16×" and "40×" with the hexagonal wrench.

See "ILLUSTRATIONS: SETTING THE EXTENSION SHAFT EH-1" on page 75.

BEFORE REQUESTING SERVICE

TROUBLESHOOTING

⚠ **WARNING**	Do not open covers to avoid the danger of electric shocks. Ask a service engineer for repairs.
	Repairs/adjustments should always be done by the service engineer. Electric shocks due to careless handling may cause death or serious burns, and exposure to laser emission may cause burns and loss of sight.

MEMO	If there is any anomaly in the product, check the following points and ask your dealer or our sales office mentioned on the back cover of this Manual.

If a trouble is suspected, check conditions following the check list shown below.
If the disposition according to the given instructions does not improve the condition, or if there is no relevant check item in the list, contact your dealer or TOPCON mentioned on the back cover of this Manual.

Before reading the check list, make sure of the following:
1. All electric connections are complete.
2. The delivery system is connected correctly.

CHECK LIST

Trouble	Condition	Remedy
The system power supply does not turn ON.	The power supply system of the hospital is OFF.	Turn ON the breaker of the power supply system.
The treatment laser does not work.	The main body is under Standby mode.	Press the Standby/Ready button and set Ready mode.
The aiming beam is dark.	The set value of aiming beam is low.	Adjust the aiming beam volume by the Aiming beam output dial.
	The optical fiber plug is not inserted completely into the laser aperture.	Insert the optical fiber plug completely into the laser aperture.
The aiming beam is not emitted.	The optical fiber is soiled, or the internal alignment is out of order.	Contact your dealer or TOPCON at the address shown on the back cover.
The treatment laser output is lowered.	The optical fiber plug is not inserted completely into the laser aperture.	Insert the optical fiber plug completely into the laser aperture.
	The optical fiber is soiled, or the internal alignment is out of order.	Contact your dealer or TOPCON at the address shown on the back cover.
The abnormal diagnosis error is displayed.	Error code/messages need to be checked.	Check conditions following the check points of the Error message list shown below. If the message does not go away, contact your dealer or TOPCON at the address shown on the back cover.
Connect Filter W304	The connector of the protect filter is not connected.	Check if the connector of the protect filter is connected correctly.
Inter lock... Unclock W303	The connector of the remote interlock is not connected.	Check if the connector of the remote interlock is connected correctly.
Connect Foot Switch W301	The Emission switch (or Footswitch) is not connected with the main body.	Check if the connection cable of the Emission switch is correctly connected to the emission switch connector of the main body front panel.

CHECK LIST

Connect Fiber W302	The optical fiber is not plugged in.	Check if the optical fiber plug is inserted completely into the laser aperture of the main body front panel.
W143 RE-1G Not detected	While the power of the main body is ON, the remote controller RE-1G is plugged in or unplugged from the port.	While the power of the main body is OFF, plug in the remote controller correctly. Then, turn on the power of the main body again.
It is impossible to set the laser emission on the instrument main body.	The remote controller is connected.	When using the remote controller, set the laser emission with it. When the remote controller is not used, turn off the power of the instrument and remove the remote controller. If the remote controller is removed and then you cannot set the laser emission on the instrument, contact your dealer or TOPCON at the address shown on the back cover.

CHECK LIST FOR LASER SLIT LAMP SL-10L G

Trouble	Condition	Remedy
The illumination lamp does not turn ON.	The power cable is slipped off.	Insert the plug completely.
	The Power switch is OFF.	Turn ON the switch.
	The illumination lamp is burned.	Change the illumination lamp with a new one.
	The fuse is burned.	Change the fuse with a new one.
	The illumination lamp socket is deteriorated.	Change the socket with a new one.
The illumination field is nonuniform or the illumination is dark.	The illumination lamp is not set correctly.	Reset the illumination lamp.
	The filter/diaphragm stops in the middle.	Reset the filter/diaphragm correctly.
	The voltage selector is not set correctly.	Reset the voltage selector correctly (which is located at the lower part of the power supply).
The aiming beam cannot be seen.	The aiming beam volume setting is the lowest.	Raise the aiming beam volume. (See item 1 of "LASER EMISSION FOR TREATMENT (SL-10L G)" on page 39.)
	The optical fiber plug is not inserted completely into the laser aperture.	Insert the optical fiber plug completely into the laser aperture.
	The aiming beam spot is off the visual field.	Bring the spot inside the visual field by the manipulator.
The laser-treated part largely differs from the aiming beam spot.	The set treatment condition of the laser unit is improper.	Reset treatment conditions. (see "OPERATIONS IMMEDIATELY BEFORE USING" on page 36.)
	The diopter adjustment of the eyepiece lens is not done.	Adjust the diopter.
	The spot is not focused.	Focus the spot by adjusting the base position.
The fuse burns.	The fuse rating is improper.	Use the specified fuse.
	The voltage selector is not set correctly.	Reset the voltage selector correctly (which is located at the lower part of the power supply).
The manipulator does not work.	The manipulator cap is fastened too tight.	Turn the cap counterclockwise to release the manipulator from the center position.

CHECK LIST FOR SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G

Trouble	Condition	Remedy
The aiming beam cannot be seen.	The aiming beam volume setting is the lowest.	Raise the aiming beam volume. (Refer to item 1 of "LASER EMISSION FOR TREATMENT (SA-1G)" on P. 40.)
	The optical fiber plug is not inserted completely into the laser aperture.	Insert the optical fiber plug completely into the laser aperture.
	The aiming beam spot is off the visual field.	Adjust the aiming beam position. (Refer to "FOCUS AND POSITION ADJUSTMENT OF AIMING BEAM FOR SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G" on P. 48.)
	The aiming beam is not at the set position.	Turn the attachment to the left until click comes.
The laser-treated part largely differs from the aiming beam spot.	The set treatment condition of the laser unit is improper.	Reset the treatment conditions. (Refer to "OPERATIONS IMMEDIATELY BEFORE USING" on P. 36.)
	The diopter adjustment of the eyepiece lens is not done.	Adjust the diopter.
	The spot is not focused.	Adjust the focus of aiming beam. (Refer to "FOCUS AND POSITION ADJUSTMENT OF AIMING BEAM FOR SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G" on P. 48.)

MAINTENANCE AND CHECKING (LC-300G)

DAILY STORAGE

- Preparations before storage
  When the instrument is not used, pull off the key and keep it to avoid use by persons other than those who are permitted to use.
  Do not place heavy objects on cables nor step on them.
- Removing accessories
  For accessories which are not be used for the next operation, to prevent these from being damaged, remove and keep them at the specified place.
  When using the endoprobe, which is a sterilized disposable product, dispose of it after using it once.
- Storage environment
  To avoid dewing, desirably the same ambient temperature, relative humidity and atmospheric pressure as when using should be maintained.
  Avoid places where the instrument is exposed to the direct sunlight.

LONG-TERM STORAGE

- Preparations before storage
  When the instrument is stored in a warehouse for a long period, to prevent dust and soil, desirably the instrument should be packed as shipped.
  When the instrument is left as installed, daily storage conditions may apply. In this case, however, it is recommended to pull off the power cable.
- Removing accessories
  For a long-term storage, it is recommended to remove all accessories and pack them as shipped.
- Environmental conditions for long-term storage
  Ambient temperature: -20 ~ +50°C
  Avoid places where the instrument is exposed to the direct sunlight.
- Checks and trial operation after long-term storage
  After long-term storage, the procedure of trial operation is the same as the normal checks before starting.
  However, when the instrument and accessories are to be moved from storage, reinstalled and reused after half a year or longer, we recommend to contact your dealer or TOPCON at the address shown on the back cover and ask checks by the service engineer.

MOVEMENT

- For relocation within a room, the instrument can easily be moved without using any tools for carrying by surely holding the instrument at specified positions with both hands.
- In case the instrument is moved to another room or outdoors, when particular care should be given not to give hard vibrations and shocks during conveyance, we recommend to contact your dealer or TOPCON shown on the back cover to ask witness of a service engineer and checks by the service engineer after the movement.

ORDERING CONSUMABLE ITEMS

When ordering consumable items, contact your dealer or TOPCON shown on the back cover and tell them the product name, product code and quantity.

Product name	Product code
Fuse	T2400 0017A

CHECKING BY USER

Checks done by the user for occasional and regular maintenance should be within the scope of checks before starting/finishing and items confirmed during use.

CHECKS BEFORE STARTING AND FINISHING

Before using, we recommend to check the following items as checks before starting and finishing.

List of starting checks

	Item	Check
1	Is there any things obstructing ventilation around the LC-300G main body?	
2	Is the instrument surely connected to a power supply with AC 100, 120, 220 or 240V and a capacity of 550VA and larger?	
3	Is the instrument connected correctly with the power supply, including protective grounding?	
4	Is the exterior cleaned and free of soils?	
5	Are accessories to be used connected correctly?	
6	Is the diopter of the eyepiece lens of the slit lamp and the laser slit lamp used for observation adjusted correctly?	
7	Is the instrument activated normally by operations following the procedure?	
8	After activation, can the standby status be reached without any error appearing on the Status display window of the main body?	

List of finishing checks

	Item	Check
1	Is the main power supply turned OFF, with all displays OFF?	
2	Have you pulled off and kept the key from the Key switch?	
3	Is the exterior cleaned?	
4	Have you removed and kept unnecessary accessories?	
5	Have you disposed of the used endoprobe (when using endoprobes)?	

To let this instrument display the performance correctly, the following items should be done by the user.

CHANGING THE FUSE

⚠ **WARNING**	When changing fuses, shut down the power supply and pull off the power cable. Removing the fuse cover without removing the power cable may cause electric shocks.

⚠ **WARNING**	Be sure to use the attached fuse. Using another fuse may lead to fire in case of a failure.

1. Make sure that the main power supply is OFF and the power cable is pulled off.
2. Press and turn the fuse holder counterclockwise by a slotted screwdriver. The fuse holder is removed.
3. Replace the fuse with the attached fuse.
4. Press and turn the fuse holder clockwise by a slotted screwdriver. The fuse holder is set.

CHANGING OTHER PARTS

When using the endoprobe, which is a sterilized disposable product, dispose of it after using it once.

PERIODICAL CHECK

In order to maintain the safety and performance of this instrument and optional accessories, regular maintenance and checks need to be done by a specialist service engineer. We recommend to do the maintenance and checks by service engineer twice a year. When regular maintenance and checks by service engineer are desired, ask your dealer or TOPCON shown on the back cover, telling them the time of your purchase and the product number.

CLEANING

CLEANING THE EXTERIOR COVER

⚠ **CAUTION**	Do not use chemicals for cleaning, such as caustic cleansers to avoid exfoliation of nameplates and damage to letters.

When the exterior is soiled, clean the part with a dry and clean soft cloth. If the soil is hard to be removed, moisten the cloth with the solution of a neutral cleanser, squeeze it out, and wipe the soiled part with it.

Do not allow liquids, including the cleanser, to enter inside the instrument and avoid troubles.

MAINTENANCE AND CHECKING (SL-10L G)

DAILY CHECKUPS

When not in use, turn OFF the Power switch.
This instrument may be affected adversely by dust, so apply the attached dust cover when not using.
Since the optical fiber is easily broken structurally. Don't bend it forcedly but handle it very carefully.
Do not place heavy objects on cables nor step on them.

ORDERING CONSUMABLE ITEMS

When ordering consumable items, contact your dealer or TOPCON shown on the back cover and tell them the product name, product code and quantity.

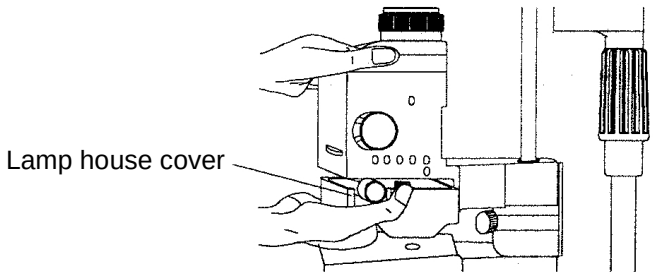
Product name	Product code
Illumination lamp	40340 20700
Socket	40821 20100
Chinrest paper	40310 40820
Fuse 1A (AC100, 120V)	44635 60030
Fuse 0.5A (AC220, 240V)	44670 81040
Fuse 6A (Common)	44635 60040

CHANGING THE ILLUMINATION LAMP

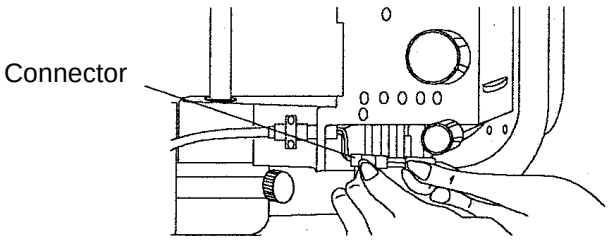
⚠ **CAUTION**	When changing lamp units, shut off the Power switch and pull off the power cable to avoid electric shocks.
	When inevitably changing lamp units immediately after putting off, beware of the high temperature to avoid burns.

MEMO	When fixing the lamp, note that an nonuniform illumination or shading may be caused if the bulb flange is floated or the notch part is not engaged correctly.

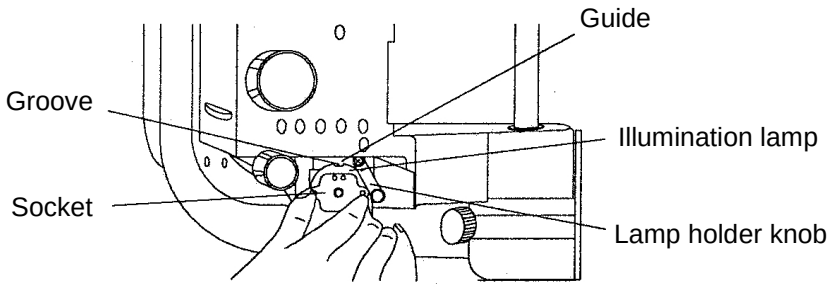
1 Turn OFF the Power switch, and remove the lamp house cover downward while pushing it from both sides.



2 Pull off the connector by holding and unlocking it.



3 Turn the Lamp holder knob, remove the illumination lamp together with the socket, and then pull off the lamp.



4 Insert the new lamp into the socket and set it, by aligning the groove of the lamp flange along the guide.

5 Assemble the illumination lamp in reverse order from removal.

6 Turn ON the Power switch and make sure that it turns ON.

CHANGING THE SOCKET

MEMO	Since the socket is deteriorated by heat, change the socket every two to three illumination lamps.

1 Remove the lamp house in the same manner as changing illumination lamp.

2 Remove the socket in the same manner as changing illumination lamp.

3 Remove the socket from the lamp, and replace it with a new one.

4 Assemble the socket in reverse order from removal.

CHANGING THE FUSE

⚠ **WARNING**	When changing fuses, shut down the power supply and pull off the power cable. Removing the fuse cover without removing the power cable may cause electric shocks.

MEMO	Be sure to use a glass-tube fuse (on the market) with the rating marked on the fuse holder side.

1 Turn OFF the Power switch, and remove the Power cable from the AC power supply.

2 Turn the fuse holder cover by a screwdriver on the rear side of the illumination power supply. The fuse is removed with the cover.

3 Replace the fuse with a new one.

4 Set the fuse in reverse order from removal.

SUPPLY OF CHINREST PAPER

When the chinrest paper is used up, pull out the pin from the chinrest, and supply a new chinrest paper.

CLEANING

CLEANING OF LENS AND MIRROR

When a lens/mirror is soiled, first blow off dust.
If this is not enough, moisten a clean cotton cloth a little with a mixed solution at the ratio of ether 8 to alcohol 2 or so, and wipe off the soil lightly. Do not attempt to wipe off the soil with hand or a hard cloth. Do not use acetone.

CLEANING OF SLIDING BOARD, WHEEL SHAFT AND RAIL

When the sliding board at the table top, wheel shafts of the base and rails running wheels are soiled, it makes the base movement heavy and unsmooth. Clean these with a dry cloth.

CLEANING OF RESIN PARTS

For soils on resin parts of the chinrest and others, wipe them off with a cloth moistened with the solution of a neutral cleanser. Do not use special chemicals.

MAINTENANCE AND CHECKING (SA-1G)

DAILY MAINTENANCE

This device may be adversely affected by dust. When it is not used, set the dust cover, an accessory of slit lamp, on it.
The optical fiber can be easily broken structurally. Don't bent it forcedly but handle it very carefully.
Don't put a heavy substance on cords nor step on them.

HOW TO CLEAN

Cleaning of lens, mirror and filter
When a lens, mirror or filter is dirty, blow away dust from it with a blower first. If it is still dirty, imbue a clean cotton cloth a little with a mixed solution at the ratio of Ether 8 to Alcohol 2 or so and wipe off dust lightly. Don't wipe a lens, mirror or filter with a hard cloth or by hand. Don't use acetone.

SPECIFICATION AND PERFORMANCE

SPECIFICATION OF LASER PHOTOCOAGULATOR LC-300G

PERFORMANCE

Laser unit

<Treatment laser>

Type:	Diode pumped solid-state laser Nd: YVO_4-KTP
Mode of operation:	True continuous wave
Oscillation wavelength:	532nm
Laser emission output (on cornea)	
When connecting the laser slit lamp SL-10L G:	50~1500mW
When connecting the slit lamp attachment for laser photocoagulator SA-1G:	50~1000mw
When connecting endoprobe:	50~1500mW
Cooling:	Forced air-cooling
Emission time:	0.02, 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.45, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.5, 2.0, 2.5, 3.0 sec and continuous
Emission interval:	0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0 sec and single

<Aiming laser>

Type:	Diode laser
Mode of operation:	True continuous wave
Wavelength:	635nm
Output:	0.9mW or less

ELECTRICAL RATING

Power supply voltage:	AC 100, 120, 220, 240V 50/60Hz
Power supply input:	Normal 150VA, Max. 550VA

CLASSIFICATION OF INSTRUMENT

Class of laser:	Class 4
Protection level against electric shock:	Type B
Protection type against electric shock:	Class I

DIMENSIONS AND WEIGHT

Size:	345 (W) × 467 (D) × 187 (H) mm
Weight:	18kg

SAFETY UNIT

Fiber detection
Emission switch detection
Beam shutter operation detection
Protect filter operation detection
Emergency stop switch
Remote interlock connector

PURPOSE OF USE

Applied to treatment of eye diseases such as eyeground disease, glaucoma, etc.

PRINCIPLE OF OPERATION

The laser beam source of this instrument uses Nd: YVO_4 (oxide crystal of neodymium-doped yttrium • vanadium) as medium. By using a semiconductor laser as excitation source and continuously generating the natural wavelength of 1064nm of the laser medium, half-wavelength 532nm laser beams are emitted by arranging a KTP (nonlinear crystal) in the optical path. The emission output is set on the front operation panel of the LC-300G, and the emission of treatment laser beams is done by the emission switch. Emitted laser beams are guided to the laser slit lamp SL-10L G or the slit lamp attachment for laser photocoagulator SA-1G by the optical fiber and then are radiated to the diseased part.

* For product improvements, the specification and appearance are subject to change without notice.

SPECIFICATION OF LASER SLIT LAMP SL-10L G

PERFORMANCE

Laser beam guide unit

Focusing method:	Parfocal
Emission range:	ϕ50-ϕ1000μm, continuously variable
Aiming method:	Coaxial with treatment laser
Safety unit:	Protect filter (Emission switch or footswitch interlock type)

Observation unit

Type:	Galileo magnification changer with converging binocular tubes
Magnification selection:	5 steps by drum rotation
Observation magnification:	6, 10, 16, 25, 40×
Eyepiece:	12.5×
Interpupillary distance adjustment range:	55 ~ 75mm
Diopter adjustment range:	-5D ~ +5D

Illumination unit

Slit width:	0 ~ 8mm, continuously variable
Slit length:	Stepped change: 0.3, 1, 3, 5 and 8mm; Continuous change: 1 ~ 8mm
Filter:	Built-in color temperature changing filter, red-free filter and heat absorption filter
Slit rotation angle:	±90 degrees
Illumination lamp:	Halogen lamp 6V 20W

Base unit

Base movement (back and forth):	90mm
Base movement (lateral):	100mm
Base fine movement (back and forth/lateral):	12mm
Base movement (vertical):	30mm

Chinrest fixation display unit

Chinrest movement (vertical):	80mm
Light source for fixation target:	Red LED

ELECTRICAL RATING

Power supply voltage:	AC 100, 120, 220, 240V 50/60Hz
Power supply input:	40VA

CLASSIFICATION OF INSTRUMENT

Protection level against electric shock:	Type B
Protection type against electric shock:	Class I

DIMENSIONS AND WEIGHT

Size:	550(W) × 407(L) × 708(H) mm
Weight:	21kg

PURPOSE OF USE

Used for laser delivery by combining with the Laser Photocoagulator LC-300G.

PRINCIPLE OF OPERATION

When the Laser Photocoagulator LC-300G emits the laser beam, this unit guides the beam to the treatment position by the optical fiber.

* For product improvements, the specification and appearance are subject to change without notice.

SPECIFICATION OF SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G

PERFORMANCE

Focusing method:	Parfocal
Emission range:	ϕ50 ~ ϕ500µm continuously variable
Emission method:	Coaxial with treatment laser
Safety unit:	Protect filter (Interlock with opening/closing of attachment arm)

DIMENSIONS AND WEIGHT

Size:	120 (W) × 130 (L) × 250 (H) mm
Weight:	0.7kg

APPLICABLE SLIT LAMP

TOPCON SLIT LAMP SL-3C
TOPCON SLIT LAMP SL-3E
TOPCON SLIT LAMP SL-3F
TOPCON PHOTO SLIT LAMP SL-7F
(The extension shaft, an accessory, is necessary.)
TOPCON SLIT LAMP SL-D7
(The extension shaft, an accessory, is necessary.)
TOPCON SLIT LAMP SL-8Z
HAAG-STREIT Goldman Original Slit Lamp 900BM
Don't install others except the above slit lamps.

PURPOSE OF USE

Used for laser delivery by combining with the Laser Photocoagulator LC-300G and the slit lamp biomicroscope.

PRINCIPLE OF OPERATION

When the Laser Photocoagulator LC-300G emits the laser beam, this unit guides the beam to the treatment position by the optical fiber.

* For product improvement, the specification and appearance are subject to change without notice.

SPECIFICATION OF PROTECT FILTER PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6

PERFORMANCE

PF-MZG, PF-MZG10.6

Mount type:	Z type (for TOPCON/Zeiss)
Applicable laser:	LD excitation Nd: YVO_4-KTP
Filter operation:	Movable type
Applicable operation microscope:	TOPCON OMS-75, OMS-85, OMS-90, OMS-110, OMS-600, OMS-610 Other operation microscope whose mount shape is the Zeiss type

PF-MWG, PF-MWG10.6

Mount type:	W type (for Leica)
Applicable laser:	LD excitation Nd: YVO_4-KTP
Filter operation:	Movable type
Applicable operation microscope:	As the filter is not applicable to some Leica operation microscopes, consult with our sales offices on the back cover of this manual when purchasing.

DIMENSIONS AND WEIGHT

PF-MZG, PF-MZG10.6

Size:	ϕ70 × 32mm
Weight:	
PF-MZG:	0.28kg
PF-MZG10.6:	0.72kg
Cable length:	
PF-MZG:	6m
PF-MZG10.6:	10.6m

PF-MWG, PF-MWG10.6

Size:	ϕ68 × 34mm
Weight:	
PF-MWG:	0.28kg
PF-MWG10.6:	0.72kg
Cable length:	
PF-MWG:	6m
PF-MWG10.6:	10.6m

PURPOSE OF USE

During the laser photocoagulation, this unit protects the patient's eyes by combining with the Laser Photocoagulator LC-300G and operation microscope.

PRINCIPLE OF OPERATION

In the link operation with the laser oscillation of the laser photocoagulator LC-300G, this unit inserts a filter which does not transmit the laser beam into the observation optical system of the operation microscope.

* For product improvements, the specification and appearance are subject to change without notice.

SPECIFICATION OF ENDOPROBE

When purchasing the endoprobe, ask our sales offices on the back cover of this manual about a proper one.

* For product improvements, the specification and appearance are subject to change without notice.

SPECIFICATION OF FOOTSWITCH FS-HG/FS-LG

DIMENSIONS AND WEIGHT

FS-HG

Size:	184(W) × 153(D) × 115(H)mm
Weight:	1.6kg
Cable length:	5m

FS-LG

Size:	150(W) × 102(D) × 108(H)mm
Weight:	1.0kg
Cable length:	5m

PURPOSE OF USE

Used as a laser emission switch by combining with the Laser Photocoaglator LC-300G.

* For product improvements, the specification and appearance are subject to change without notice.

SPECIFICATION OF REMOTE CONTROLLER RE-1G

PERFORMANCE

Setting function

- Emission output of treatment laser
- Emission time
- Emission interval
- Output of aiming laser
- Standby/Ready selection
- Repeat mode
- Count reset

* Each setting function is the same as the Laser Photocoagulator LC-300G.

Adjustment angle (Panel inclination): 0° ~ 60°

DIMENSIONS AND WEIGHT

Size:	160 (W) × 102 (D) × 125 (H) mm
Weight:	0.8kg
Cable length:	3m

PURPOSE OF USE

Used for setting the laser emission for treatment/aiming by combining with the Laser Photocoagulator LC-300G.

* For product improvements, the specification and appearance are subject to change without notice.

SPECIFICATION OF CABLE SUPPORT CP-1

DIMENSIONS AND WEIGHT

Size:	30(W) × 60(D) × 850(H)mm
Weight:	0.4kg

PURPOSE OF USE

Used as a support to hold the fiber from the Laser Photocoagulator LC-300G.

* For product improvements, the specification and appearance are subject to change without notice.

SPECIFICATION OF EXTENSION SHAFT EH-1

DIMENSIONS AND WEIGHT

Outside diameter:	ϕ22 × 44mm
Weight:	0.04kg

PURPOSE OF USE

Used to extend the magnification selection knob of SL-7F or SL-D7 when combining the Topcon photo slit lamp SL-7F (hereinafter, SL-7F) or slit lamp SL-D7 (hereinafter, SL-D7) with the slit lamp attachment for Laser Photocoagulator SA-1G.

* For product improvements, the specification and appearance are subject to change without notice.

PERFORMANCE

Performance of Laser Photocoagulator LC-300G and accessories

1. Specification

For the specification of Laser Photocoagulator LC-300G, see page 62 of this Manual.
For the specification of Laser Slit Lamp SL-10L G, see page 64 of this Manual.
For the specification of Slit Lamp Attachment for Laser Photocoagulator SA-1G, see page 65 of this Manual.
For the specification of Protect Filter PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6 for microscope, see page 65 of this Manual.
For the specification of Endoprobe, see page 66 of this Manual.
For the specification of Footswitch FS-HG/FS-LG, see page 66 of this Manual.
For the specification of Remote Controller RE-1G, see page 67 of this Manual.
For the specification of Cable Support CP-1, see page 67 of this Manual.
For the specification of Extension Shaft EH-1, see page 67 of this Manual.

2. Functions and physiological effects

This instrument has functions of cutting, bleed-stopping, coagulation etc. to vital textures.

3. Application

This instrument is used by doctors to treat eyeground diseases and eye diseases, such as glaucoma.

4. Output causing dangerous effects to the patient

The treatment laser beam emitted by this instrument would cause damage, such as burns, to the patient's eye and skin when it is emitted to body parts other than the diseased part for treatment.

5. Output causing dangerous effects to the operator

The treatment laser beam emitted by this instrument has a possibility of causing damage, such as burns, to the eye and skin of the operator and people around the instrument.

OPTIONAL ACCESSORIES

⚠ **CAUTION**	Surely fix accessories to avoid falling during operation.

LASER SLIT LAMP SL-10L G

Is a laser slit lamp used in combination with the Laser Photocoagulator LC-300G.
For the specification, see "SPECIFICATION OF LASER SLIT LAMP SL-10L G" on page 64.

STANDARD ACCESSORIES OF SL-10L G

Standard accessories of SL-10L G are as shown below. Make sure all are in the set:

Name	Quantity
Power cable	(1)
Electric protect filter cable	(1)
Emission switch cable	(1)
Dust cover	(1)
Test rod	(1)
Saucer	(1)
Spare illumination lamp	(1)
Spare socket	(1)
Spare fuse	(1)
Chinrest paper	(1)
Spare chinrest paper pin	(2)
Cleaning brush	(1)
Phillips screwdriver	(1)
Slotted screwdriver	(1)
Spanner	(1)

OPTIONAL ACCESSORIES OF SL-10L G

Elbow rest:
Is an elbow rest prepared for use in combination with the instrument.

AUTOMATIC INSTRUMENT TABLE AIT-15

Is an electric instrument table used in combination with the instrument.
The special table top for the slit lamp is included in SL-10L G.

<AIT-15 specifications>

- Power supply voltage: AC100, 120, 200, 230, 240V
- Frequency: 50/60Hz
- Power supply input: 270VA
- Dimensions: 510 (W) × 450 (L) mm
- Table height: 660 ~ 880mm
- Weight: 23kg

SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G

Is a slit lamp attachment for laser used by combining with the Laser Photocoagulator LC-300G.
For the specification, refer to "SPECIFICATION OF SLIT LAMP ATTACHMENT FOR LASER PHOTOCOAGULATOR SA-1G" on P.65.

STANDARD ACCESSORIES OF SA-1G

Standard accessories of slit lamp attachment are as shown below. Make sure all are in the set:

Name	Quantity
Mirror (battledore shape)	(1)
Accessory mount	(1)
Head band	(1)

PROTECT FILTER PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6

Is a special protect filter for use with Laser Photocoagulator LC-300G and is attached to an operation microscope.
Two mount types, the Zeiss type PF-MZG, PF-MZG10.6 and the Leica type PF-MWG, PF-MWG10.6, are available.
Choose a type suitable for your microscope.

For the specification, see "SPECIFICATION OF PROTECT FILTER PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6" on page 65.

STANDARD ACCESSORY OF PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6

Standard accessory of PF-MZG/PF-MWG, PF-MZG10.6/PF-MWG10.6 is as shown below. Make sure it is in the set:

Name	Quantity
Fixing screw	(1)

ENDOPROBE

* When purchasing the endoprobe, ask our sales offices on the back cover of this manual about a proper one.

FOOTSWITCH FS-HG/FS-LG

Is a footswitch used in combination with the Laser Photocoagulator LC-300G to emit the treatment laser beam. There are two kinds. One is a footswitch with a high stepping force (FS-HG) and the other is a one with a low stepping force (FS-LG). Select one of them optionally.
For the specification, see "SPECIFICATION OF FOOTSWITCH FS-HG/FS-LG" on page 66.

REMOTE CONTROLLER RE-1G

Is a remote controller to set the laser emission for treatment/aiming by connecting with the Laser Photocoagulator LC-300G.
For the specification, see "SPECIFICATION OF REMOTE CONTROLLER RE-1G" on page 67.

CABLE SUPPORT CP-1

Is a cable support to hold the fiber.
For the specification, see "SPECIFICATION OF CABLE SUPPORT CP-1" on page 67.

EXTENSION SHAFT EH-1

Is an extension shaft for magnification selection knob. This is used when installing the slit lamp attachment for laser photocoagulator SA-1G to the Topcon photo slit lamp SL-7F.
For the specification, see "SPECIFICATION OF EXTENSION SHAFT EH-1" on page 67.

STANDARD ACCESSORY OF EH-1

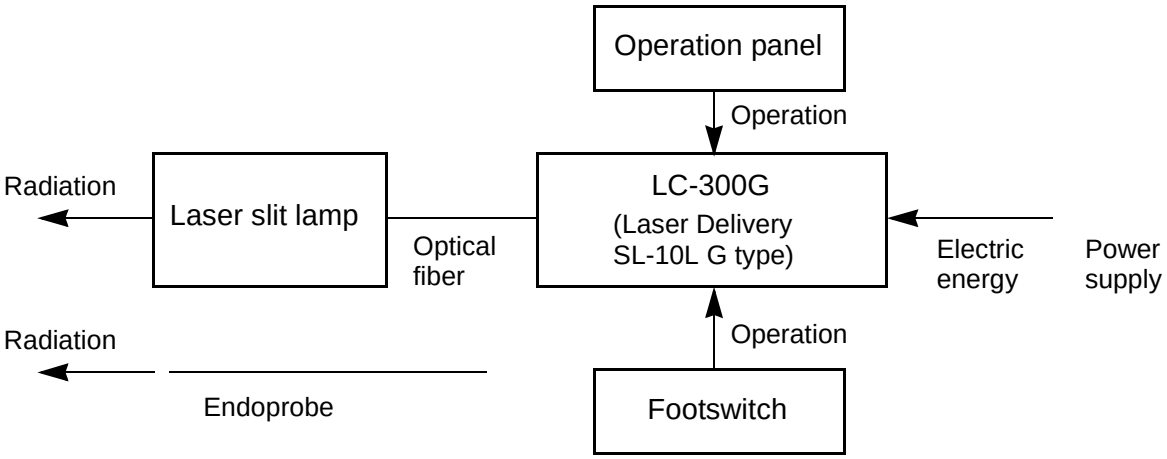
The following is the standard accessory of EH-1. Make sure it is in the set.

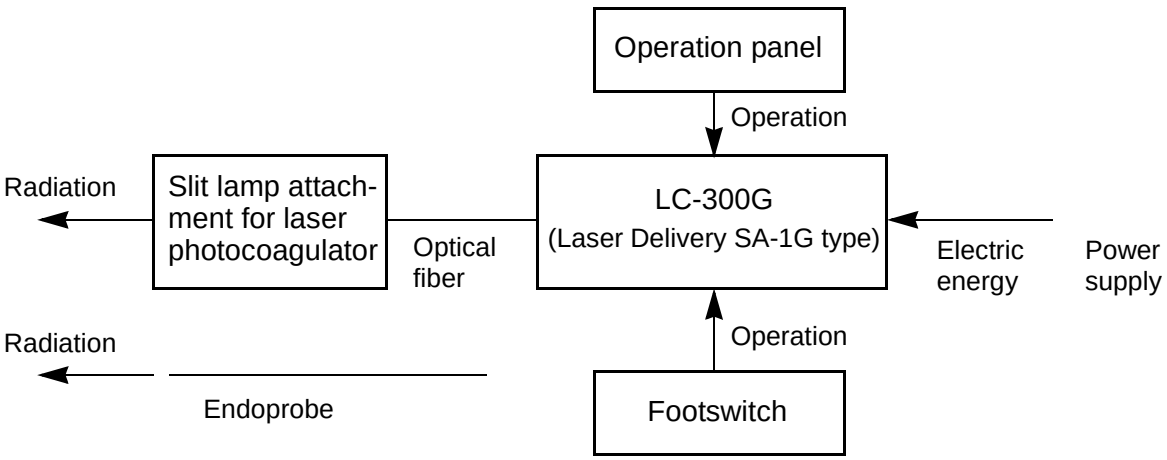
Name	Quantity
Hexagonal wrench	(1)

REFERENCE MATERIALS

PRINCIPLE OF OPERATION

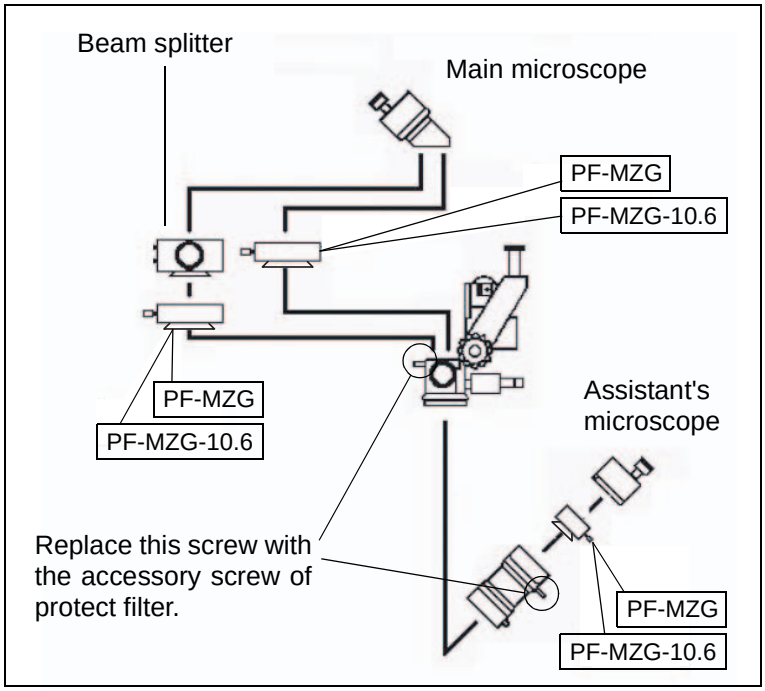
The laser beam source of this instrument uses Nd:YVO4 (oxide crystal of neodymium-doped yttrium•vanadium) as medium. By using a semiconductor laser as excitation source and continuously generating the natural wavelength of 1,064nm of the laser medium, half-wavelength 532nm laser beams are emitted by arranging a KTP (nonlinear crystal) in the optical path.
The emission output is set on the front operation panel of the LC-300G, and the emission of treatment laser beams is started/stopped by the Footswitch.
Emitted laser beams are radiated to the diseased part through the endoprobe, or guided to the slit lamp attachment for laser photocoagulator or to the laser slit lamp by the optical fiber and then are radiated to the diseased part.



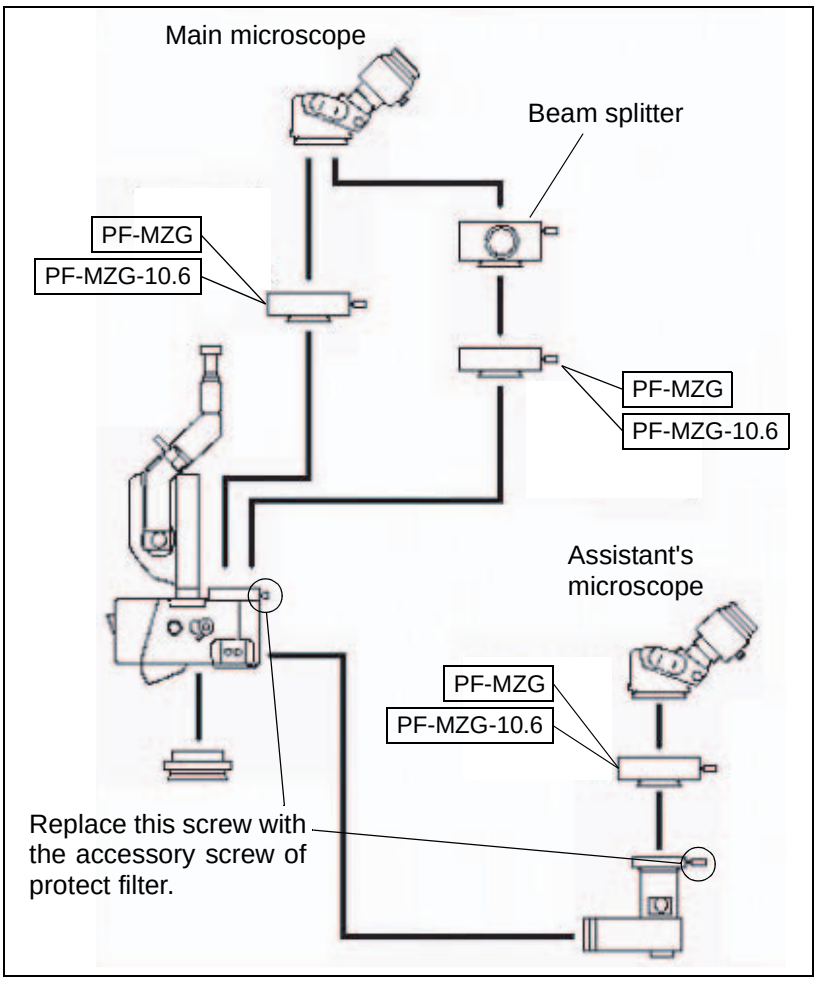


ILLUSTRATIONS: SETTING THE PROTECT FILTER

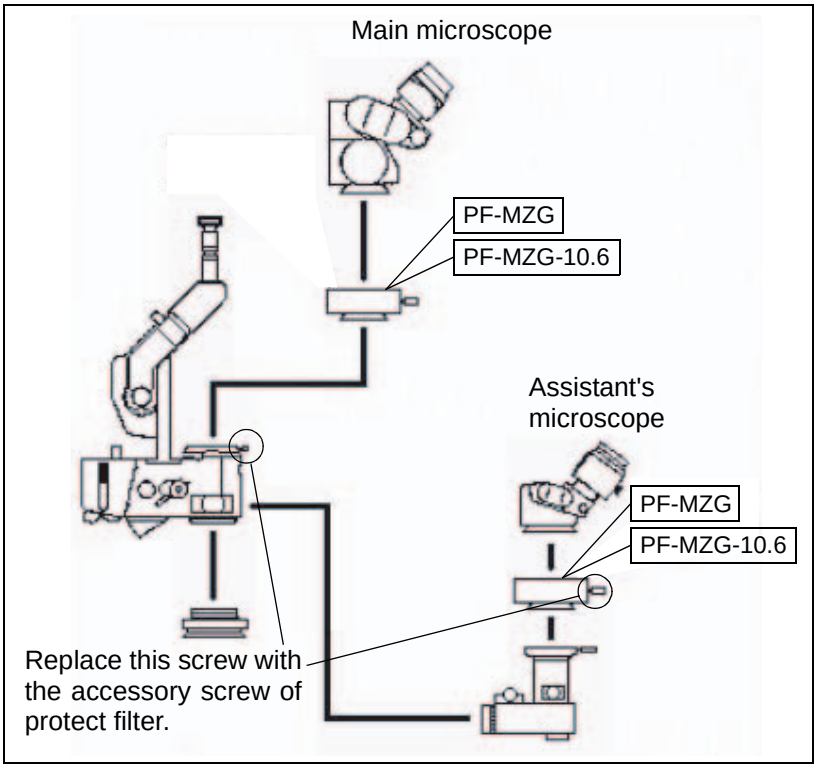
<Setting to TOPCON operation microscope OMS-75/OMS-85/OMS-90/OMS-110>



<Setting to TOPCON operation microscope OMS-600>



<Setting to TOPCON operation microscope OMS-610>

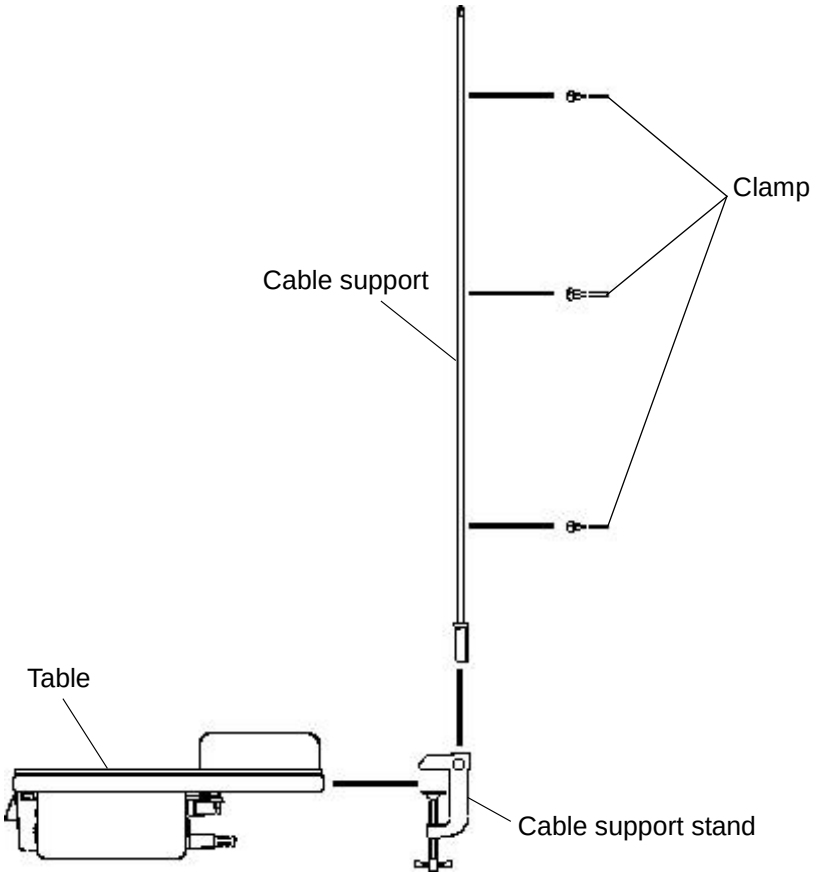


USING THE PROTECT FILTER

⚠ WARNING	Let the observers whose microscopes (for assistant) have no laser protect filters wear goggles (applied to 532nm, OD4 or more) suitable for the laser wavelength. The laser beam may damage their eyes.
	During operation, let the people around the instrument wear the goggles (applied to 532nm, OD4 or more) suitable for the laser wavelength. The laser beam may damage their eyes.
⚠ CAUTION	Place the Footswitch in a position where it is not in the way. To avoid stumbling/injury to your foot, do not step too deep into the switch.
	Before using, surely adjust the diopter and interpupillary distance. Incorrect adjustments will lead to improper treatment. (For the adjustment method, see the instruction manual of the microscope used for observation.)
MEMO	Before using, adjust the balance of the microscope stand/arm following the instruction manual of the microscope.
	Before using, see through the eyepiece and others and make sure that the protect filter is inserted into the observation field.
	Do not attempt to disassemble/rebuild the instrument by yourself.

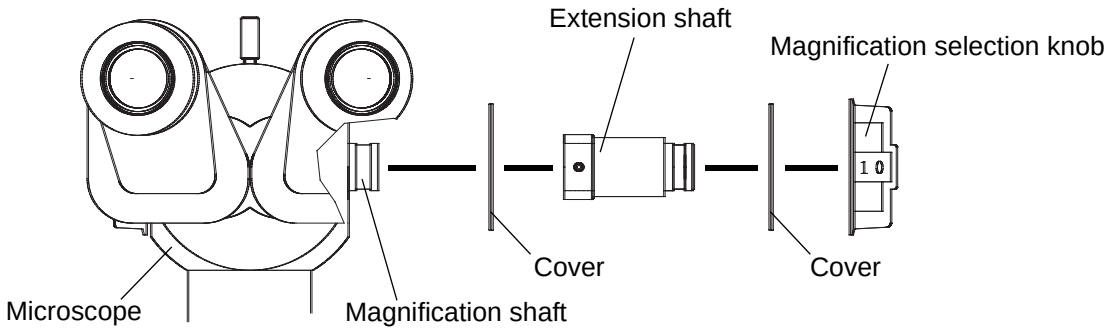
- For preparations about the operation microscope, refer to the instruction manual of the microscope and that of each device to be used.
- Make sure that the cable plug is surely connected to the protect filter connector of the currently used Laser Phtocoagulator LC-300G main body.

ILLUSTRATIONS: SETTING THE CABLE SUPPORT CP-1



ILLUSTRATIONS: SETTING THE EXTENSION SHAFT EH-1

<Setting to TOPCON photo slit lamp SL-7F/slit lamp SL-D7>



When calling please give us the following information about your unit:

- Machine type: LC-300G
- Manufacturing No. (Shown on the rating plate on the right side of the base.)
- Period of Usage (Please give us the date of purchase).
- Description of Problem (as detailed as possible).

LASER PHOTOCOAGULATOR LC-300G

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LASER PHOTOCOAGULATOR

LC-300G

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