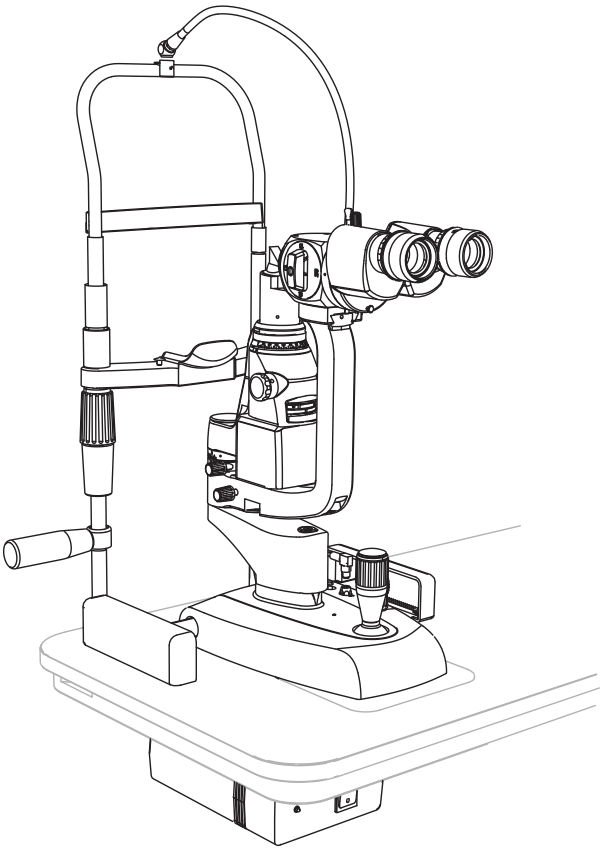
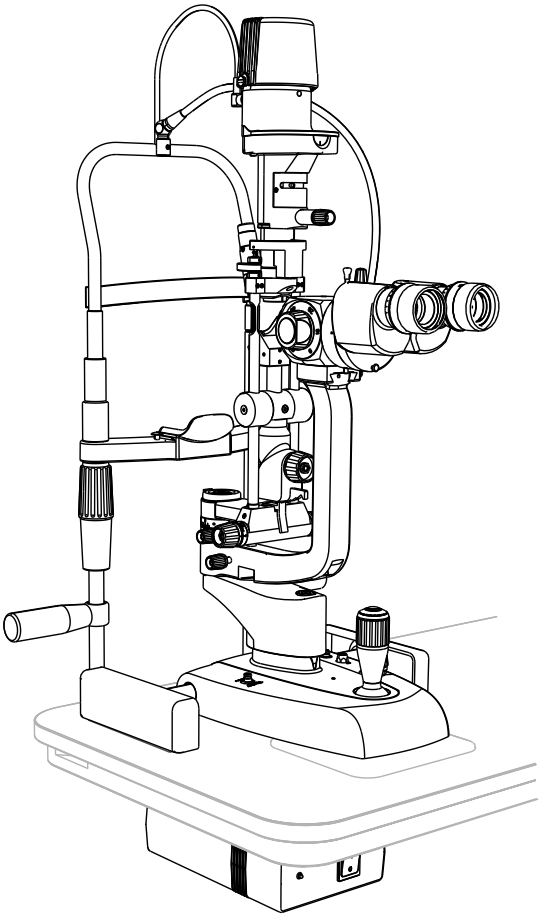
COSTRUZIONE STRUMENTI OFTALMICI





SLIT LAMP

SERVICE MANUAL

SL9800 / SL9900 / SL9900 ELITE

COSTRUZIONE STRUMENTI OFTALMICI

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Color inside

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1 INTRODUCTION

The slit lamp is the result of a long research period, carried out by experts in the sector in order to give the product technical innovation, quality and design.
This manual is intended for technical personnel only, previously trained and authorized by the Manufacturer to carry out ordinary and corrective maintenance technical interventions.
Do not carry out operations not described in this manual.

1.1 SYMBOLS

Within the instructions for the Technical Assistance, on the package or on the device, there might be the following symbols:

Symbol	Meaning
	Caution
	Danger of electric shock
	Components sensitive to electrostatic discharges (ESD)
	Read the instructions for use
	General obligation
	Note. Useful information for the user
	General prohibition sign
	Manufacturer
	CE Marking (Directive 93/42/EEC)
	Medical device
	Waste disposal in compliance with the Directive 2012/19/EU (WEEE) and 2011/65/EU (RoHS II)

1.1.1 DEVICE SYMBOLS

Symbol	Meaning
	Type B applied part
	Class II device

1.2 GENERAL WARNINGS

THE INFORMATION GIVEN IN THESE INSTRUCTIONS FOR THE TECHNICAL ASSISTANCE REFER TO THE SLIT LAMPS SL9800, SL9900 AND SL9900 ELITE DEVICES ("DEVICE" FROM NOW ON).

Within the instructions for the Technical Assistance, the paragraphs dedicated to one or another device are marked with SL9800, SL9900 or SL9900 ELITE.
The paragraphs dedicated to device-specific configurations only are marked with "Standard configuration" or "Digital configuration".
"Standard configuration" identifies the devices which are equipped with standard base and are not equipped with beam splitter.
"Digital configuration" identifies the devices which are equipped with digital base and beam splitter.
The standard base is equipped with joystick but is not equipped with joystick button and with connector for the beam splitter.
The digital base is equipped with joystick button and with connector for the beam splitter.
When not specified, the paragraph is valid for all devices and configurations.

THE ORIGINAL TEXT IS IN ENGLISH.

The "colour inside" logo on the cover page of these instructions for the Technical Assistance indicates that the manual contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

Before carrying out any maintenance on the device, check the concerned model and configuration.

Before carrying out any maintenance on the device, carefully read the instructions for the Technical Assistance. Follow the directions given in the instructions for the Technical Assistance.

It is forbidden to carry out any maintenance on the device not mentioned in the instructions for the Technical Assistance.

Keep this manual close by for future consultation.

It is forbidden to reproduce, totally or partially, texts or images contained in these instructions without written authorization of the Manufacturer.

The Manufacturer reserves himself the right to modify the contents of these instructions without notice.

1.3 NORMATIVE REFERENCES

1.3.1 EU DIRECTIVES

- Regulation (EU) 2017/745 of the European Parliament and of the Council of 5th April 2017 on medical devices
- Directive 2012/19/EU on waste from electrical and electronic equipment (WEEE)

1.3.2 TECHNICAL STANDARDS

- IEC 60601-1: 2005 + A1:2012 - "Medical electrical equipment - Part 1: General requirements for basic safety and essential performance".
- EC 60601-1-2:2014 Edition 4 - "Collateral Standard: Electromagnetic disturbances - Requirements and tests".
- UNI EN ISO 15004-1:2009 Ophthalmic Instruments. Fundamental requirements and test methods - Part 1: General requirements applicable to all Ophthalmic devices.
- UNI EN ISO 15004-2:2007 Ophthalmic Instruments. Fundamental requirements and test methods - Part 2: Light hazard protection.
- UNI CEI EN ISO 14971:2012 Medical devices. Application of risk management to medical devices.

1.3.3 QUALITY MANAGEMENT SYSTEM STANDARDS

- UNI CEI EN ISO 13485:2016 "Medical devices. Quality management systems - Requirements for regulatory purposes".

1.4 HOW TO REPORT MALFUNCTIONS TO THE MANUFACTURER

You shall report any operating malfunctions or faults of the device to the Manufacturer, C.S.O. Costruzione Strumenti Oftalmici SRL, by accessing the following link:
https://service.csoitalia.it/index.php.
Together with the malfunction or fault description, the following information shall also be sent:

- Client
- Device serial number
- Release of the application software currently in use
- Version of the Operating System installed on the PC
- LOG file: C:\Program Files\CSO\Phoenix or C:\Program Files (x86)\CSO\Phoenix
- LOG file: C:\Program Files\CSO\Phoenix\Live\SLLive.log
- C:\Program Files (x86)\CSO\Phoenix\Live\SLLive.log.

1.5 MANUFACTURER IDENTIFICATION

C.S.O. SRL
Costruzione Strumenti Oftalmici
Via degli Stagnacci, 12/E
50018 - Scandicci (FI) - ITALY
phone: +39-055-722191 - fax: +39-055-721557
cso@csoitalia.it
www.csoitalia.it

2 SAFETY

2.1 SAFETY WARNINGS

DANGER
Danger of electric shock. Do not let water fall on the device. Do not immerse the device in water or other liquids.

DANGER
Danger of electric shock. Before any maintenance operation, check that the power cables are not damaged. If the cables are damaged, they shall be replaced.

DANGER
Danger of electric shock. Unplug the power supply cable from the power socket before disinfecting or cleaning the device and before any maintenance operation.

CAUTION
Always keep the device out of the reach of children.

CAUTION
Danger of stumbling and falling. Do not leave free cables in a place where people could walk.

CAUTION
Risk of electric shock. Do not touch power or connection cables if you have wet hands.

CAUTION
Risk of electric shock. Do not leave the power supply cables in contact with sharp edges or cutting parts. Always collect and fasten the power supply cables.

CAUTION
If a strange smell comes from the device, if the device emits heat or smoke, turn off the device immediately. Do not continue to use a damaged device or damaged part. Danger of injuries.

CAUTION
The power grid shall have a residual-current device (IΔn=30mA) and circuit breaker (Vn=230V) to protect the device. Place the device so that the power socket is easily accessible.

It is forbidden to carry out any maintenance on the device not mentioned in the instructions for the Technical Assistance.

It is forbidden to place the device in humid, dusty places or environments subject to sudden variations in temperature and humidity.

It is forbidden to use any extension cable not authorized by the device Manufacturer.

The device does not generate and does not receive any electromagnetic interference if placed near other electrical appliances. No preventive or corrective actions are required.

The device is classified following the technical standard IEC 60601-1: 2005 + A1: 2012 as an electro-medical device and is therefore suitable for installation in the patient area.

Patient area: any volume in which a patient with applied parts may intentionally or unintentionally come into contact with other electromedical devices or electromedical systems, masses or foreign masses, or other people in contact with these elements.

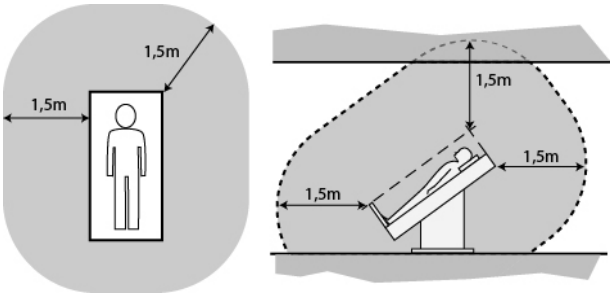


Fig. 1 - Patient area

2.2 DEVICE IDENTIFICATION

2.2.1 REGISTRATION DATA IN THE LIST OF MEDICAL DEVICES

The device registration data can be verified on the Italian Ministry of Health website at this page:
[Ministero della Salute - Ricerca dispositivi]

2.2.2 DEVICE DATA PLATE

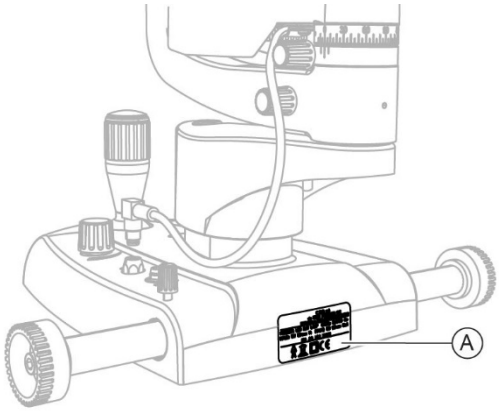


Fig. 2 - Data plate position

Pos	Description
A	Device data plate

The letter **-D** in the model name indicates the digital configuration of the device.
The digital configuration of the device includes a joystick with button, a digital base with sensor and a beam splitter.

SL9800 device, Xx and Xx-D model

Fig. 3 - Data plate for the Xx model

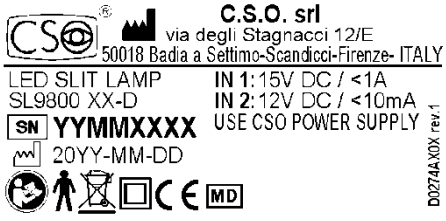


Fig. 4 - Data plate for the Xx-D model

SL9900 device, Xx and Xx-D model

Fig. 5 - Data plate for the Xx model

Fig. 6 - Data plate for the Xx-D model

SL9900 ELITE device, Xx-D model

Fig. 7 - Data plate for the Xx-D model

2.2.3 DATA PLATE OF THE VIDEOCAMERA

Fig. 8 - Data plate of the videocamera for the device SL9800 and SL9900 in the model Xx-D

Fig. 9 - Data plate of the videocamera for the device SL9900 ELITE in the model Xx-D

Fig. 10 - Data plate of the videocamera for the device SL9800 and SL9900 in the model Xx-D

2.2.4 POWER SUPPLY UNIT DATA PLATE

Fig. 11 - Data plate of the power supply unit

2.3 MEDICAL DEVICE CLASSIFICATION

Technical data	Value
Classification in compliance with annexe VIII of Regulation (EU) 2017/745	Class I

2.4 ELECTROMEDICAL DEVICE CLASSIFICATION

Classification based on the IEC 60601-1:2005 + A1:2012 technical standard

Technical data	Value
Type of protection against direct and indirect contacts	Class II
Applied parts	Type B
Protection degree against humidity	IP20 (no protection against infiltration by liquids)
Sterilisation or disinfection method	This device can be disinfected
Degree of protection in the presence of anaesthetics or inflammable detergents	No protection
Degree of electrical connection between device and patient	Devices with part applied to the patient
Use conditions	Continuous functioning

2.5 CLASSIFICATION FOR PHOTOBIOLOGICAL SAFETY

Technical data	Value
Device classification in accordance with EN 15004-2	Risk group 2

2.6 ENVIRONMENTAL CONDITIONS

Phase	Technical data	Min	Max
Transport	Temperature	-40°C	+70°C
	Atmospheric pressure	500 hPa	1060 hPa
	Relative humidity	10%	95%
Storage	Temperature	-10°C	+55°C
	Atmospheric pressure	700 hPa	1060 hPa
	Relative humidity	10%	95%
Use	Temperature	+10°C	+35°C
	Atmospheric pressure	800 hPa	1060 hPa
	Relative humidity	30%	90%

CAUTION
Danger of damage to the device. During transport and storage, the device may be exposed to the environmental conditions described for a maximum period of 15 weeks, if kept in the original package.

2.7 DISPOSAL AT THE END OF THE USEFUL LIFE

Warnings for the correct disposal of the device in accordance with Directive 2012/19/EU and Directive 2011/65/EU relating to the reduction of the use of hazardous substances in electrical and electronic equipment, as well as waste disposal.
At the end of its useful life, the device shall not be disposed of as urban waste. The device may be delivered to designated waste sorting centres set up by the municipal administration or to dealers that offer this service. Separately disposing of an electrical device prevents possible negative consequences for the environment and health, caused by its improper disposal, and lets the materials it is made of to be recycled so as to achieve significant savings of energy and resources. The symbol of the crossed-out wheeled bin is shown on the data plate of the device. The graphic symbol of the crossed-out wheeled bin indicates the obligation to separately collect and dispose of the electrical and electronic equipment at the end of their useful life.

The user has to consider the effects potentially dangerous for the environment and the human health originating from an improper disposal of the whole device or its parts.

In case the user wishes to dispose of the device used at the end of its useful life, the Manufacturer facilitates the possibility of its reuse and the recovery and recycling of the materials contained therein. This to prevent the release of hazardous substances into the environment and to promote conservation of natural resources. Before disposing of the device, it is necessary to take into consideration the European and national regulations that order what follows:

- not to dispose as urban waste but collect it separately and address to a firm specialized in the disposal of electrical and electronic equipment or to the local administration in charge for waste collection
- in the event that a new device is purchased from the same Manufacturer to replace an old one placed on the market before 13 August 2005, equivalent and with the same functions of the new device, the Distributor or Manufacturer are legally required to collect the old device
- if the user decides to dispose a used device, put on the market after the 13th August 2005, the Distributor or the Manufacturer have to collect it
- the Manufacturer takes care, by joining a consortium for electronic waste, of the treatment and the recycling of the used device by paying its costs

The Manufacturer is available to provide the user with information regarding the dangerous substances contained in the device, the recycling of these substances and the potential reuse of the used device.
Strict administrative sanctions for transgressors are provided for by law.
For specific information about the disposal in countries other than Italy, contact the local Dealer.

3 DEVICE DESCRIPTION

3.1 SUPPLY DESCRIPTION

SL9800 device

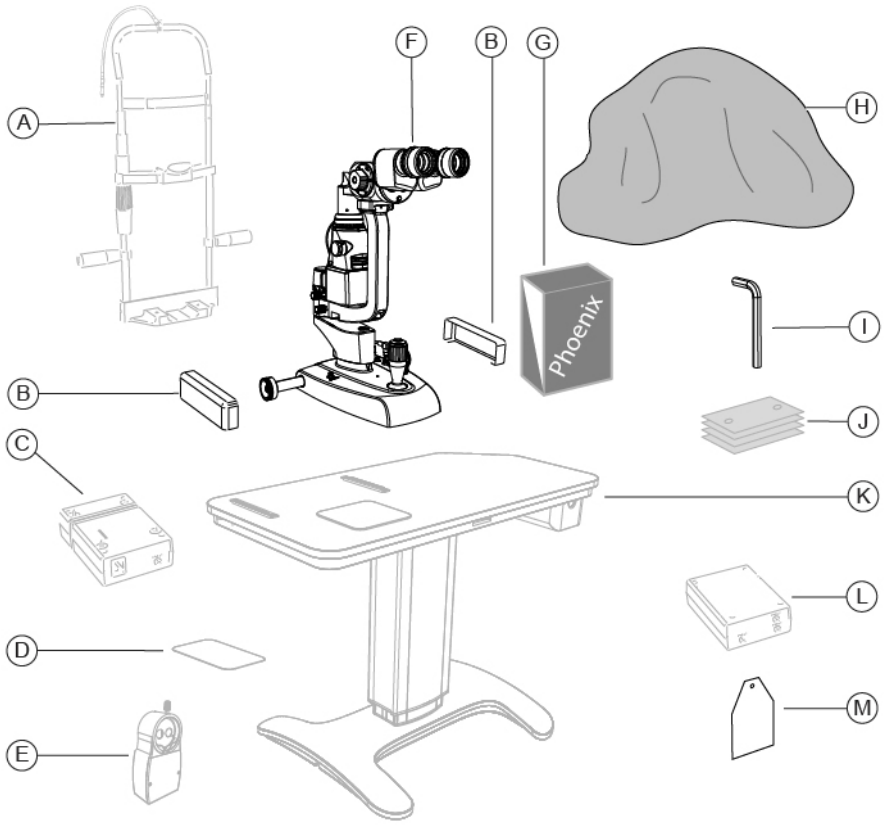


Fig. 12 - Supply description

Pos	Name		Description
A	Chin rest	Optional (*)	Adjustable height. Adjustable distance between chin and forehead. Fixation point included.
B	Wheel cover		Protection against accidental crushing of fingers.
C	Power supply unit	Optional (*)	A cable is provided with the power supply unit.
D	Sticker pad	Optional (*)	Sticker for right/left identification.
E	Beam splitter	Optional	Digital beam splitter with connection cables. Only compatible with 3x, 5x and zoom magnification adjusters.
F	Device		Consisting of an observation unit with microscope and a lighting assembly with LED illumination installed at the bottom.
G	Application software	Optional	Application software for image acquisition and device management. When the videocamera is installed, the device shall be used in conjunction with the Phoenix application software.
H	Dust cover		Place on the device when not in use to protect it from dust.
I	Hexagon wrench with screws		
J	Chin cup papers	Optional	Papers to be placed on the chin cup of the chin rest.
K	Ophthalmic table	Optional	Table top with support base equipped with one or two columns and electric height adjustment. Drawer and auxiliary power sockets with cable guides.
L	Isolation transformer	Optional	230V/230V for the use of the non-electromedical devices in the patient area.
M	Breathing shield		

Optional: accessory not provided with the basic supply.
Accessories marked with (*) are essential for the proper functioning of the device.

SL9900 device

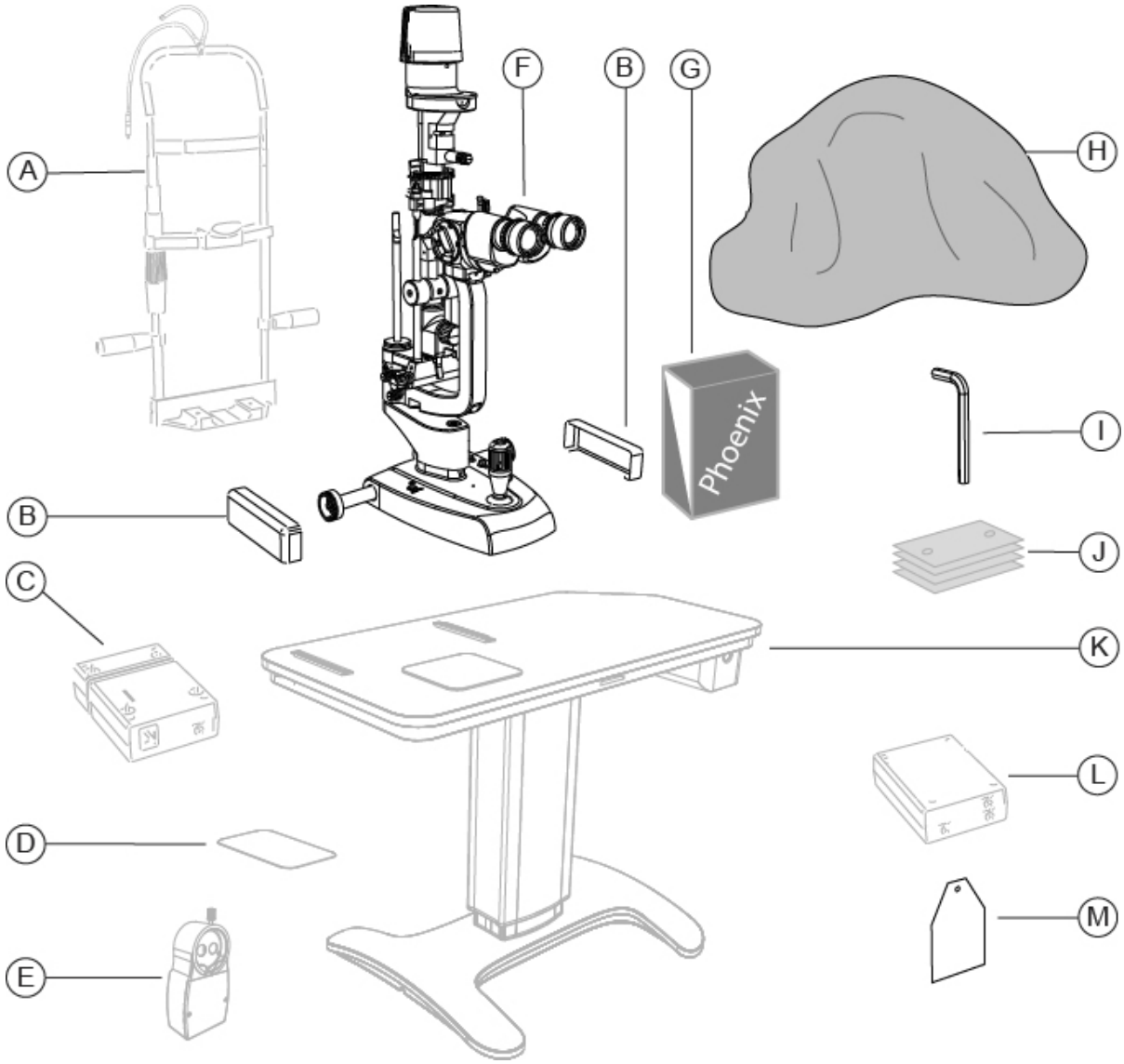


Fig. 13 - Supply description

Pos	Name		Description
A	Chin rest	Optional (*)	Adjustable height. Adjustable distance between chin and forehead. Fixation point included.
B	Wheel cover		Protection against accidental crushing of fingers.
C	Power supply unit	Optional (*)	A cable is provided with the power supply unit.
D	Sticker pad	Optional (*)	Sticker for right/left identification.
E	Beam splitter	Optional	Digital beam splitter with connection cables. Only compatible with 3x, 5x and zoom magnification adjusters.
F	Device		Consisting of an observation unit with microscope and a lighting assembly with LED illumination installed at the top. The device is equipped with a system of oscillation of the lighting assembly.
G	Application software	Optional	Application software for image acquisition and device management. When the videocamera is installed, the device shall be used in conjunction with the Phoenix application software.
H	Dust cover		Place on the device when not in use to protect it from dust.
I	Hexagon wrench with screws		
J	Chin cup papers	Optional	Papers to be placed on the chin cup of the chin rest.
K	Ophthalmic table	Optional	Table top with support base equipped with one or two columns and electric height adjustment. Drawer and auxiliary power sockets with cable guides.
L	Isolation transformer	Optional	230V/230V for the use of the non-electromedical devices in the patient area.
M	Breathing shield		

Optional: accessory not provided with the basic supply.
Accessories marked with (*) are essential for the proper functioning of the device.

Device SL9900 ELITE

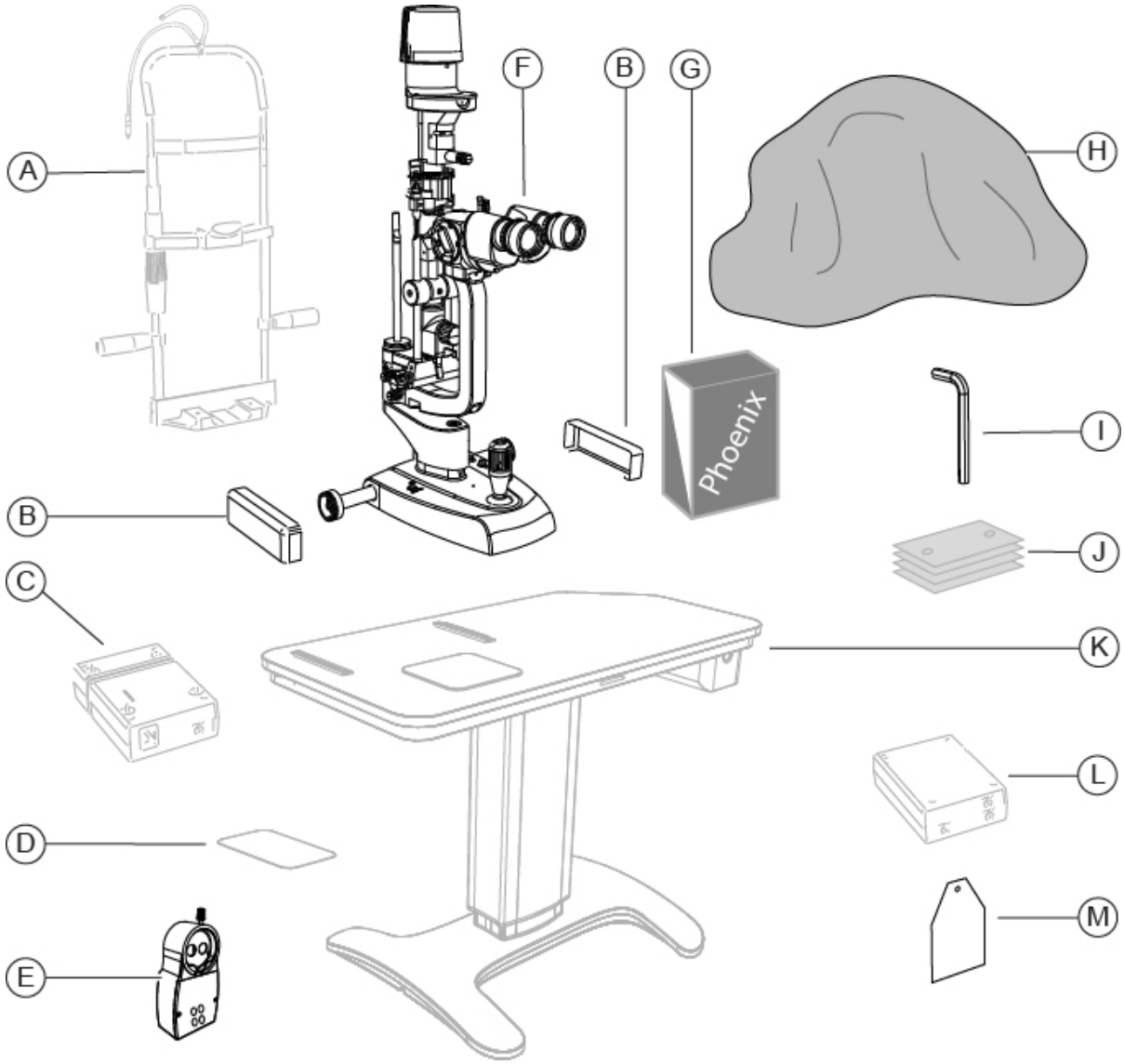


Fig. 14 - Supply description

Pos	Name		Description
A	Chin rest	Optional (*)	Adjustable height. Adjustable distance between chin and forehead. Fixation point included.
B	Wheel cover		Protection against accidental crushing of fingers.
C	Power supply unit	Optional (*)	A cable is provided with the power supply unit.
D	Sticker pad	Optional (*)	Sticker for right/left identification.
E	Beam splitter	Optional	Digital beam splitter with connection cables. Only compatible with 3x, 5x and zoom magnification adjusters. The beam splitter is equipped with function keys for a quick access to the operating settings customized by the operator.
F	Device		Consisting of an observation unit with microscope and a lighting assembly with LED illumination installed at the top. The device is equipped with a system of oscillation of the lighting assembly.
G	Application software	Optional	Application software for image acquisition and device management. When the videocamera is installed, the device shall be used in conjunction with the Phoenix application software.
H	Dust cover		Place on the device when not in use to protect it from dust.
I	Hexagon wrench with screws		
J	Chin cup papers	Optional	Papers to be placed on the chin cup of the chin rest.
K	Ophthalmic table	Optional	Table top with support base equipped with one or two columns and electric height adjustment. Drawer and auxiliary power sockets with cable guides.
L	Isolation transformer	Optional	230V/230V for the use of the non-electromedical devices in the patient area.
M	Breathing shield		

Optional: accessory not provided with the basic supply.
Accessories marked with (*) are essential for the proper functioning of the device.

3.1.1 SL9800 DEVICE

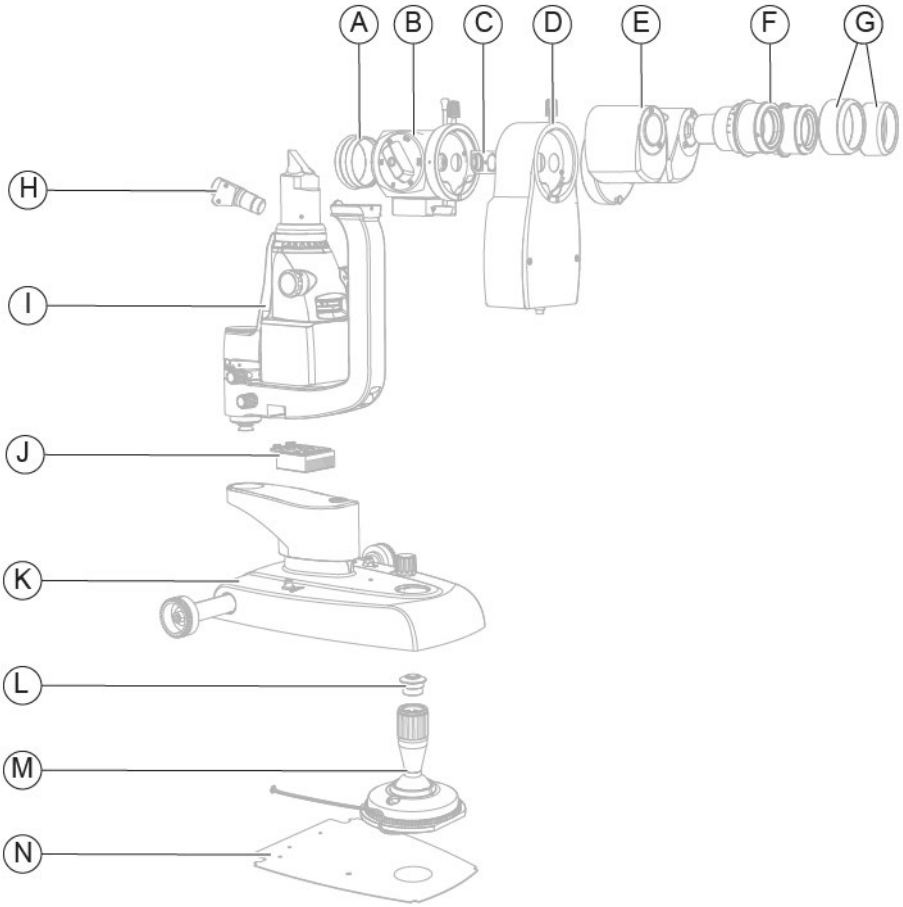


Fig. 15 - SL9800 device

Pos	Description
A	Magnification adjuster lens
B	Magnification adjuster
C	Yellow filter
D	Beam splitter (*)
E	Binoculars
F	Eyepieces
G	Eyepiece covers
H	Illuminator (*)
I	Lighting assembly complete with arm
J	Lighting unit
K	Base (*)
L	Joystick button (*)
M	Joystick
N	Plate (*)

The parts marked with (*) vary by device configuration and may not be present or may differ from illustrations.

For the full list of parts and their features, refer to the **"Spare parts and accessories list" on page 170.**

3.1.2 SL9900 DEVICE

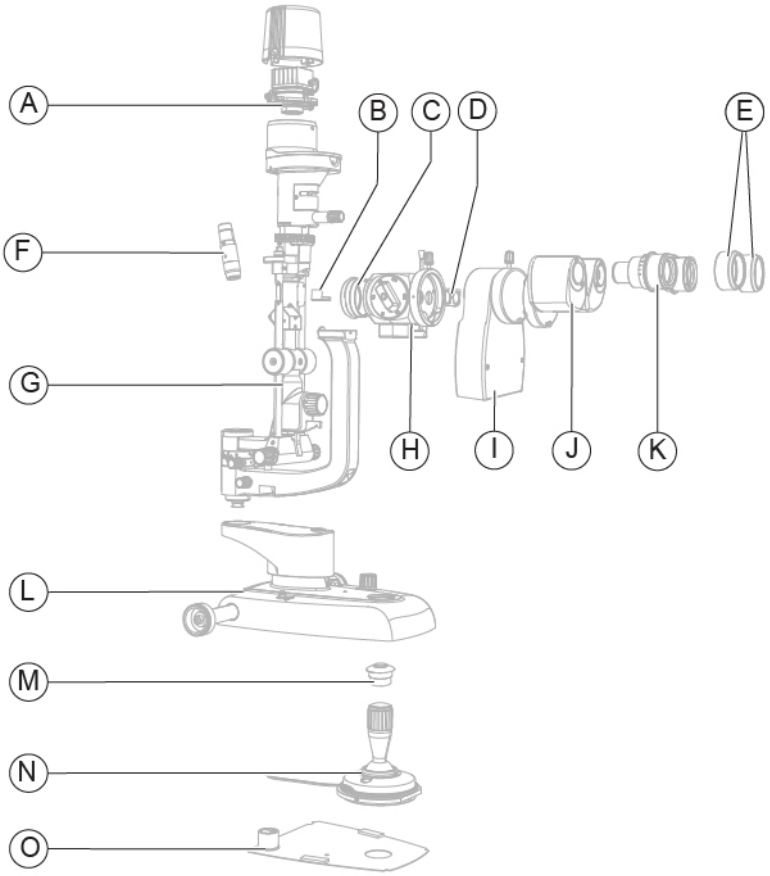


Fig. 16 - SL9900 device

Pos	Description
A	Lighting unit
B	Light diffusing filter
C	Magnification adjuster lens
D	Yellow filter
E	Eyepiece covers
F	Illuminator (*)
G	Lighting assembly
H	Magnification adjuster
I	Beam splitter (*)
J	Binoculars
K	Eyepieces
L	Base (*)
M	Joystick button (*)
N	Joystick
O	Plate (*)

The parts marked with (*) vary by device configuration and may not be present or may differ from illustrations.

For the full list of parts and their features, refer to the **"Spare parts and accessories list" on page 170.**

3.1.3 DEVICE SL9900 ELITE

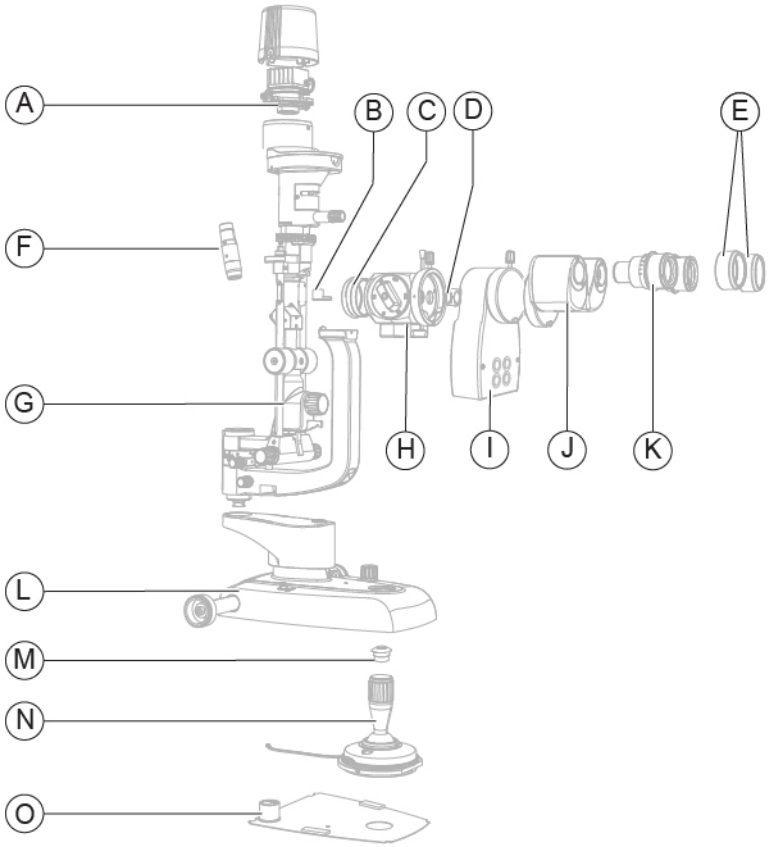


Fig. 17 - SL9900 ELITE device

Pos	Description
A	Lighting unit
B	Light diffusing filter
C	Magnification adjuster lens
D	Yellow filter
E	Eyepiece covers
F	Illuminator
G	Lighting assembly
H	Magnification adjuster
I	Beam splitter with function keys
J	Binoculars
K	Eyepieces
L	Base
M	Joystick button
N	Joystick
O	Plate

For the full list of parts and their features, refer to the **"Spare parts and accessories list" on page 170.**

3.1.4 POWER SUPPLY UNIT

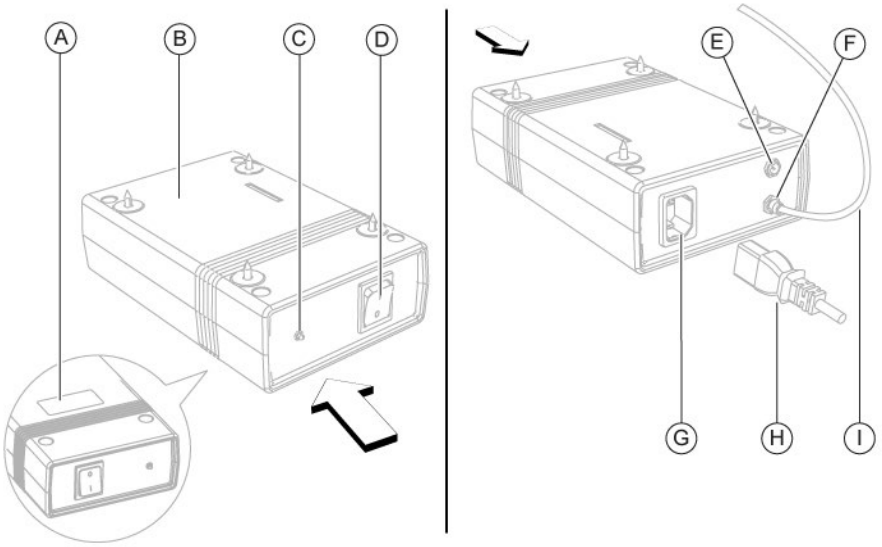


Fig. 18 - Power supply unit

Pos	Description
A	Data plate
B	Power supply unit
C	Power indicator light
D	Power switch
E	Power cable connector of the fixation point
F	Connector of the device power supply cable
G	Connector of the power supply unit power supply cable
H	Power supply cable of the power supply unit
I	Device power supply cable

3.1.5 CHIN REST

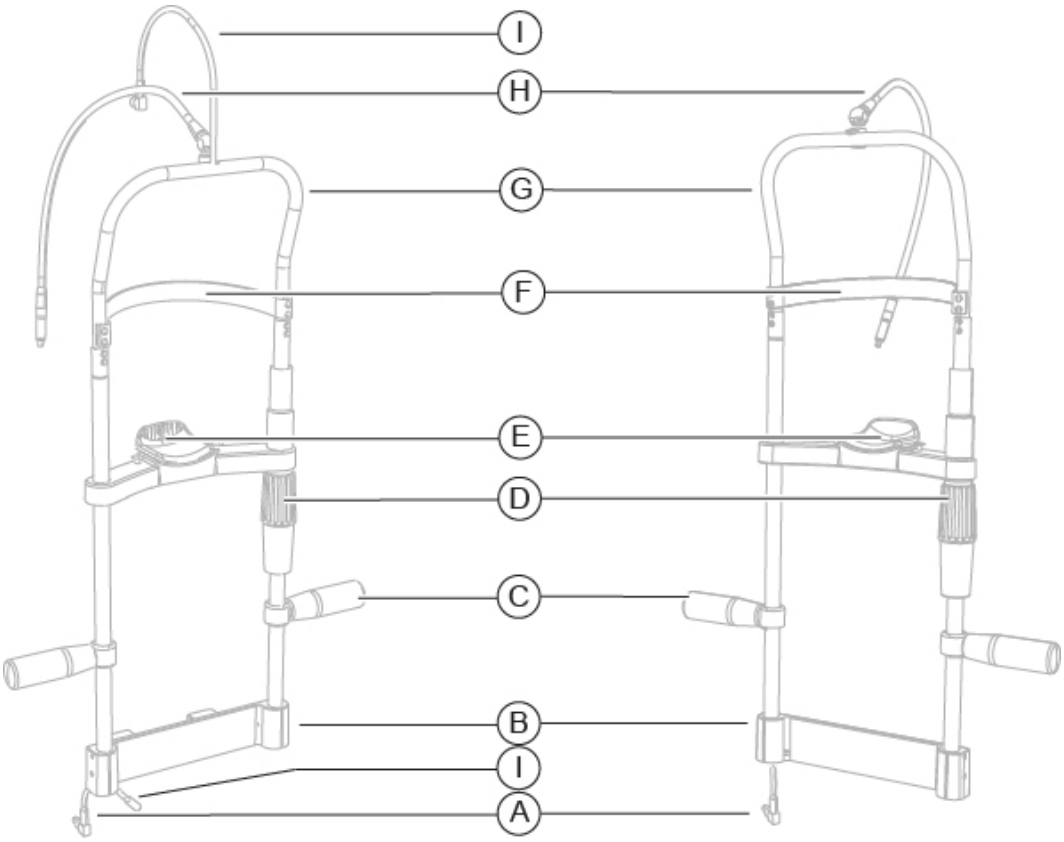


Fig. 19 - Chin rest for SL9900 and SL9900 ELITE device (left) and for SL9800 device (right)

Pos	Description
A	Power cable of the fixation point
B	Chin rest support
C	Chin rest handle
D	Chin cup adjustment knob
E	Chin cup
F	Forehead rest
G	Chin rest structure
H	Fixation point
I	Connection cable between the base and the lighting unit

3.1.6 PERSONAL COMPUTER

If the beam splitter is installed on the device, the device shall be used in conjunction with a PC and the Phoenix application software.

Read the document "Minimum PC requirements" which can be downloaded from the website www.csoitalia.it under the section "Documents - Software download" (registration required).
Read the instructions for use of the application software.

Fig. 20 - Personal Computer

The PC shall comply with standard IEC 60950-1 Information technology equipment - Safety - Part 1: General requirements.
If the PC is installed in the patient area it is necessary to install an isolation transformer compliant with the directive IEC 60601-1:2005 + A1:2012- "Medical electrical equipment - Part 1: General requirements for basic safety and essential performance".

It is possible to connect other accessories to the PC (printer, modem, scanner, etc) through the ports interfaces.
Accessories (printer, modem, scanner, etc.) shall be installed outside the patient area.

The accessories shall comply with standard IEC 60950-1 Information technology equipment - Safety - Part 1: General requirements.
If the accessories are installed in the patient area it is necessary to install an isolation transformer compliant with the directive IEC 60601-1:2005 + A1:2012 - "Medical electrical equipment - Part 1: General requirements for basic safety and essential performance".

PC technical specifications:

CPU	I3 or higher (I5 recommended)
CHIPSET	Intel
RAM	4 Gbyte or higher (8 Gbyte recommended)
VIDEO CARD	1 Gbyte of non-shared memory
RESOLUTION	1280x960 or higher
PORT	USB 3.0
OPERATING SYSTEM	Windows 10 (64 bit)

3.2 TECHNICAL DATA

3.2.1 SL9800

Technical data	Value
Supply voltage	120-230 V ±10% | 50/60 Hz | 1 A
Size (HxWxD)	440 x 313 x 335 mm
Device weight	7.4 kg
Base movement (x, y, z)	105 x 110 x 30 mm
Fine movement (x, y)	14 ± 0.5 mm
Main unit package size	525 x 770 x 380 mm
Table top package size	680 x 530 x 195 mm
Accessories package size	355 x 245 x 240 mm
Consumables	Package of chin cup papers

Illumination

Technical data	With prism-holder head	With split head
Slit projection index	1,33X	1,33X
Slit width (continuous setting)	0 - 15 mm	0 - 15 mm
Slit length (continuous setting)	1 - 15 mm	1 - 15 mm
Maximal length of the slit	15 mm	15 mm
Aperture diaphragms	15, 9, 5.5, 0.3 mm	15, 9, 5.5, 0.3 mm
Filters	Blue, red, green (red free)	Blue, red, green (red free)
Illuminator	White LED	White LED
Slit rotation	±90° continuous on Tabo system	±90° continuous on Tabo system
Incidence angle	0° horizontal	Total angle 10.2°
Rotation interval of the slit projector	±90°, angular scale, reference on 0°	±90°, angular scale, reference on 0°
Working distance (prism outlet/patient's eye distance)	69.5 mm	80 mm
Device operating voltage	15V DC 1A	15V DC 1A
Light source type	White LED	White LED
Luminosity adjustment	Continuous adjustment	Continuous adjustment
Luminous intensity	284000 Lux	284000 Lux
Colour temperature	3100K	3100K

Chin rest

Technical data	Value
Fixation point	Red light adjustable
Chinrest stroke	70 mm ±1

3.2.2 SL9900 AND SL9900 ELITE

Technical data	Value
Supply voltage	120-230 V ±10% | 50/60 Hz | 1 A
Size (HxWxD)	675 x 313 x 335 mm
Device weight (Xx, Xx-D)	7.8 kg
Device weight (ELITE Xx-D)	7.8 kg
Base movement (x, y, z)	105 x 110 x 30 mm
Fine movement (x, y)	14 ± 0.5 mm
Main unit package size	525 x 770 x 380 mm
Table top package size	680 x 530 x 195 mm
Accessories package size	355 x 245 x 240 mm
Consumables	Package of chin cup papers

Illumination

Technical data	Value
Slit projection index	1X
Slit length (continuous setting)	1 - 12 mm
Slit width (continuous setting)	0 - 12 mm
Maximal length of the slit	12 mm
Aperture diaphragms	12, 9, 5.3, 1, 0.2 mm
Filters	Blue, red, green (red free), grey
Illuminator	White LED
Slit rotation	±90° continuous on Tabo system
Incidence angle	Variable 0° / 5° / 10° / 15° / 20°
Rotation interval of the slit projector	±90°, angular scale, reference on 0° and ±10°
Operation distance (prism outlet/patient's eye distance)	80 mm
Horizontal decentration	± 4° reference on 0°
Device operating voltage	15V DC 1A
Light source type	White LED
Luminosity adjustment	Continuous adjustment
Luminous intensity	284000 Lux

Chin rest

Technical data	Value
Fixation point	Red light adjustable
Chinrest stroke	70 mm ±1

3.2.3 MAGNIFICATION ADJUSTER

The magnification adjuster features differ by the chosen configuration: 2x, 3x, 5x and zoom.

Magnification adjuster 2x

Technical data	Value
Type	Convergent - 2 positions
Ocular convergence angle	13°
Eyepieces	10x
Refractive error compensation	±8 D
Declared magnifications	10x / 16x
Visual field	18,5mm / 12mm
Interpupillary distance	from 51.5 mm to 87 mm

Magnification adjuster 3x

Technical data	Value
Type	Galilean convergent with magnification change system - 3 positions
Ocular convergence angle	6°
Eyepieces	12,5x
Refractive error compensation	±8 D
Declared magnifications	10x / 16x / 25x (3 levels)
Real corresponding magnifications	8,5x / 14,8x / 25,6x (3 levels)
Visual field	From 26 mm to 8.5 mm (3 levels)
Interpupillary distance	From 50 mm to 80 mm
Barrier filter	Yellow

Magnification adjuster 5x

Technical data	Value
Type	Galilean convergent with magnification change system - 5 positions
Ocular convergence angle	6°
Eyepieces	12,5x
Refractive error compensation	±8 D
Declared magnifications	6x / 10x / 16x / 25x / 40x (5 levels)
Real corresponding magnifications	5,6x / 8,5x / 14,8x / 25,6x / 39,3x (5 levels)
Visual field	From 41 mm to 5.7 mm
Interpupillary distance	From 50 mm to 80 mm
Barrier filter	Yellow

Magnification adjuster Zoom

Technical data	Value
Type	Galilean convergent with continuous variable magnification adjuster
Ocular convergence angle	6°
Eyepieces	12,5x
Refractive error compensation	±8 D
Declared magnifications	7x / 30x
Visual field	From 30 mm to 7.4 mm
Interpupillary distance	From 50 mm to 80 mm
Barrier filter	Yellow

3.2.4 BEAM SPLITTER

Technical data	Value
Resolution	5 Mpx
Pixel resolution	2448x2048
Frame rate	35 fps
Communication port	USB 3.0

4 INSTALLATION

4.1 ASSEMBLING THE INSTALLATION ACCESSORIES ON THE TABLE TOP

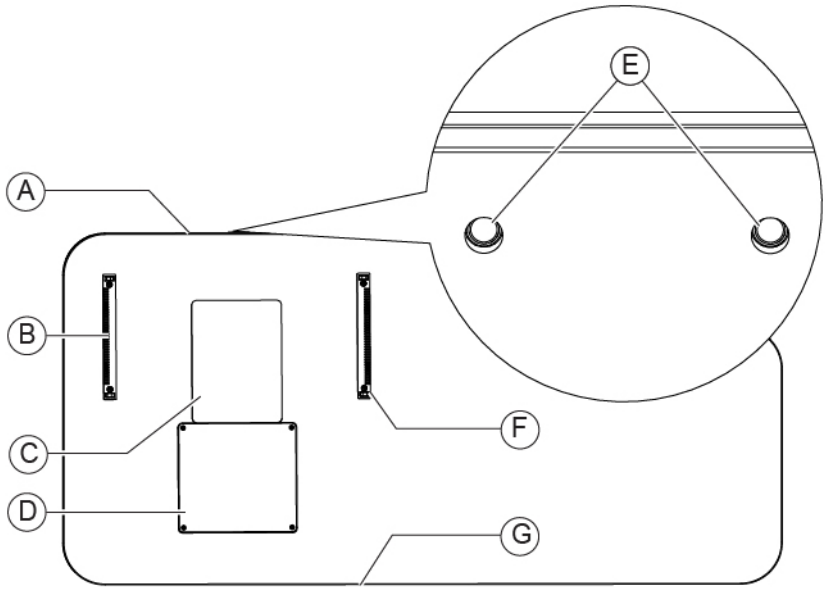


Fig. 21 - Installation accessories on the table top

Pos	Description
A	Front edge of the table top (Patient side)
B	Left guide rail
C	Sticker pad
D	Sliding plate
E	Inserts for fixing the chin rest on the underside of the table top
F	Right guide rail
G	Rear edge of the table top (Operator side)

Procedure for assembling the installation accessories on the table top:

1 Install the right and left guide rails on the table top.
Use self-tapping screws Ø 2.9 x 13.
2 Install the sliding plate on the table top.
Use self-tapping screws Ø 2.2 x 2.9. Alternatively, apply the adhesive plate (code 100710831).

The two guides shall be placed equidistant from the central axis, keeping them aligned with the inserts placed on the underside of the table top.

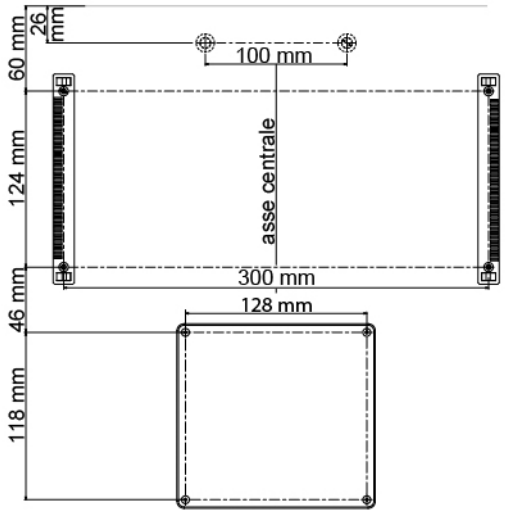


Fig. 22 - Distances for installation on the table top

3 Carefully clean the surface of the table top.
4 Verify the sticker pad position respectively to the central axis (A).
5 Remove the protective film. Place the sticker pad between the two guides and the sliding plate.

Respect the indicated distances while placing the sticker pad on the table top.

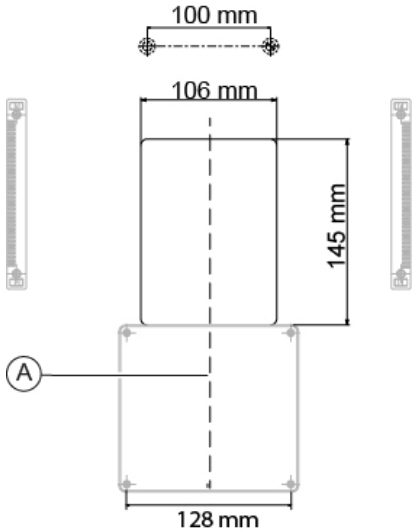


Fig. 23 - Distances for installing the sticker pad

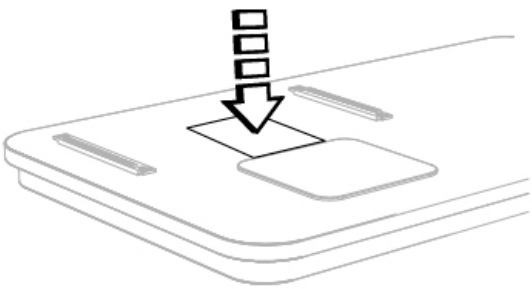


Fig. 24 - Place the sticker pad

4.2 INSTALLING THE DEVICE

CAUTION
Danger of falling device. The device must be installed on a horizontal and stable surface.

1 Install the guides, the sliding plate and the sticker pad as described in paragraph **"Assembling the installation accessories on the table top" on page 27.**
2 Place the power supply unit under the table top. Screw the screws into the four holes.

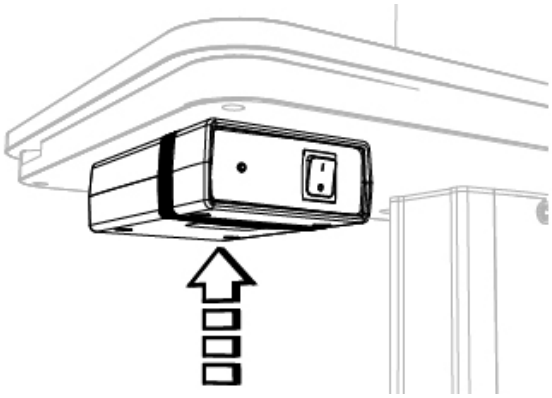


Fig. 25 - Place the power supply unit

3 Remove the joystick protection (A) placed under the device base.

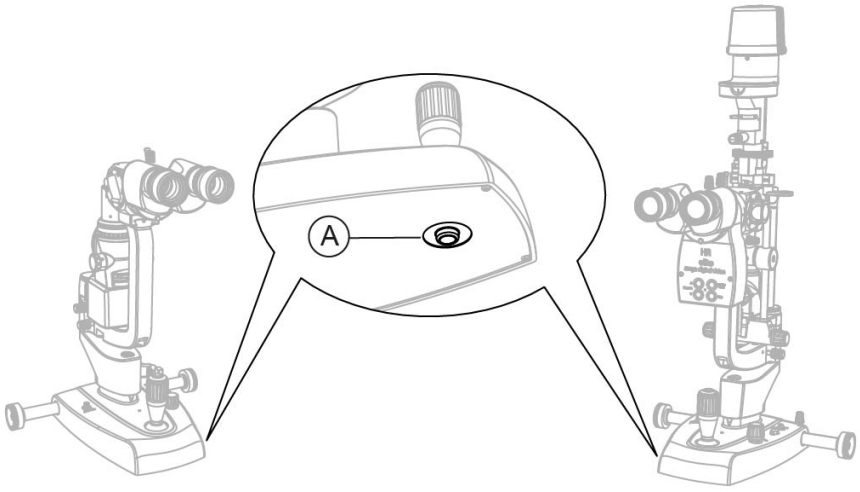


Fig. 26 - Remove the joystick protection

4 Place the device on the table top and align the cogwheels on the guide rails.
5 Install the two wheel covers on the guides on the table top.

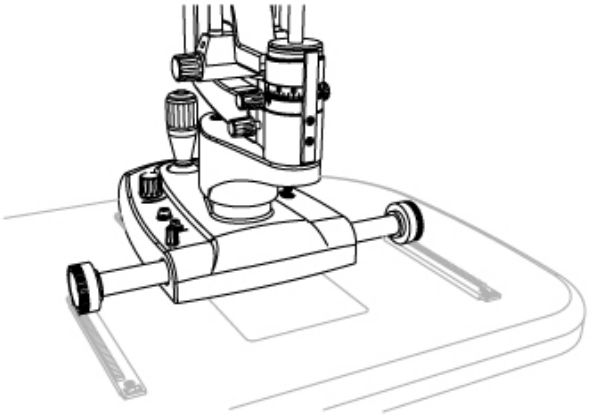


Fig. 27 - Place the device

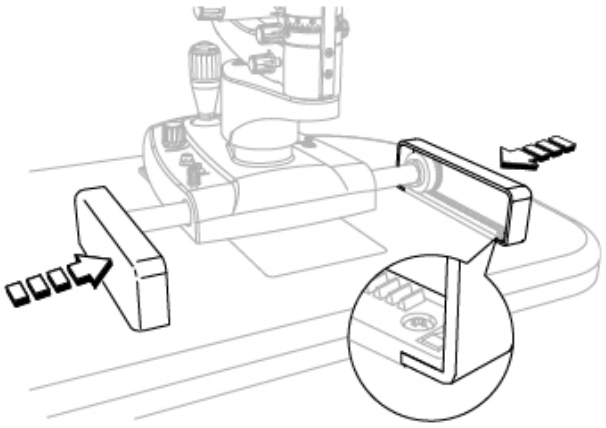


Fig. 28 - Install the wheel covers

6 Install the chinrest. Under the table top there are two inserts to fasten the chin rest support to the table top.

The chin rest shall be installed so that the eye level indicator (1) is placed at a height of 380 mm from the table top.

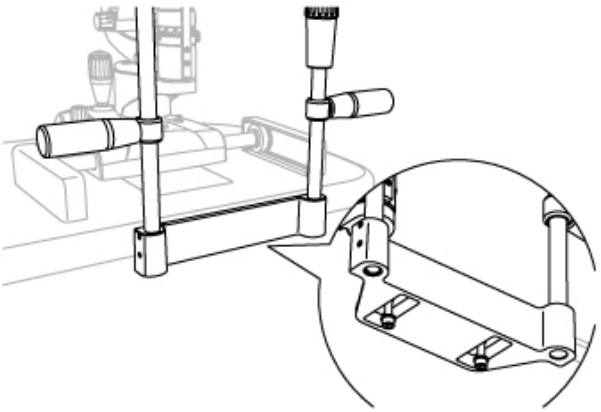


Fig. 29 - Place the chin rest

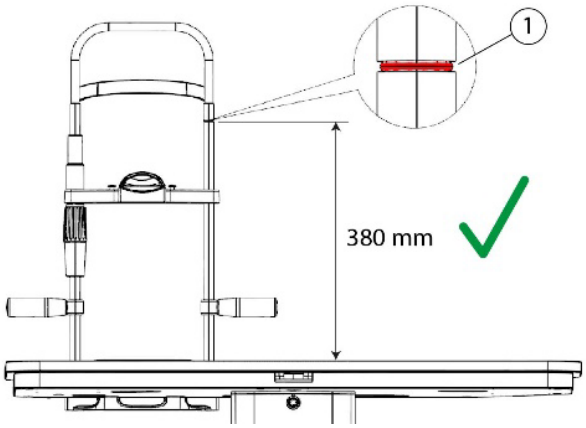


Fig. 30 - Correct height of the eye level indicator

7 If the eye level indicator does not reach the required height, adjust the chin rest.
8 Loosen the 4 locking grub screws placed on the chinrest support.
9 Slide the rods of the chin rest until reaching the required height of 380 mm. Tighten the previously loosened locking grub screws.

The chin rest rods shall be adjusted upwards no more than 15 mm.

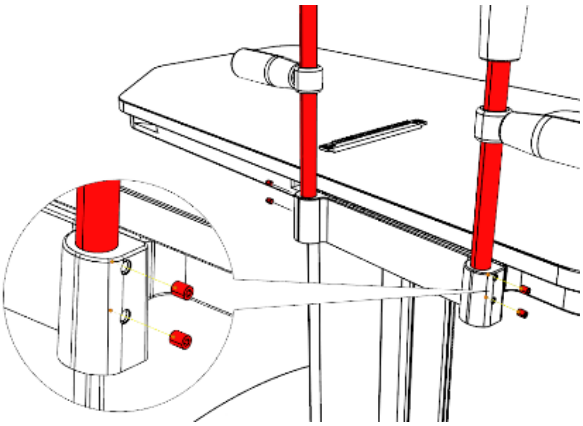


Fig. 31 - Loosen the grub screws of the chin rest

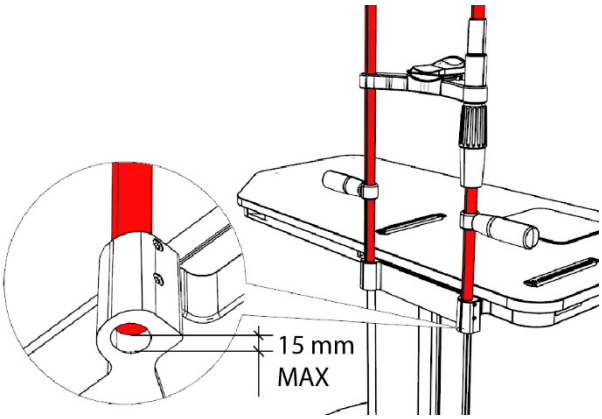


Fig. 32 - Maximum adjustment height of the rods

10 Carry out the electrical connections between the components.

4.3 DEVICE CONNECTIONS

SL9800 [Standard configuration]

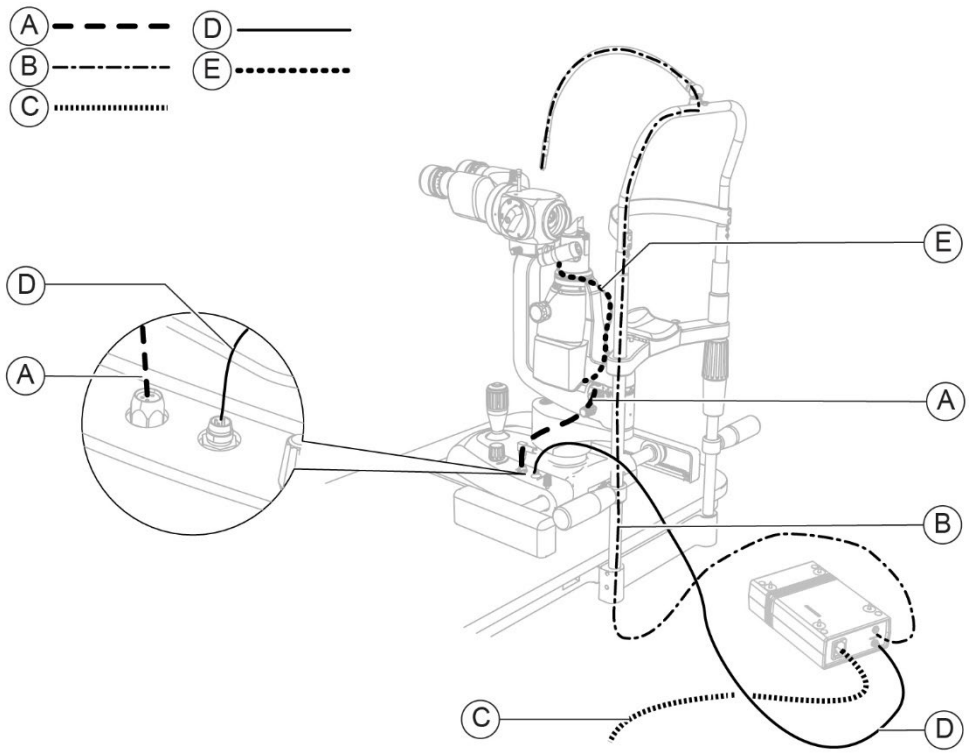


Fig. 33 - SL9800 connections [Standard configuration]

Pos	Name
A	Connection cable between the base and the lighting unit
B	Power cable of the fixation point
C	Power supply cable of the power supply unit
D	Device power supply cable
E	Connection cable between the lighting unit and the illuminator (*)

The parts marked with (*) are optional.

For the electrical connections of the ophthalmic table, see the instructions for use of the ophthalmic table or the ophthalmic unit.

SL9800 [Digital configuration]

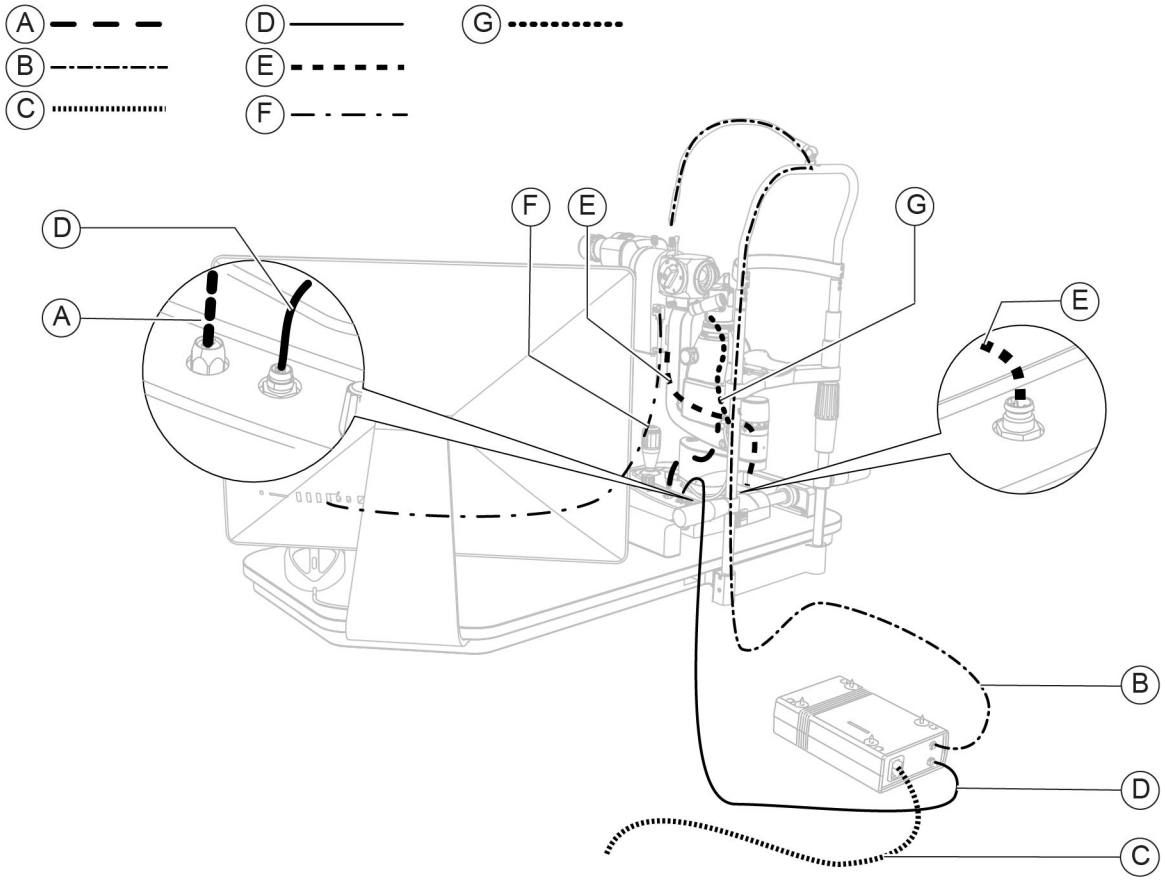


Fig. 34 - SL9800 connections [Digital configuration]

Pos	Name
A	Connection cable between the base and the lighting unit
B	Power cable of the fixation point
C	Power supply cable of the power supply unit
D	Device power supply cable
E	Connection cable between the base and the beam splitter
F	Connection cable between the beam splitter and the PC
G	Connection cable between the lighting unit and the illuminator (*)

The parts marked with (*) are optional.

For the electrical connections of the ophthalmic table, see the instructions for use of the ophthalmic table or the ophthalmic unit.

SL9900 [Standard configuration]

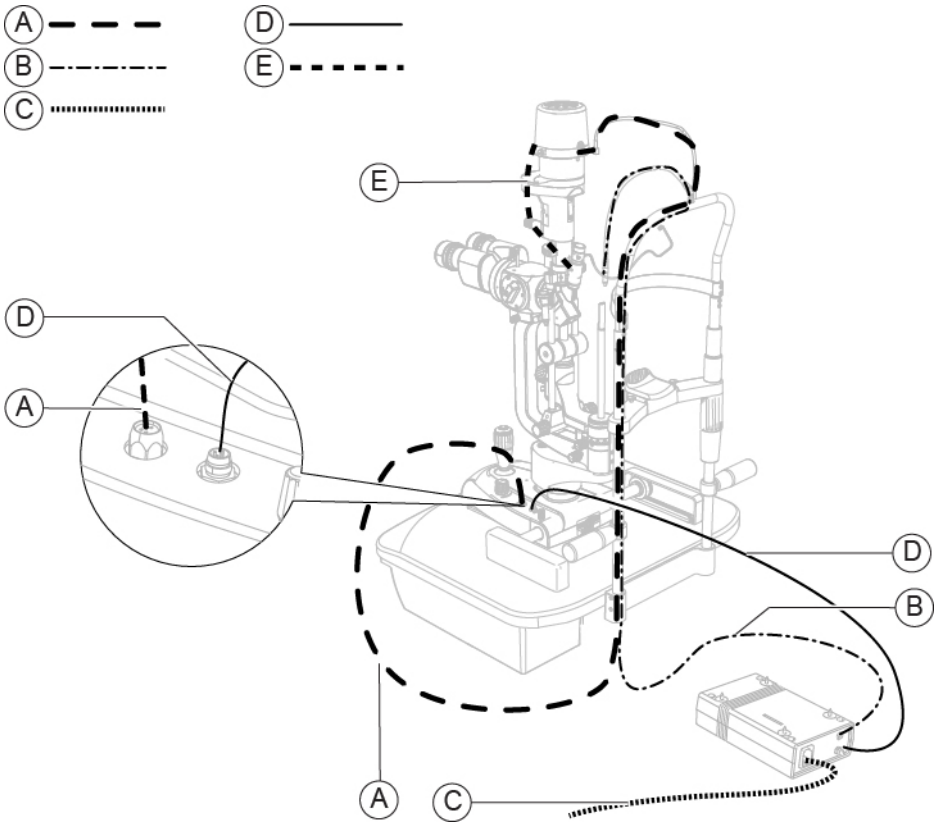


Fig. 35 - SL9900 connections [Standard configuration]

Pos	Name
A	Connection cable between the base and the lighting unit
B	Power cable of the fixation point
C	Power supply cable of the power supply unit
D	Device power supply cable
E	Connection cable between the lighting unit and the illuminator (*)

The parts marked with (*) are optional.

For the electrical connections of the ophthalmic table, see the instructions for use of the ophthalmic table or the ophthalmic unit.

SL9900 and SL9900 ELITE [Digital configuration]

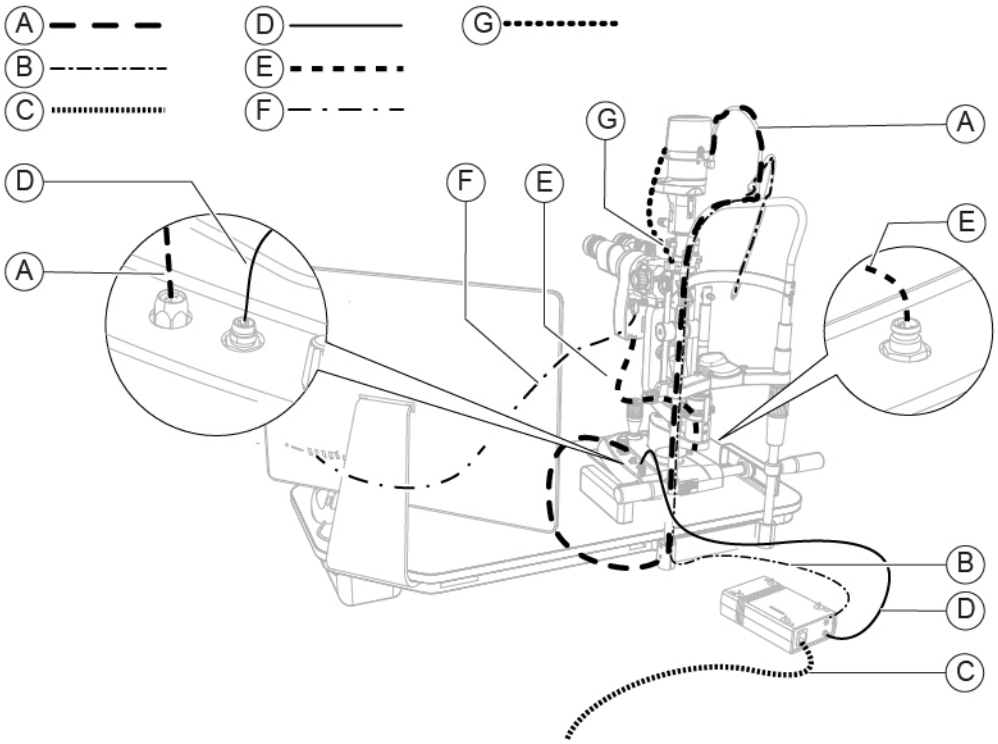


Fig. 36 - SL9900 and SL9900 ELITE connections [Digital configuration]

Pos	Name
A	Connection cable between the base and the lighting unit
B	Power cable of the fixation point
C	Power supply cable of the power supply unit
D	Device power supply cable
E	Connection cable between the base and the beam splitter
F	Connection cable between the beam splitter and the PC
G	Connection cable between the lighting unit and the illuminator (*)

The parts marked with (*) are optional.

For the electrical connections of the ophthalmic table, see the instructions for use of the ophthalmic table or the ophthalmic unit.

4.4 POSITIONING OF ELECTRICAL CABLES

CAUTION
Danger of falling device. Do not leave loose cables which may represent an obstacle or danger for the patient or operator.

CAUTION
Danger of stumbling and falling. Do not let the power or connection cables free in a place where people could walk.

CAUTION
Risk of electric shock. Do not leave the power supply cables in contact with sharp edges or cutting parts. Always collect and fasten the power supply cables.

It is forbidden to use any extension cable not authorized by the device Manufacturer.

For the proper placement of electrical cables and connection to the elevation column, read the instructions for use of ophthalmic tables or of ophthalmic units. The instruction manual can also be downloaded from the website www.csoitalia.it.

The power socket located on the lower part of the column of the ophthalmic table is specific for the connection to the power grid. One of the power sockets placed at the top of the lifting column is dedicated to the power supply unit of the device.

4.5 PHOENIX APPLICATION SOFTWARE - [DIGITAL CONFIGURATION]

4.5.1 INSTALLING THE PHOENIX APPLICATION SOFTWARE

The following procedure refers to installing the Phoenix application software on a Windows 10 operating system.

1 Switch the power switch of the power supply unit to ON.
2 Turn on the PC.
3 Make sure you have the required authorisations (administrator rights) before starting the installation procedure.
4 When active, temporarily disable all antivirus protections.
5 Start the installation of the Phoenix application software.
6 Insert the CD-ROM or the USB memory and wait for the installation procedure to start. If the Autorun function of the operating system is disabled, manually start the "Setup.exe" executable file.
7 If Microsoft .NET 3.5 Framework is not installed on your PC, the download and installation window will appear (requires internet connection).

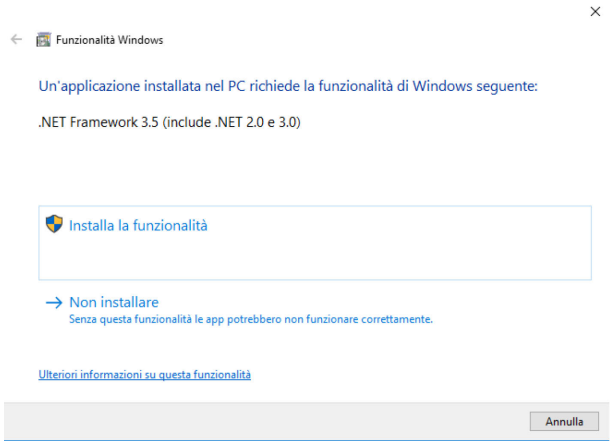


Fig. 37 - License agreement

8 Once the procedure described below is complete, or if Microsoft .NET 3.5 Framework is already installed, click on NEXT in the "Setup Wizard" screen to start software installation.

Fig. 38 - Installation confirmation

9 Select the destination path of the file. If possible, do not change the default displayed path.

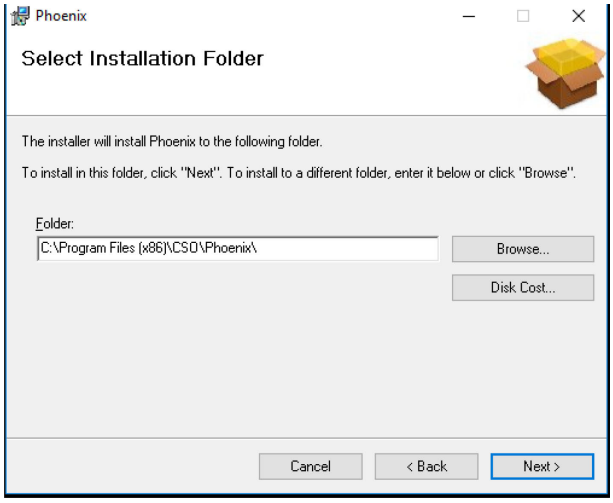


Fig. 39 - Selecting the installation folder

10 Click on NEXT to start the installation.

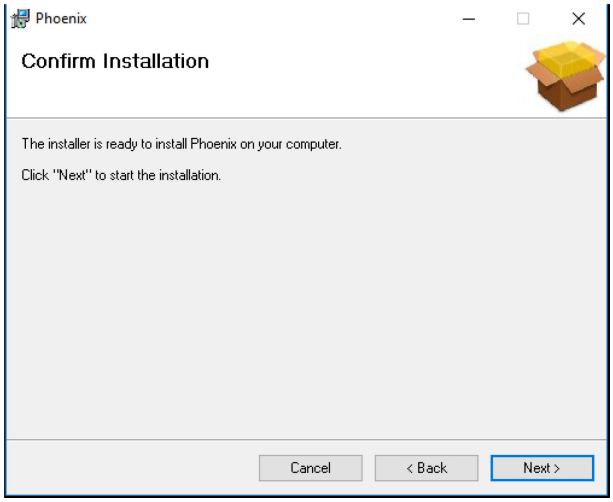


Fig. 40 - Installation confirmation

11 At the end of the installation, click on OK to confirm and proceed with the installation of a demo database. Otherwise, click on CANCEL.

12 Select the desired destination folder and click on OK.

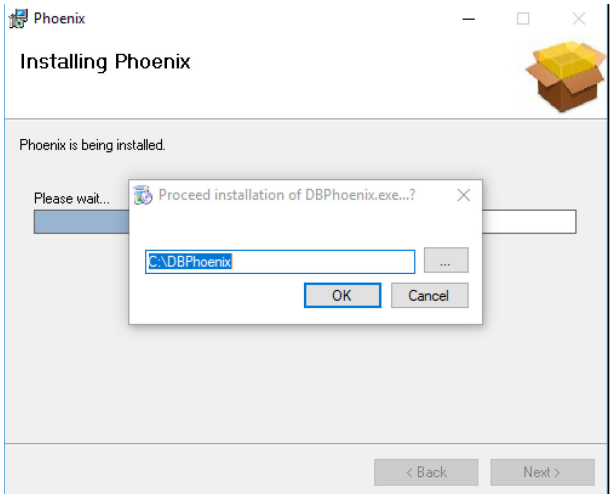


Fig. 41 - Selecting the destination folder

13 After installing the demo database, click on CLOSE to complete the procedure.

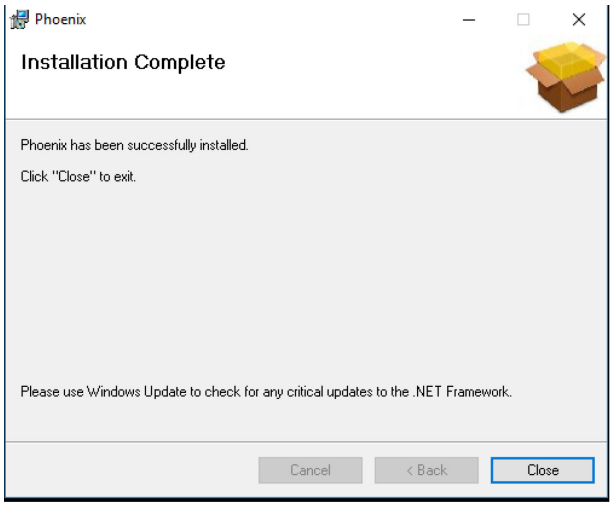


Fig. 42 - Installation completed

14 When the installation is complete, the shortcut icon  will appear on the desktop.

The application software needs administrator privileges to run. If this requirement conflicts with the Company's security policy, contact the CSO Technical Assistance to consider possible solutions.

15 After the registration procedure, connect with the database through the database configuration window.
- If the database has been created during the installation, click on OK.
- If the database already exists, click on BROWSE and select the desired Phoenix.mdb file.

16 Now the application can be run using the desktop shortcut.

17 In case of first run, refer to the software activation and registration procedure.

18 If the database does not already exist, click on BROWSE and select the desired Phoenix.mdb file.

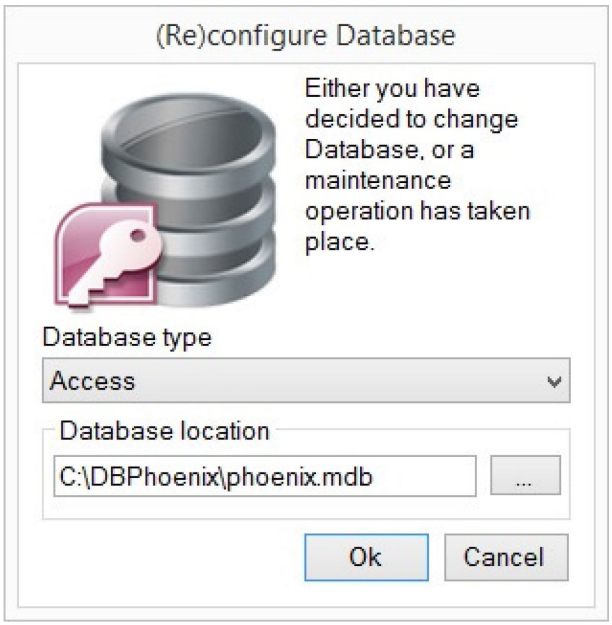


Fig. 43 - Database configuration

19 The application is now ready to be used. Please read the section on managing patients and exams from the Phoenix application software handbook.

4.5.2 ACTIVATION AND REGISTRATION OF THE PHOENIX APPLICATION SOFTWARE

A license module is available.

- LITE

1 Verify the device serial number. All the devices released from 2016 contain their own license. Thus, the software is self-activated when the device is connected to the USB port. In the lower part of the screen a popup that shows the license number, the P-number and the serial number found on the device will be visualized. It won't be necessary to proceed with the activation procedure. Otherwise, proceed with the installation procedure as described below.

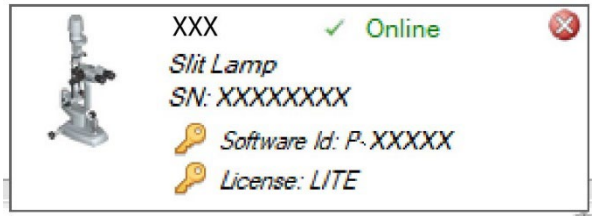


Fig. 44 - Popup window

2 Click on USE FREE TRIAL to start the software in DEMO mode. This mode includes the same functions as the LITE license, but can be run 60 times before preventing the software restart.

3 Enter the 5-digit P-number. The P-number, which is the software license identifier, is found on the device data plate or has been provided by the Supplier.

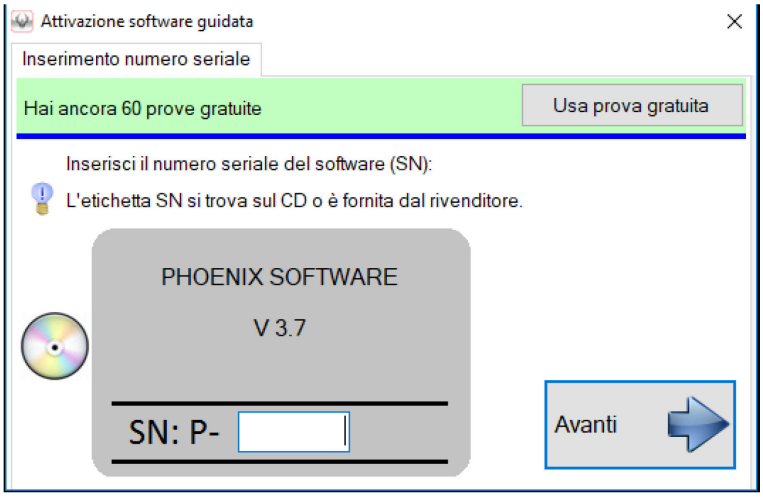


Fig. 45 - Activation wizard

4 Click on AVANTI.

5 The web verification wizard will be displayed.
6 If the computer is connected to the internet, enter the eight-digit serial number found on the device data plate.
7 Choose a verification mode by entering one of the two numbers, then click on VERIFY to complete the procedure.

Fig. 46 - WEB activation wizard

8 If the internet connection for the computer is not available, a 24-digit request code will be produced. Note the code. Send the code to the Technical Assistance.
9 Click on DONE.
10 Enter the 24-digit request code in the activation wizard.

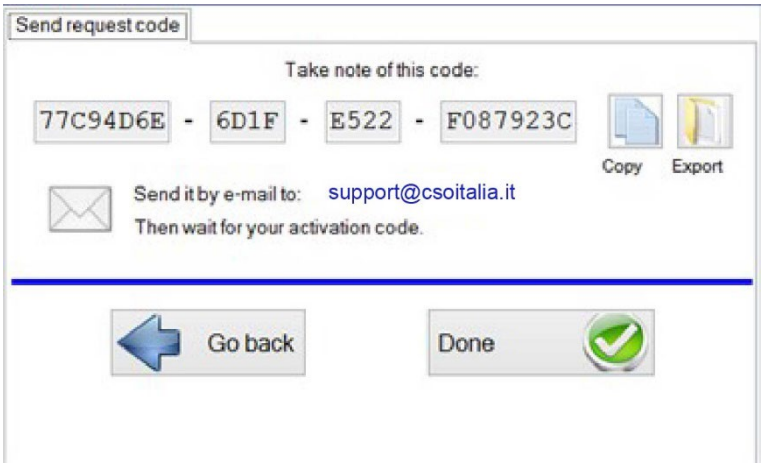


Fig. 47 - Activation code

11 Wait for the activation code to be communicated. Input the activation code in the activation wizard. The activation form appears on the screen every time the software is restarted.

12 The request code will be also displayed (in the lower part on the right) in this wizard, in the event it had not been recorded during the previous stage.

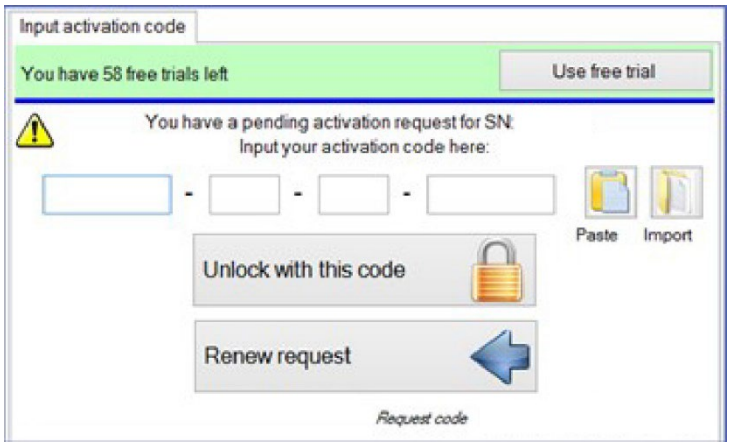


Fig. 48 - Entering the code

13 Click on UNLOCK WITH THIS CODE to complete the activation procedure. If the procedure fails, click on RENEW REQUEST to start a new activation request.

4.5.3 INSTALLING THE REVIEW STATION

1 Connect the device to the PC and start the Phoenix application software.
2 Read the Software SN (P-number) of the device on the lower left side.

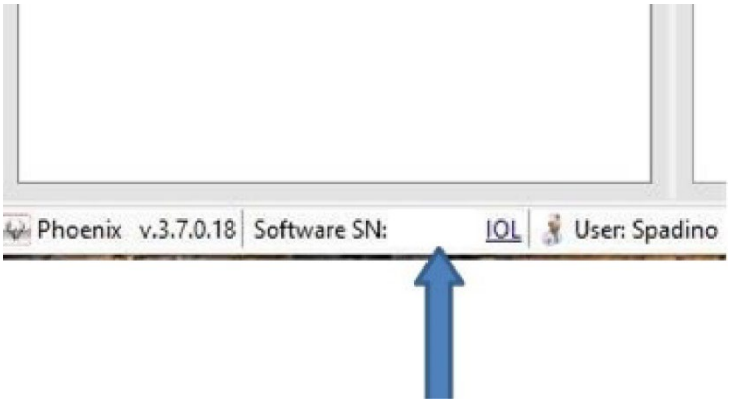


Fig. 49 - P-number reading

3 Install the software (Review Station) on the client PC and enter the previously read P-number to activate the software.

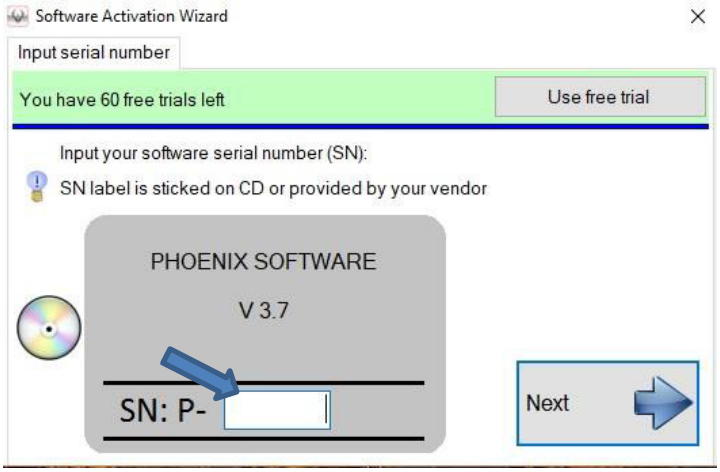


Fig. 50 - Activation wizard

4 Click on NEXT. The software will generate a code.

5 Click on COPY or EXPORT.

6 Send such code to support@csoitalia.it in order to receive the activation code. In the subject line of the e-mail, please write: "Review Station activation".

7 Click on DONE to move on to the following step.

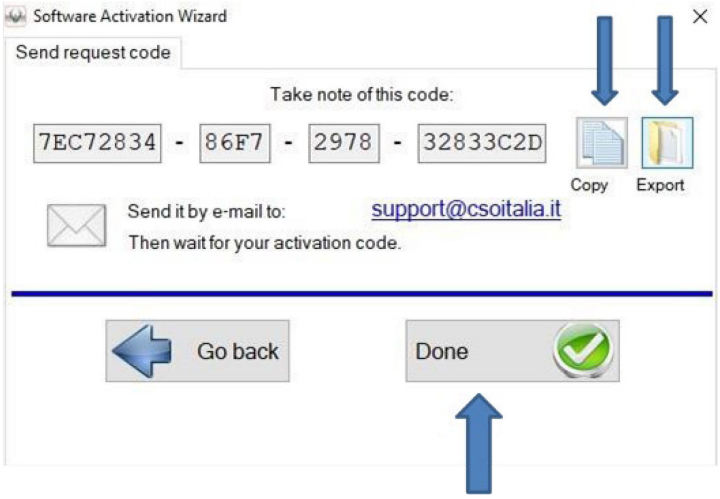


Fig. 51 - Requesting the activation code

8 Once you receive the activation code by support@csoitalia.it, enter the code into the text box.

9 Click on UNLOCK WITH THIS CODE.

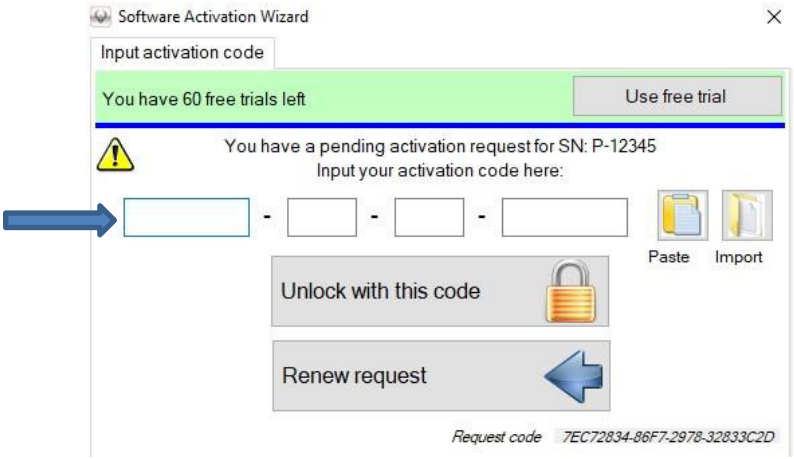


Fig. 52 - Entering the activation code

10 The Review Station of the Phoenix application software is now active.

4.5.4 INSTALLING THE DEVICE IN A LOCAL NETWORK

The application software requires administrator privileges to run, only for the first use (activation and calibration).
If this requirement conflicts with the Company's security policy, contact the CSO Technical Assistance to consider possible solutions.

During the first Phoenix application software installation, when installing the database, select the desired destination folder. Once selected, click on EXTRACT and confirm.

1 If the database was already created during a previous installation of the device, connect the device PC to the LAN network. Copy the DBPhoenix folder from your PC and paste it into the desired shared destination folder. Check that the database file and folder have full administrator read and write privileges for the users being enabled to sharing.
2 For each PC (and Review station) connected to the LAN network, connect to the database in the new location through the database configuration window.
3 Click on SETTING>DATABASE>BROWSE and select the desired Phoenix.mdb file from the new shared folder.
4 In the event of installation of an additional Review Station, if the database is already present on the server or in a relevant location, connect to the database through the database configuration window. Make sure you have read and write permissions for the new user.
5 For each PC, click on SETTING>DATABASE>BROWSE and select the desired Phoenix.mdb file from the shared folder.

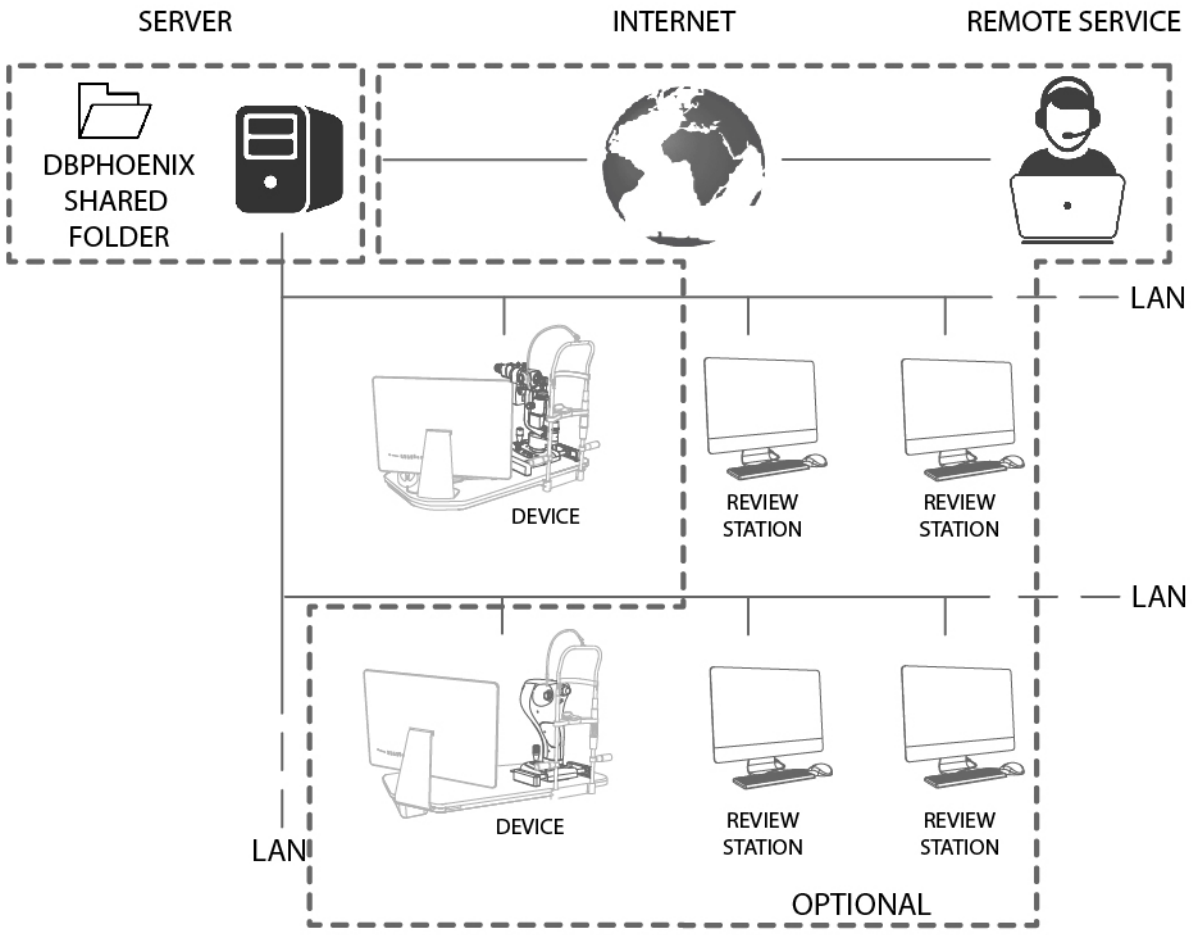
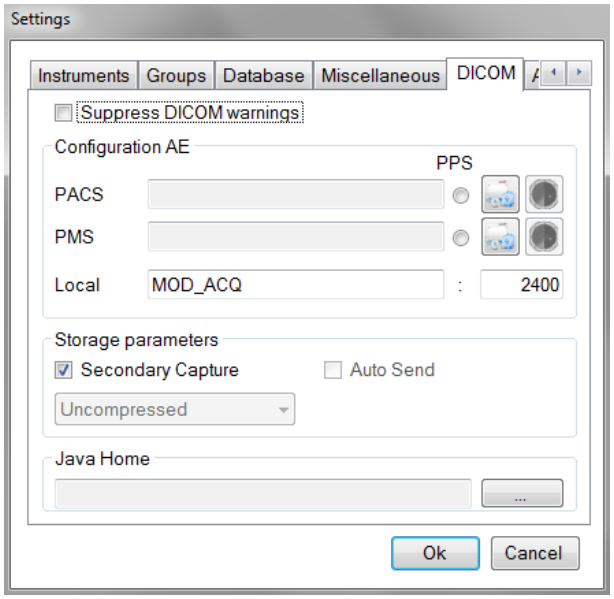


Fig. 53 - LAN path

4.5.5 DICOM ACTIVATION PROCEDURE

DICOM is a digital medical standard adopted by many health associations and hospitals from all over the world. It is used by healthcare operators to exchange images and other information through IT systems adopting such standard.



Settings: DICOM settings panel

1 Deselect the box "Suppress DICOM warnings" to display possible error messages which do not conflict with image acquisition.
If the DICOM entry is selected, the remaining menus need to be used.

2 Click on PACS or PMS. This allows the user to identify the PACS system, which receives information, or the PMS system, from where information is requested. In the relevant fields, enter:

- Title: ID PACS/PMS.
- Host: IP address of PACS/PMS.
- Port: PC port referred to by the PACS/PMS.
- Time out: maximum waiting time before disconnecting a call.
- Limit: only for PMS configuration, it indicates the maximum possible quantity of examinations to be received. If the field is left blank, you can receive an unlimited number of exams.

3 Click on OK to save the chosen settings, otherwise click on CANCEL.

4 Click on PING to send a call to the PACS/PMS system.

5 Click on RESET to delete the PACS/PMS settings.

The LOCAL setting allows you to configure the name and the port of the local Application Entity (AE).
Storage parameters allow the user to specify different options for data storage:

- Secondary acquisition: select this check box to send the secondary acquisition instead of the original acquisition. The secondary acquisition identifies the image that is shown in the gallery, created at a later time, after the original acquisition.
- Auto-send: select this check box to configure the application to send images immediately after acquisition. This option is not available when secondary acquisition is selected.

- Lossless compression: to select the compression level to be used during transfer, ranging from 5% to 100% in steps of 5%, in .jpeg format. Otherwise, files are sent in their original format (not compressed). This rule is based on a best-first algorithm: when images are originally acquired as non-compressed, all compression options are available. When the image is acquired by lossless compression, it shall be forwarded compressed. This option is not available when secondary acquisition is selected.

This parameter defines the required setting to use DICOM functions and is set up at the end of the software installation.

4.5.6 UPDATING THE PHOENIX APPLICATION SOFTWARE

Read the instructions for use before using the Phoenix application software.
The instruction manual can be downloaded from the website www.csoitalia.it or you may read the application software guide.

Before updating the Phoenix application software, uninstall the previous software version.

Before updating the Phoenix application software, please read the following table to check compatibility between the Phoenix application software and the operating system used with the device.

Before updating the Phoenix application software, make a backup of the patients archive currently used with the device. Follow the procedure described in paragraphs **"Import and export of examinations" on page 50** and **"Backup of the database archive and restoration of patient examinations" on page 50.**

Operating system	Versions of the Phoenix application software					
	3.0	3.1	3.2	3.4	3.6	3.7
Windows 7 Home Premium or Professional 32 bit with SPK1	X	X	X	X	X	X
Windows 7 Home Premium or Professional 64 bit with SPK1	X	X	X	X	X	X
Windows 8 and Pro 32 bit		X	X	X	X	X
Windows 8 and Pro 64 bit		X	X	X	X	X
Windows 8.1 and Pro 32 bit		X	X	X	X	X
Windows 8.1 and Pro 64 bit		X	X	X	X	X
Windows 10 Home or Pro 32 bit					X	X
Windows 10 Home or Pro 64 bit					X	X
DEVICE PRODUCTION YEAR	March 2014	November 2014	September 2015	December 2016	September 2017	August 2018

1 In case of software updates, the installation window may appear.
This means the WCF service menu has been used to install the Web service application interface.

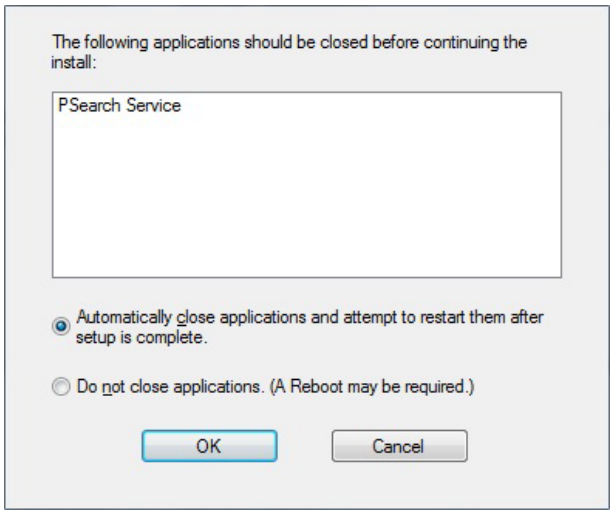


Fig. 54 - Installation window

2 Before proceeding, make sure to uninstall the service by following the file path below.

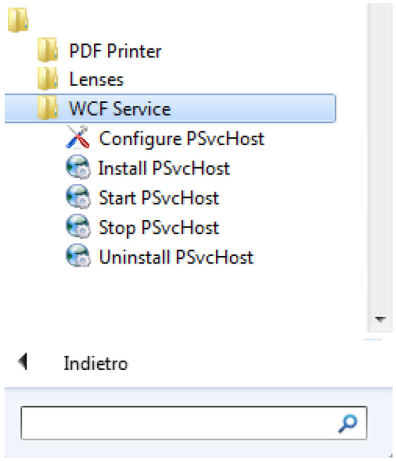


Fig. 55 - WCF Service folder

3 After this action the uninstalling procedure will be completed correctly.

4.5.7 IMPORT AND EXPORT OF EXAMINATIONS

1 To export an examination or a patient folder, right-click on the corresponding line of the Patients / Examinations list, then select the Export symbol. After changing the personal data (not mandatory and for privacy reasons) and confirming export, a file with .zcs extension is created.
2 To import an existing .zcs file, drag and drop the file into the panel of the Patients / Examinations list (Windows 7). As an alternative select File >Import in the main screen.

4.5.8 BACKUP OF THE DATABASE ARCHIVE AND RESTORATION OF PATIENT EXAMINATIONS

1 To backup the databases archive of the patients' examinations, use third-parties applications for the management of backup files.
The backup default path is: C:\BDphoenix.

4.6 DEVICE START UP - [STANDARD CONFIGURATION]

1 Switch the power switch of the power supply unit to ON. The operation indicator on the device base turns on.
2 Remove the cap (A).
3 Insert the calibration rod (B) into its seat (C).

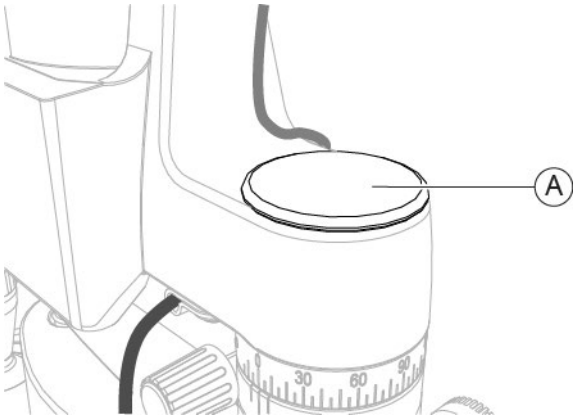


Fig. 56 - Remove the cap

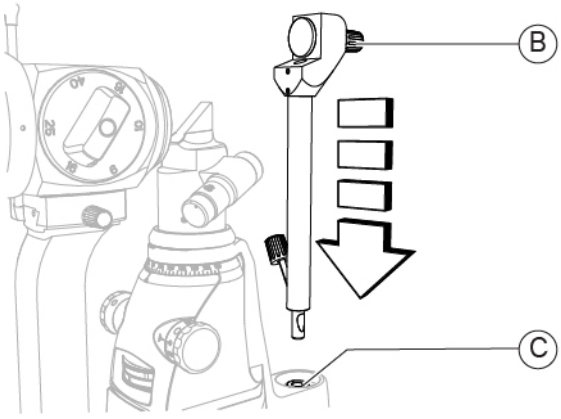


Fig. 57 - Insert the calibration rod

4 Turn the light intensity adjustment knob (D) half a turn clockwise.
5 Turn the magnification adjuster selector (E) and set the minimum magnification value.

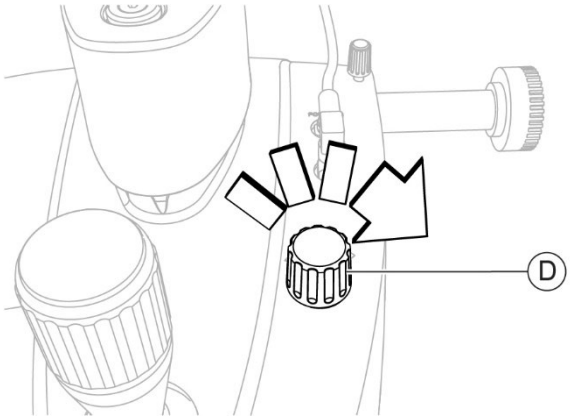


Fig. 58 - Turn the adjustment knob

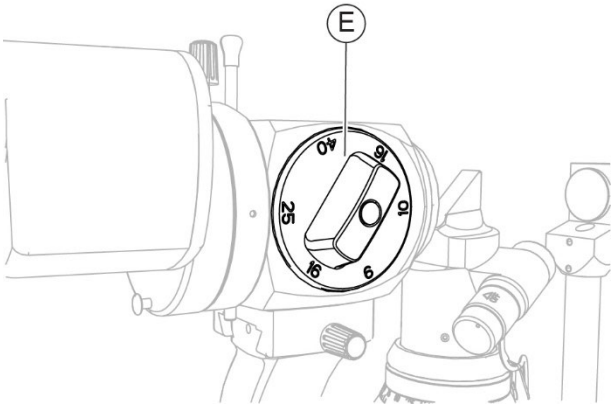


Fig. 59 - Turn the magnification adjuster selector

6 Turn the filter selector (F) to the through-light position (no filter set).
7 Turn the adjustment dial (G) and set the highest value.

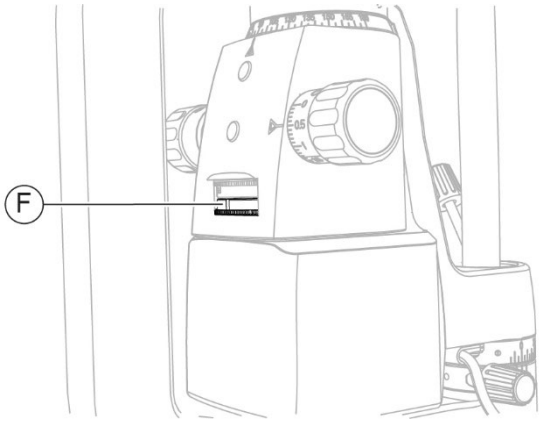


Fig. 60 - Turn the filter selector

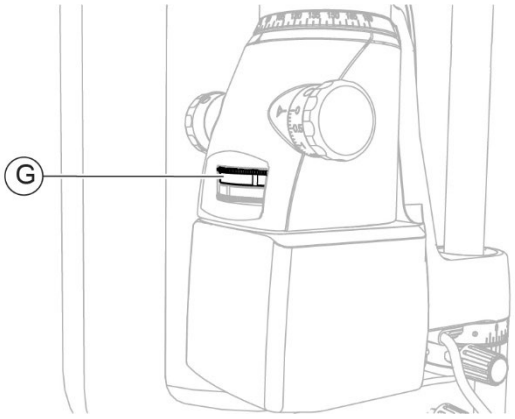


Fig. 61 - Turn the adjustment dial

8 Observe the calibration rod through the eyepieces.
9 Slowly turn the adjustment dial (H) of the eyepieces to focus the light projection (I) on the calibration rod. Check for correct focusing.

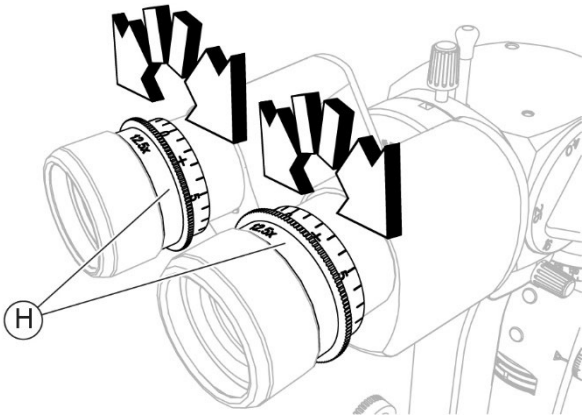


Fig. 62 - Turn the adjustment dial

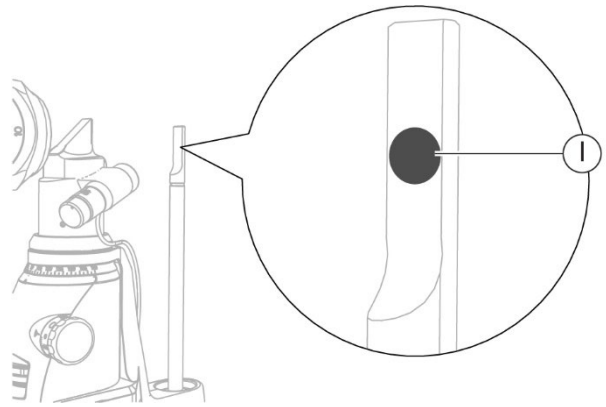


Fig. 63 - Light projection

10 Turn the adjustment dial (G) and set the lowest value.

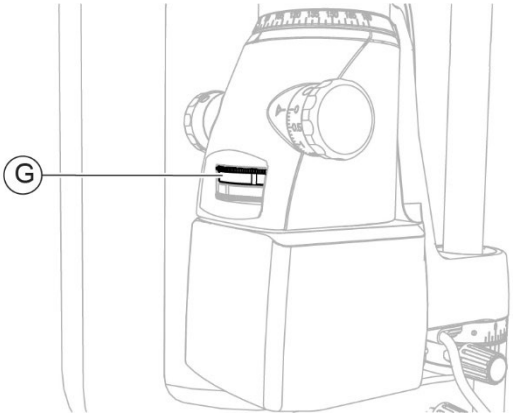


Fig. 64 - Turn the adjustment dial

4.7 DEVICE START UP - [DIGITAL CONFIGURATION]

Read the instructions for use before using the Phoenix application software.
The instruction manual can be downloaded from the website www.csoitalia.it or you may read the application software guide.

1 Switch the power switch of the power supply unit to ON. The operation indicator on the base turns on.
2 Turn on the PC.
3 Launch the Phoenix application software.
4 Wait until the main screen of the application software is displayed.
5 Click on NEW PATIENT and enter the personal data. If the patient is already present in the database, you can automatically search for their surname by typing it into the command prompt. A new examination will be created automatically.
7 Select the device to be used.
8 The image acquisition screen will open. Image acquisition can be now carried out.

4.8 DIGITAL CALIBRATION OF THE MICROSCOPE - [DIGITAL CONFIGURATION]

Digital calibration shall be carried out at the first start-up of the device or after the device has been left unused for a long period of time.
The digital calibration shall be regularly carried out in order to check proper operation of the device or following the repositioning of the device.
The procedure should be carried out in a dark room to simulate the environmental conditions of a standard acquisition procedure.

Follow the instructions given in the Phoenix application software handbook concerning the device calibration.

Close attention shall be paid while performing the procedure. It is important to check device stability before starting with the procedure.
calibration is essential to obtaining precise measurements.

The digital calibration procedure of the microscope is required to allow calibrated measurements in microns or millimetres instead of standard pixels.

1 Log into the Phoenix application software and start the calibration procedure by clicking on "Calibrate" (neutral calibration) from the Calibration menu.
2 Select the magnification set as indicated on the magnification adjuster of the device (6x-10x-16x-25x-40x or 5x-8x-12.5x-20x-32x).
3 Use a squared paper as target of the device (for instance graph paper with 1 mm blocks) and acquire the image using a neutral magnification (16x or 12.5x depending on the magnification set).
4 Once the image acquired, use the calibration wizard and manually drag the red grid (0.5 x 0.5 mm squares) with the mouse until the red squares overlap the 1 mm x 1 mm squares on paper.
Each red square shall contain 4 white-bordered squares.
5 When the procedure is complete, click on OK from the calibration wizard, then click on YES to save the calibration.
6 All measurements placed on the images from now on will be available in microns or millimetres.

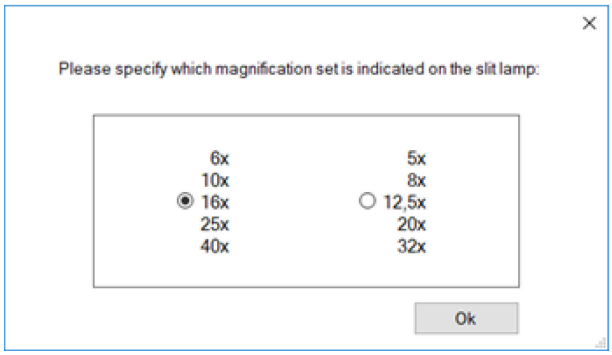


Fig. 65 - Magnification set selection window

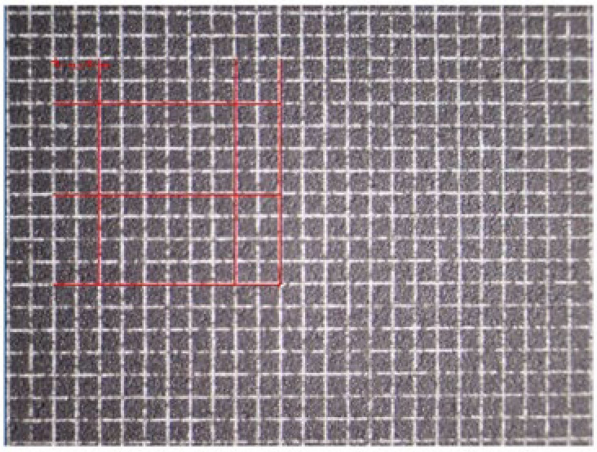


Fig. 66 - Device calibration grid

Fig. 67 - Device calibration menu

4.9 FUNCTIONAL TEST OF THE DEVICE - [DIGITAL CONFIGURATION]

After installing the application software, carry out a functional test of the device.

1 Make sure the device is on. Otherwise, turn the power switch of the power supply unit to ON.
2 Run the Phoenix application software and wait until the main screen of the application software is shown.
3 Acquire an image (for instance a graph paper placed on the calibration testing tool).
4 Check correct image acquisition.
5 Measure the distances through the Phoenix application software.
6 Check the distance measured matches the size of the graph paper.

Examination modes and image acquisition information can be found in the instructions for use of the device.

5 ORDINARY MAINTENANCE

5.1 SAFETY WARNINGS

DANGER
Danger of electric shock. Unplug the power supply cable from the power socket before disinfecting or cleaning the device and before any maintenance operation.

It is forbidden to carry out any maintenance on the device not mentioned in the instructions for the Technical Assistance.

In case of operational faults or malfunctions and for any operation not mentioned in this manual, there is the obligation to contact the device Manufacturer.

5.2 CLEANING AND DISINFECTION

CAUTION
Carefully follow the instructions for cleaning and disinfection described in this manual, in order to avoid any damage to the device and accessories.

CAUTION
A correct cleaning and disinfection procedure, together with appropriate operating procedures, is essential to preventing the spread of infections or cross contamination.

CAUTION
Danger of material damage. Do not use spray products.
Do not use excessively wet cloths, as they may drip.
If needed, use a damp and well wrung out cloth.
Make sure no liquid penetrates into the device.

Cleaning and disinfection procedures shall be routinely carried out.

Device parts that do not come into direct contact with the patient shall be cleaned at least once a day.
Device parts that do come into direct contact with the patient shall be thoroughly cleaned and disinfected after each use.

This section describes the procedures to be carried out during use and maintenance in order to ensure proper cleaning and disinfection of the device and its accessories.

5.2.1 RECOMMENDED PRODUCTS FOR CLEANING AND DISINFECTION

CAUTION
Danger of material damage. Do not use solvents, acidic or basic solutions (pH <4,5 or >8,0), abrasive or caustic substances, chlorine-based and chlorine-derived products.
The Manufacturer is not liable for any damage caused by using disinfectant products not indicated in this manual.

The choice of the most suitable product and procedures for the cleaning and disinfection of the device takes into account both the sensitivity of the device to specific substances and the product's disinfecting effectiveness.
For cleaning and disinfection procedures, use products approved by the FDA or CE for medical devices or medical-surgical devices.
Abide by the products listed below, divided by category:

Detergents	Use polyenzymatic solutions or neutral surfactant-based solutions.
Disinfectants and decontaminating products	Use products for disinfecting surfaces (containing or not containing aldehyde) or formaldehyde-free surface disinfectants (i.e. Kohrsolin FF). Alternatively, you may use ethyl alcohol, 70% v/v alcohol or isopropyl alcohol.

For information about using the chosen product, please comply with the instructions provided by the manufacturer.

5.2.2 CLASSIFICATION OF THE CRITICALITY OF THE DEVICE

CAUTION
The device is supplied non-sterile and it shall not be sterilized prior to use.

This device is classified as "non-critical" since it only comes into contact with intact skin and therefore has a low infectious risk.
For devices classified as non-critical, regular cleaning or low-level disinfection is sufficient.
However, when the patient's condition is transmissible by direct contact or in the case of accidental exposure to body fluids, the device shall be disinfected with a higher-level disinfectant after cleaning.

5.2.3 DEVICE CLEANING

CAUTION
Carefully follow the cleaning instructions described in this section in order to avoid any damage to the device and its accessories.

CAUTION
Danger of material damage. Clean using a non-abrasive cloth to avoid damaging the surface.

The device shall be regularly cleaned.

The device is provided with a cover whose function is to protect it from dust, especially during periods of non-use.

Clean the outer parts of the device using a damp, non-abrasive cloth and a rinse-free cleaning solution.

For more information about suitable cleansing products, read the paragraph **"Recommended products for cleaning and disinfection" on page 56.**

5.2.4 CLEANING THE APPLIED PARTS

CAUTION
Danger of material damage. Only use detergent and disinfectant products specifically approved for medical devices or medical-surgical devices.

Applied parts that come into direct contact with the patient during the examination shall be thoroughly cleaned after each use with a disinfectant approved for the purpose.

1 Unplug the device from the power socket.
2 Clean the applied parts using products suitable for surface disinfection (they may contain aldehyde).
Alternatively, use a non-abrasive cloth soaked in a solution of water, ethyl alcohol (70% maximum) or isopropyl alcohol.

For more information about suitable cleansing products, read the paragraph **"Recommended products for cleaning and disinfection" on page 56.**

5.2.5 CLEANING THE OPTICAL COMPONENTS

CAUTION
Danger of material damage. The device is equipped with optical components. The optical components of the device are precision- and pressure-sensitive parts. Clean using a non-abrasive cloth to avoid damaging the surface.

Clean the optical components carefully using a dry, non-abrasive, lint-free cloth.

6 CORRECTIVE MAINTENANCE

6.1 SAFETY WARNINGS

DANGER
Danger of electric shock. Unplug the power supply cable from the power socket before disinfecting or cleaning the device and before any maintenance operation.

It is forbidden to carry out any maintenance on the device not mentioned in the instructions for the Technical Assistance.

In case of operational faults or malfunctions and for any operation not mentioned in this manual, there is the obligation to contact the device Manufacturer.

Only use original spare parts to replace device components. The code is indicated within the **"Spare parts and accessories list" on page 170.**

The electrical safety test shall be carried out in accordance with the EN60601-1 standard after any operation requiring electronic components to be replaced or the device protective shells to be removed.

Should you encounter any problem which is not mentioned in the lists or procedures indicated within the following paragraphs, please ask for further information to the Manufacturer or the local Dealer.

Before replacing a component, make sure all tools and materials required for the installation are available.

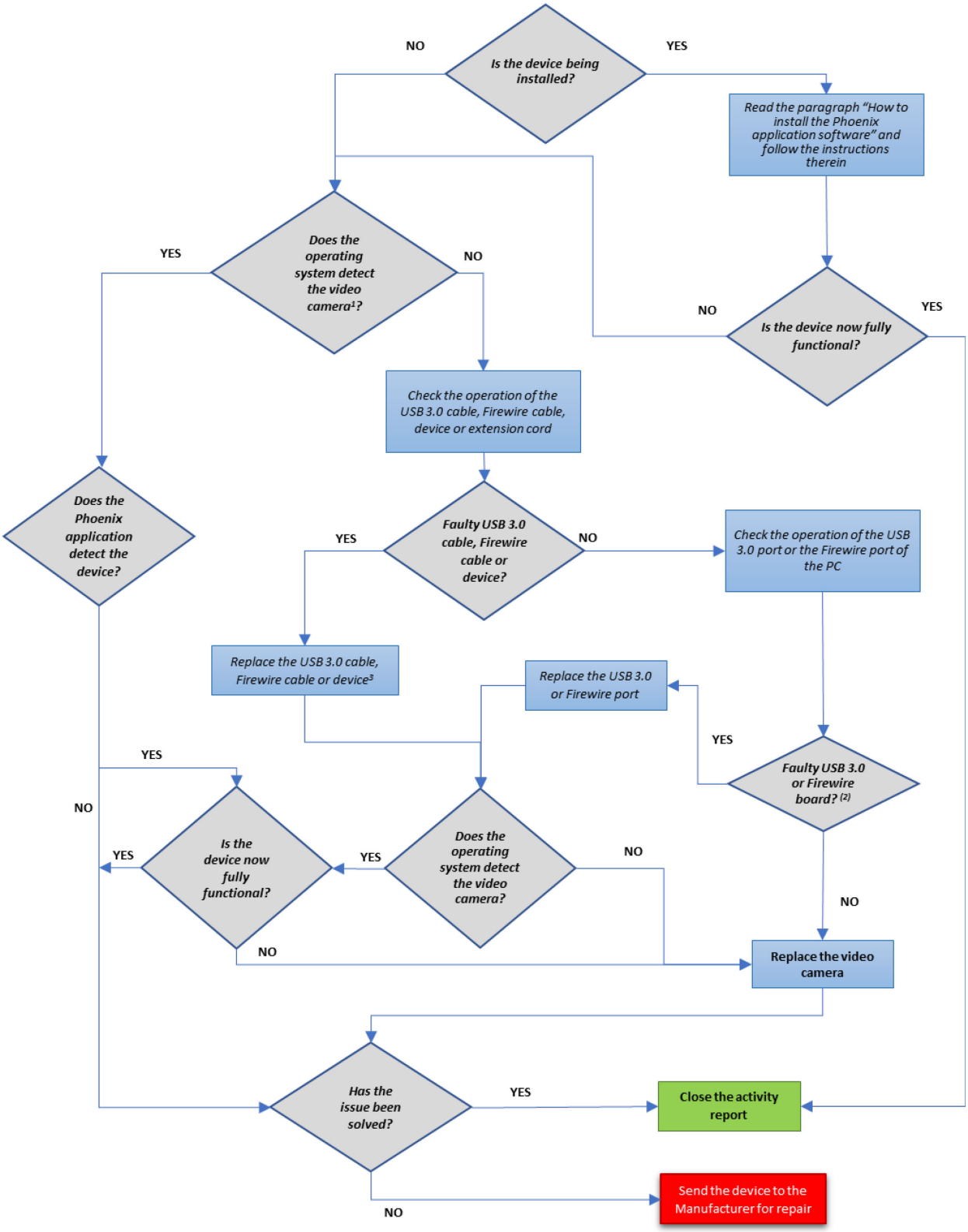
It is prohibited to use a powered screwdriver for any components' fixing or adjusting procedure.

6.2 FLOW CHARTS - [DIGITAL CONFIGURATION]

Should the instructions given in the flow chart fail to solve the issue, please contact the CSO Technical Assistance.

Only use original spare parts to replace device components. The code is indicated within the **"Spare parts and accessories list" on page 170.**

The Phoenix software cannot detect the device



[1] Access "Device manager>image acquisition devices" and check that the acquisition devices are correctly detected.
[2] Minimum functional requirement: 3.0 USB port with Texas Instruments or Intel chipset, or Firewire port Texas Instruments and HUB with power supply unit.
[3] Use only cables and extensions supplied and certified by CSO
[4] See paragraph "Device connections" on page 32.

6.3 MESSAGES FROM THE APPLICATION SOFTWARE - [DIGITAL CONFIGURATION]

ID	Message	Solution
PHSL001	"Generic DB Exception"	Follow the path: Settings > Database. Check database position and reconnect the .mdb file.
PHSL002	"Microsoft.NET Framework"	Delete the "instruments.db" file in the C:\Programdata\PhoenixData\Instruments folder. Click on Instruments Wizard to add the devices. Perform calibration.
PHSL003	"SLlive has encountered an issue and will now close"	Delete the Settings file from the folder C:\User\"username"\appdata\Local\CSO. Check the USB 3.0 cable. Incompatible USB 3.0 port.
PHSL004	"Phoenix has stopped working"	The software cannot start and crashes before the first screen is displayed. Setting files are corrupt. Follow the procedure described (Windows XP): – Delete the Settings file from the folder "Document and Settings\Users\Local Settings\Application Data\CSO". – Delete the settings.jsn file from the folder "C:\programdata\isolatedtorage". – Restart the program. Follow the procedure described (Windows 7/10): – Delete the "CSO" folder from the path "Appdata\Local" of the connected user. If the problem persists: – Delete the setting.jsn file from the folder "C:\programdata\isolatedtorage". – Restart the program.
PHSL005	"Database not accessible"	Provide the necessary authorisations (administrator privileges) to the "DBPhoenix" folder.
PHSL006	"Could not find a part of the path […]"	Database location is incorrect or server is off. The software cannot detect the location of the pictures folder in the system file. Restore the path of the database pictures folder.
PHSL007	"[…] Abort due to constraint violation Columns Code, Scheme are not unique […]"	The Instruments database is corrupt. The database shall be recreated. Delete the instruments folder and create a new one (radar symbol from Instruments + calibration).
PHSL008	"[…] Device appears unconnected…"	Something prevents the drivers installation. Close the software and install the drivers manually from the folder C:\ProgramsX86\CSO\Phoenix\Driver.
PHSL009	"[…] failed to lazily initialize a collaction, session is disconnected […]"	NHibernate.LazyinitializationException Issue concerning the synchronization between the database and the Middleware library. Temporary issue which can be solved after the update of the patients gallery.

For any message of cases which are not included in the list, please ask the Manufacturer for information.
Send the following data to the Technical Assistance:

- Device Serial Number
- Detailed description of the issue and of the system behaviour
- Log files

If a message appears in the dialogue box, expand message details and paste message information in the e-mail. Follow the indications given in paragraph **"How to report malfunctions to the Manufacturer" on page 5.**

6.4 TROUBLESHOOTING

ID	Issue	Solution
SL001	The Phoenix application software does not start	The software cannot start and crashes before the first screen is displayed. Setting files are corrupt. Follow the procedure described (Windows XP): – Delete the Settings file from the folder "Document and Settings\Users\Local Settings\Application Data\CSO". – Delete the settings.jsn file from the folder "C:\programdata\isolatedtorage". – Restart the program. Follow the procedure described (Windows 7/10): – Delete the "CSO" folder from the path "Appdata\Local" of the connected user. If the problem persists: – Delete the setting.jsn file from the folder "C:\programdata\isolatedtorage". – Restart the program.
SL002	The Phoenix application software requires activation	USB 3.0 cable disconnected. USB 3.0 cable damaged. Replace the USB 3.0 cable with a CSO certified one. If the problem persists, follow the instructions given in the paragraph **"Flow charts - [Digital configuration]" on page 58.**
SL003	The beam splitter does not work (black or grey screen)	USB 3.0 cable damaged. Replace the USB 3.0 cable with a CSO certified one. If the problem persists, follow the instructions given in the paragraph **"Flow charts - [Digital configuration]" on page 58.**
SL004	Error reading offset 0xF0F01104 in live (black or grey screen)	Problems to the USB 3.0 cable or to the beam splitter. Replace the USB 3.0 cable with a CSO certified one. If the problem persists, follow the instructions given in the paragraph **"Flow charts - [Digital configuration]" on page 58.**
SL005	Message: "Not enough bandwidth to start live"	The device has been connected to a USB 2.0 port. USB 3.0 cable damaged. The USB 3.0 cable used is not CSO certified. Replace the USB 3.0 cable with a CSO certified one.

ID	Issue	Solution
SL006	The left/right position of the device is not detected when moving the base	***Before replacing any of the following components, make sure the sticker pad is positioned correctly.*** ***Check that the sticker pad is a different colour than the colour of the table top.*** Replace one of the following components: – Plate. Follow the procedure described in paragraph **"Replacement of the plate - [Digital configuration -** SL9800]**" on page 120** or in paragraph **"Replacement of the plate - [Digital configuration - SL9900 and SL9900** ELITE]**" on page 122.** – Joystick. Follow the procedure described in paragraph **"Replacement of the joystick - [Digital configuration -** SL9800]**" on page 126** or in paragraph **"Replacement of the joystick [Digital configuration - SL9900 and SL9900** ELITE]**" on page 129.** – Base. Follow the procedure described in paragraph **"Replacement of the** base**" on page 134.**
SL007	The joystick button does not work	Check the connection cable between the beam splitter and the base is properly connected to the connectors. If the problem persists, replace the joystick button. Follow the procedure described in paragraph **"Replacement of the joystick button - [Digital configuration]" on page 132.** If the problem persists, replace the joystick. Follow the procedure described in paragraph **"Replacement of the joystick - [Digital configuration -** SL9800]**" on page 126** or in paragraph **"Replacement of the joystick [Digital configuration - SL9900 and SL9900** ELITE]**" on page 129.**
SL008	The Phoenix application software doesn't detect the device	See paragraph **"Flow charts - [Digital configuration]" on page 58.**
SL009	Message: "DN_DRIVER LOADED error in OHCI module"	***For Firewire beam splitter only (Windows 10 operating system only).*** Download the correct drive and the installation instructions from the CSO website, in the section Documents/Software download.
SL010	Message: "The device does not work. SIDSPEED register incorrect"	***For Firewire beam splitter only (Windows XP operating system only).*** Follow the instructions on how to change the register value SIDSPEED reported on the CSO website under the section Documents/Software download.
SL011	Message: "The device does not work. Firewire IEEE 1394 legacy driver not installed"	***For Firewire beam splitter only (Windows 7 operating system only).*** Install the Firewire IEEE 1394 legacy driver. Download the driver from the CSO website, under the section Documents/Software download.
SL012	The image is out of focus or the device is not calibrated	Check eyepieces are properly adjusted. Check the magnification adjuster is properly positioned. Check the correct focusing of the device using the tool supplied. In case of digital configuration, follow the procedure described in the paragraph **"Digital calibration of the microscope - [Digital** configuration]**" on page 53.**
SL013	The acquired image appears in yellow colour	Remove the yellow filter.
SL014	The acquired image is not clear	Check the optical path of the beam splitter is clean. Check the room lighting.

6.4.1 LIGHT SIGNALS

The device is equipped with 3 indicator lights for monitoring the operation of the device and its components.

Before carrying out any maintenance operation on the device, check for the presence of light signals and read the troubleshooting in this section.

6.4.1.1 DESCRIPTION OF LIGHT INDICATORS

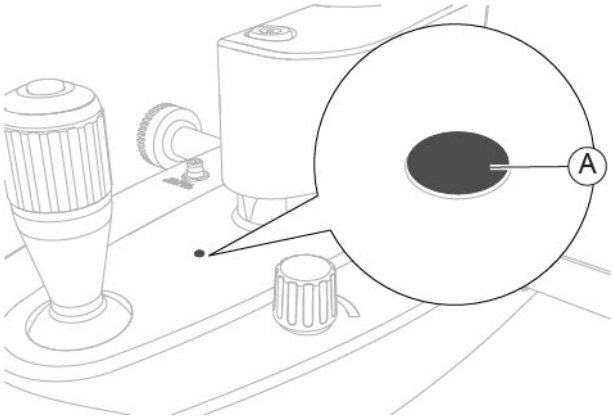


Fig. 68 - Operation indicator

Pos	Description	Position	Colour code
A	LED operation indicator	On the device base	Green light Red light Orange light

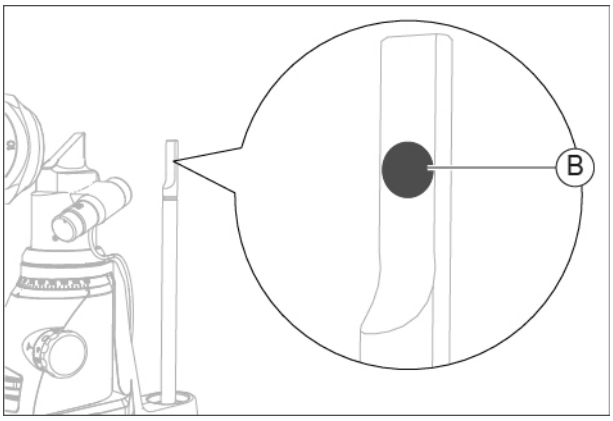


Fig. 69 - Light projection [SL9800]

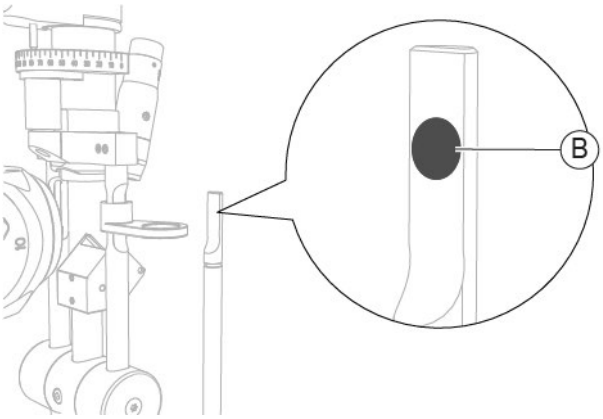


Fig. 70 - Light projection [SL9900 and SL9900 ELITE]

Pos	Description	Position	Colour code
B	Light projection	On the calibration tool and on the calibration testing tool	0% No light projection 25% Intensity at 25% 50% Intensity at 50% 100% Full intensity

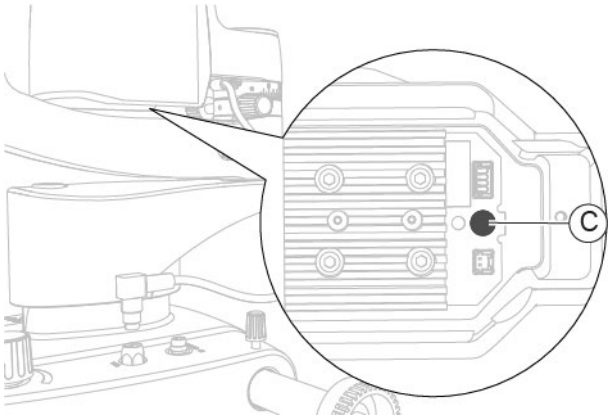


Fig. 71 - Light indicator of the lighting assembly [SL9800]

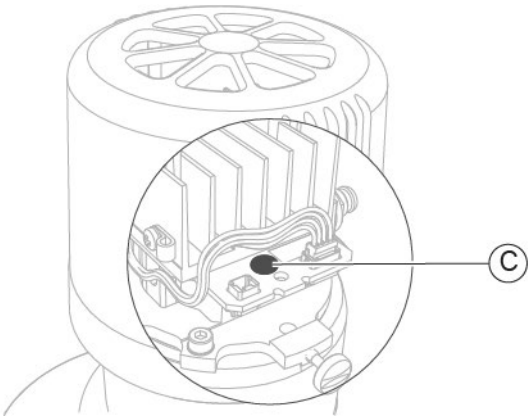
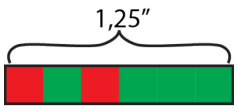
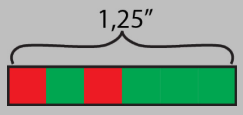
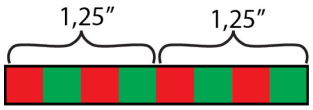
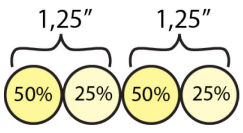


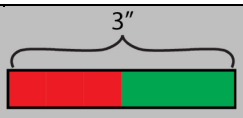
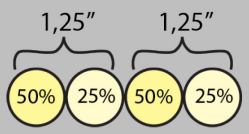
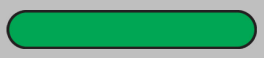
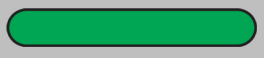
Fig. 72 - Light indicator of the lighting assembly [SL9900 and SL9900 ELITE]

Pos	Description	Position	Colour code
C	LED light indicator	On the circuit board inside the lighting unit	Off Green light Red light

6.4.1.2 TROUBLESHOOTING

ID	POS	Status		Meaning	Solution
01	A		Steady green light.	Correct functioning.	
	B	100%	Full intensity.		
	C		Steady green light.		
02	A		Steady red light.	Lighting unit not powered.	Check and restore the connection between the base and the lighting unit. Follow the indications given in paragraph **"Device connections" on page 32.**
	B	0%	No light projection.		
	C		Off.		
03	A		Steady red light.	Overheating of the circuit board.	Turn off the power supply unit. Wait until the device has completely cooled down. Turn the power supply unit back on.
	B	0%	No light projection.		
	C		Steady red light.		

ID	POS	Status		Meaning	Solution
04	A		Three rapid flashes (red-green-red light) alternating with steady green light.	***Option 1*** No 5 V power supply or connection cable disconnected. ***Option 2*** A short circuit has occurred on the output of the 5 V cable that powers the base or the lighting unit.	***Option 1*** Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Check and restore the connection between the base and the lighting unit. Follow the indications given in paragraph **"Device connections" on page 32.** Turn the power supply unit back on. ***Option 2*** Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Resolve the short circuit. Turn the power supply unit back on.
	B		Flashes with variable intensity light projection (50-0%).		
	C		Off.		
05	A		Three rapid flashes (red-green-red light) alternating with steady green light.	No ground 5V connection to the circuit board.	Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Check and restore the connection between the base and the lighting unit. Follow the indications given in paragraph **"Device connections" on page 32.** Turn the power supply unit back on.
	B		Steady and variable intensity light projection (50-25%).		
	C		Off.		
06	A		Rapid flashes (red-green light).	Device power supply voltage higher than allowed.	Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Reduce the power supply voltage supplied to the device to reach a value below the maximum allowed limit (<27 Vdc, <18 Vac). Turn the power supply unit back on.
	B		Flashes with variable intensity light projection (50-25%).		
	C		Steady green light.		

ID	POS	Status		Meaning	Solution
07	A		Slow flashes (red-green light).	Device power supply voltage lower than allowed.	Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Increase the power supply voltage supplied to the device to reach a value above the minimum allowed limit (>10 Vdc, >8 Vac). Turn the power supply unit back on.
	B		Flashes with variable intensity light projection (50-25%).		
	C		Steady green light.		
08	A		Steady orange light.	A short circuit has occurred inside the lighting unit.	Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Resolve the short circuit. Turn the power supply unit back on.
	B		No light projection.		
	C		Steady green light.		
09	A		Steady green light.	No connection to the positive electrode of the lighting unit. Potentiometer inside the base at the minimum value.	Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Check and restore the connection. Turn the power supply unit back on.
	B		Intensity at 50%.		
	C		Steady green light.		
10	A		Steady red light.	No connection to the positive electrode of the lighting unit. Potentiometer inside the base at the maximum value.	Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Check and restore the connection. Turn the power supply unit back on.
	B		Intensity at 50%.		
	C		Steady green light.		
11	A		Steady green light.	No connection to the cathode (ground) of the lighting unit. Potentiometer inside the base at the minimum value.	Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Check and restore the connection. Turn the power supply unit back on.
	B		No light projection.		
	C		Steady green light.		

ID	POS	Status		Meaning	Solution
12	A		Steady red light.	No connection to the cathode (ground) of the lighting unit. Potentiometer inside the base at the maximum value.	Turn off the power supply unit. Wait until the operation indicator on the device base turns off. Check and restore the connection. Turn the power supply unit back on.
	B		No light projection.		
	C		Steady green light.		

6.5 REPLACEMENT OF THE PARTS

Any part replacement operation shall only be carried out by qualified and trained technical personnel.

To replace the device parts, use original spare parts only. The code is indicated within the **"Spare parts and accessories list" on page 170.**

6.5.1 TESTING THE LIGHTING ASSEMBLY CALIBRATION - [SL9800]

The test of the lighting assembly calibration (SL9800) must always be carried out before any corrective maintenance activity on the device SL9800.

The test of the lighting assembly calibration (SL9800) must also be carried out following a corrective maintenance activity for the **Replacement of the lighting assembly complete with arm - [SL9800]** or for the **Replacement of the magnification adjuster**.

Material and warnings:

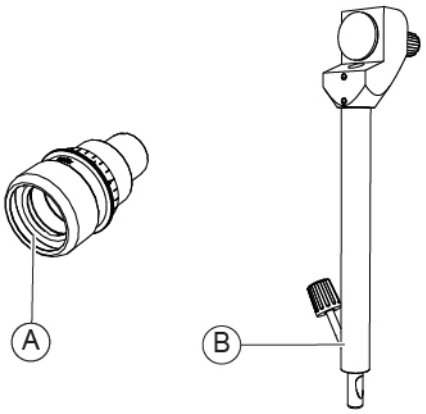


Fig. 73 - Eyepiece with reference cross and calibration rod

Pos	Description	Code
A	Eyepiece with reference cross	103005110
B	Calibration rod	200200100

Procedure for testing the lighting assembly calibration:

1 Turn the power switch of the power supply unit to ON.
2 Remove the cap (A).
3 Insert the calibration rod (B) into its seat (C).

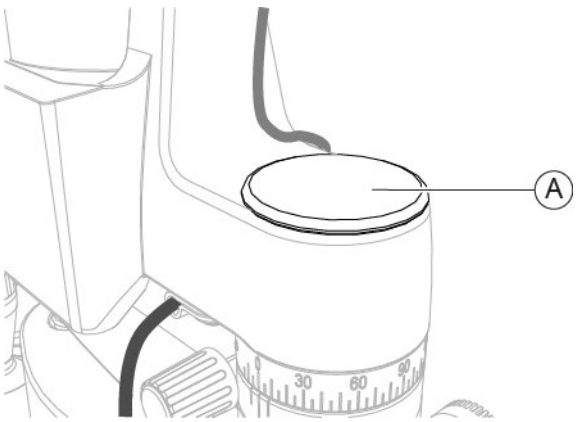


Fig. 74 - Remove the cap

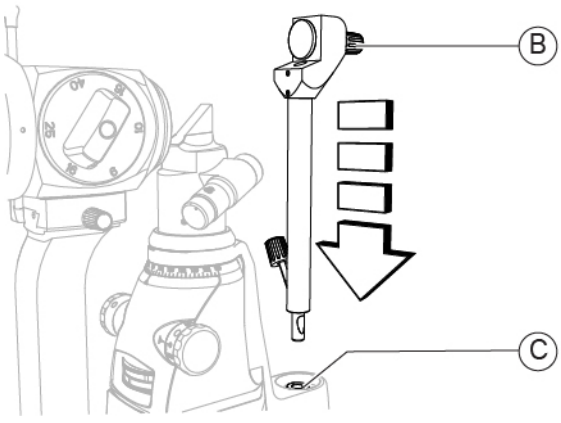


Fig. 75 - Insert the calibration rod

4 Remove the eyepieces as described in the paragraph **"Replacement of the eyepieces" on page 78.**
5 Install the eyepiece with reference cross on the binoculars. Bring the orthogonal fiducial lines in vertical and horizontal position.
6 Turn the adjustment dial (D) and set the highest value.
7 Turn the filter selector (E) to the through-light position (no filter set).

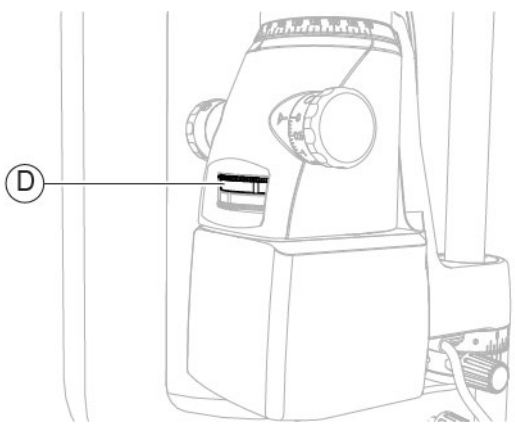


Fig. 76 - Turn the adjustment dial

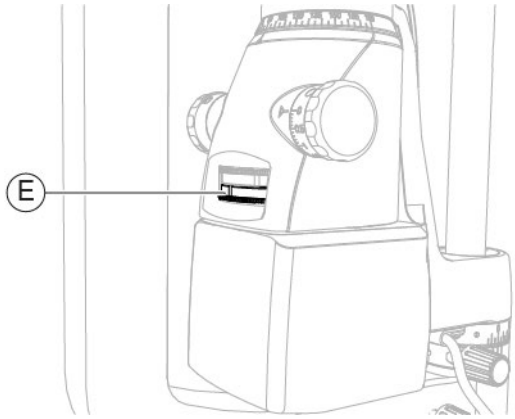


Fig. 77 - Turn the filter selector

8 Turn the lighting head (F) to the 90° position.
9 Turn the knob (G) and set the lowest value.

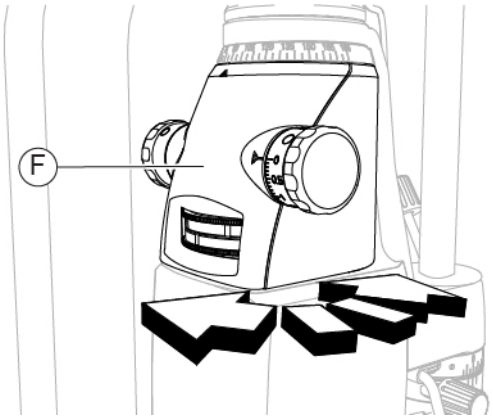


Fig. 78 - Turn the lighting head

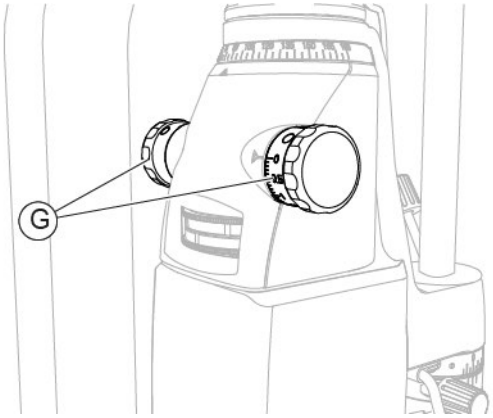


Fig. 79 - Turn the knob

10 Turn the eyepiece with reference cross (H) to position "0".
11 Observe the calibration rod through the eyepieces and swing the lighting assembly (I) by +/- 70°.

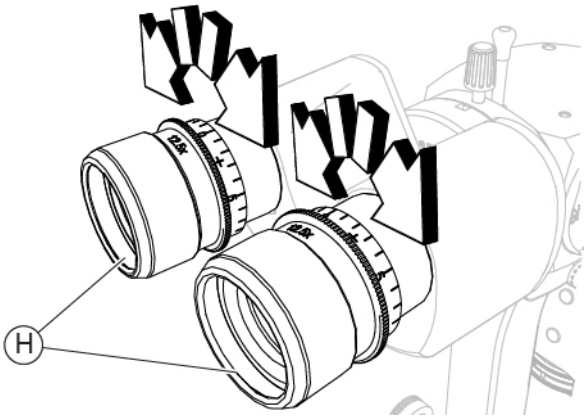


Fig. 80 - Turn the eyepiece with reference cross

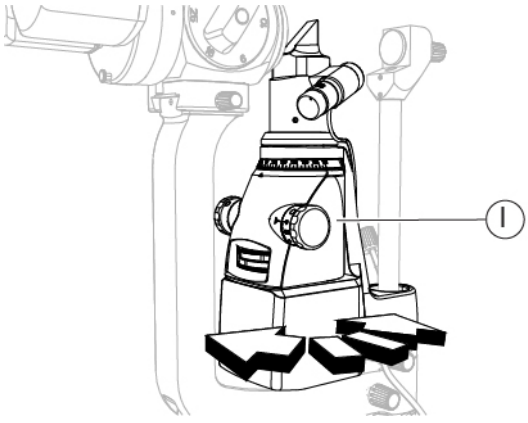


Fig. 81 - Swing the lighting assembly

12 While swinging the lighting assembly, check that the vertical projection of the slit remains centred in relation to the reference cross of the eyepiece.
13 If the slit projection is not centred, turn the knob (J) on the calibration rod to adjust the focal distance (K). Keep the light diffusing filter (L) facing downwards.

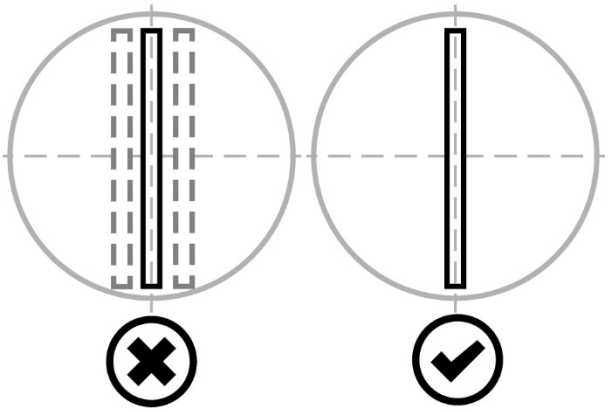


Fig. 82 - Check the vertical projection of the slit

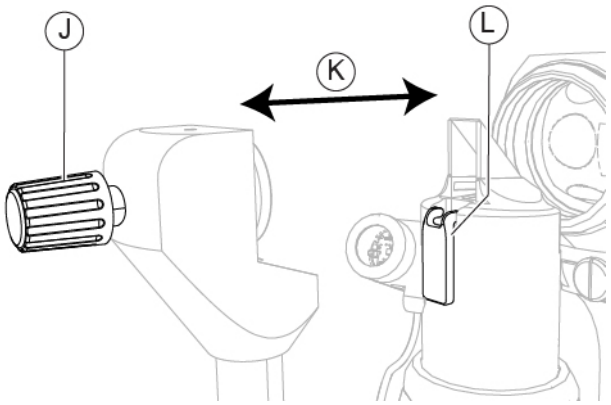


Fig. 83 - Turn the knob

14 Observe the calibration rod through the eyepieces and turn the lighting head (F) to the 0°-180° position.
15 Check that the horizontal projection of the slit remains centred in relation to the reference cross of the eyepiece.

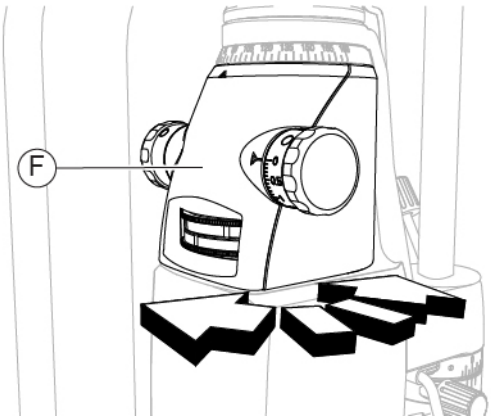


Fig. 84 - Turn the lighting head

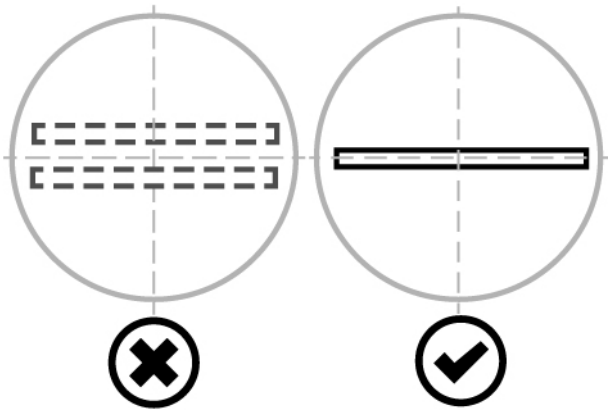


Fig. 85 - Check the horizontal projection of the slit

16 If the slit projection is not centred, carry out the lighting assembly calibration, as described in the paragraph **"Lighting assembly calibration - [SL9800]" on page 148.**
17 Remove the eyepiece with reference cross and install the eyepieces as described in the paragraph **"Replacement of the eyepieces" on page 78.**

6.5.2 TESTING THE LIGHTING ASSEMBLY CALIBRATION - [SL9900 AND SL9900 ELITE]

The test of the lighting assembly calibration (SL9900 and SL9900 ELITE) must always be carried out before any corrective maintenance activity on the device SL9900 or SL9900 ELITE.

The test of the lighting assembly calibration (SL9900 and SL9900 ELITE) shall only be carried out following a corrective maintenance activity for the **Replacement of the lighting assembly - [SL9900 and SL9900 ELITE]** or for the **Replacement of the magnification adjuster**.

Material and warnings:

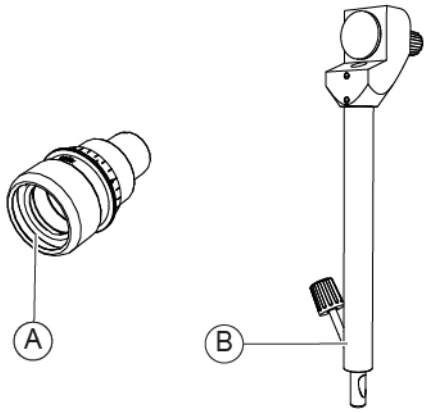


Fig. 86 - Eyepiece with reference cross and calibration rod

Pos	Description	Code
A	Eyepiece with reference cross	103005110
B	Calibration rod	200200100

Procedure for testing the lighting assembly calibration:

1 Turn the power switch of the power supply unit to ON.
2 Remove the cap (A).
3 Insert the calibration rod (B) into its seat (C).

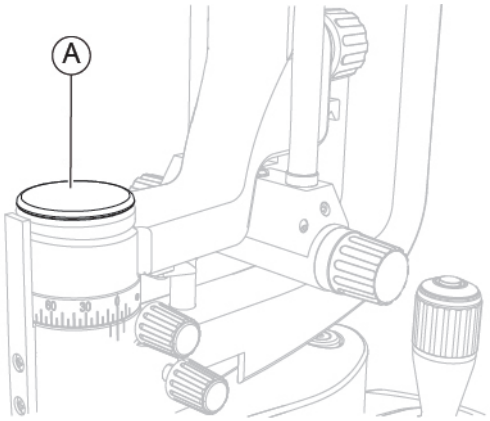


Fig. 87 - Remove the cap

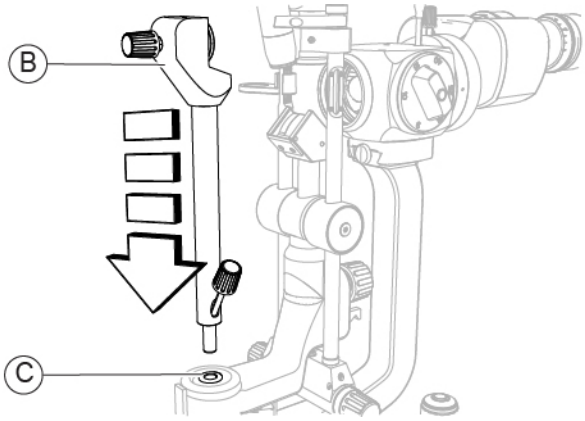


Fig. 88 - Insert the calibration rod

4 Remove the eyepieces as described in the paragraph **"Replacement of the eyepieces" on page 78.**
5 Install the eyepiece with reference cross on the binoculars. Bring the orthogonal fiducial lines in vertical and horizontal position.

6 Turn the filter selector (D) to the through light position (no filter set).
7 Turn the knob (E) and set the highest value.

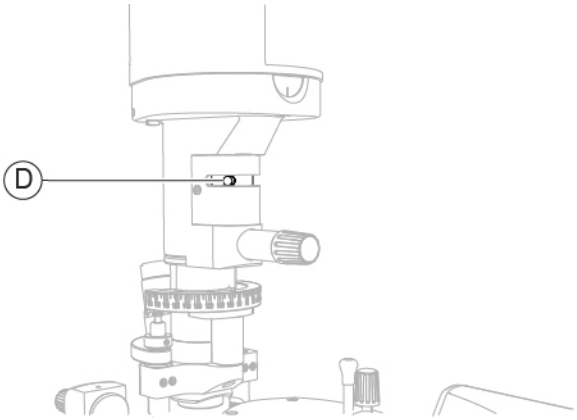


Fig. 89 - Turn the filter selector

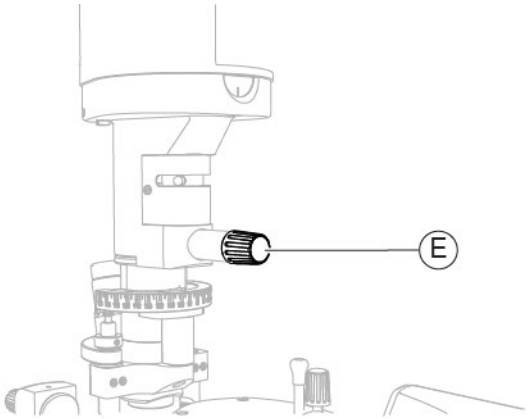


Fig. 90 - Turn the knob

8 Turn the lighting head (F) to the 90° position.
9 Turn the knob (G) and set the lowest value.

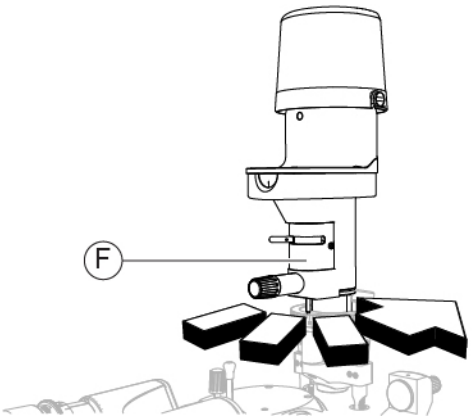


Fig. 91 - Turn the lighting head

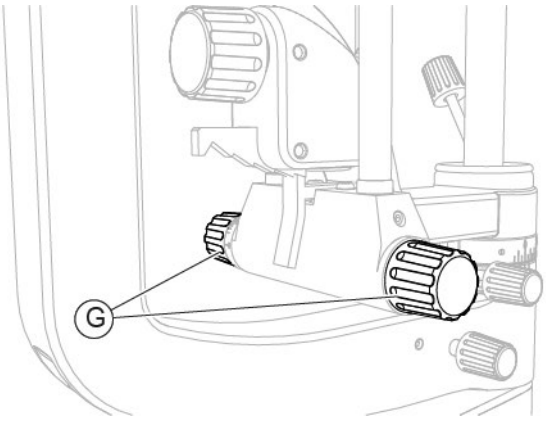


Fig. 92 - Turn the knob

10 Turn the eyepiece with reference cross (H) bringing the orthogonal fiducial lines in vertical and horizontal position.
11 Observe the calibration rod through the eyepieces and swing the lighting assembly (I) by +/- 70°.

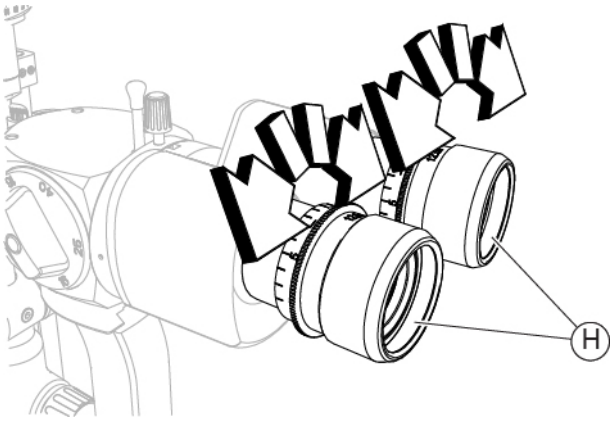


Fig. 93 - Turn the eyepiece with reference cross

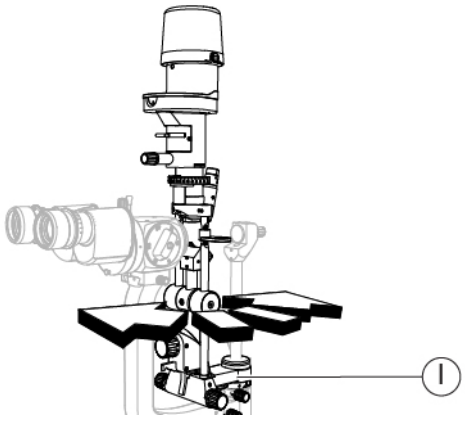


Fig. 94 - Swing the lighting assembly

12 While swinging the lighting assembly, check that the vertical projection of the slit remains centred in relation to the reference cross of the eyepiece.

13 Observe the calibration rod through the eyepieces and turn the lighting head (F) to the 0°-180° position.

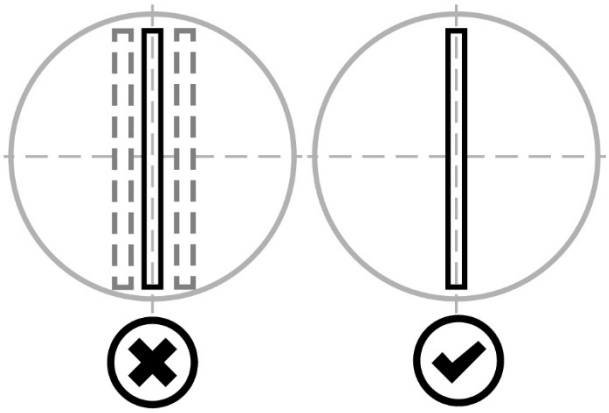


Fig. 95 - Check the vertical projection of the slit

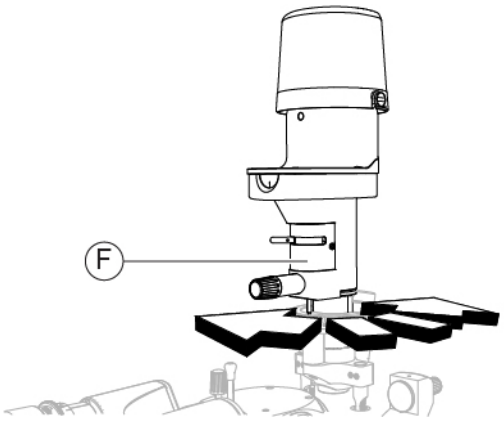


Fig. 96 - Turn the lighting head

14 Check that the horizontal projection of the slit remains centred in relation to the reference cross of for the eyepieces.

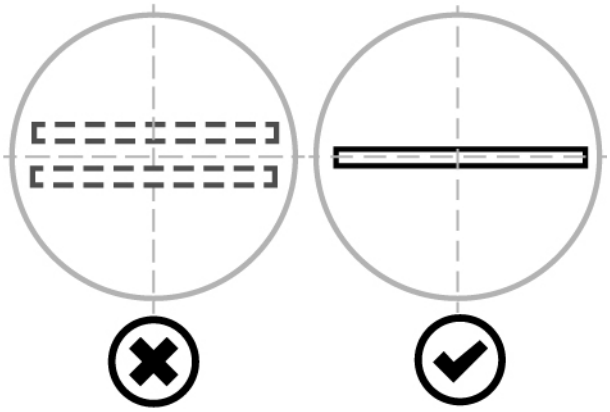


Fig. 97 - Check the horizontal projection of the slit

15 If the slit projection is not centred during the rotations described, carry out the lighting assembly calibration, as described in the paragraph **"Lighting assembly calibration - [SL9900 and SL9900 ELITE]" on page 156.**

6.5.3 REPLACEMENT OF THE POWER SUPPLY UNIT

Material and warnings:

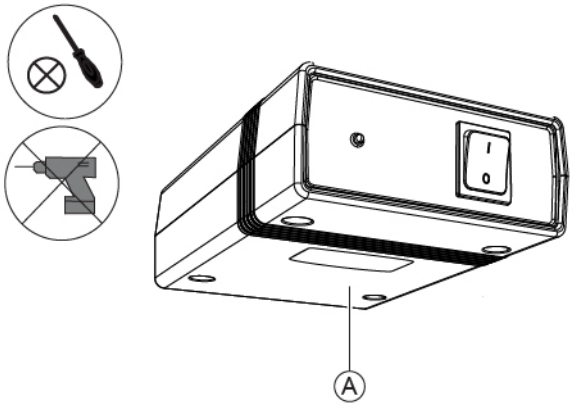


Fig. 98 - Power supply unit

Pos	Description	Code
A	Power supply unit (PSP1501)	100259900

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

The described procedure applies to power supply units installed under the table top.

Disassembling procedure for the power supply unit:

1 Turn off the device and the PC.
2 If present, fasten the table wheels. Lower the brake lever.
3 Disconnect the power cables on the power supply unit.
4 Loosen the screws on the four holes of the power supply unit.
5 Unscrew the four screws and remove the power supply unit.

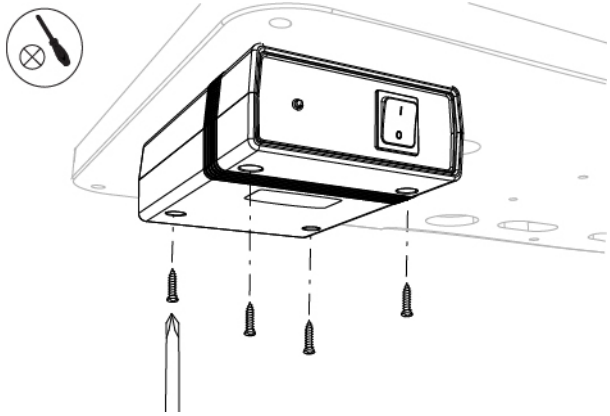


Fig. 99 - Unscrew the screws

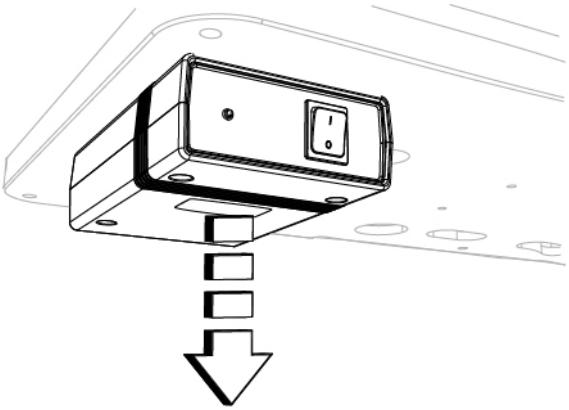


Fig. 100 - Remove the power supply unit

Assembling procedure for the power supply unit:

1 Place the power supply unit under the table top, where the previous power supply unit was installed.
2 Screw in the screws to the four holes on the power supply unit.
3 Connect the power cables on the power supply unit.

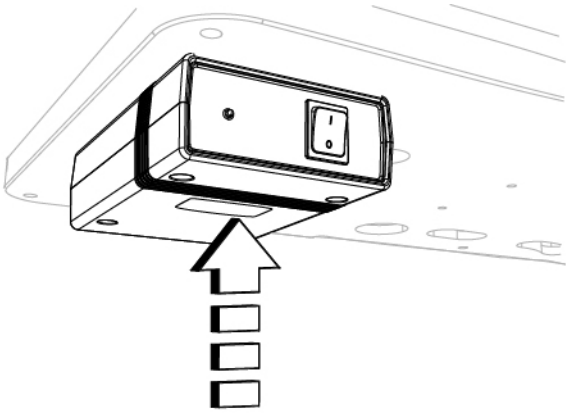


Fig. 101 - Place the power supply unit

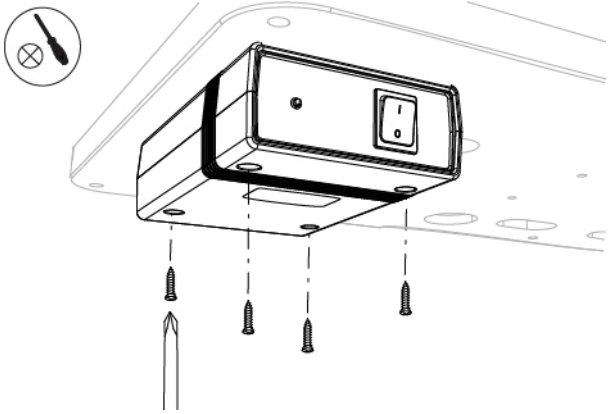


Fig. 102 - Screw in the screws

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.4 REPLACEMENT OF THE EYEPIECE COVERS

Material and warnings:

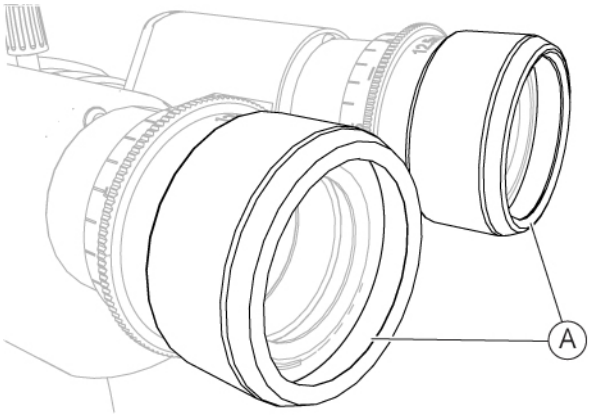


Fig. 103 - Eyepiece covers

Pos	Description	Code
A	Eyepiece covers	100226627
	Sealing ring	100226628

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

Disassembling procedure for the eyepiece covers:

1 Remove the eyepiece covers from the eyepieces.
2 Remove the sealing rings (A).

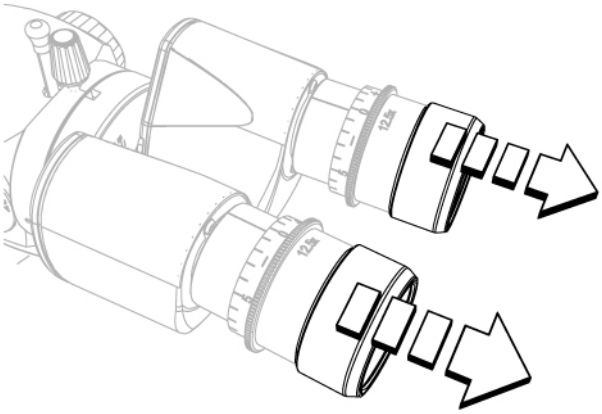


Fig. 104 - Remove the eyepiece covers

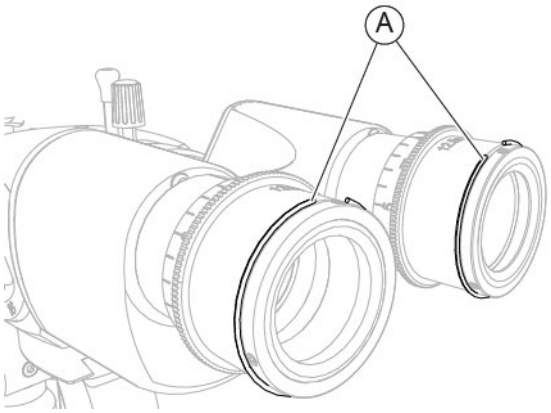


Fig. 105 - Remove the sealing rings

Assembling procedure for the eyepiece covers:

1 Install the sealing rings (A).
2 Install the eyepiece covers on the eyepieces.

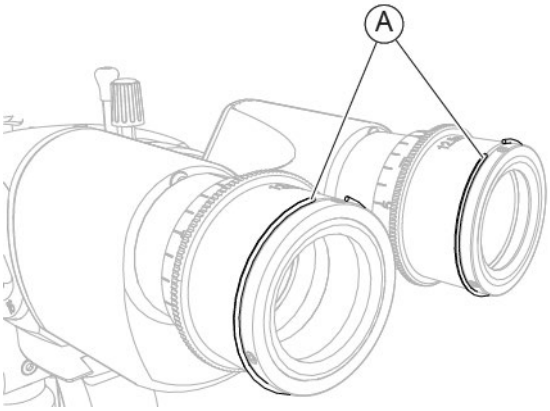


Fig. 106 - Install the sealing rings

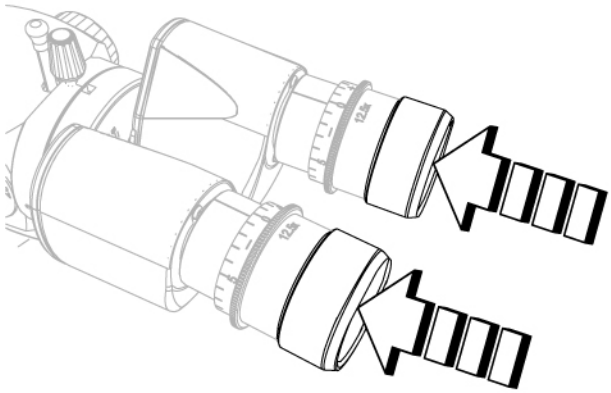


Fig. 107 - Install the eyepiece covers

6.5.5 REPLACEMENT OF THE EYEPIECES

Material and warnings:

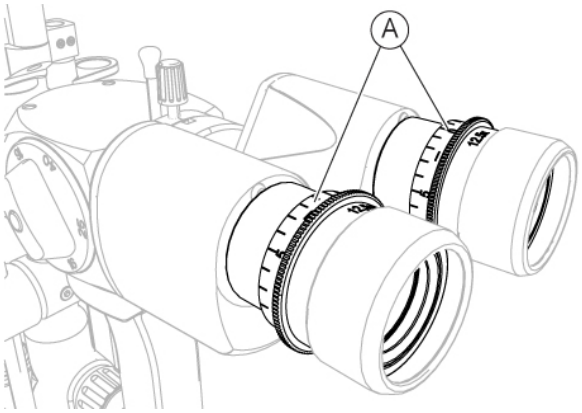


Fig. 108 - Eyepieces

Pos	Description	Code
A	Eyepieces	100226619

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

Disassembling and assembling procedure for the eyepieces:

1 Remove the eyepieces installed on the binoculars.
2 Carry out the replacement. Install the eyepieces on the binoculars.

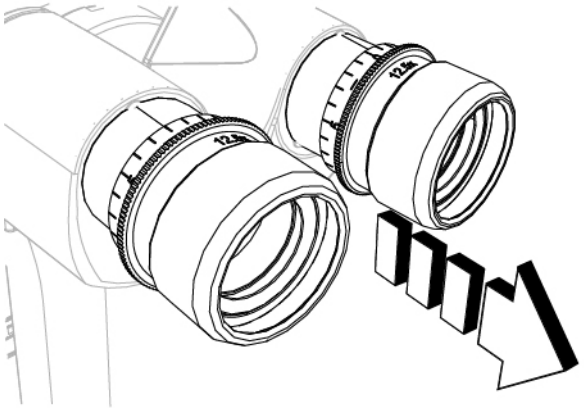


Fig. 109 - Remove the eyepieces

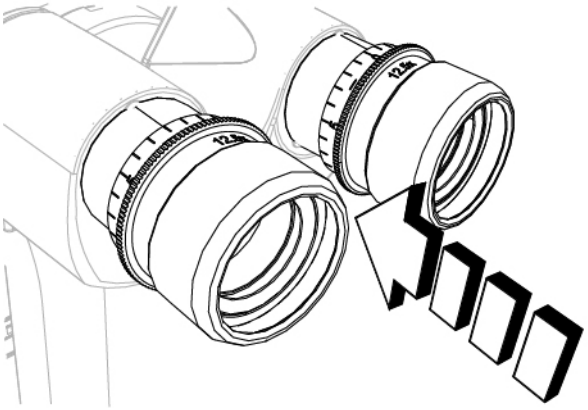


Fig. 110 - Install the eyepieces

6.5.6 REPLACEMENT OF THE BINOCULARS

Material and warnings:

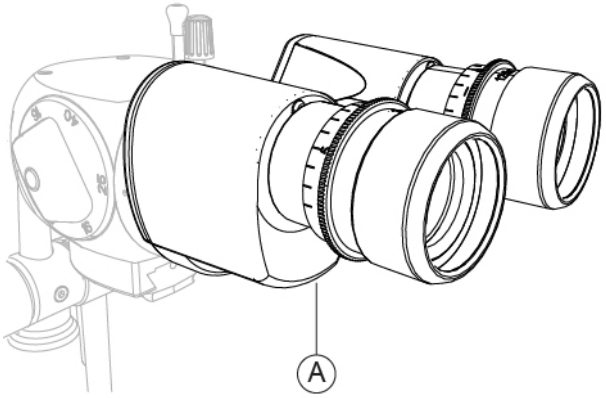


Fig. 111 - Binoculars

Pos	Description	Code
A	Binoculars (22 mm)	100250600

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

Disassembling procedure for the binoculars:

1 Hold the binoculars.
2 Loosen the locking/unlocking knob (A).
3 Remove the binoculars by rotating them downwards.

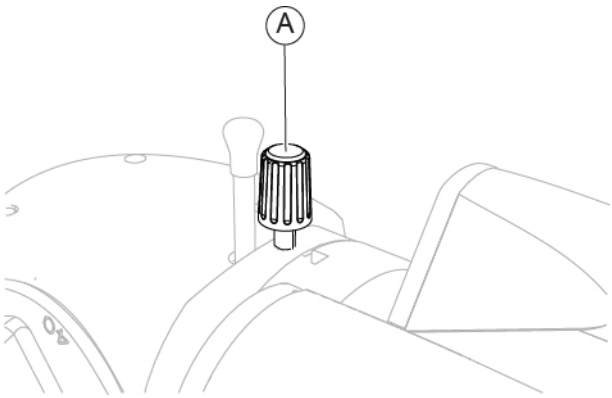


Fig. 112 - Loosen the knob

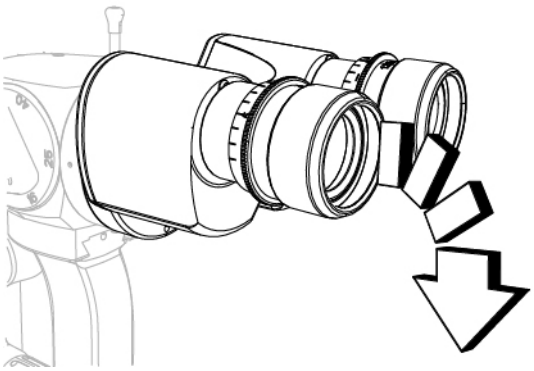


Fig. 113 - Remove the binoculars

Assembling procedure for the binoculars:

1 Place the binoculars on the magnification adjuster.
2 Tighten the locking/unlocking knob (A).

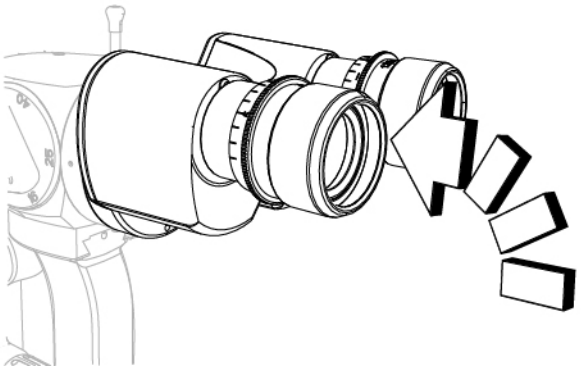


Fig. 114 - Place the binoculars

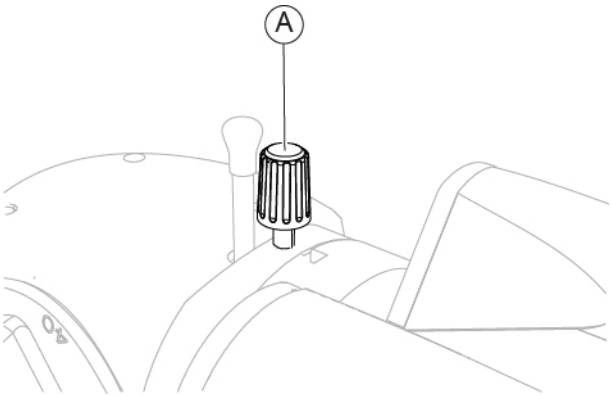


Fig. 115 - Tighten the knob

6.5.7 REPLACEMENT OF THE BEAM SPLITTER [DIGITAL CONFIGURATION]

Material and warnings:

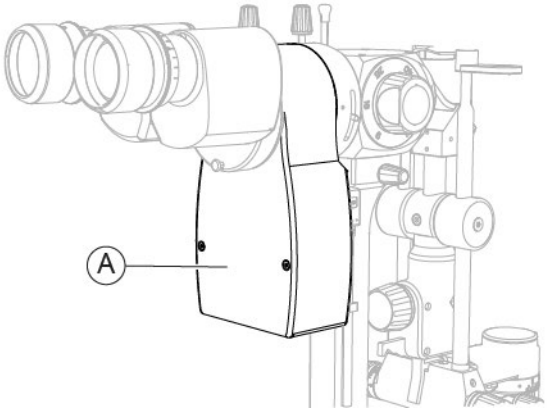


Fig. 116 - Beam splitter

Pos	Description	Code
A	Beam splitter including USB videocamera [SL9800 and SL9900]	100258305
	Beam splitter including USB videocamera [SL9900 ELITE]	100259300
	Beam splitter including Firewire videocamera [SL9800 and SL9900]	100250305

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

Disassembling procedure for the beam splitter:

1 Remove the binoculars as described in the paragraph **"Replacement of the binoculars" on page 79.**
2 Disconnect the connection cable (A) between the beam splitter and the PC.
3 Disconnect the connection cable (B) between the beam splitter and the base.

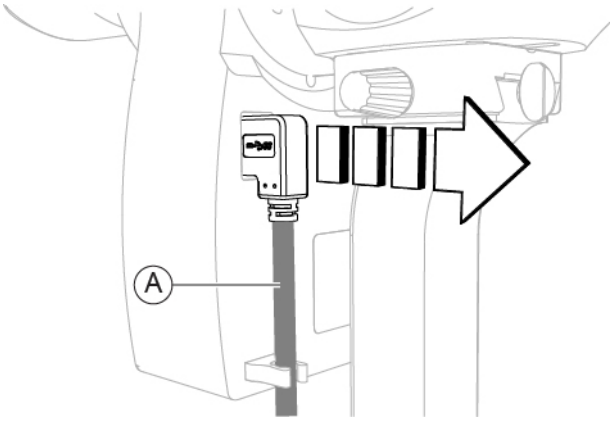


Fig. 117 - Disconnect the cable

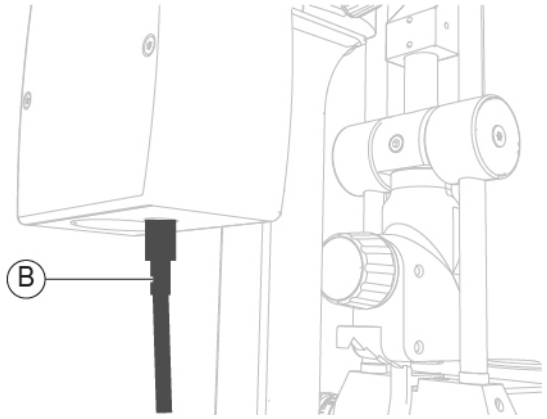


Fig. 118 - Disconnect the cable

4 Loosen the knob (D).
5 Remove the beam splitter (C).

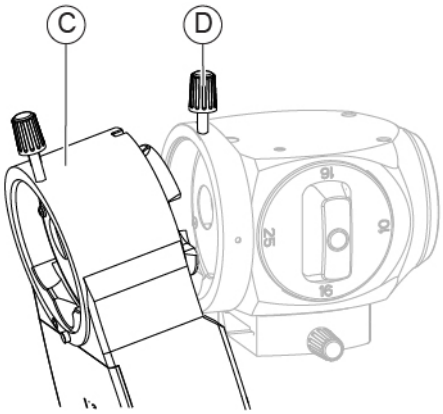


Fig. 119 - Remove the beam splitter

Assembling procedure for the beam splitter:

1 Place the beam splitter (C) onto the magnification adjuster.
2 Tighten the knob (D) to fasten the beam splitter.
3 Connect the connection cable (B) between the beam splitter and the base.

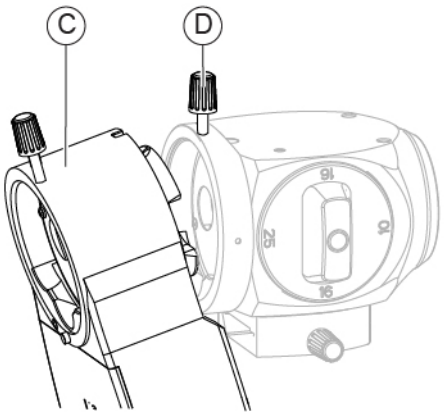


Fig. 120 - Place the beam splitter

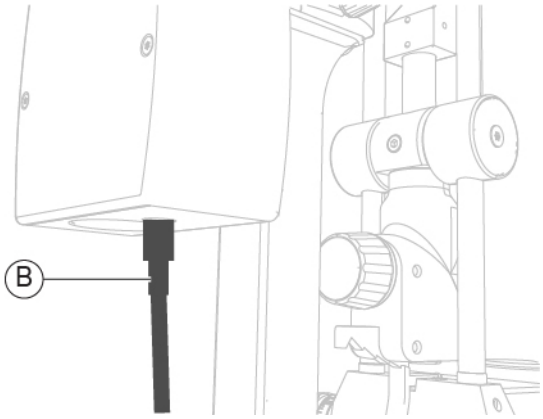


Fig. 121 - Connect the cable

4 Connect the connection cable (A) between the beam splitter and the PC.
5 Install the binoculars as described in the paragraph **"Replacement of the** binoculars**" on page 79.**

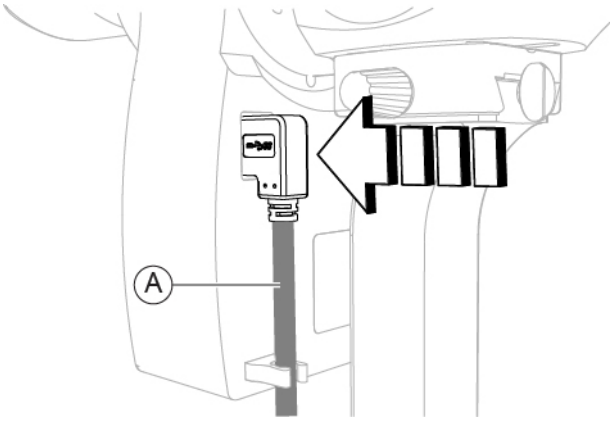


Fig. 122 - Connect the cable

6.5.8 REPLACEMENT OF THE MAGNIFICATION ADJUSTER

Material and warnings:

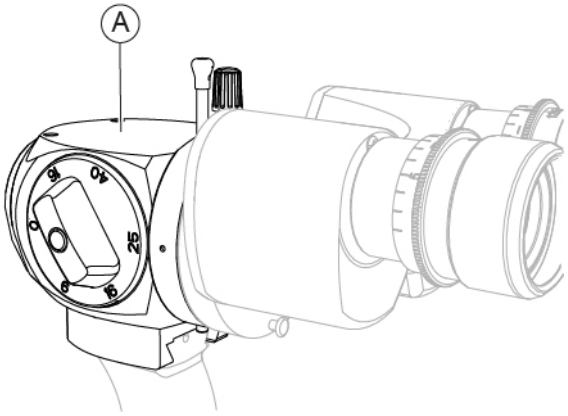


Fig. 123 - Magnification adjuster

Pos	Description	Code
A	Magnification adjuster 5x (without yellow filter)	100239615
	Magnification adjuster 3x (without yellow filter)	100270613
	Magnification adjuster 5x (with yellow filter)	100239615_f
	Magnification adjuster 3x (with yellow filter)	100270613_f
	Magnification adjuster 2x	100272600
	Magnification adjuster Zoom	100271601

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

Disassembling procedure for the magnification adjuster:

1 Remove the binoculars as described in the paragraph **"Replacement of the binoculars" on page 79.**
2 For devices equipped with beam splitter, remove the beam splitter as described in the paragraph **"Replacement of the beam splitter [Digital configuration]" on page 80.**
3 Loosen the locking/unlocking knob (A).
4 Remove the magnification adjuster from the arm.

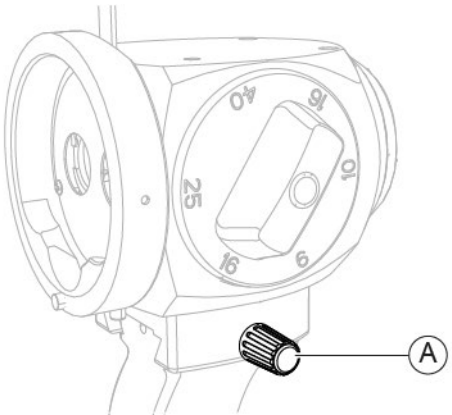


Fig. 124 - Loosen the knob

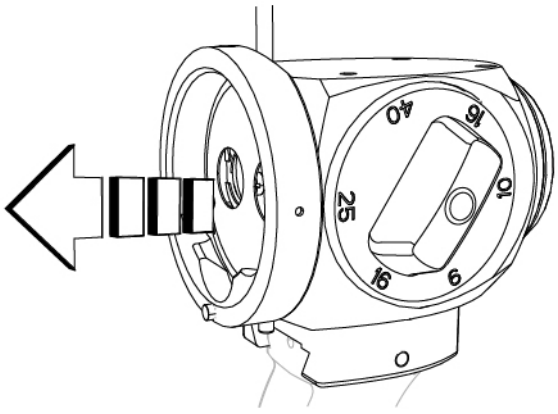


Fig. 125 - Remove the magnification adjuster

Assembling procedure for the magnification adjuster:

1 Install the magnification adjuster on the arm.
2 Push the magnification adjuster until reaching the stop element (B).

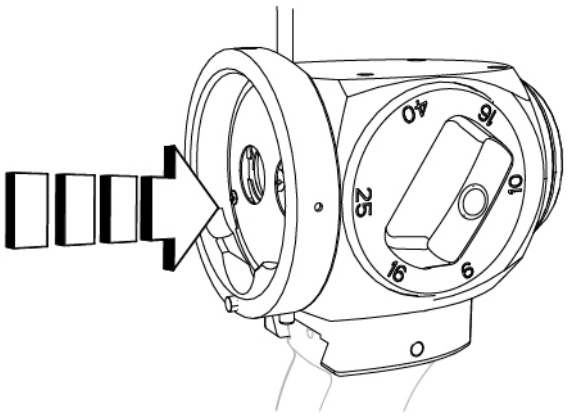


Fig. 126 - Install the binoculars

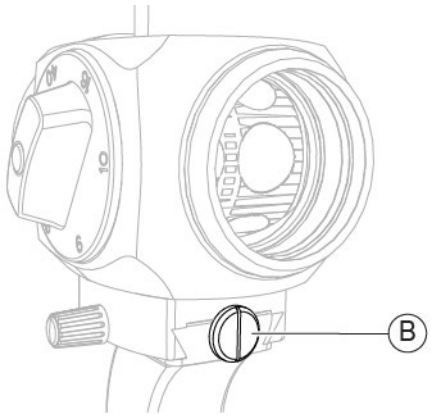


Fig. 127 - Stop element

3 Tighten the locking/unlocking knob (A).

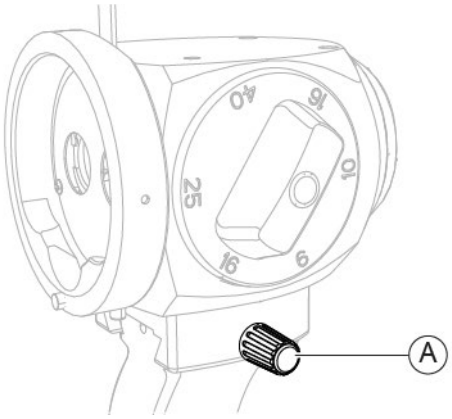


Fig. 128 - Tighten the knob

4 For devices equipped with beam splitter, install the beam splitter as described in the paragraph **"Replacement of the beam splitter [Digital configuration]" on page 80.**
5 Install the binoculars as described in the paragraph **"Replacement of the binoculars" on page 79.**

When the operation is complete, carry out the manual calibration of the microscope as described in the paragraph **"Manual calibration of the microscope" on page 85.**

6.5.8.1 MANUAL CALIBRATION OF THE MICROSCOPE - [SL9800]

The manual calibration of the microscope must only be carried out following a corrective maintenance activity for the **Replacement of the magnification adjuster**.

Carry out the manual calibration of the microscope (SL9800) only after **Testing the lighting assembly calibration - [SL9800]**, if the device is not calibrated.

Close attention shall be paid while performing the procedure. It is important to check device stability before starting with the procedure.
calibration is essential to obtaining precise measurements.

Manual calibration of the microscope shall only be carried out by qualified and trained technical personnel.

Material and warnings:

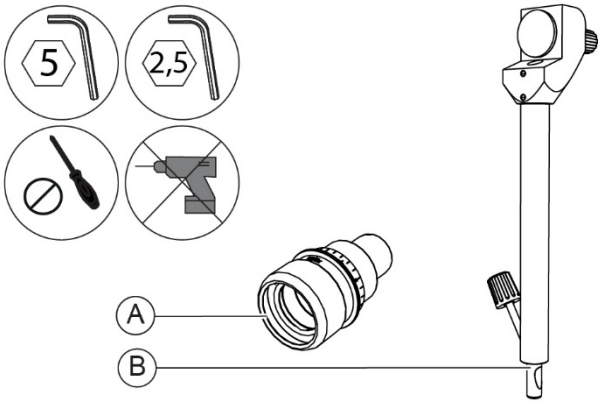


Fig. 129 - Eyepiece with reference cross and calibration rod

Pos	Description	Code
A	Eyepiece with reference cross	103005110
B	Calibration rod	200200100
	Dioptometer (*)	200200160

(*) Use only in case it is necessary to compensate a possible ametropia of the operator.

For more information about how to use the dioptometer, read the dioptometer instructions for use.

Manual microscope calibration procedure for SL9800

1 Turn the power switch of the power supply unit to ON.
2 Remove the cap (A).
3 Insert the calibration rod (B) into its seat (C).

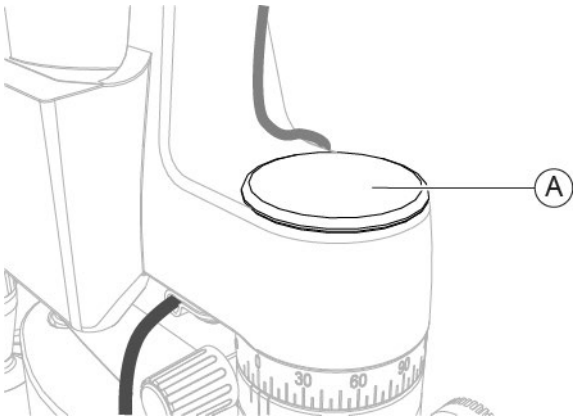


Fig. 130 - Remove the cap

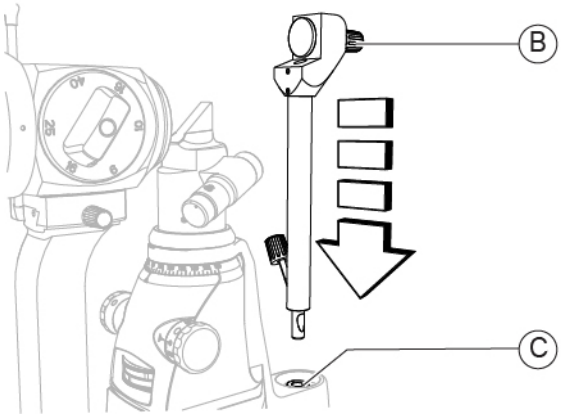


Fig. 131 - Insert the calibration rod

4 Remove the eyepieces as described in the paragraph **"Replacement of the eyepieces" on page 78.**
5 Install the eyepiece with reference cross on the binoculars. Bring the orthogonal fiducial lines in vertical and horizontal position.
6 Turn the adjustment dial (D) and set the lowest value.
7 Turn the filter selector (E) to the through-light position (no filter set).

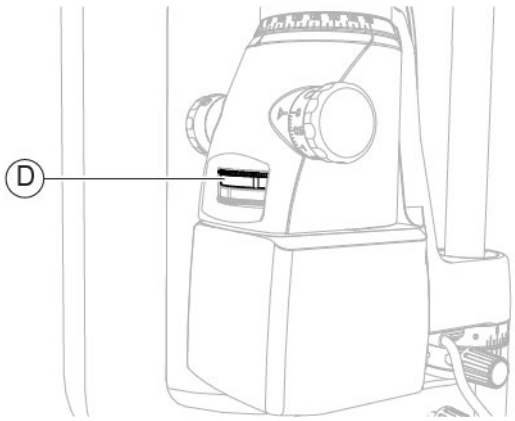


Fig. 132 - Turn the adjustment dial

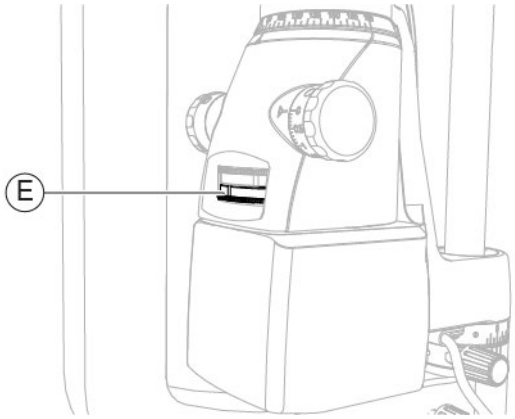


Fig. 133 - Turn the filter selector

8 Turn the eyepiece with reference cross (F) to position "0".
9 Turn the magnification adjuster selector (G) and set the maximum magnification value.

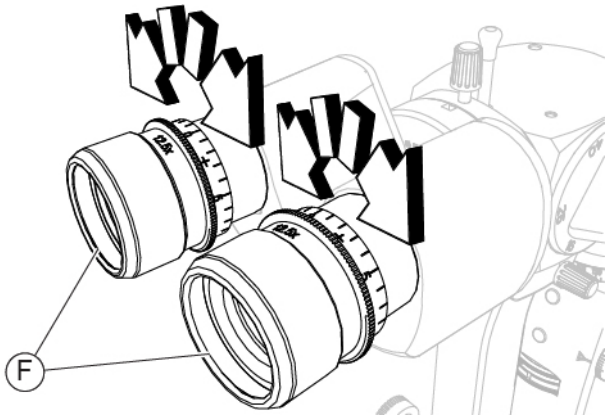


Fig. 134 - Turn the eyepiece with reference cross

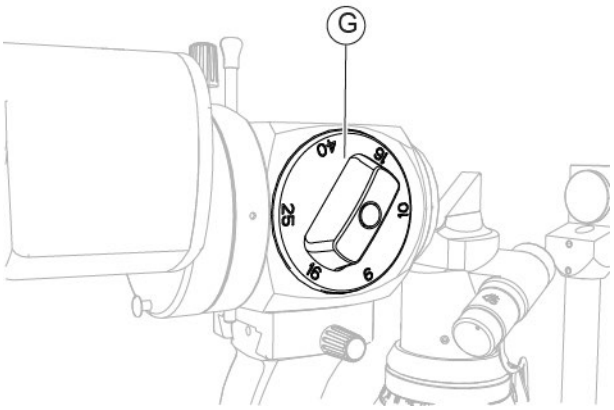


Fig. 135 - Turn the magnification adjuster selector

10 Remove the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**
11 Hold the magnification adjuster and loosen the 3 screws (H) on the bottom of the magnification adjuster.
Loosen the screws just enough to allow for a slight movement of the magnification adjuster.
12 Reinstall the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**
13 Observe the calibration rod through the eyepieces and slightly turn the magnification adjuster left and right to centre the image.
Check the image is centred.

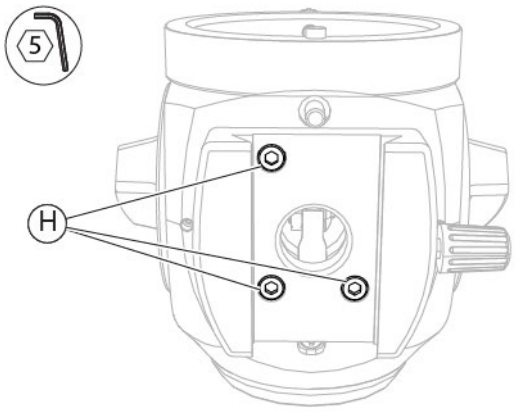


Fig. 136 - Loosen the screws

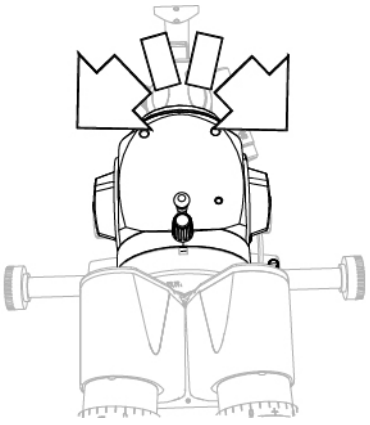


Fig. 137 - Turn the magnification adjuster

14 Remove the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**
15 Hold the magnification adjuster and tighten the 3 screws (H) on the bottom of the magnification adjuster.
16 Reinstall the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**
17 Remove the eyepiece with reference cross and install the eyepieces as described in the paragraph **"Replacement of the eyepieces" on page 78.**
18 Loosen the screw (I).

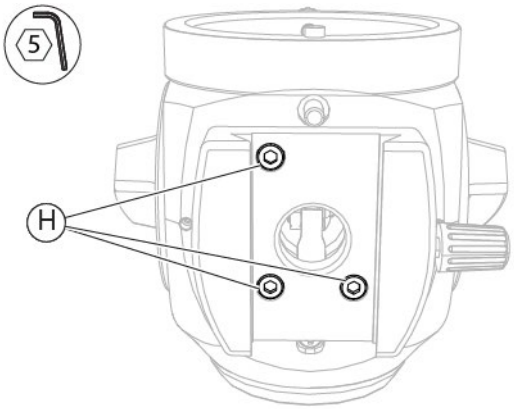


Fig. 138 - Tighten the screws

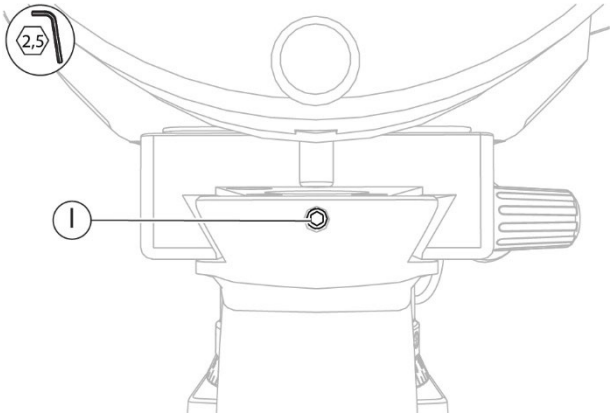


Fig. 139 - Loosen the screw

19 Loosen the stop element (J).
20 Turn the magnification adjuster selector (G) and set the maximum magnification value.

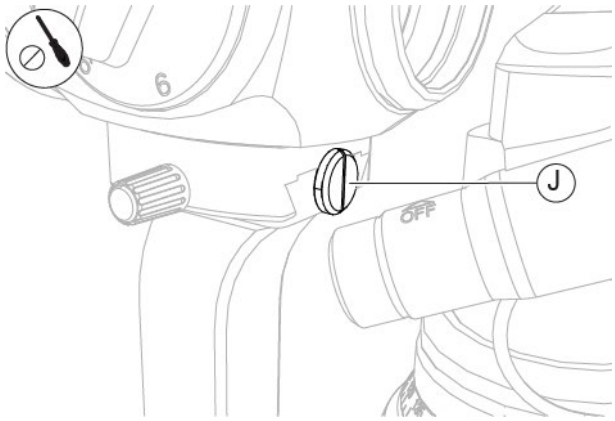


Fig. 140 - Loosen the stop element

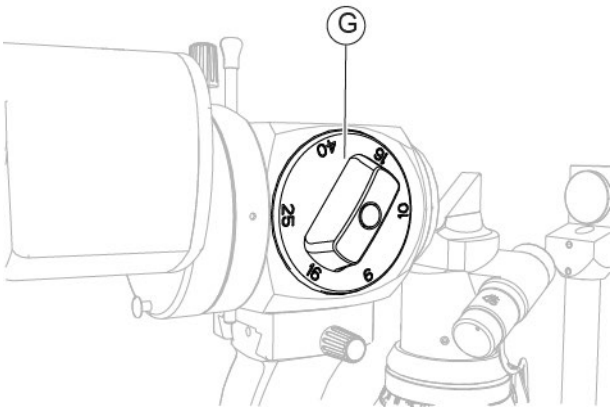


Fig. 141 - Turn the magnification adjuster selector

21 Observe the calibration rod through the eyepieces and move the microscope back or forth to focus the image. Check the image is in focus.
22 Check the image remains in focus for all available magnification values.
23 Tighten the stop element (J).

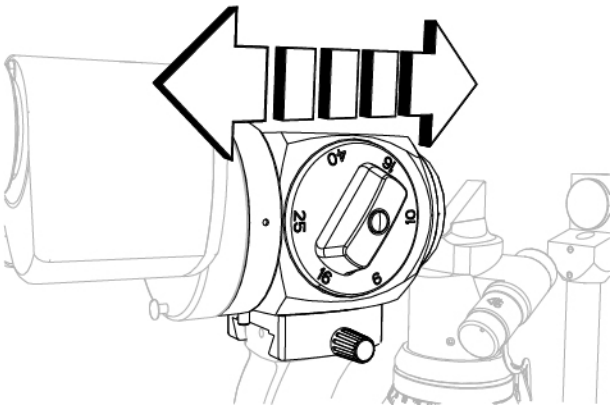


Fig. 142 - Move the microscope

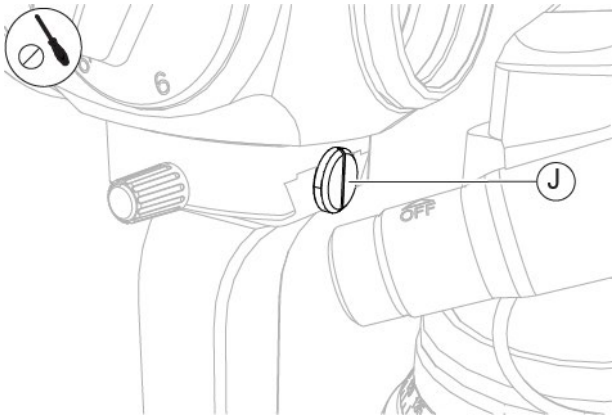


Fig. 143 - Tighten the stop element

24 Tighten the screw (I).
25 Check for correct focusing.

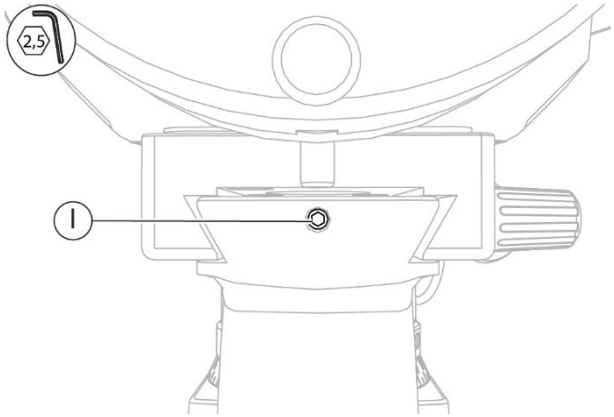


Fig. 144 - Tighten the screw

26 Remove the calibration rod (B) from its seat (C).
27 Insert the cap (A).

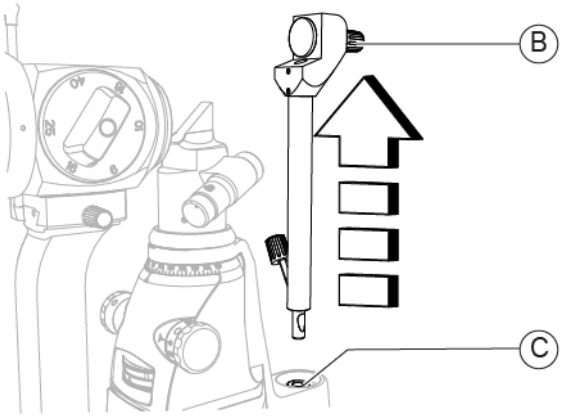


Fig. 145 - Remove the calibration rod

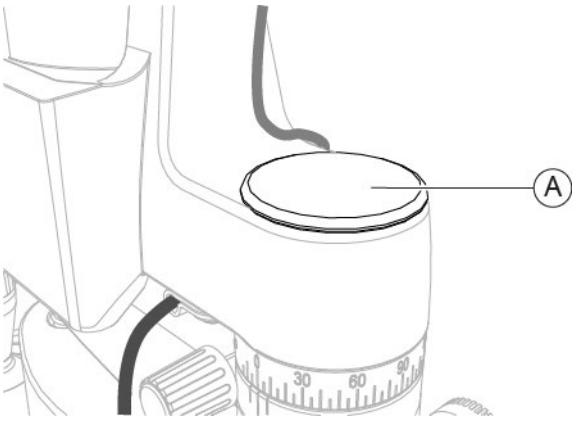


Fig. 146 - Insert the cap

6.5.8.2 MANUAL MICROSCOPE CALIBRATION - [SL9900 AND SL9900 ELITE]

The manual calibration of the microscope must only be carried out following a corrective maintenance activity for the **Replacement of the magnification adjuster**.

Carry out the manual calibration of the microscope (SL9900 or SL9900 ELITE) only after **Testing the lighting assembly calibration - [SL9900 and SL9900 ELITE]**, if the device is not calibrated.

Close attention shall be paid while performing the procedure. It is important to check device stability before starting with the procedure.
Calibration is essential to obtaining precise measurements.

Manual calibration of the microscope shall only be carried out by qualified and trained technical personnel.

Material and warnings:

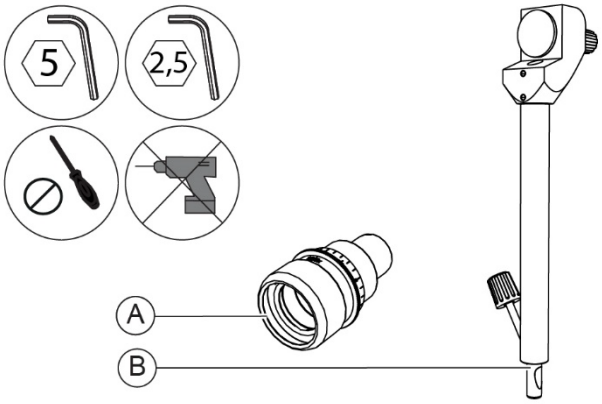


Fig. 147 - Eyepiece with reference cross and calibration rod

Pos	Description	Code
A	Eyepiece with reference cross	103005110
B	Calibration rod	200200100
	Dioptometer (*)	200200160

(*) Use only in case it is necessary to compensate a possible ametropia of the operator.

For more information about how to use the dioptometer, read the dioptometer instructions for use.

Manual microscope calibration procedure for SL9900 and SL9900 ELITE

1 Turn the power switch of the power supply unit to ON.
2 Remove the cap (A).
3 Insert the calibration rod (B) into its seat (C).

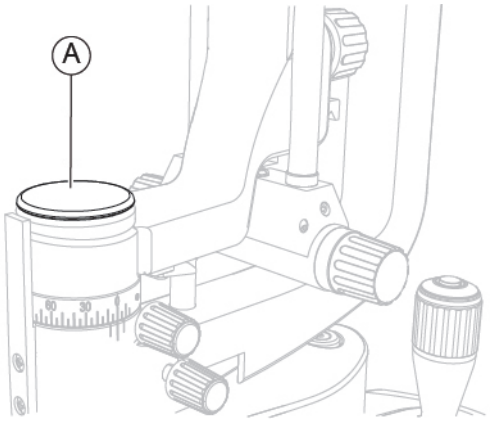


Fig. 148 - Remove the cap

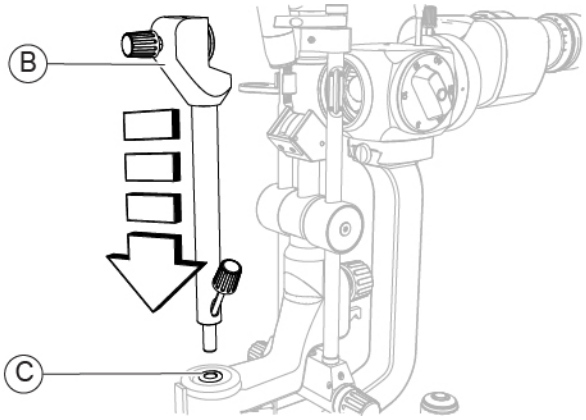


Fig. 149 - Insert the calibration rod

4 Remove the eyepieces as described in the paragraph **"Replacement of the eyepieces" on page 78.**
5 Install the eyepiece with reference cross on the binoculars. Bring the orthogonal fiducial lines in vertical and horizontal position.
6 Turn the filter selector (D) to the through light position (no filter set).
7 Turn the knob (E) and set the lowest value.

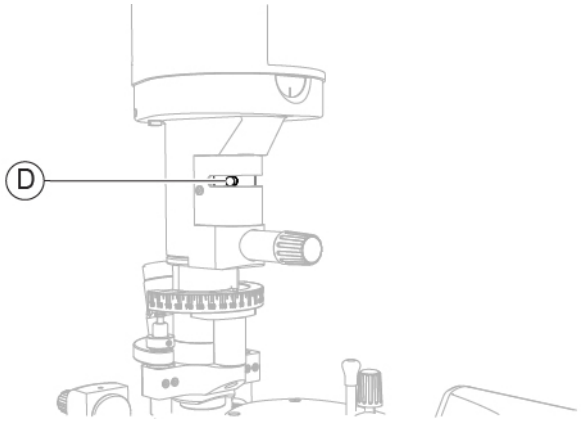


Fig. 150 - Turn the filter selector

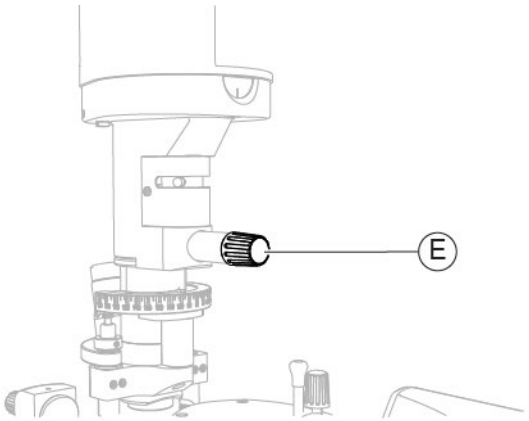


Fig. 151 - Turn the knob

8 Turn the eyepiece with reference cross (F) to position "0".
9 Turn the magnification adjuster selector (G) and set the maximum magnification value.

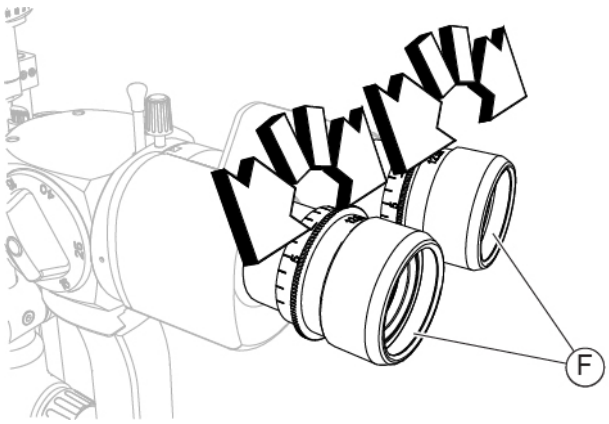


Fig. 152 - Turn the eyepiece with reference cross

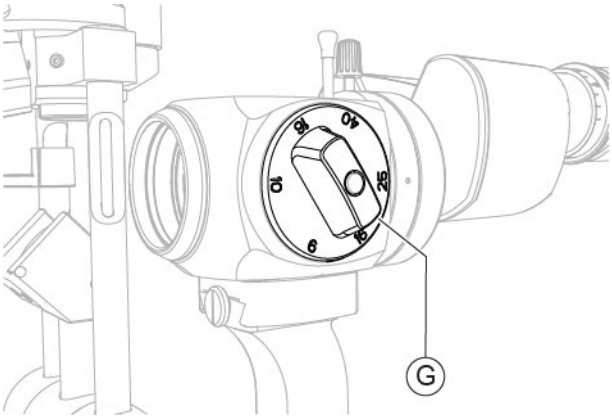


Fig. 153 - Turn the selector

10 Remove the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**
11 Hold the magnification adjuster and loosen the 3 screws (H) on the bottom of the magnification adjuster. Loosen the screws just enough to allow for a slight movement of the magnification adjuster.
12 Reinstall the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**
13 Observe the calibration rod through the eyepieces and slightly turn the magnification adjuster left and right to centre the image. Check the image is centred.

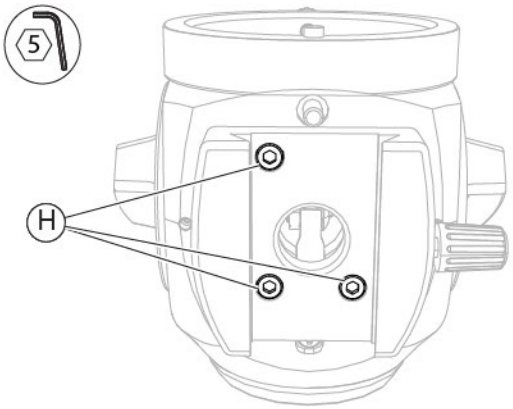


Fig. 154 - Loosen the screws

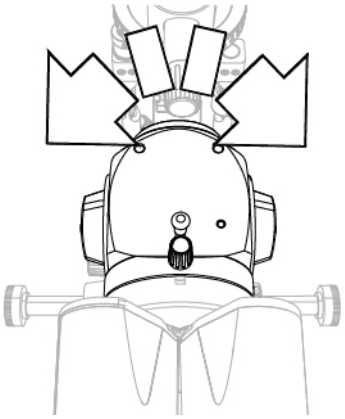


Fig. 155 - Turn the magnification adjuster

14 Remove the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**

15 Hold the magnification adjuster and tighten the 3 screws (H) on the bottom of the magnification adjuster.
16 Reinstall the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**
17 Loosen the screw (I).

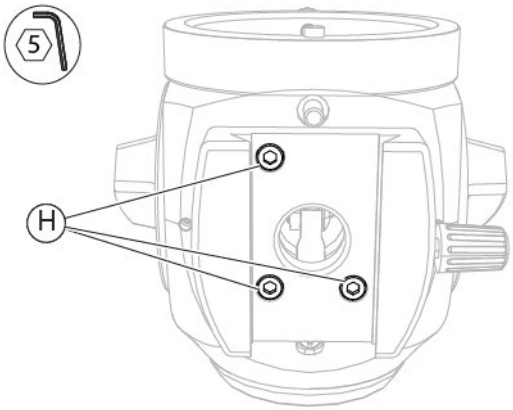


Fig. 156 - Tighten the screws

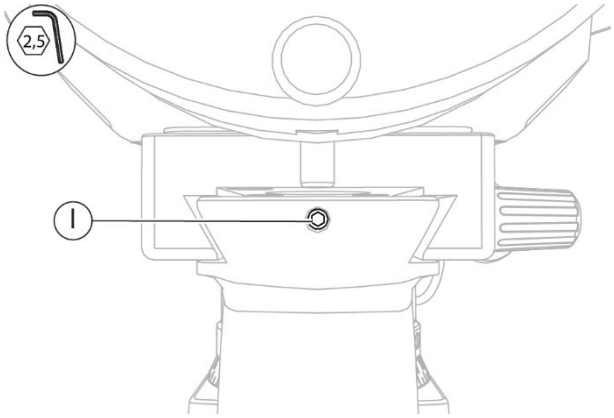


Fig. 157 - Loosen the screw

18 Loosen the stop element (J).
19 Observe the calibration rod through the eyepieces and move the microscope back or forth to focus the image.
Check the image is in focus.

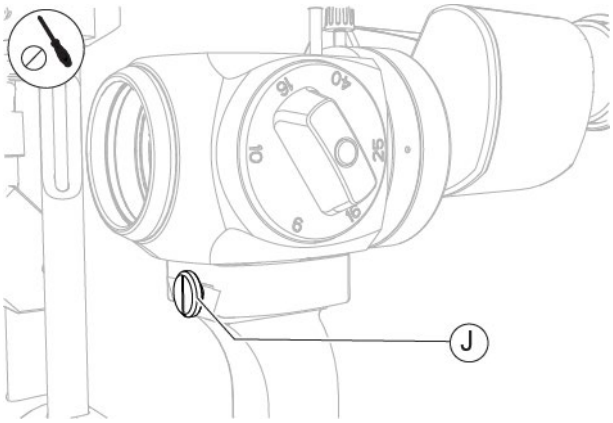


Fig. 158 - Loosen the stop element

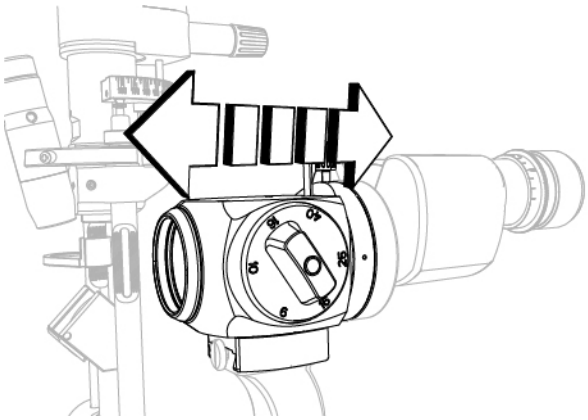


Fig. 159 - Move the microscope

20 Check the image remains in focus for all available magnification values.
21 Tighten the stop element (J).
22 Tighten the screw (I).

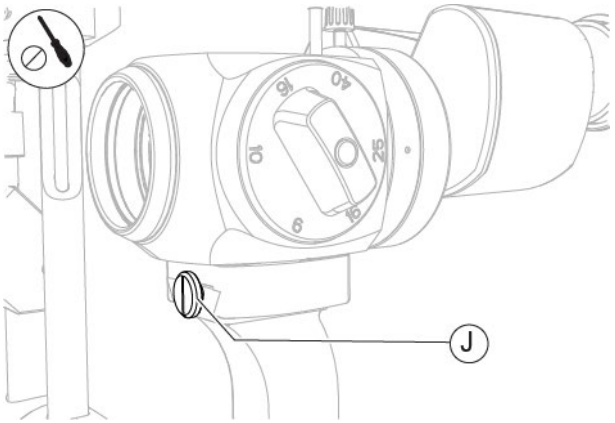


Fig. 160 - Tighten the stop element

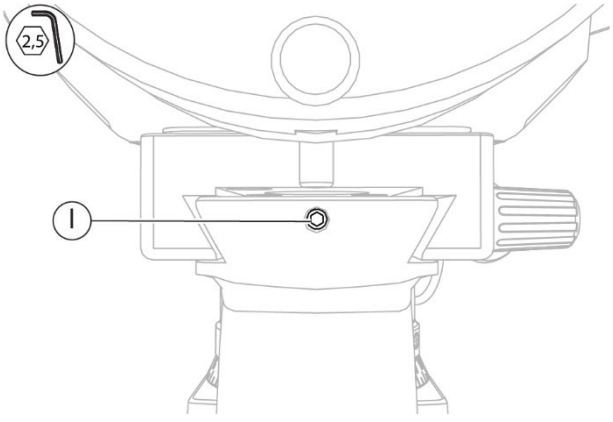


Fig. 161 - Tighten the screw

23 Check for correct focusing.
24 Remove the eyepiece with reference cross and install the eyepieces as described in the paragraph **"Replacement of the eyepieces" on page 78.**
25 Remove the calibration rod (B) from its seat (C).
26 Insert the cap (A).

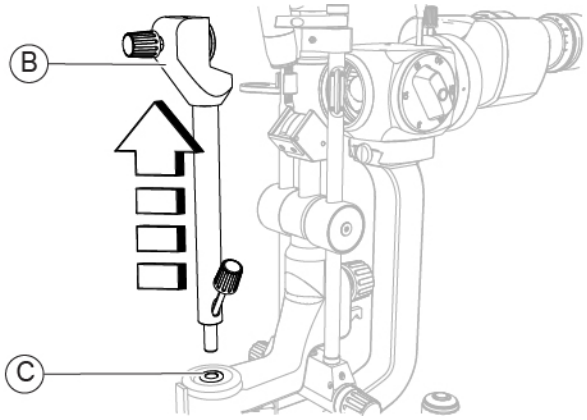


Fig. 162 - Remove the calibration rod

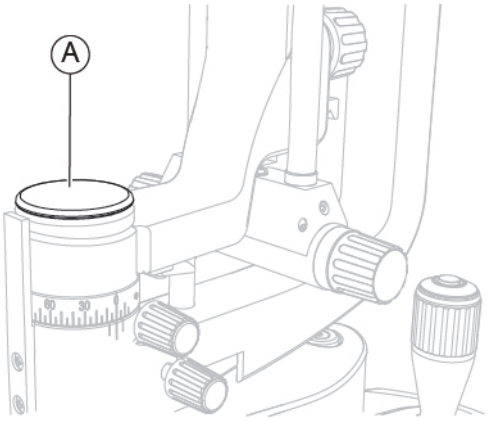


Fig. 163 - Insert the cap

6.5.9 REPLACEMENT OF THE MAGNIFICATION ADJUSTER LENS

Material and warnings:

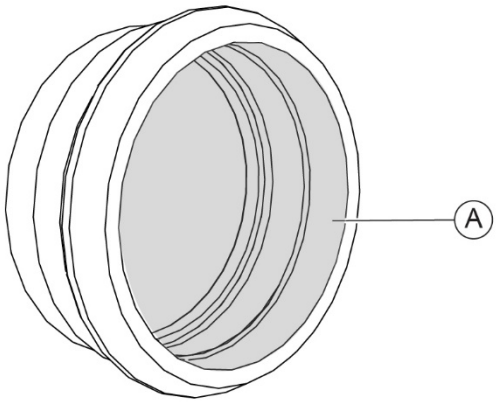


Fig. 164 - Magnification adjuster lens

Pos	Description	Code
A	Magnification adjuster lens	100250610

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

Disassembling and assembling procedure for the magnification adjuster lens:

1 Unscrew and remove the lens from the magnification adjuster.
2 Carry out the replacement. Screw the lens onto the magnification adjuster.

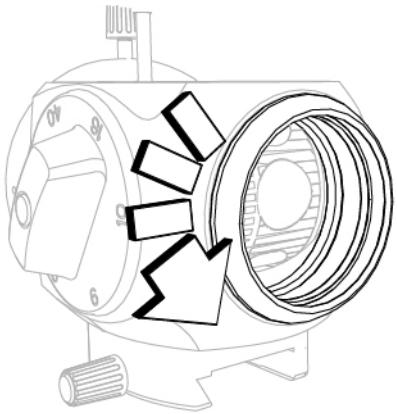


Fig. 165 - Unscrew and remove the lens

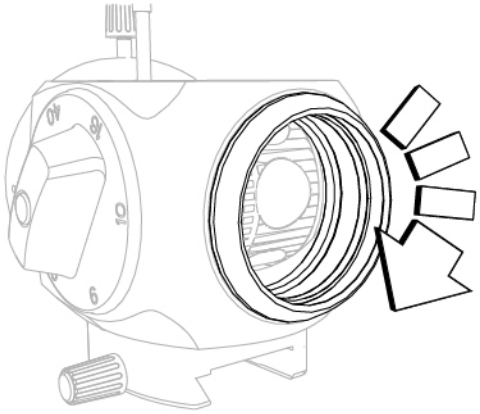


Fig. 166 - Screw in the lens

When the operation is complete, carry out the manual calibration of the microscope as described in the paragraph **"Manual calibration of the microscope" on page 85.**

6.5.10 REPLACEMENT OF THE YELLOW FILTER

The replacement procedure only applies to devices equipped with magnification adjuster that includes the yellow filter.

For the full list of magnification adjusters and their features, refer to the **"Spare parts and accessories list" on page 170.**

Material and warnings:

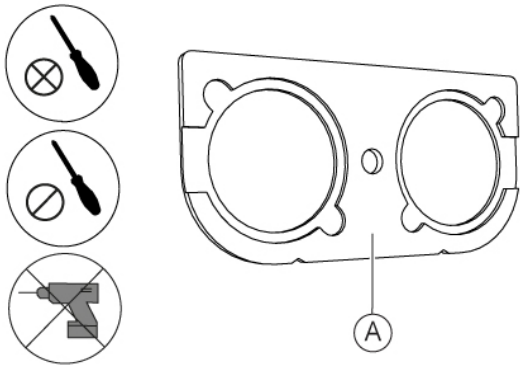


Fig. 167 - Yellow filter

Pos	Description	Code
A	Yellow filter	960264601

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the yellow filter:

1 Remove the binoculars as described in the paragraph **"Replacement of the binoculars" on page 79.**
2 Unscrew the screws (B) fixing the plate (A) to the magnification adjuster.
3 Tilt and remove the plate (A).
4 Unscrew the screw (C) fixing the yellow filter to the yellow filter insertion rod.
5 Remove the yellow filter (D) from the magnification adjuster.

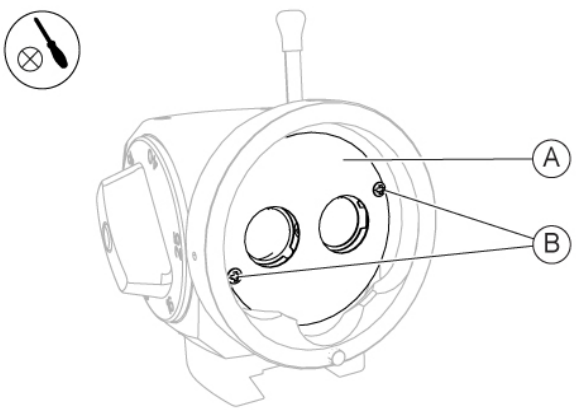


Fig. 168 - Unscrew the screws

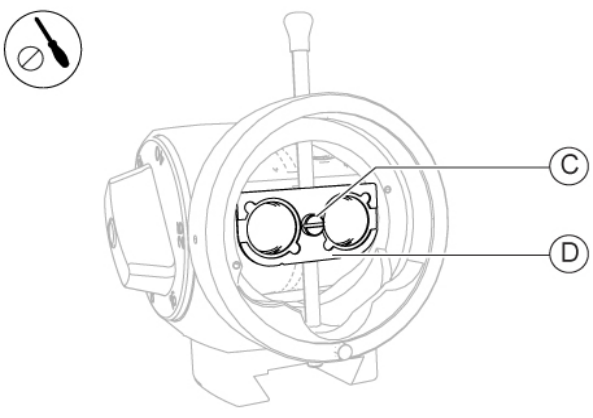


Fig. 169 - Remove the yellow filter

Assembling procedure for the yellow filter:

1 Place the yellow filter (D) into the magnification adjuster.
2 Screw in the screw (C) to fasten the yellow filter to the yellow filter insertion rod.
3 Place the plate (A) into the magnification adjuster. Check that the holes (E) on the plate are in the correct position.

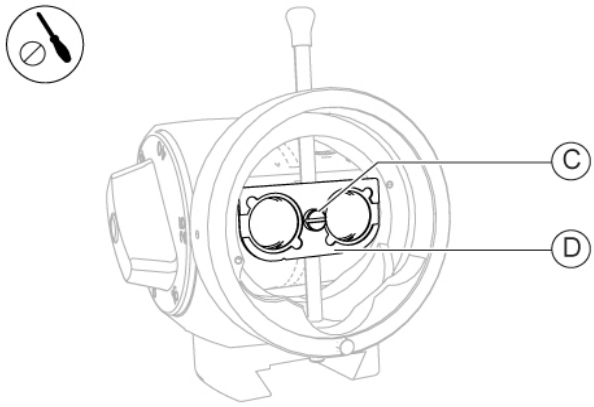


Fig. 170 - Place the yellow filter

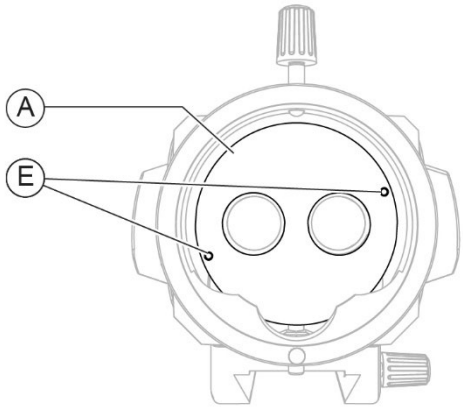


Fig. 171 - Check the holes position

4 Screw in the screws (B) to fasten the plate into the magnification adjuster.

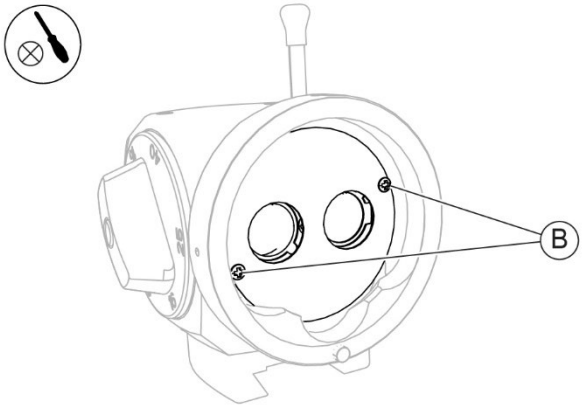


Fig. 172 - Place the plate and screw in the screws

5 Install the binoculars as described in the paragraph **"Replacement of the binoculars" on page 79.**

6.5.11 REPLACEMENT OF THE PROJECTION MIRROR - [SL9900 AND SL9900 ELITE]

Material and warnings:

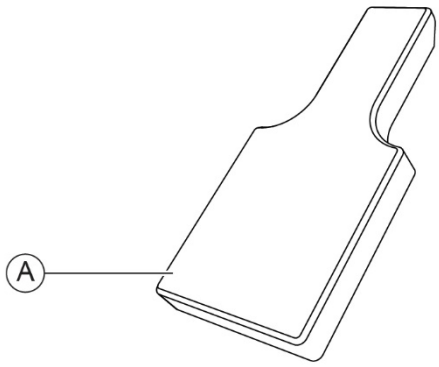


Fig. 173 - Projection mirror

Pos	Description	Code
A	Projection mirror	960206021.O

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the projection mirror:

1 Turn the lighting assembly (A).
2 Remove the projection mirror (B).

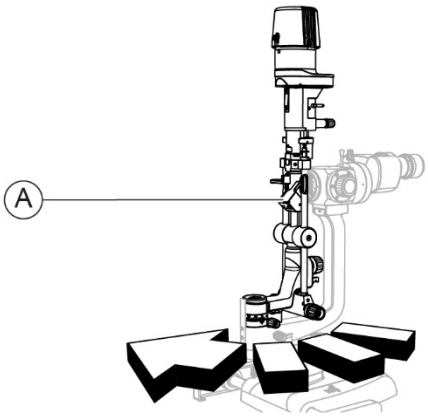


Fig. 174 - Turn the lighting assembly

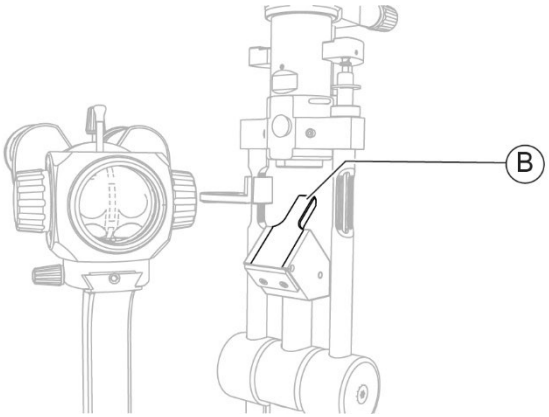


Fig. 175 - Remove the projection mirror

Assembling procedure for the projection mirror:

1 Insert the projection mirror (B) into the seat (C).
2 Turn the lighting assembly (A) to the start position.

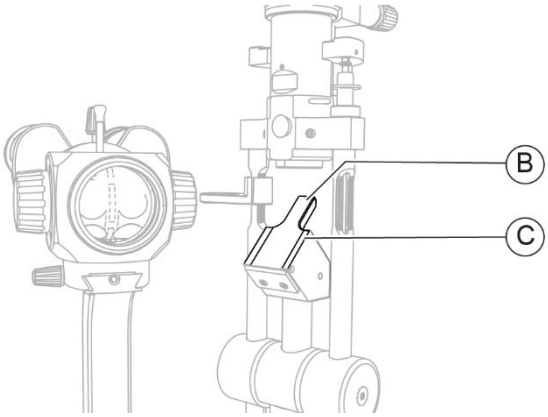


Fig. 176 - Insert the projection mirror

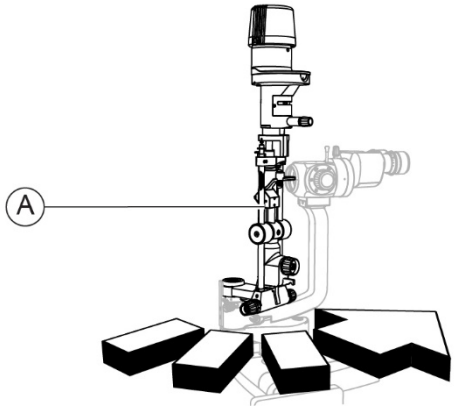


Fig. 177 - Turn the lighting assembly

6.5.12 REPLACEMENT OF THE LIGHTING UNIT - [SL9800]

Material and warnings:

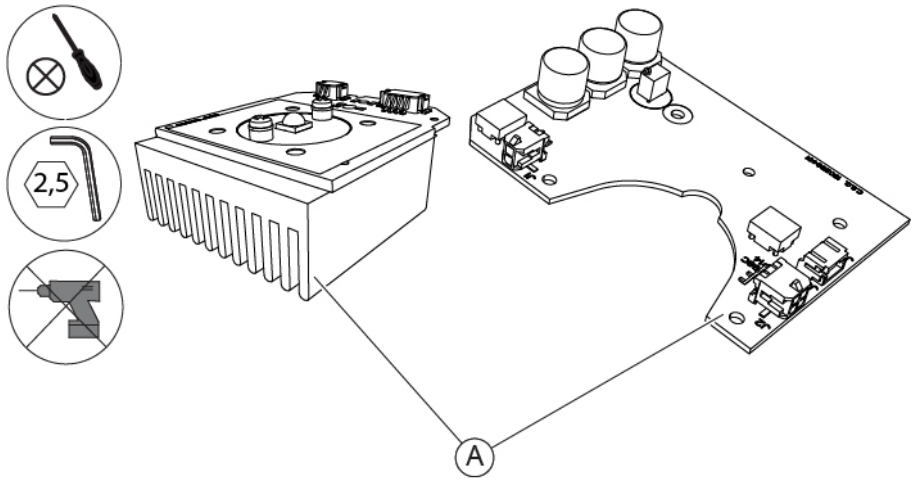


Fig. 178 - Lighting unit and circuit board

Pos	Description	Code
A	Lighting unit and circuit board	960258527

The code for the lighting unit replacement includes also the circuit board.
Always replace the lighting unit together with the circuit board.

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

CAUTION
While replacing the lighting unit, be careful not to touch the LED light indicator to avoid damaging it.

Disassembling procedure for the lighting unit:

1 Disconnect the connection cable (A) between the base and the lighting unit from the connector (B).
2 Turn the lighting assembly to access the lighting unit.

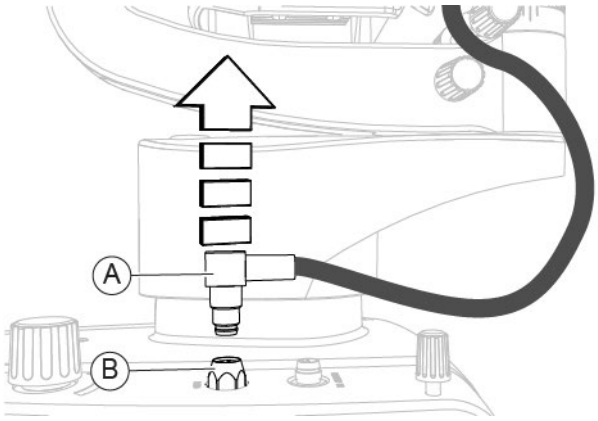


Fig. 179 - Disconnect the cable

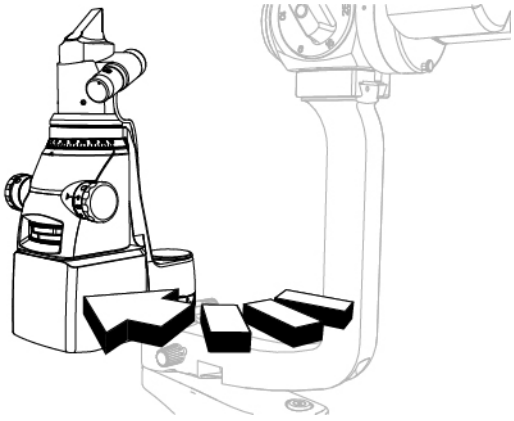


Fig. 180 - Turn the lighting assembly

3 Unscrew the screws (C) and (D).
4 Disconnect the connection cable (A) between the base and the lighting unit from the connector (E).
5 If the device is equipped with illuminator, disconnect the connection cable (F) between the lighting unit and the illuminator from the connector (G).

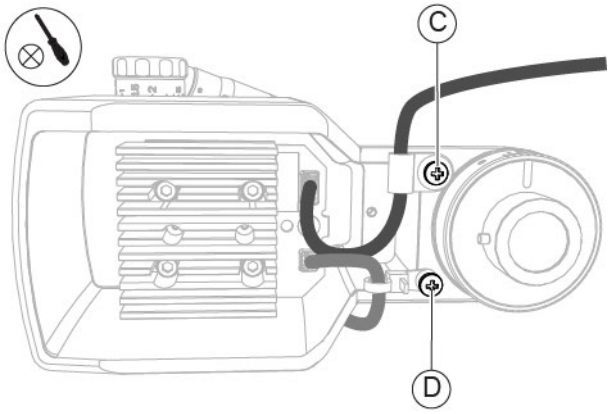


Fig. 181 - Unscrew the screw

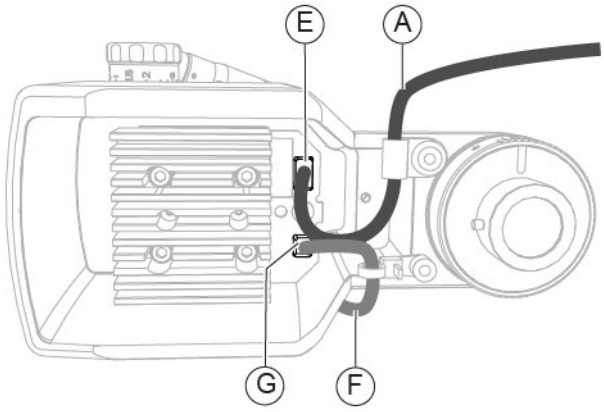


Fig. 182 - Disconnect the cables

6 Unscrew the screws (H).
7 Remove the lighting unit from its seat.

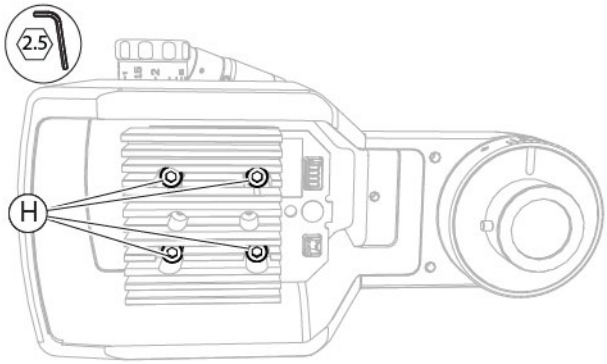


Fig. 183 - Unscrew the screws

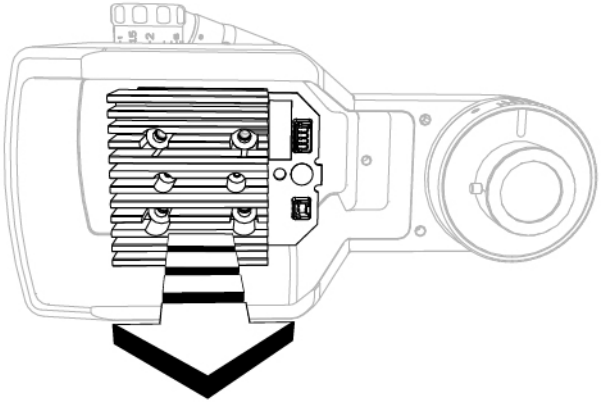


Fig. 184 - Remove the lighting unit

8 Remove the plate.
In case of standard configuration, follow the procedure described in the paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**
In case of digital configuration, follow the procedure described in paragraph **"Replacement of the plate - [Digital configuration - SL9800]" on page 120.**
9 Access the underside of the base.
10 Unscrew the screws (I).
11 Remove the cogwheel (J).
12 Disconnect the connection cable (K) between the base and the circuit board from the connector J1 (L).
13 Disconnect the connection cable (M) between the base and the circuit board from the connector J2 (N).
14 Disconnect the connection cable (O) between the base and the circuit board from the connectors J3 and J4 (P).

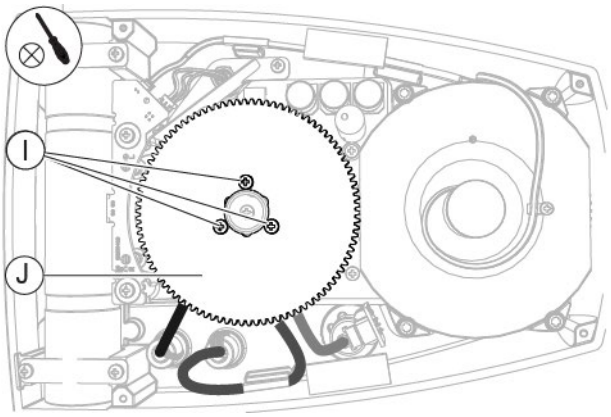


Fig. 185 - Unscrew the screws and remove the cogwheel

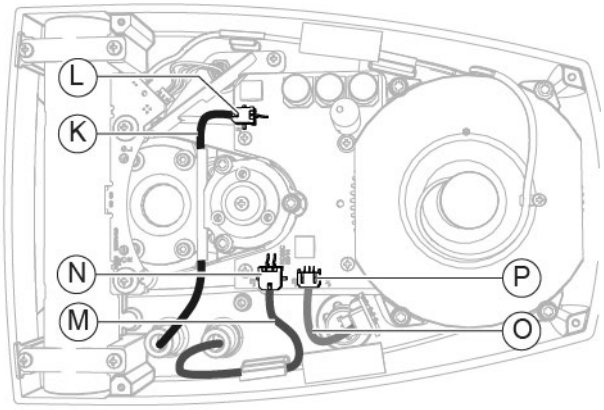


Fig. 186 - Disconnect the connection cables from the connectors

15 Unscrew the screws (Q).
16 Remove the circuit board.

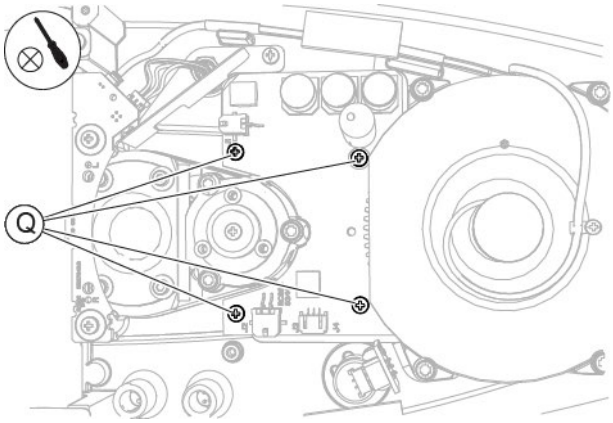


Fig. 187 - Unscrew the screws

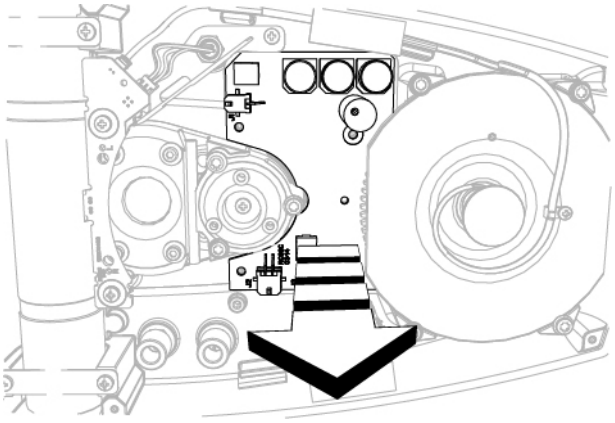


Fig. 188 - Remove the circuit board

Assembling procedure for the lighting unit:

1 Place the circuit board.
2 Screw in the screws (Q) to fasten the circuit board.

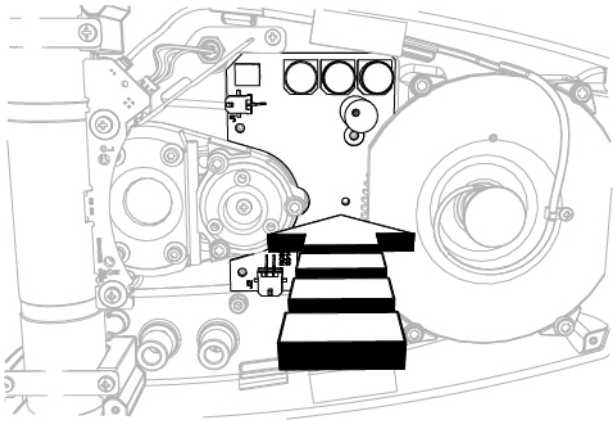


Fig. 189 – Place the circuit board

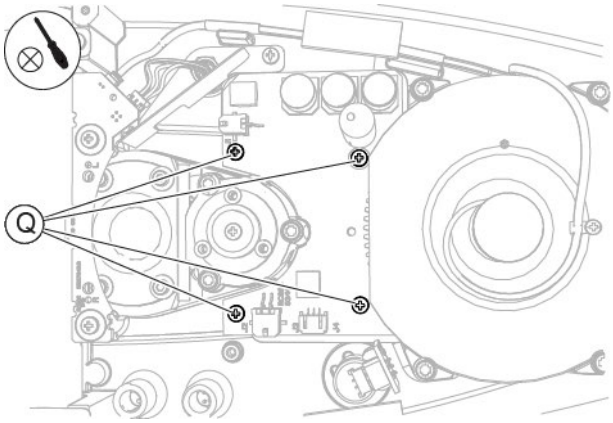


Fig. 190 - Screw in the screws

3 Connect the connection cable (O) between the base and the circuit board to the connectors J3 and J4 (P).
4 Connect the connection cable (M) between the base and the circuit board to the connector J2 (N).
5 Connect the connection cable (K) between the base and the circuit board to the connector J1 (L).
6 Place the cogwheel (J).
7 Screw in the screws (I) to fasten the cogwheel.

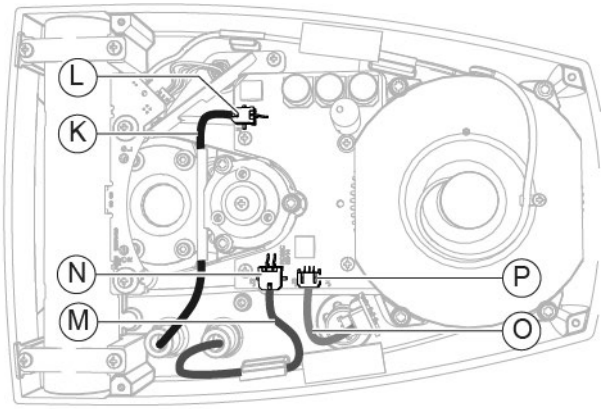


Fig. 191 - Connect the connection cables to the connectors

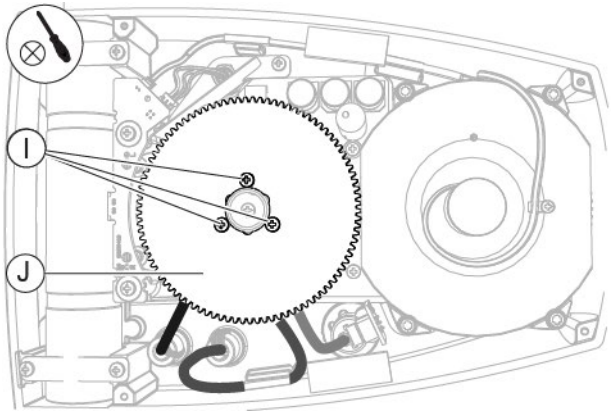


Fig. 192 - Place the cogwheel and screw in the screws

8 Install the plate.
In case of standard configuration, follow the procedure described in the paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**
In case of digital configuration, follow the procedure described in the paragraph **"Replacement of the plate - [Digital configuration - SL9800]" on page 120.**

9 Place the lighting unit into its seat.
10 Screw in the screws (H) to fasten the lighting unit.

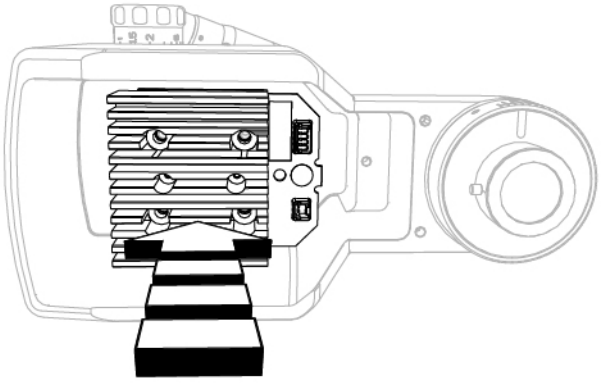


Fig. 193 - Place the lighting unit

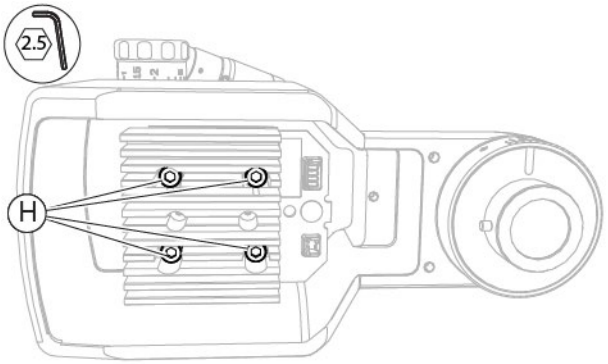


Fig. 194 - Screw in the screws

11 Connect the connection cable (A) between the base and the lighting unit to the connector (E).
12 If the device is equipped with illuminator, connect the connection cable (F) between the lighting unit and the illuminator to the connector (G).
13 Screw in the screws (D) and (C).

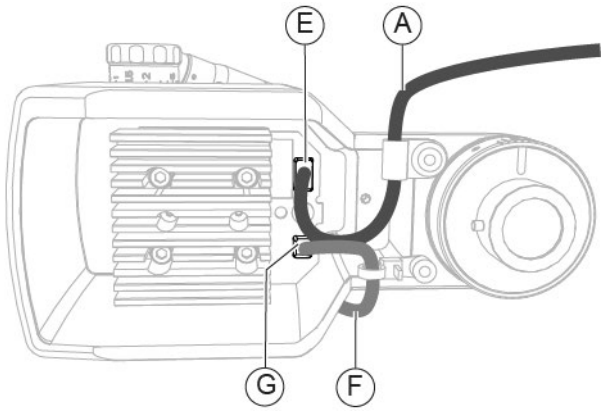


Fig. 195 - Connect the cables

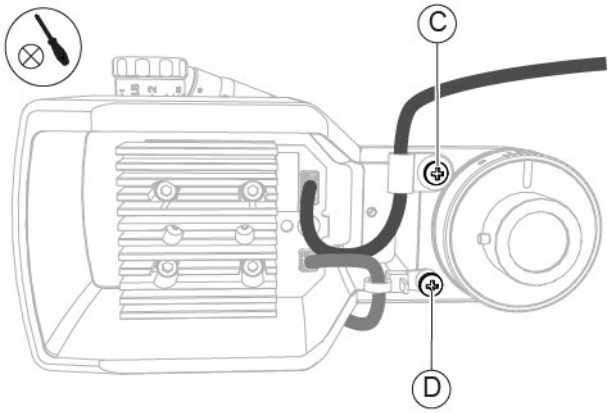


Fig. 196 - Screw in the screw

14 Turn the lighting assembly until reaching the start position.
15 Connect the connection cable (A) between the lighting unit and the base to the connector (B).

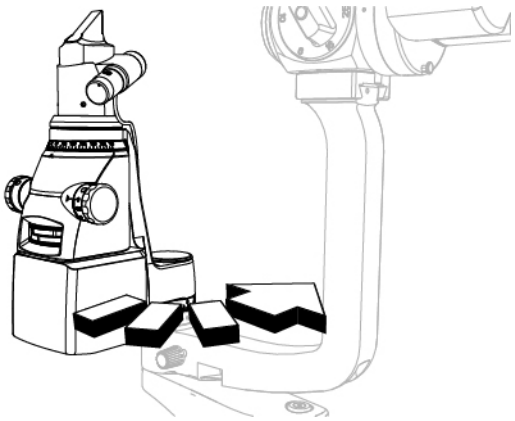


Fig. 197 - Turn the lighting assembly

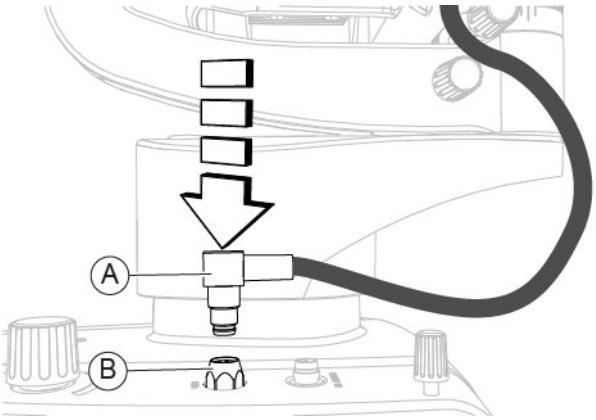


Fig. 198 - Connect the cable

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.13 REPLACEMENT OF THE LIGHTING UNIT - [SL9900 AND SL9900 ELITE]

Material and warnings:

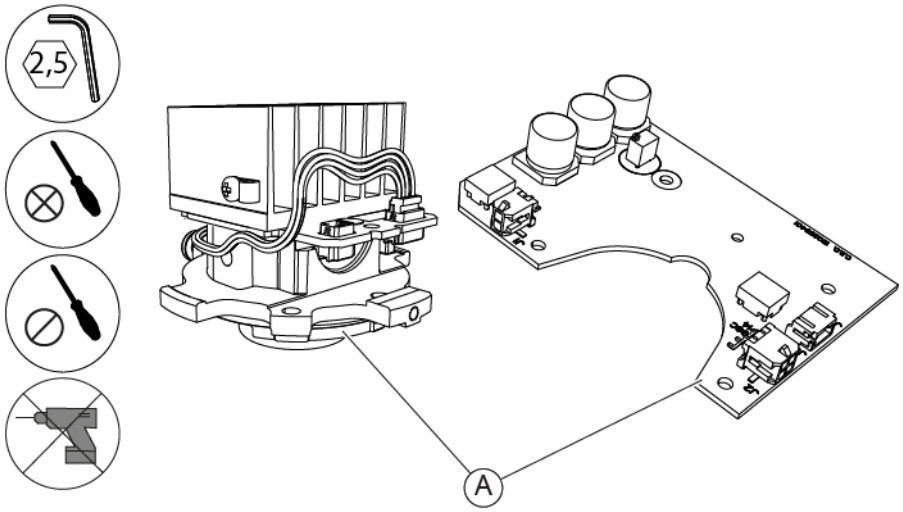


Fig. 199 - Lighting unit and circuit board

Pos	Description	Code
A	Lighting unit and circuit board	960259509

The code for the lighting unit replacement includes also the circuit board.
Always replace the lighting unit together with the circuit board.

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

CAUTION
While replacing the lighting unit, be careful not to touch the LED light indicator to avoid damaging it.

Disassembling procedure for the lighting unit:

1 Unscrew the screws (A).
2 Remove the lighting unit cover.

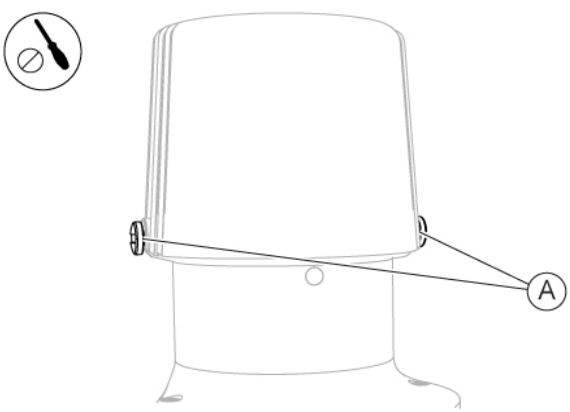


Fig. 200 - Unscrew the screws

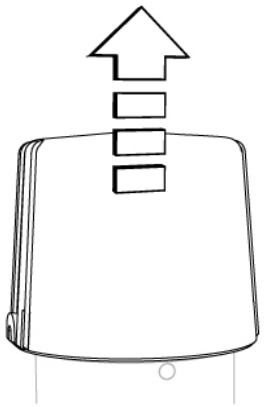


Fig. 201 - Remove the cover

3 Unscrew the screw (B) of the cable clamp.
4 If the device is equipped with illuminator, disconnect the connection cable (C) between the lighting unit and the illuminator from the connector (D).
5 Disconnect the connection cable (F) between the base and the lighting unit from the connector (E).

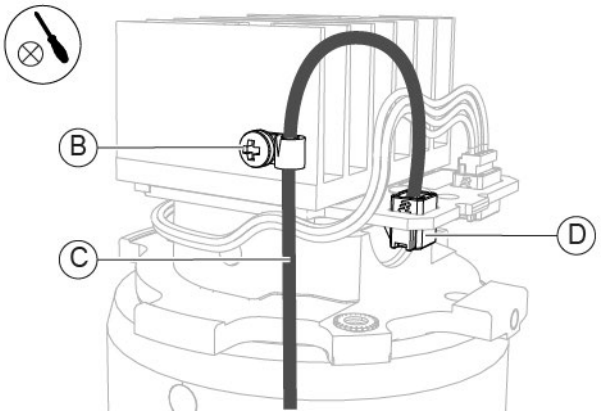


Fig. 202 - Disconnect the cable

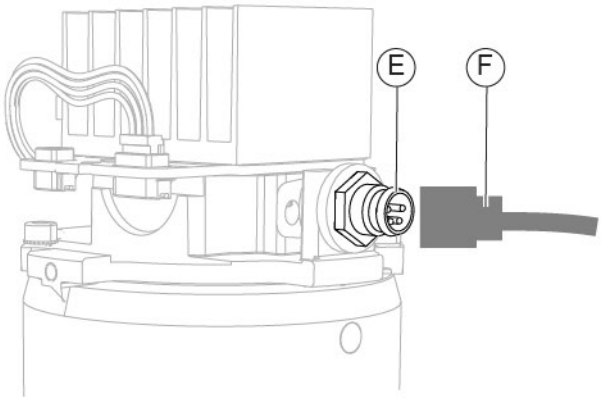


Fig. 203 - Disconnect the cable

6 Unscrew the screws (G).
7 Remove the lighting unit.

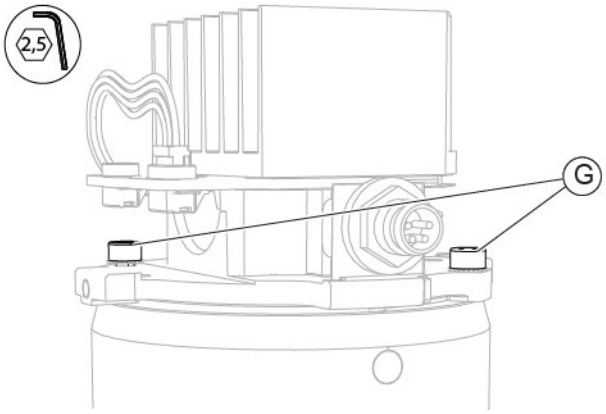


Fig. 204 - Unscrew the screws

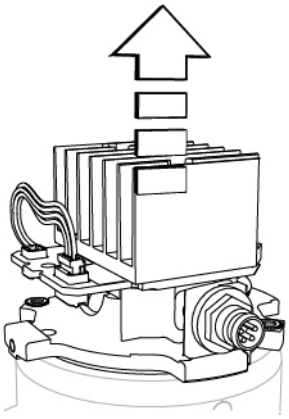


Fig. 205 - Remove the lighting unit

8 Remove the plate.
In case of standard configuration, follow the procedure described in the paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**
In case of digital configuration, follow the procedure described in the paragraph **"Replacement of the plate - [Digital configuration - SL9900 and SL9900 ELITE]" on page 122.**
9 Access the underside of the base.
10 Unscrew the screws (H).
11 Remove the cogwheel (I).
12 Disconnect the connection cable (J) between the base and the circuit board from the connector J1 (K).
13 Disconnect the connection cable (L) between the base and the circuit board from the connector J2 (M).
14 Disconnect the connection cable (N) between the base and the circuit board from the connectors J3 and J4 (O).

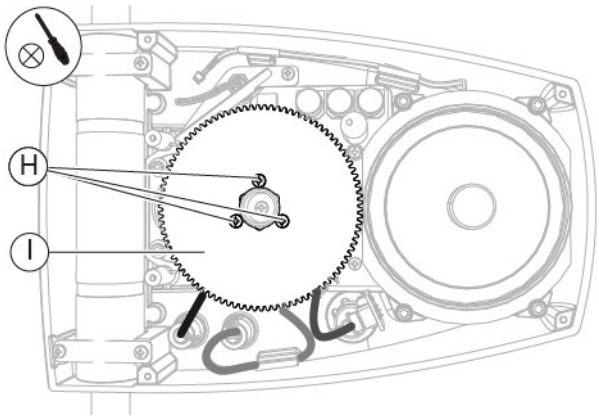


Fig. 206 - Unscrew the screws and remove the cogwheel

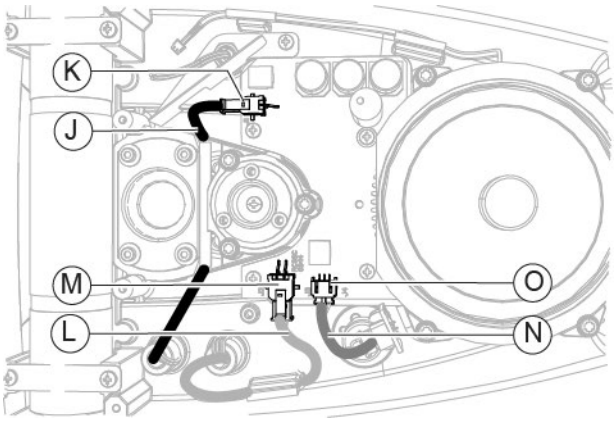


Fig. 207 - Disconnect the cables from the connectors

15 Unscrew the screws (P).
16 Remove the circuit board.

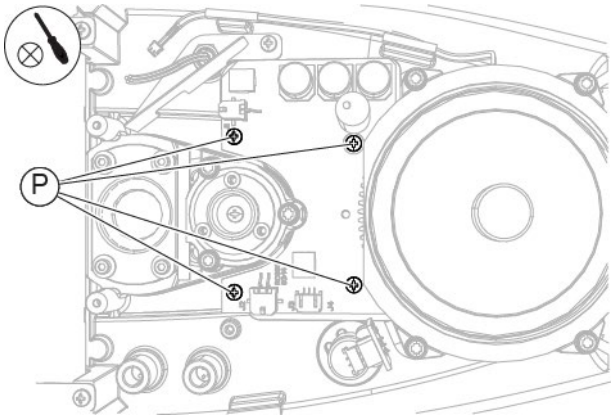


Fig. 208 - Unscrew the screws

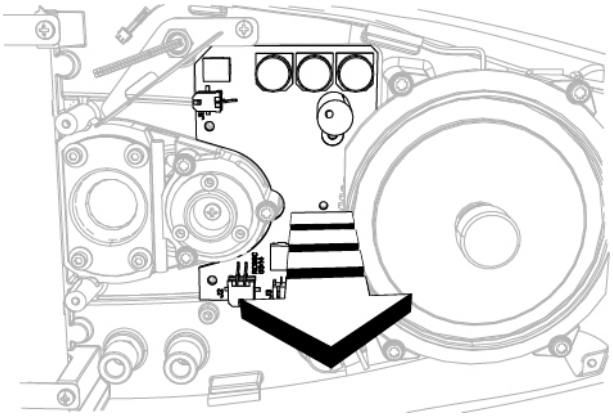


Fig. 209 - Remove the circuit board

Assembling procedure for the lighting unit:

1 Place the circuit board.
2 Screw in the screws (P).

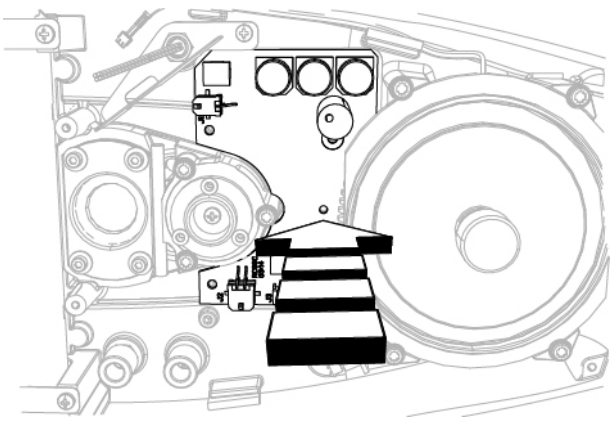


Fig. 210 – Place the circuit board

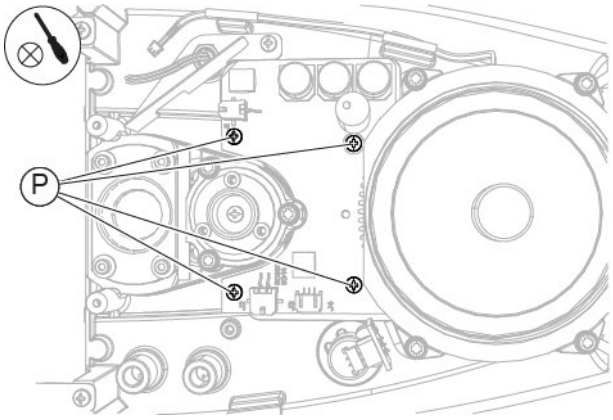


Fig. 211 - Screw in the screws

3 Connect the connection cable (N) between the base and the circuit board to the connectors J3 and J4 (O).
4 Connect the connection cable (L) between the base and the circuit board to the connector J2 (M).
5 Connect the connection cable (J) between the base and the circuit board to the connector J1 (K).
6 Place the cogwheel (I).
7 Screw in the screws (H).

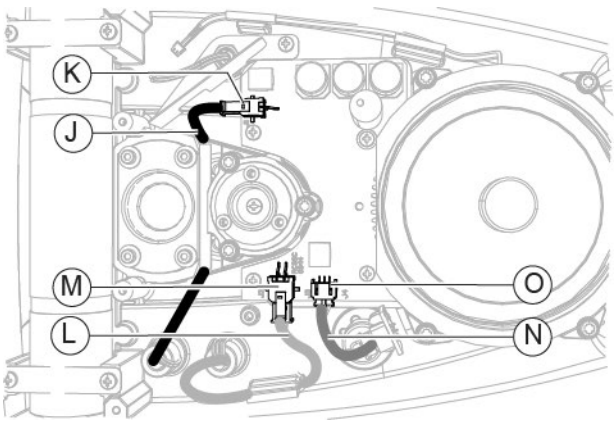


Fig. 212 - Connect the cables to the connectors

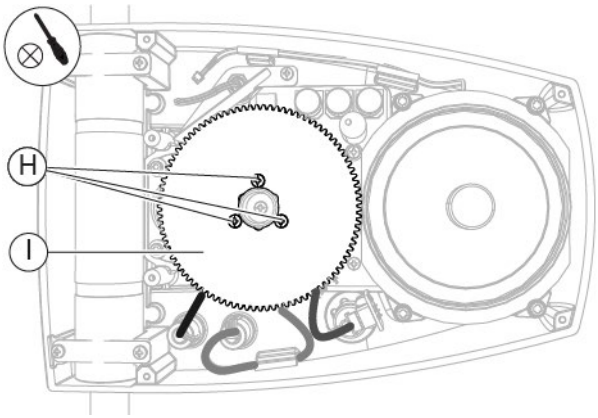


Fig. 213 - Place the cogwheel and screw in the screws

8 Install the plate.
In case of standard configuration, follow the procedure described in the paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**
In case of digital configuration, follow the procedure described in the paragraph **"Replacement of the plate - [Digital configuration - SL9900 and SL9900 ELITE]" on page 122.**

9 Place the lighting unit into its seat. Maintain the connector facing the front part of the device.

10 Screw in the screws (G) to fasten the lighting unit.

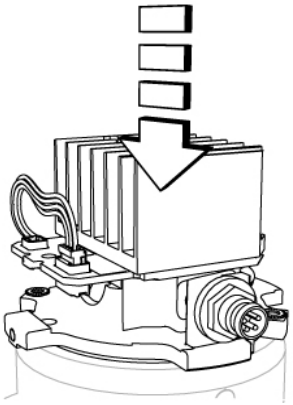


Fig. 214 - Place the lighting unit

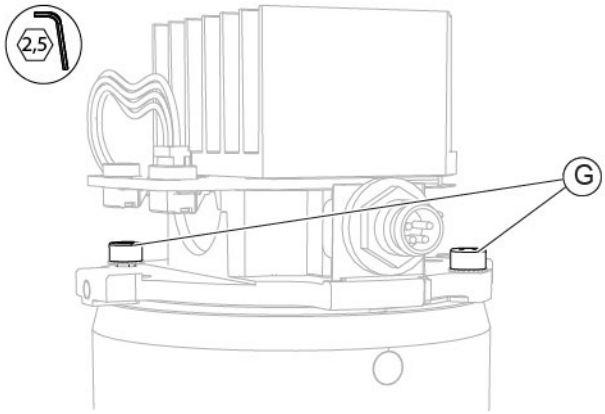


Fig. 215 - Screw in the screws

11 Connect the connection cable (F) between the lighting unit and the base to the connector (E).

12 If the device is equipped with illuminator, connect the connection cable (C) between the lighting unit and the illuminator to the connector (D).

13 Screw in the screw (B) of the cable clamp.

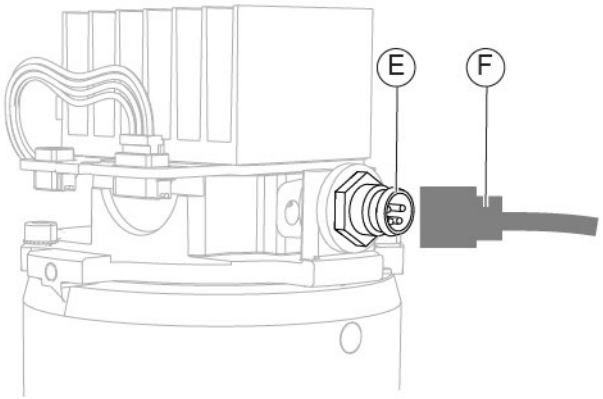


Fig. 216 - Connect the cable

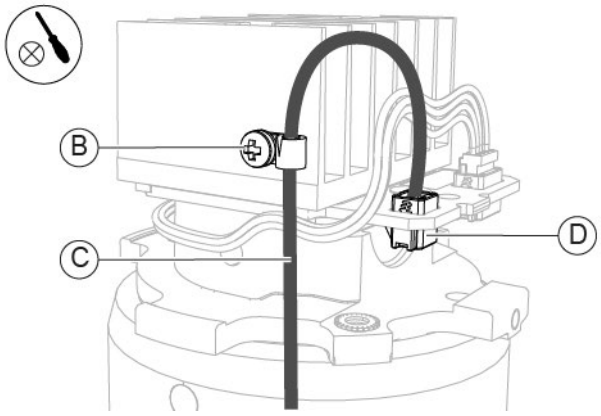


Fig. 217 - Connect the cable

14 Place the lighting unit cover on the lighting assembly.
15 Screw in the screws (A) to fasten the lighting unit cover.

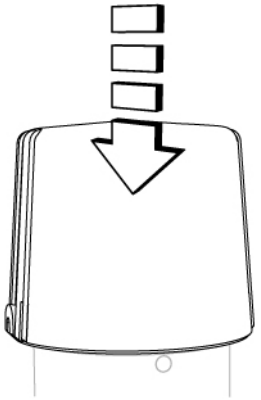


Fig. 218 - Place the cover

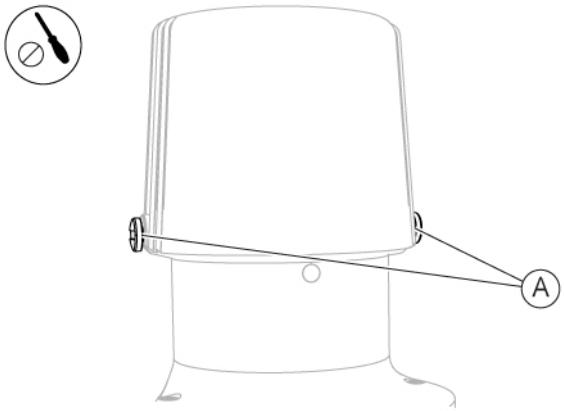


Fig. 219 - Screw in the screws

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.14 REPLACEMENT OF THE ILLUMINATOR - [SL9800]

Material and warnings:

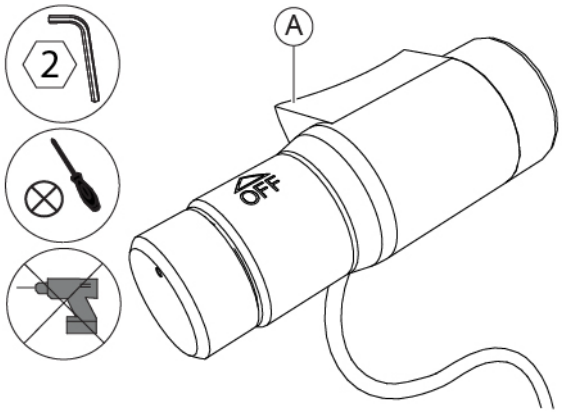


Fig. 220 - Illuminator

Pos	Description	Code
A	Illuminator	100272210

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the illuminator:

1 Disconnect the connection cable (A) between the base and the lighting unit from the connector (B).
2 Turn the lighting assembly to access the lighting unit.

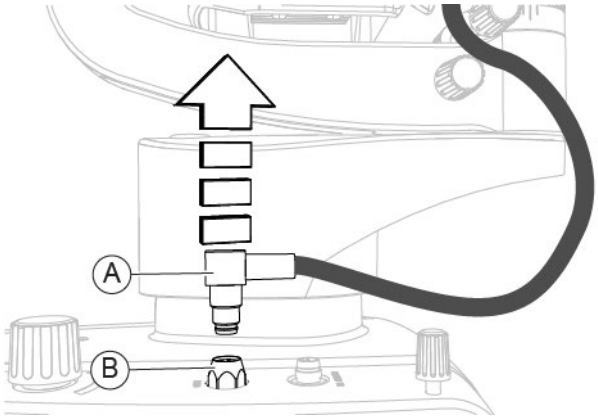


Fig. 221 - Disconnect the cable

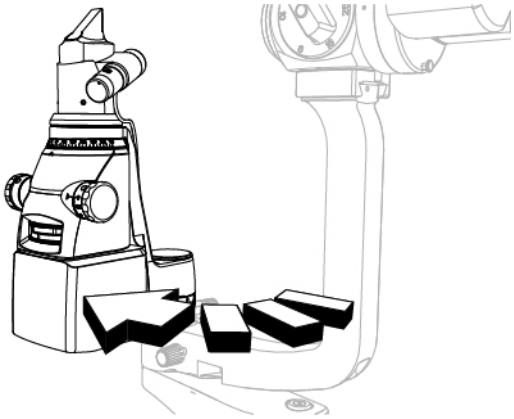


Fig. 222 - Turn the lighting assembly

3 Access the lighting unit.
4 Unscrew the screw (C) of the cable clamp (D).
5 Disconnect the connection cable (E) between the lighting unit and the illuminator from the connector (F).

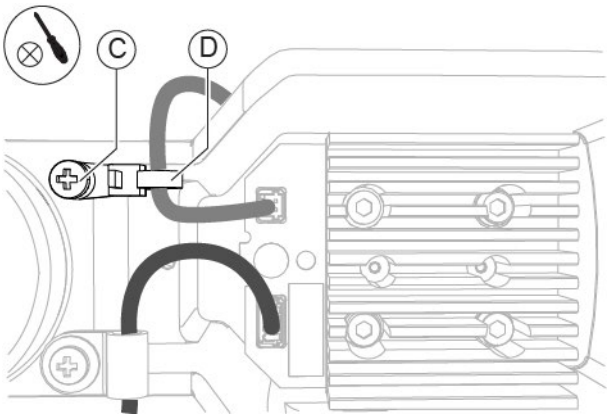


Fig. 223 - Unscrew the screw

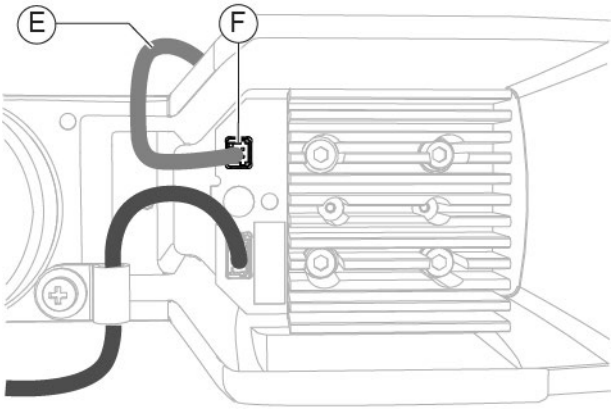


Fig. 224 - Disconnect the cable

6 Unscrew the screw (G).
7 Remove the illuminator.

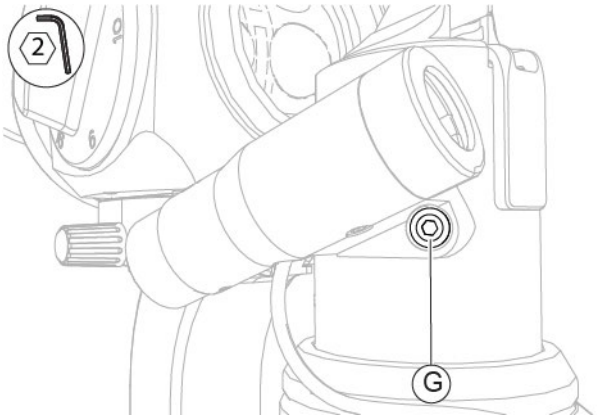


Fig. 225 - Unscrew the screw

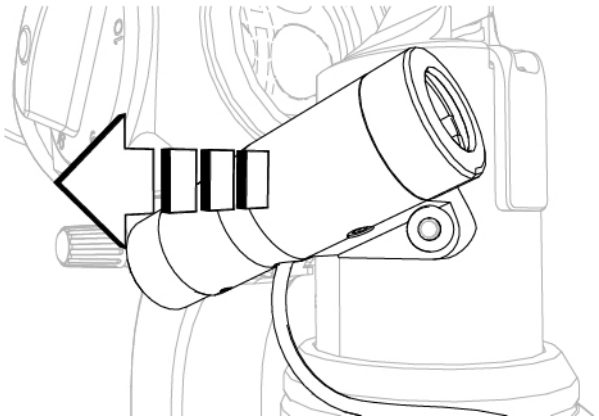


Fig. 226 - Remove the illuminator

Assembling procedure for the illuminator:

1 Place the illuminator.
2 Screw in the screw (G) to fasten the illuminator.

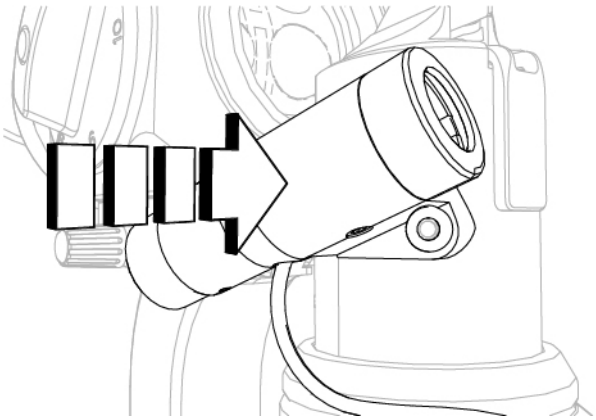


Fig. 227 - Place the illuminator

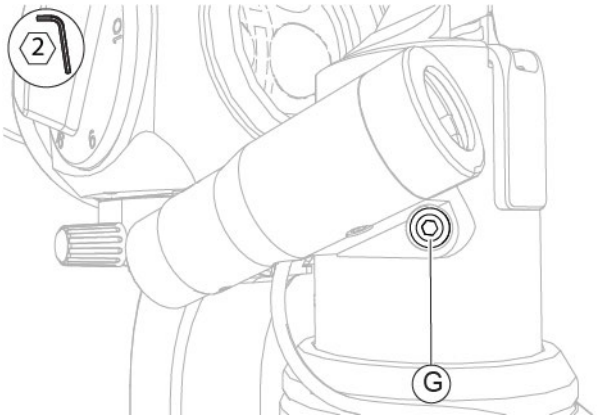


Fig. 228 - Screw in the screw

3 Connect the connection cable (E) between the lighting unit and the illuminator to the connector (F).
4 Screw in the screw (C) of the cable clamp (D).

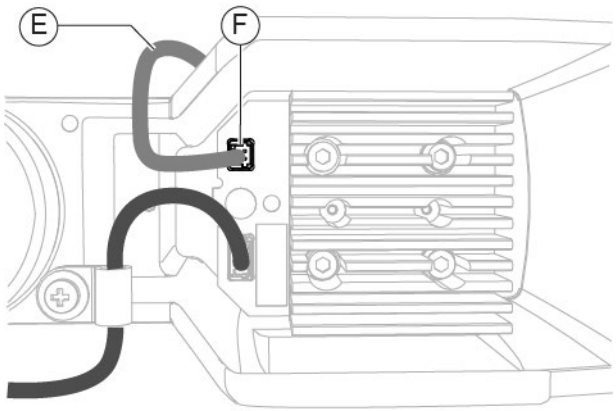


Fig. 229 - Connect the cable

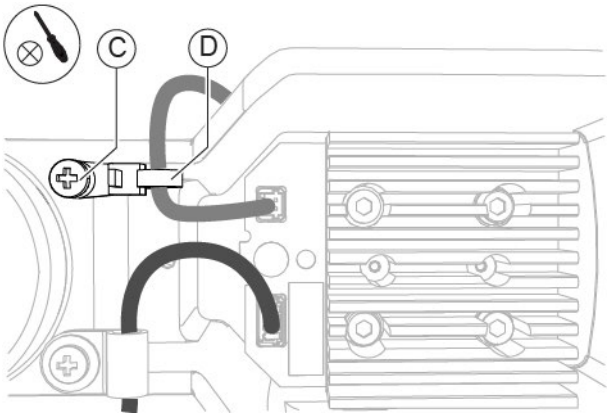


Fig. 230 - Screw in the screw

5 Turn the lighting assembly until reaching the start position.
6 Connect the connection cable (A) between the base and the lighting unit to the connector (B).

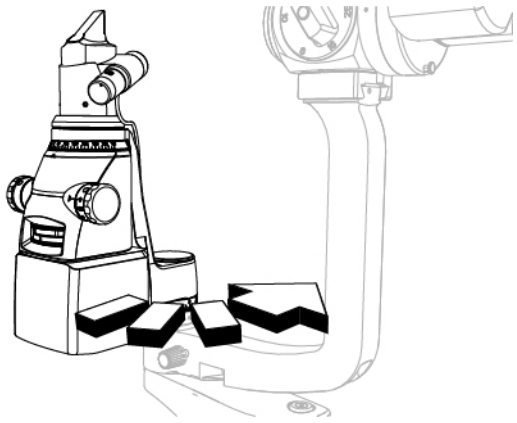


Fig. 231 - Turn the lighting assembly

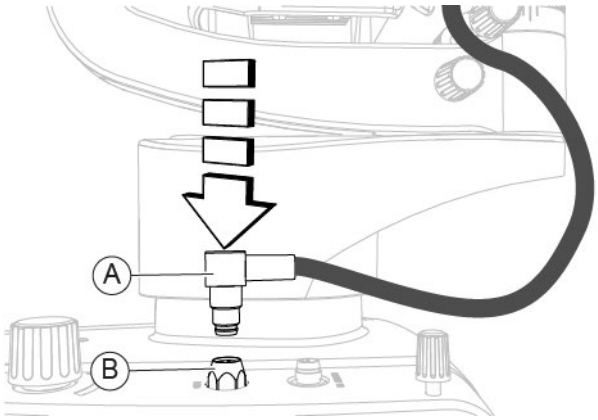


Fig. 232 - Connect the cable

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.15 REPLACEMENT OF THE ILLUMINATOR - [SL9900 AND SL9900 ELITE]

Material and warnings:

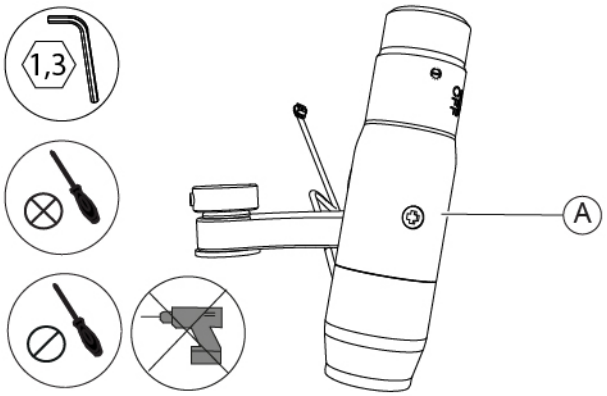


Fig. 233 - Illuminator

Pos	Description	Code
A	Illuminator	100270210

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the illuminator:

1 Unscrew the screws (A) of the lighting unit cover.
2 Remove the lighting unit cover.

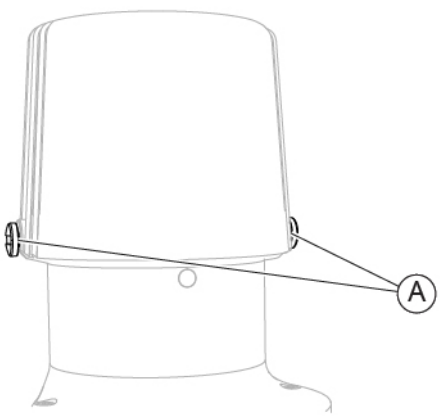


Fig. 234 - Unscrew the screws

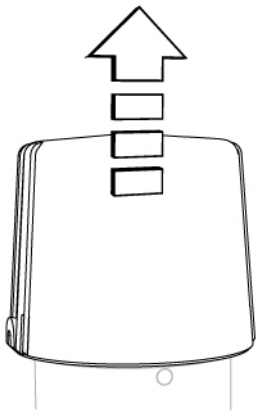


Fig. 235 - Remove the cover

3 Unscrew the screw (B) of the cable clamp.
4 Disconnect the connection cable (C) between the lighting unit and the illuminator from the connector (D).

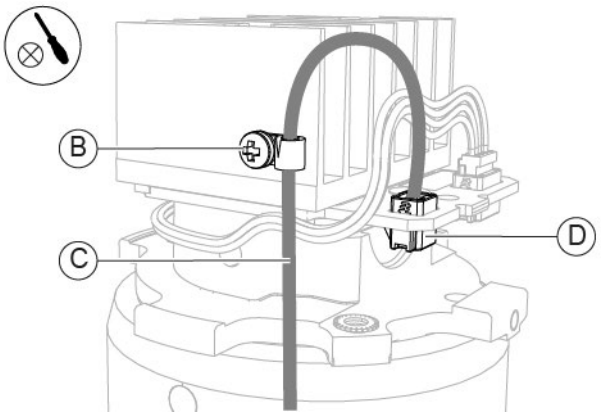


Fig. 236 - Unscrew the screw and disconnect the cable

5 Turn the slit adjustment knob (E) to lower the component (F).
6 Manually lift the component (F) and hold it up.

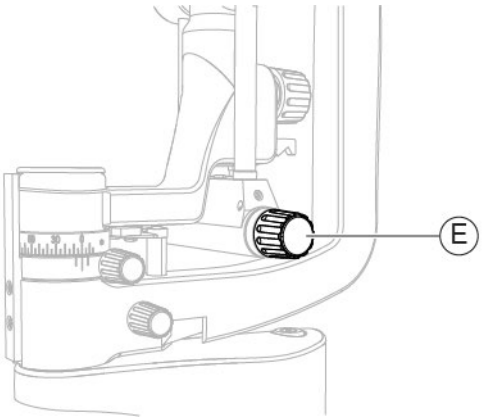


Fig. 237 - Turn the knob

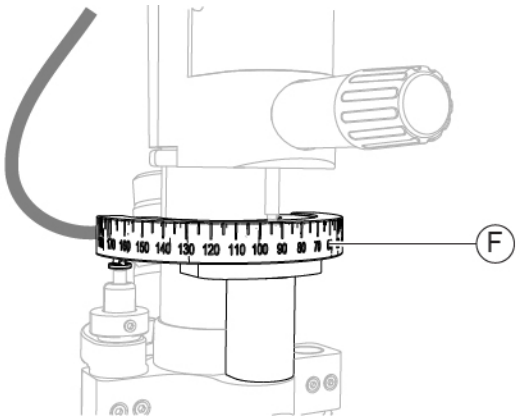


Fig. 238 - Manually lift the component

7 Unscrew the screw (G) of the locking ring.

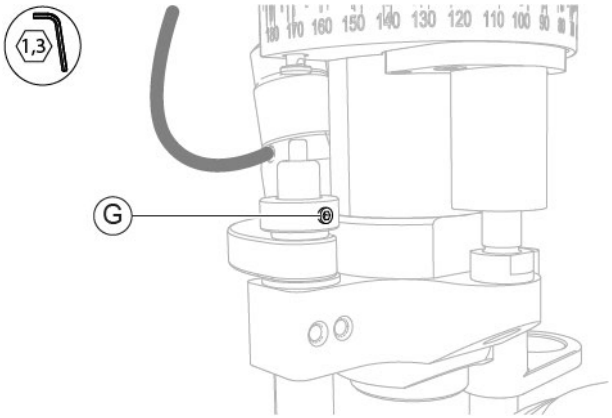


Fig. 239 - Unscrew the screw

8 Remove the locking ring (H) from the rod (I).
9 Remove the round ring (J) from the rod (I).
10 Remove the illuminator (K) from the rod (I).
11 Remove the flat ring (L) from the rod (I).

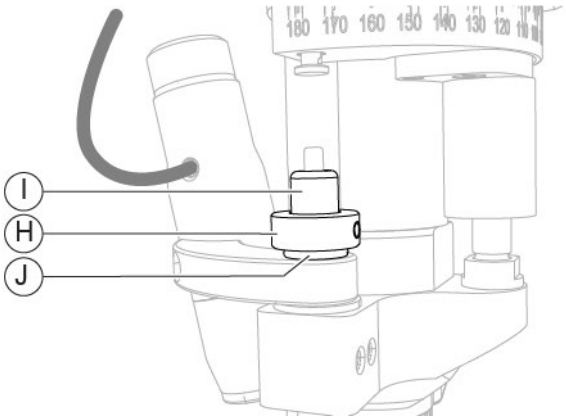


Fig. 240 - Remove the locking ring and the round ring

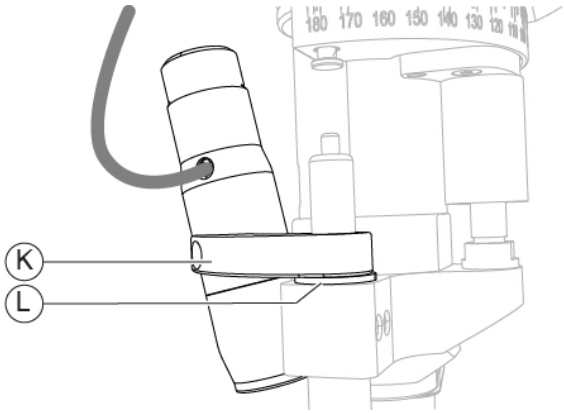


Fig. 241 - Remove the illuminator and the flat ring

Assembling procedure for the illuminator:

1 Manually lift the component (F) and hold it up.

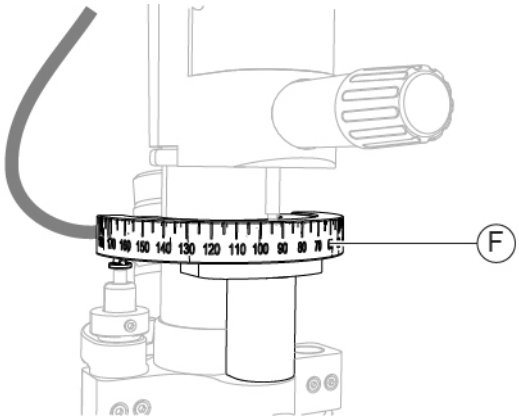


Fig. 242 - Manually lift the component

2 Insert the flat ring (L) on the rod (I).
3 Insert the illuminator (K) on the rod (I).
4 Insert the round ring (J) on the rod (I).
5 Insert the locking ring (H) on the rod (I).

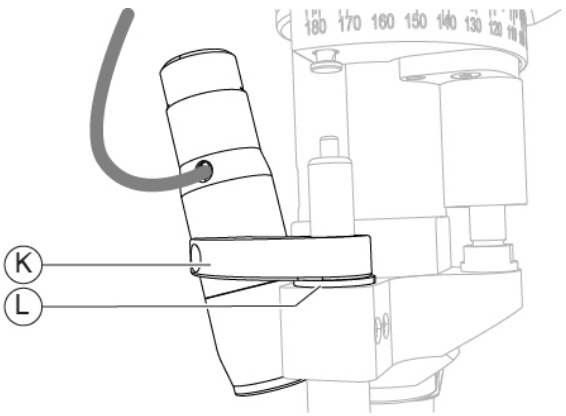


Fig. 243 - Insert the flat ring and the illuminator

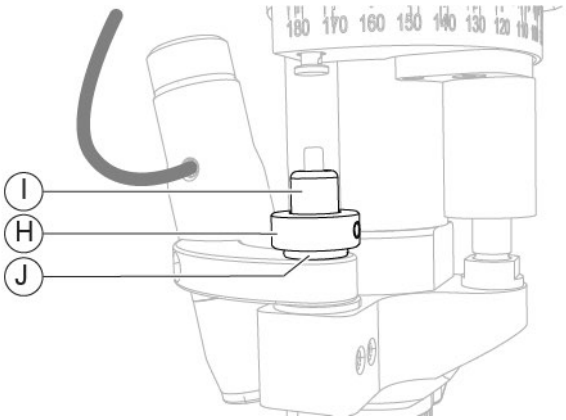


Fig. 244 - Insert the round ring and the locking ring

6 Screw in the screw (G) of the locking ring.
7 Manually lower the component (F).

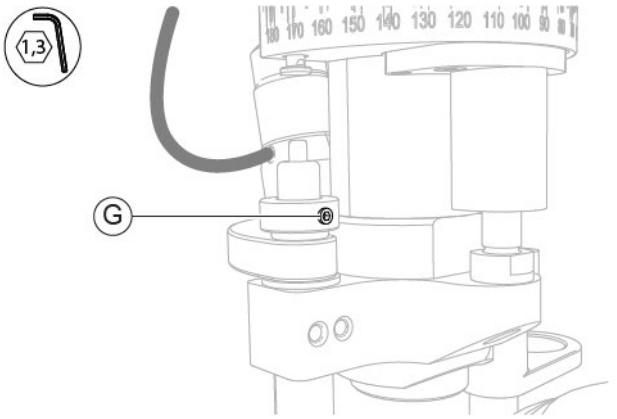


Fig. 245 - Screw in the screw

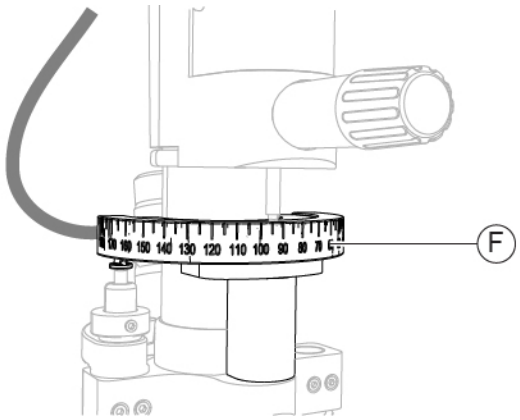


Fig. 246 - Manually lower the component

8 Connect the connection cable (C) between the lighting unit and the illuminator to the connector (D).
9 Screw in the screw (B) of the cable clamp.

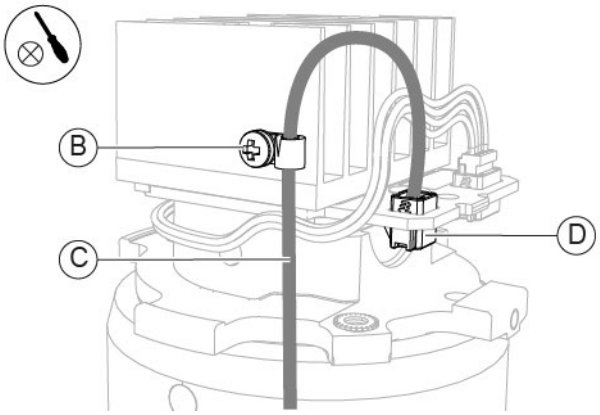


Fig. 247 – Connect the cable and screw in the screw

10 Install the lighting unit cover.
11 Screw in the screws (A) of the lighting unit cover.

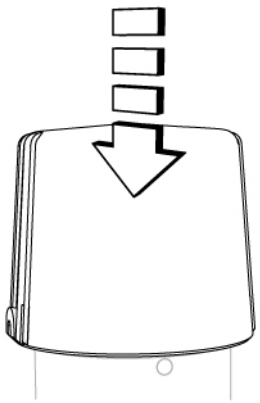


Fig. 248 – Install the cover

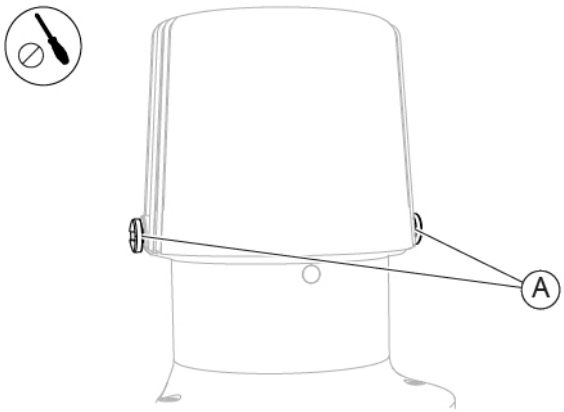


Fig. 249 - Screw in the screws

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.16 REPLACEMENT OF THE ADDITIONAL LIGHT DIFFUSING FILTER - [SL9900 AND SL9900 ELITE]

Material and warnings:

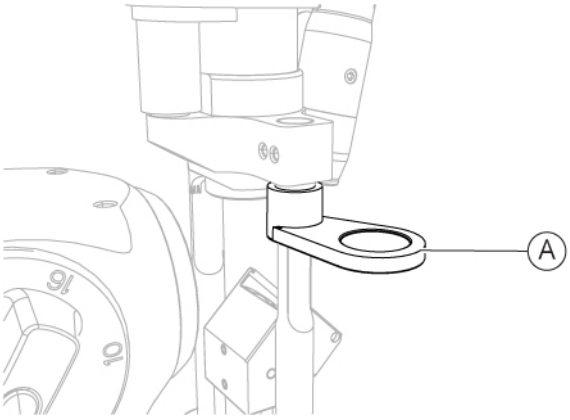


Fig. 250 - Additional light diffusing filter

Pos	Description	Code
A	Additional light diffusing filter	100250250

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

Disassembling procedure for the additional light diffusing filter:

1 Lower the light diffusing filter.
2 Remove the light diffusing filter from the lighting assembly.

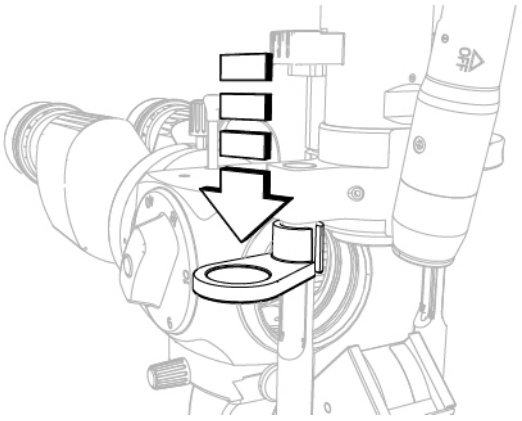


Fig. 251 - Lower the light diffusing filter

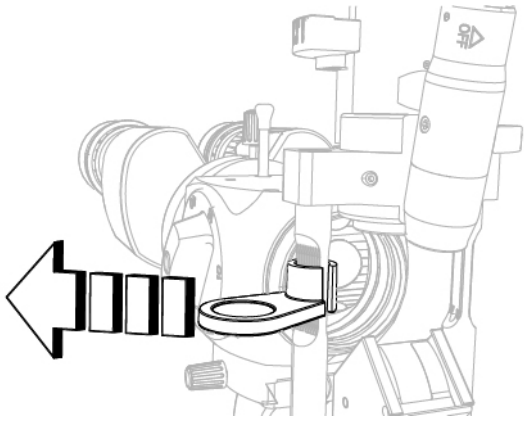


Fig. 252 - Remove the light diffusing filter

Assembling procedure for the additional light diffusing filter:

1 Insert the light diffusing filter onto the lighting assembly.
2 Lift the light diffusing filter.

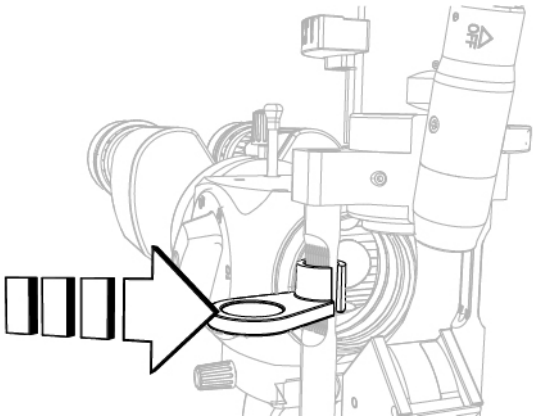


Fig. 253 - Insert the light diffusing filter

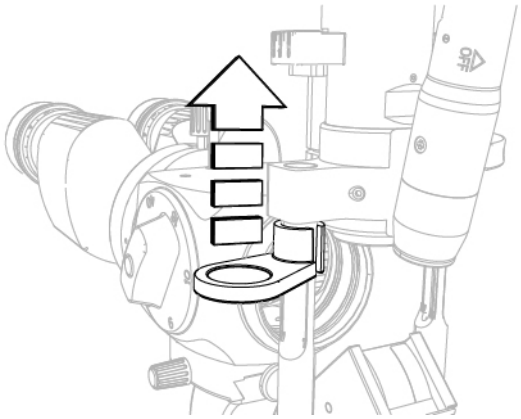


Fig. 254 - Lift the light diffusing filter

6.5.17 DISASSEMBLING OF THE PLATE - [STANDARD CONFIGURATION]

Material and warnings:

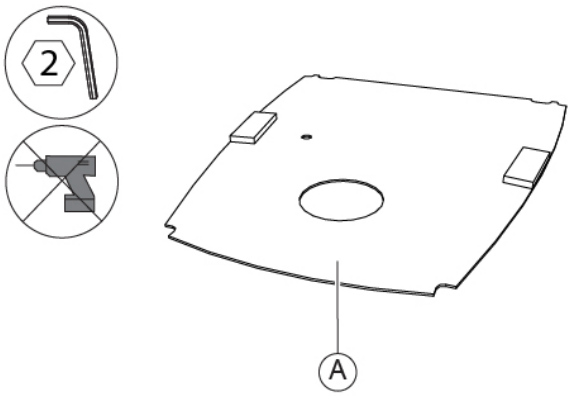


Fig. 255 - Plate

Pos	Description
A	Plate

The described procedure shall be only read when a maintenance operation requires disassembling and/or reassembling the plate for standard configuration.
The plate for standard configuration is not supplied as a spare part, therefore it is not possible to request its replacement.

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before disassembling or reassembling, make sure you have all tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the plate:

1 Place the device horizontally, so that the eyepieces face upwards.
2 Unscrew the four screws (A) on the plate.

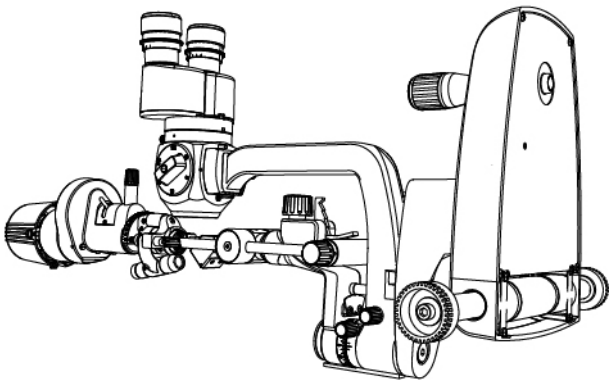


Fig. 256 - Place the device

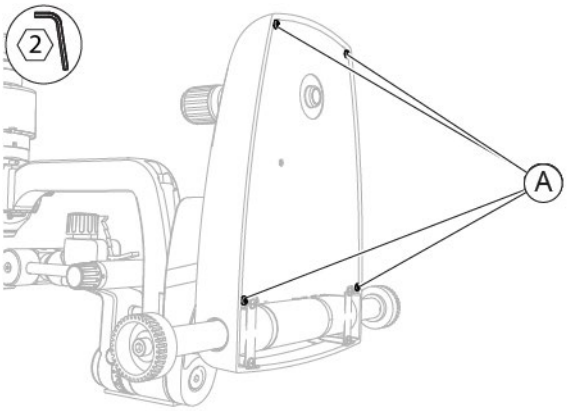


Fig. 257 - Unscrew the screws

3 Remove the plate.

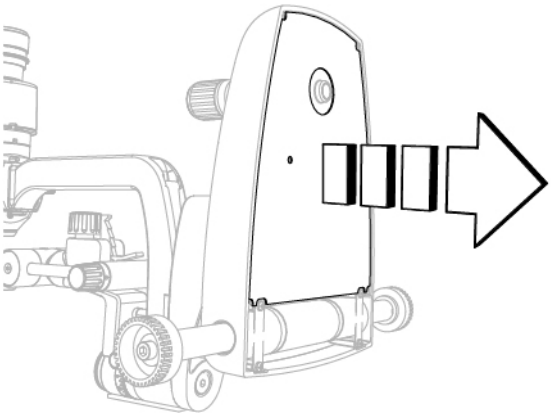


Fig. 258 - Remove the plate

Assembling procedure for the plate:

1 Place the plate under the base of the device.
2 Screw in the four screws (A) M3x10 to fasten the plate.

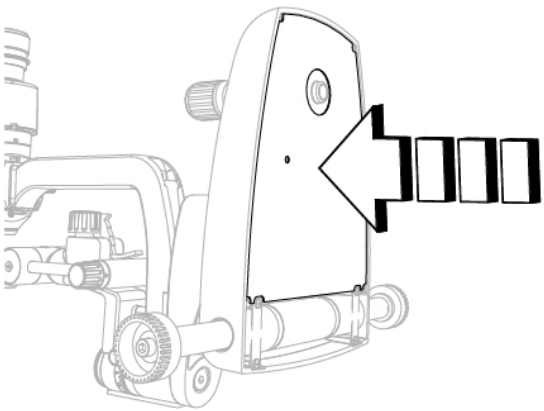


Fig. 259 - Bring the plate close

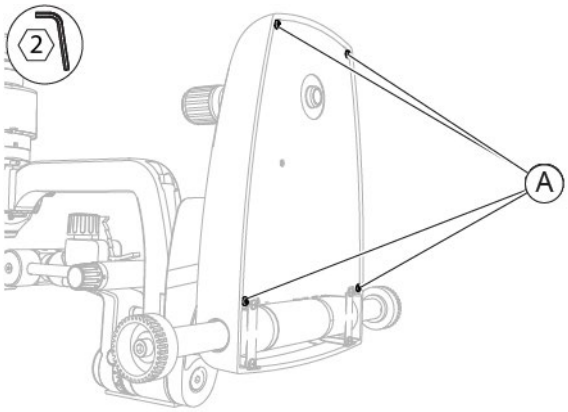


Fig. 260 - Screw in the screws

6.5.18 REPLACEMENT OF THE PLATE - [DIGITAL CONFIGURATION - SL9800]

Material and warnings:

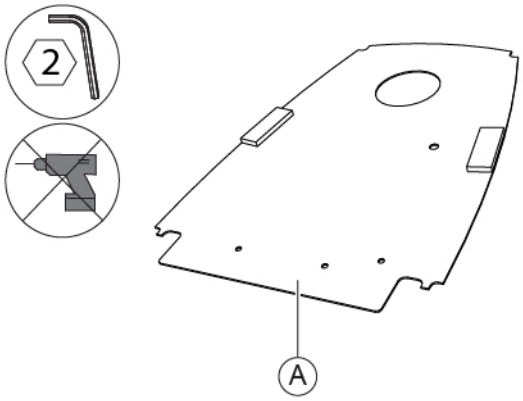


Fig. 261 - Plate

Pos	Description	Code
A	Plate	100270420

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the plate:

1 Place the device horizontally, so that the eyepieces face upwards.
2 Unscrew the four screws (A) M3x10 on the plate.

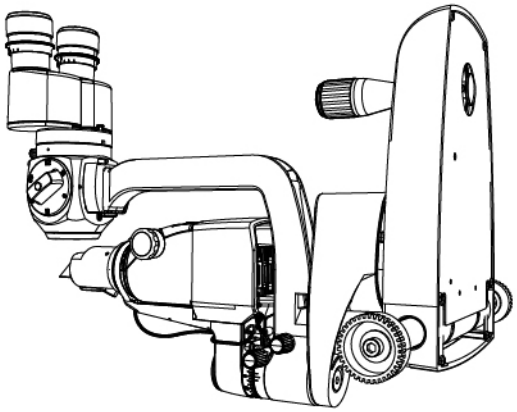


Fig. 262 - Place the device

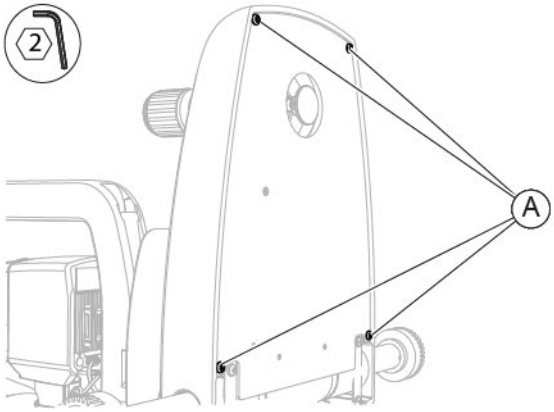


Fig. 263 - Unscrew the screws

3 Remove the plate.

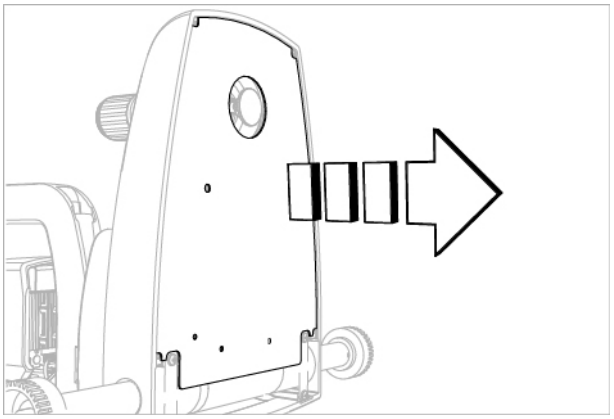


Fig. 264 - Remove the plate

Assembling procedure for the plate:

1 Place the plate under the base of the device.
2 Screw in the four screws (A) M3x10 to fasten the plate.

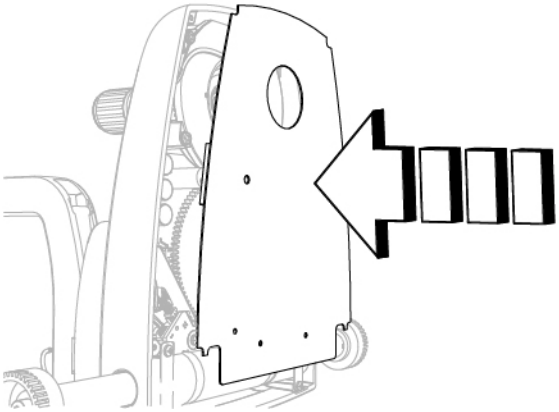


Fig. 265 - Insert the plate

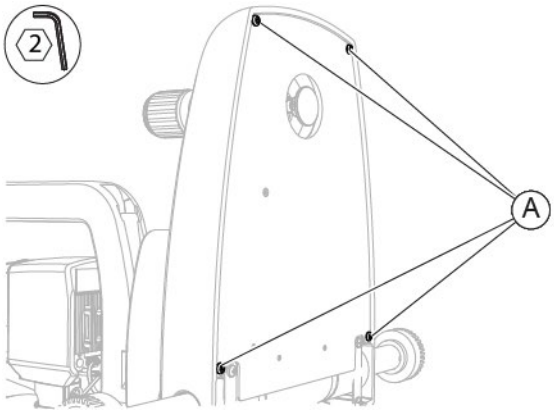


Fig. 266 - Screw the screws

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.19 REPLACEMENT OF THE PLATE - [DIGITAL CONFIGURATION - SL9900 AND SL9900 ELITE]

Material and warnings:

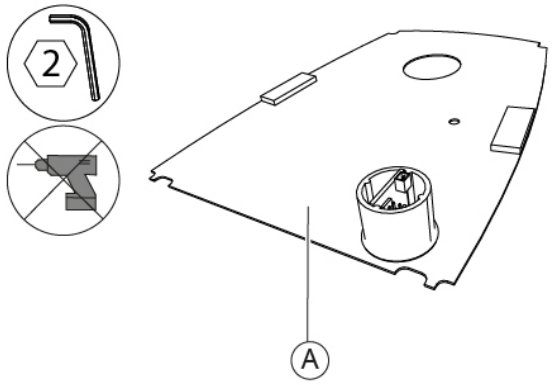


Fig. 267 - Plate

Pos	Description	Code
A	Plate	100257420

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the plate:

1 Place the device horizontally, so that the eyepieces face upwards.
2 Unscrew the four screws (A) M3x10 on the plate.

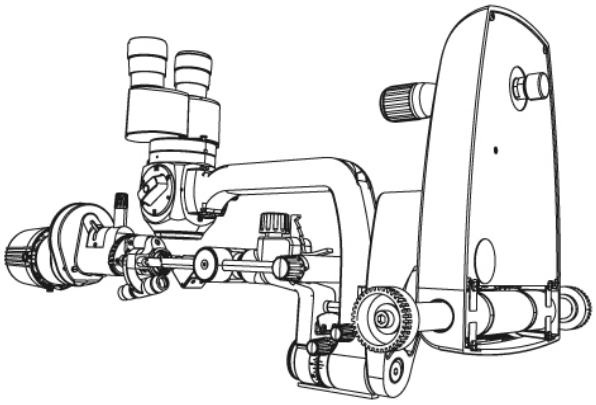


Fig. 268 - Place the device

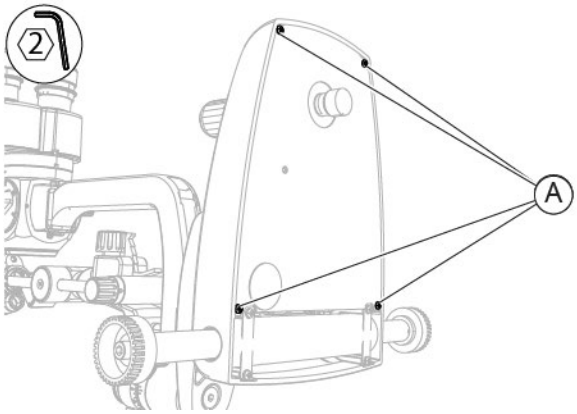


Fig. 269 - Unscrew the screws

3 Move the plate slightly and disconnect the connection cable (C) between the joystick and the plate sensor from the connector (B).
4 Disconnect the connection cable (D) between the connector on the base and the plate sensor from the connector (E).
5 Remove the plate.

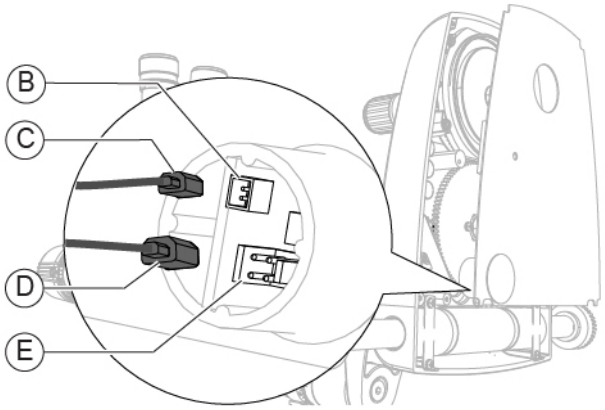


Fig. 270 - Disconnect the cables

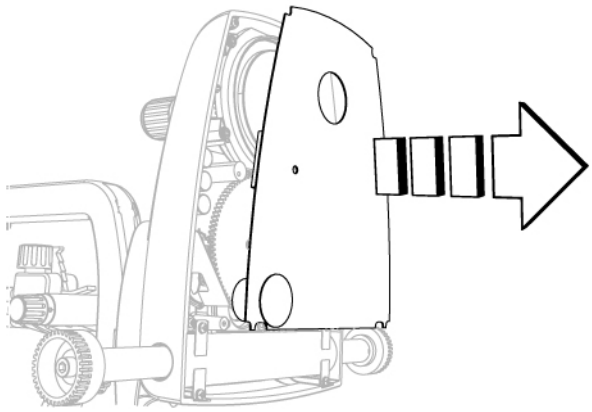


Fig. 271 - Remove the plate

Assembling procedure for the plate:

1 Bring the plate closer to the base of the device.
2 Connect the connection cable (C) between the joystick and the plate sensor to the connector (B).
3 Connect the connection cable (D) between the connector on the base and the plate sensor to the connector (E).
4 Place the plate under the base of the device.

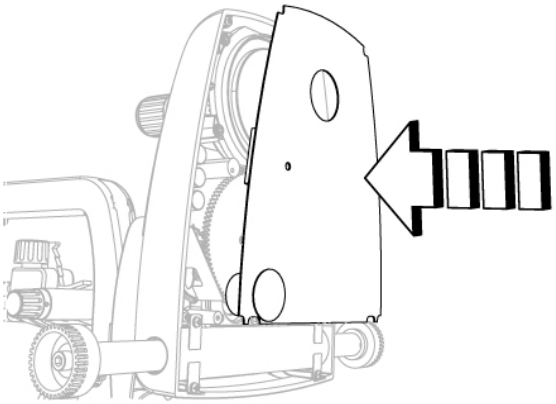


Fig. 272 - Bring the plate close

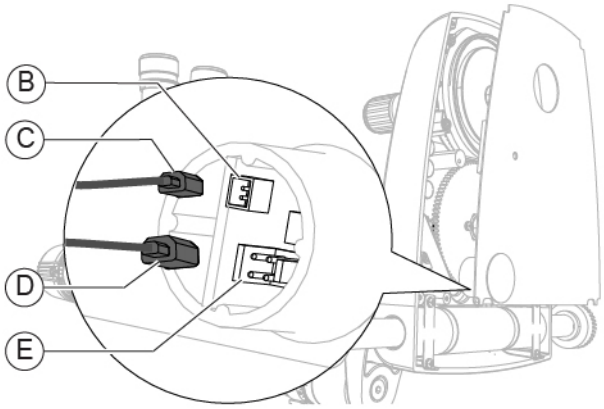


Fig. 273 - Connect the cables

5 Screw in the four screws (A) M3x10 to fasten the plate.

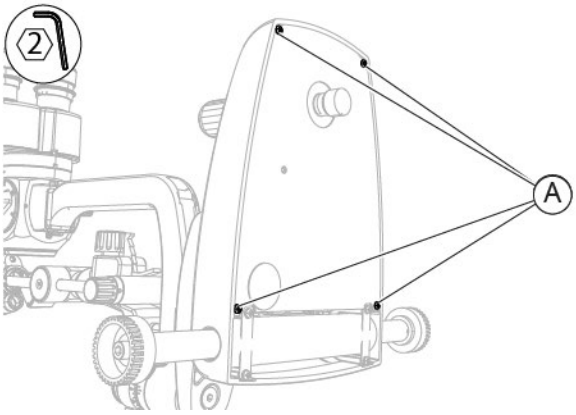


Fig. 274 - Screw in the screws

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.20 REPLACEMENT OF THE JOYSTICK [STANDARD CONFIGURATION]

Material and warnings:

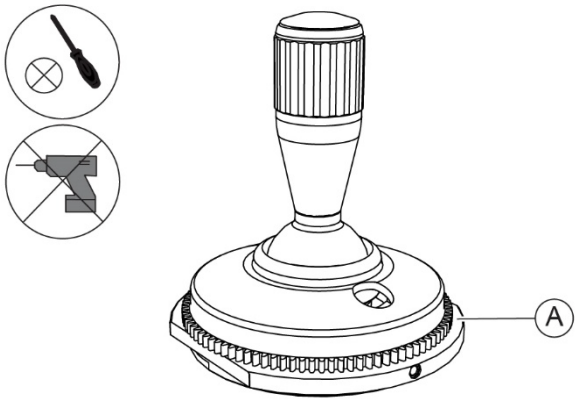


Fig. 275 - Joystick

Pos	Description	Code
A	Joystick [Standard configuration]	100270404

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the joystick:

1 Remove the plate.
Follow the procedure described in paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**
2 Unscrew the screws (A) on the joystick.
3 Remove the joystick from the base.
While removing the joystick, be careful not to damage the cable.

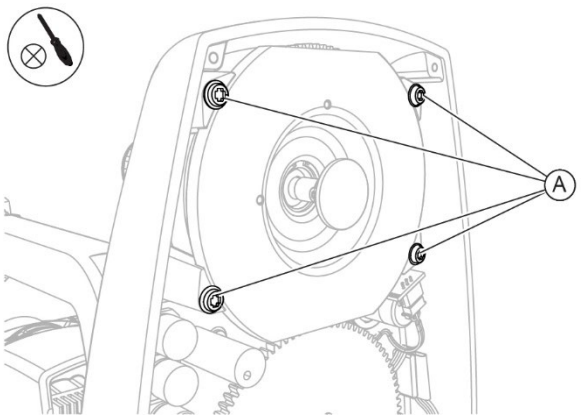


Fig. 276 - Unscrew the screws

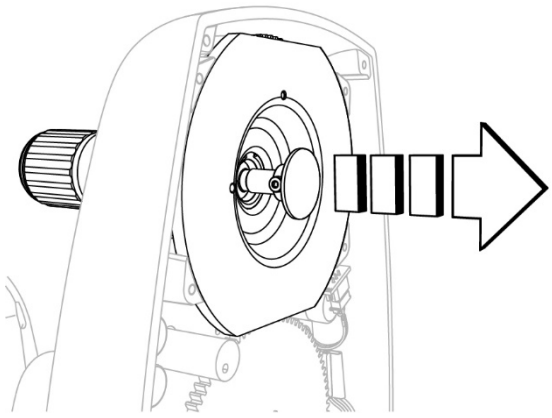


Fig. 277 - Remove the joystick

Assembling procedure for the joystick:

1 Insert the joystick into the base.
2 Screw in the four screws (A) to fasten the joystick.

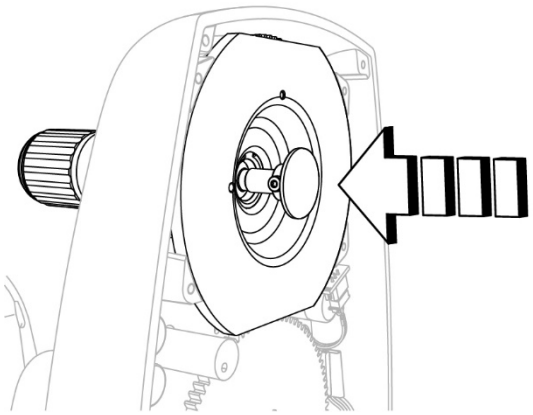


Fig. 278 - Insert the joystick

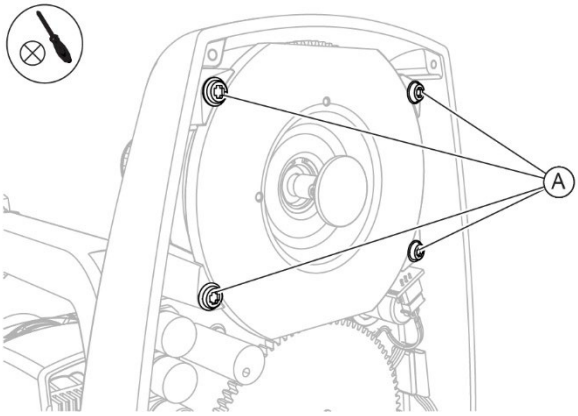


Fig. 279 - Screw in the screws

3 Install the plate.
Follow the procedure described in paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.21 REPLACEMENT OF THE JOYSTICK - [DIGITAL CONFIGURATION - SL9800]

Material and warnings:

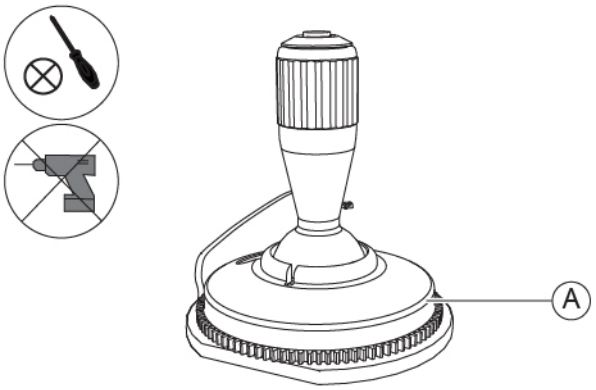


Fig. 280 - Joystick

Pos	Description	Code
A	Joystick [Digital configuration]	100113401

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the joystick:

1 Remove the plate.
Follow the procedure described in paragraph **"Replacement of the plate - [Digital configuration - SL9800]" on page 120.**
2 Unplug the connection cable (A) between the joystick and the sensor from the connector (B).
3 Unscrew the screws (C).

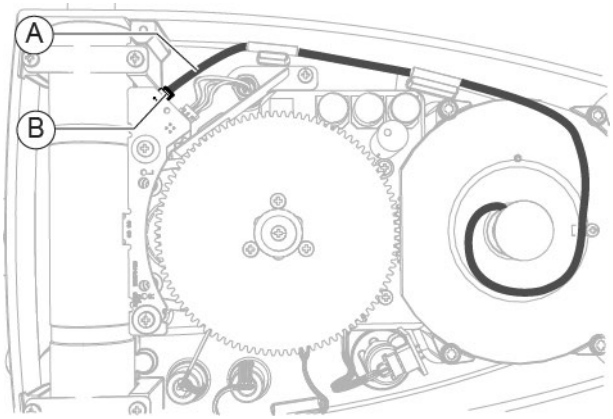


Fig. 281 - Disconnect the cable

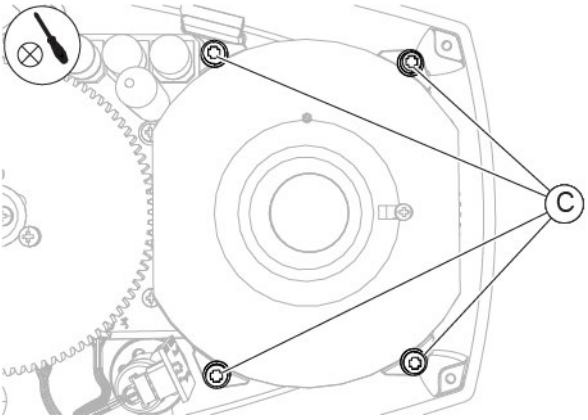


Fig. 282 - Unscrew the screws

4 Remove the joystick.
While removing the joystick, be careful not to damage the cable.

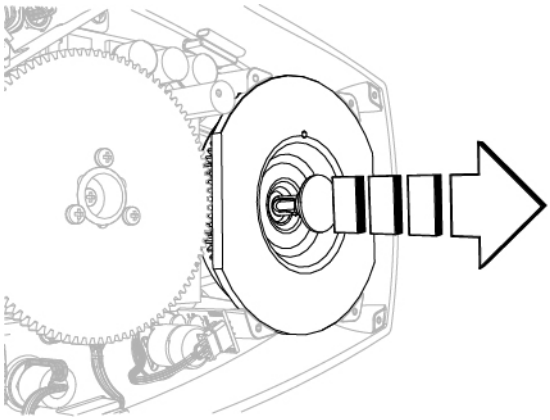


Fig. 283 - Remove the joystick

Assembling procedure for the joystick:

1 Insert the joystick into the base.
2 Screw in the screws (C) to fasten the joystick.

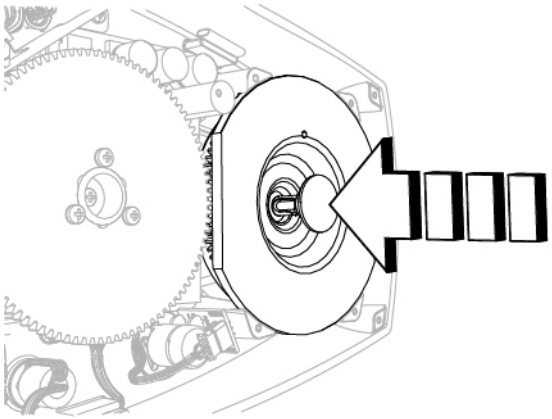


Fig. 284 - Insert the joystick

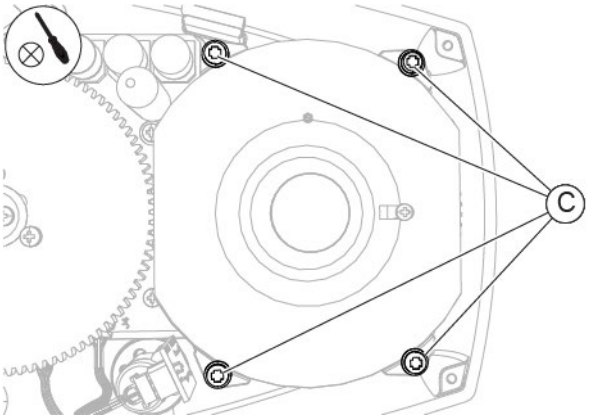


Fig. 285 - Screw in the screws

3 Plug the connection cable (A) between the joystick and the sensor into the connector (B).

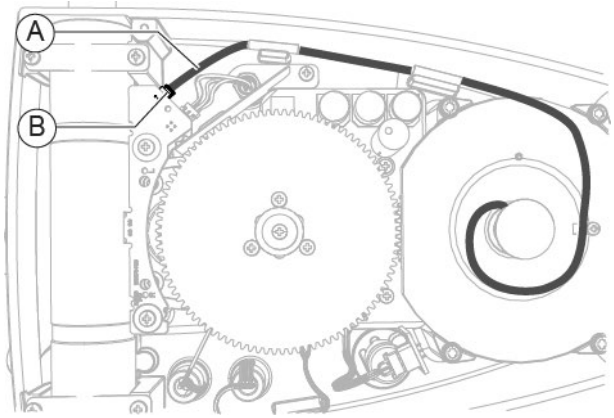


Fig. 286 - Connect the cable

4 Install the plate.
Follow the procedure described in paragraph **"Replacement of the plate - [Digital configuration - SL9800]" on page 120.**

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.22 REPLACEMENT OF THE JOYSTICK [DIGITAL CONFIGURATION - SL9900 AND SL9900 ELITE]

Material and warnings:

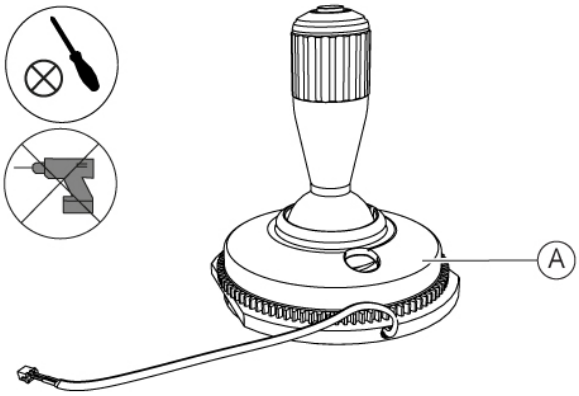


Fig. 287 - Joystick

Pos	Description	Code
A	Joystick [Digital configuration]	100270403

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the joystick:

1 Remove the plate.
Follow the procedure described in paragraph **"Replacement of the plate - [Digital configuration - SL9900 and SL9900 ELITE]" on page 122.**
2 Unscrew the screws (A) on the joystick.
3 Remove the joystick from the base.
While removing the joystick, be careful not to damage the cable.

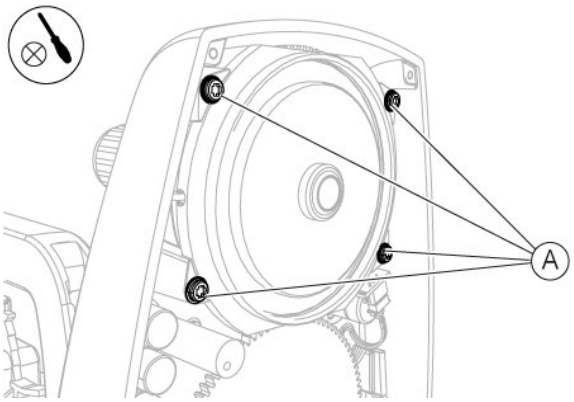


Fig. 288 - Unscrew the screws

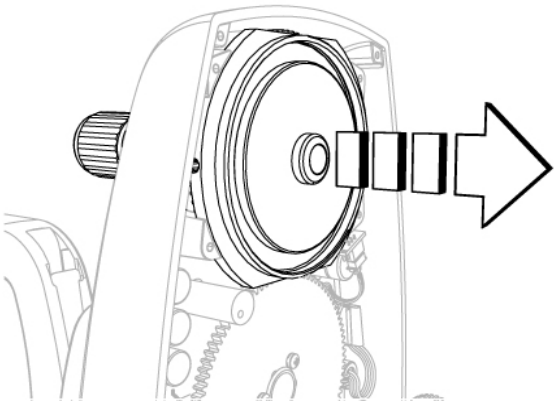


Fig. 289 - Remove the joystick

4 Remove the disc (B).
5 Remove the gasket (C).
6 Remove the bearing (D).

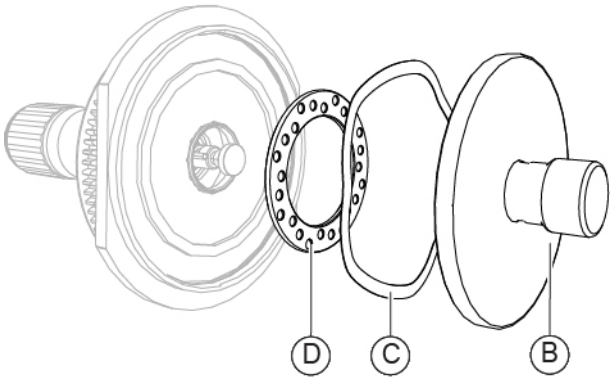


Fig. 290 - Remove the disc, the gasket and the bearing

The disc, the gasket and the bearing are not supplied as spare parts.
Keep these components when disassembling the joystick.

Assembling procedure for the joystick:

1 Place the bearing (D) on the lower part of the joystick.
2 Place the gasket (C) into its seat inside the disc (B).
3 Place the disc (B) on the lower part of the joystick.
4 Insert the joystick into the base.

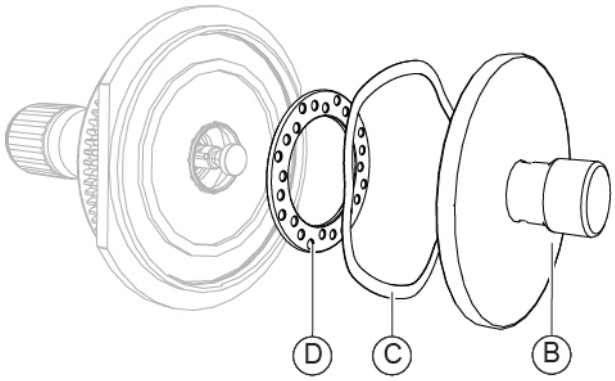


Fig. 291 - Insert the bearing, the gasket and the disc

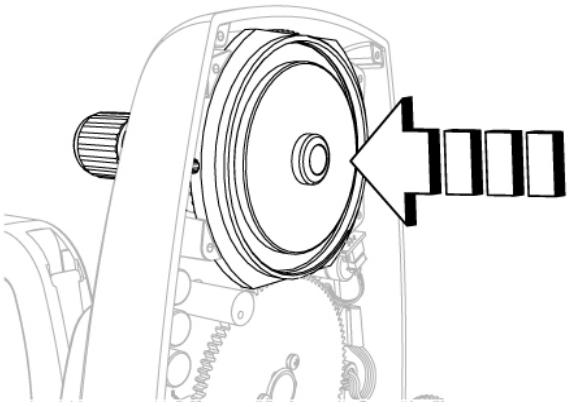


Fig. 292 - Insert the joystick

5 Screw in the four screws (A) to fasten the joystick.

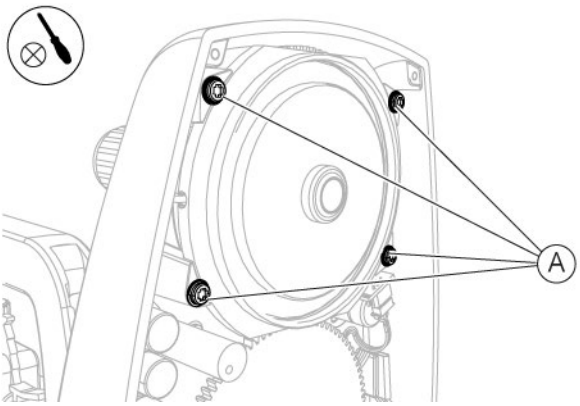


Fig. 293 - Screw in the screws

6 Install the plate.
Follow the procedure described in paragraph **"Replacement of the plate - [Digital configuration - SL9900 and SL9900 ELITE]" on page 122.**

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.23 REPLACEMENT OF THE JOYSTICK BUTTON - [DIGITAL CONFIGURATION]

Material and warnings:

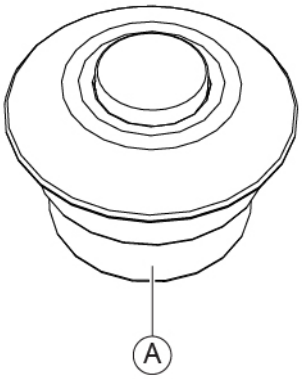


Fig. 294 - Joystick button

Pos	Description	Code
A	Joystick button	100258402

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Disassembling procedure for the joystick button:

1 Remove the joystick button.
2 Disconnect the connection cable (A) from the joystick button (B).

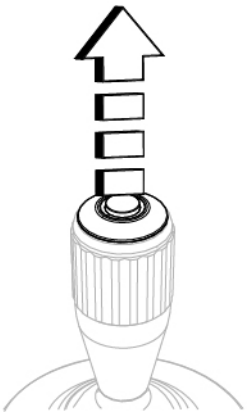


Fig. 295 - Remove the joystick button

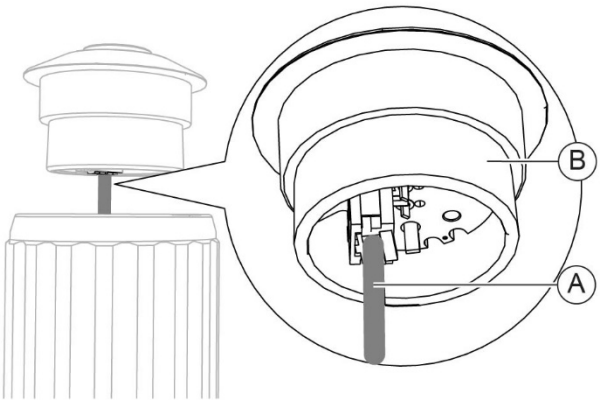


Fig. 296 - Disconnect the cable

Assembling procedure for the joystick button:

1 Connect connection cable (A) to the joystick button (B).
2 Insert the joystick button in its seat.

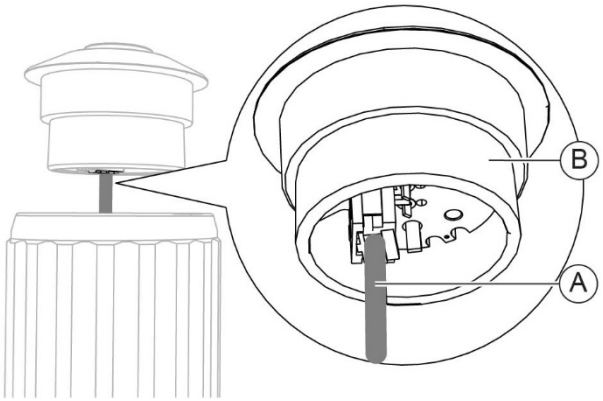


Fig. 297 - Connect the cable

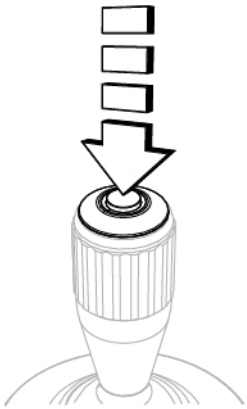


Fig. 298 - Insert the joystick button

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.24 REPLACEMENT OF THE BASE [SL9800]

Material and warnings:

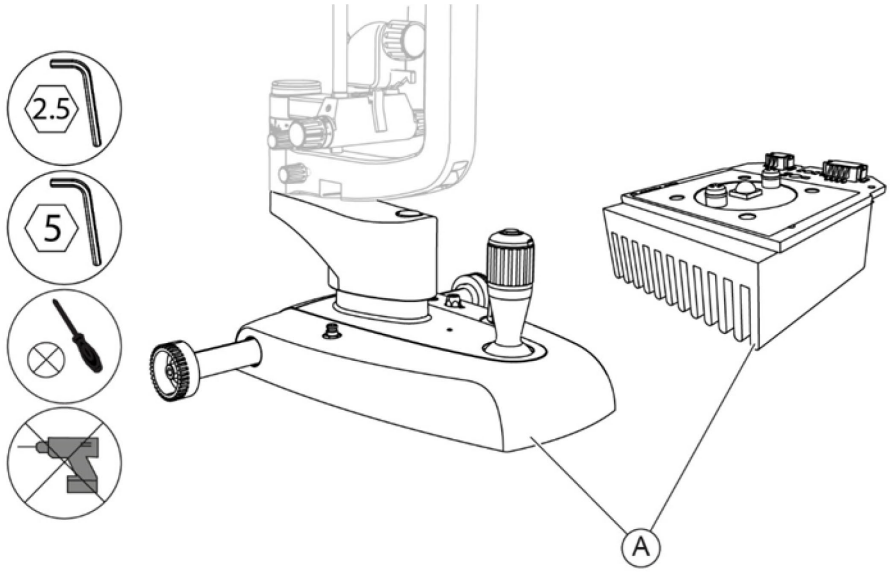


Fig. 299 - Base

Pos	Description	Code
A	Base for standard configuration [SL9800] + Lighting unit	100272410.R + 100258527
	Base for digital configuration [SL9800] + Lighting unit	100274400.D + 100258527

Always replace the lighting unit together with the base.

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Base disassembling procedure:

1 Disconnect the connection cable (A) between the base and the lighting unit from the connector (B).
2 Disconnect the power cable (D) of the device from the connector (C).
3 Hold the lighting assembly.
4 Unscrew the screw (E) fastening the base to the arm of the magnification adjuster.

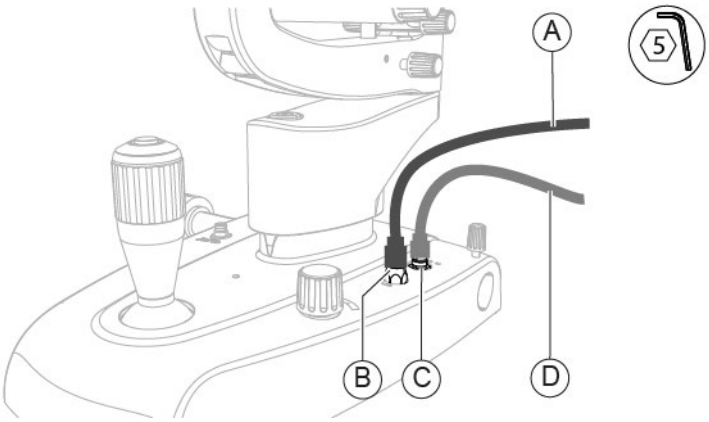


Fig. 300 - Disconnect the cables

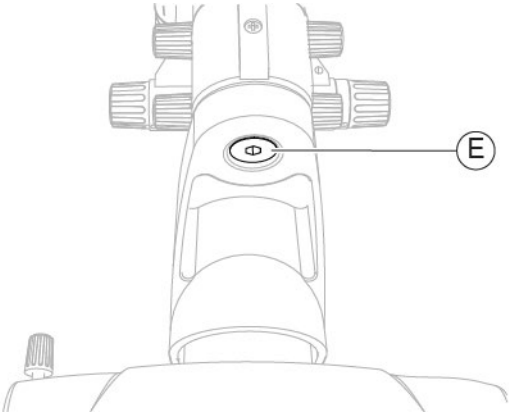


Fig. 301 - Unscrew the screw

5 Remove the structure assembly complete with lighting assembly from the base.
6 Turn the lighting assembly to access the lighting unit.

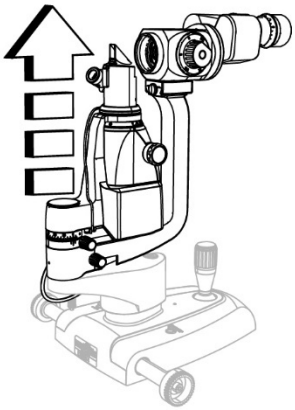


Fig. 302 - Remove the structure assembly complete with lighting assembly

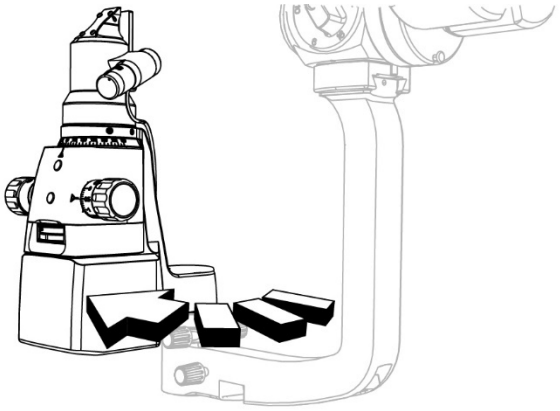


Fig. 303 - Turn the lighting assembly

7 Unscrew the screw (F).
8 Disconnect the connection cable (A) between the base and the lighting unit from the connector (G).

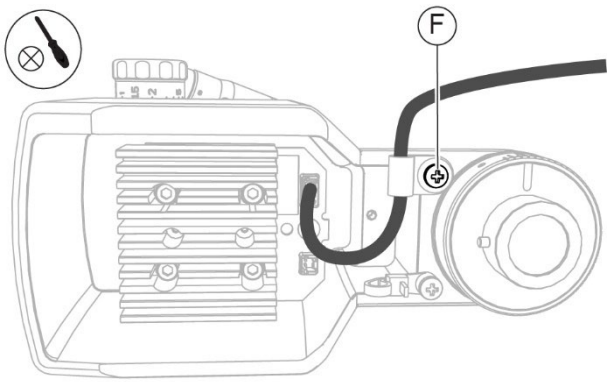


Fig. 304 - Unscrew the screw

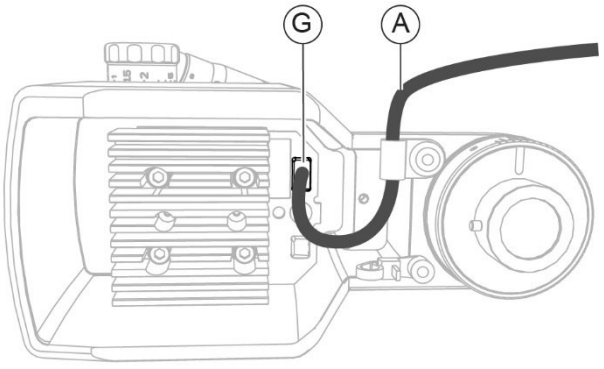


Fig. 305 - Disconnect the cables

9 Unscrew the screws (H).
10 Remove the lighting unit from its seat.

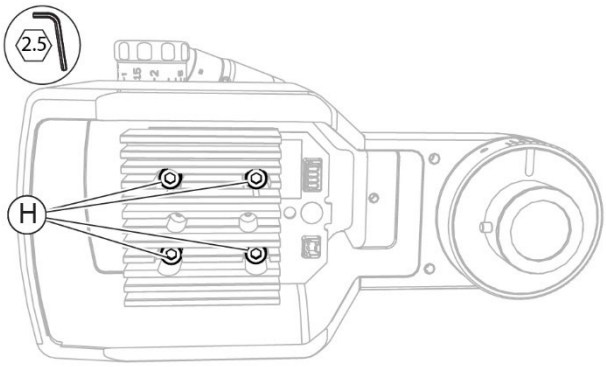


Fig. 306 - Unscrew the screws

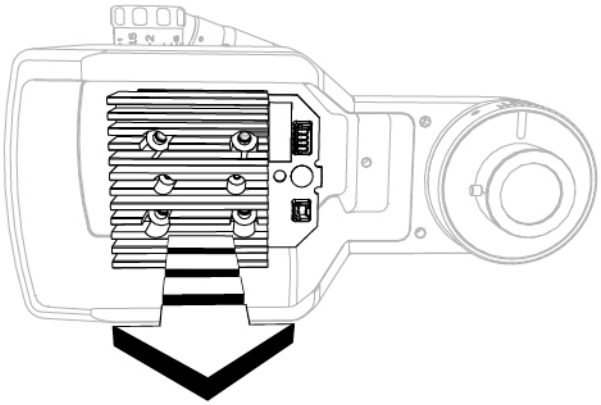


Fig. 307 - Remove the lighting unit

Assembling procedure for the base:

1 Place the lighting unit into its seat.
2 Screw in the screws (H) to fasten the lighting unit.

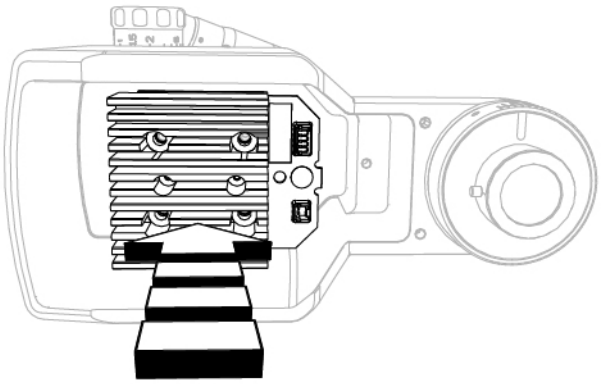


Fig. 308 - Place the lighting unit

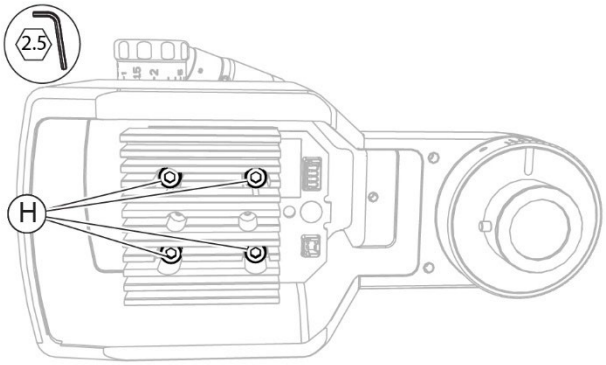


Fig. 309 - Screw in the screws

3 Connect the connection cable (A) between the base and the lighting unit to the connector (G).
4 Screw the screw (F).

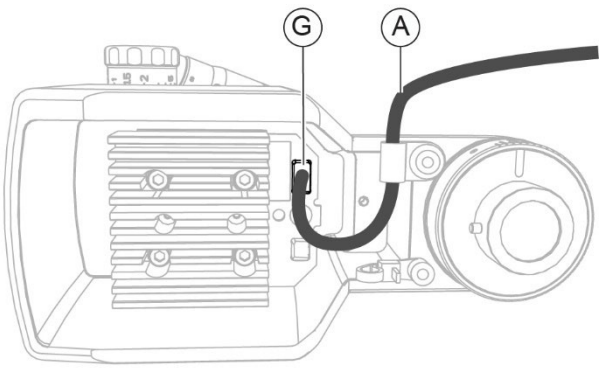


Fig. 310 - Connect the cables

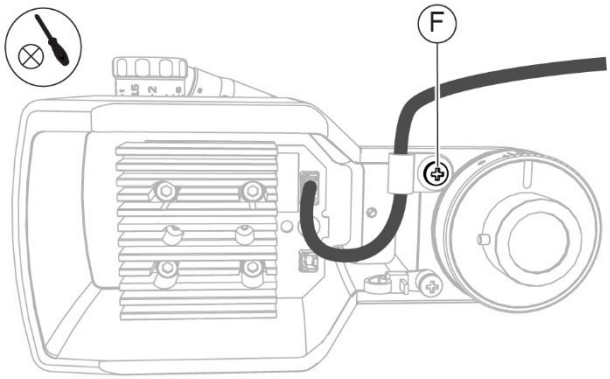


Fig. 311 - Screw in the screw

5 Turn the lighting assembly until reaching the start position.
6 Insert the structure assembly complete with lighting assembly onto the base. Align the hole on the lighting assembly arm with the track on the base.

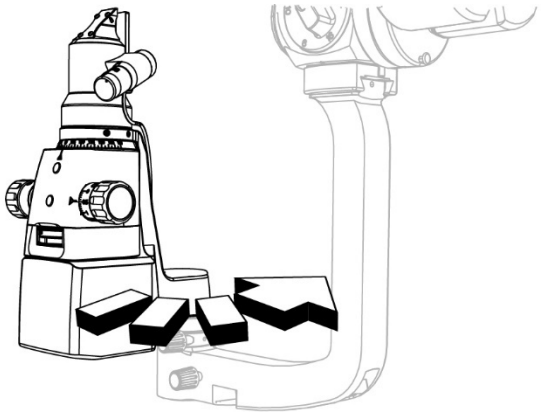


Fig. 312 - Turn the lighting assembly

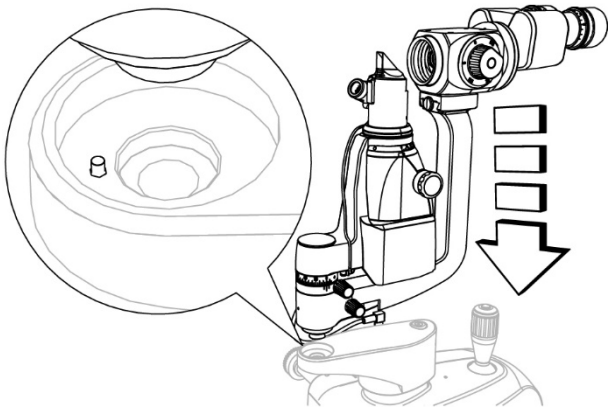


Fig. 313 - Insert the structure assembly complete with lighting assembly

7 Screw in the screw (E) to fasten the base to the arm of the magnification adjuster.
8 Connect the connection cable (A) between the base and the lighting unit to the connector (B).
9 Connect the power cable (D) of the device to the connector (C).

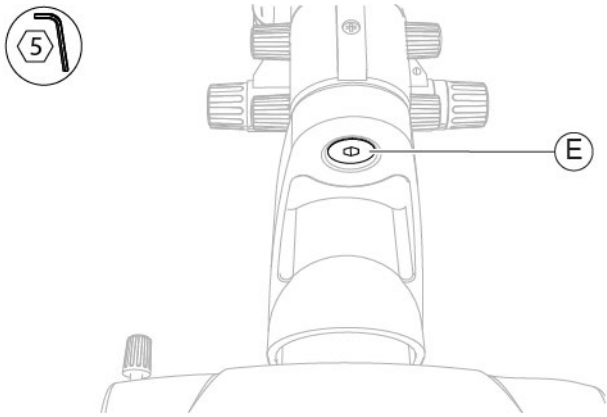


Fig. 314 - Screw in the screw

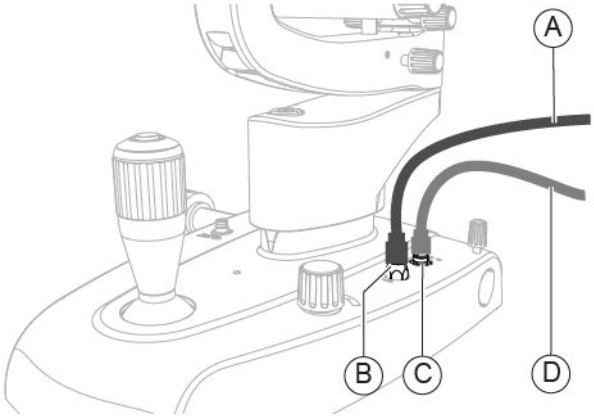


Fig. 315 - Connect the cables

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.25 REPLACEMENT OF THE BASE - [SL9900 AND SL9900 ELITE]

Material and warnings:

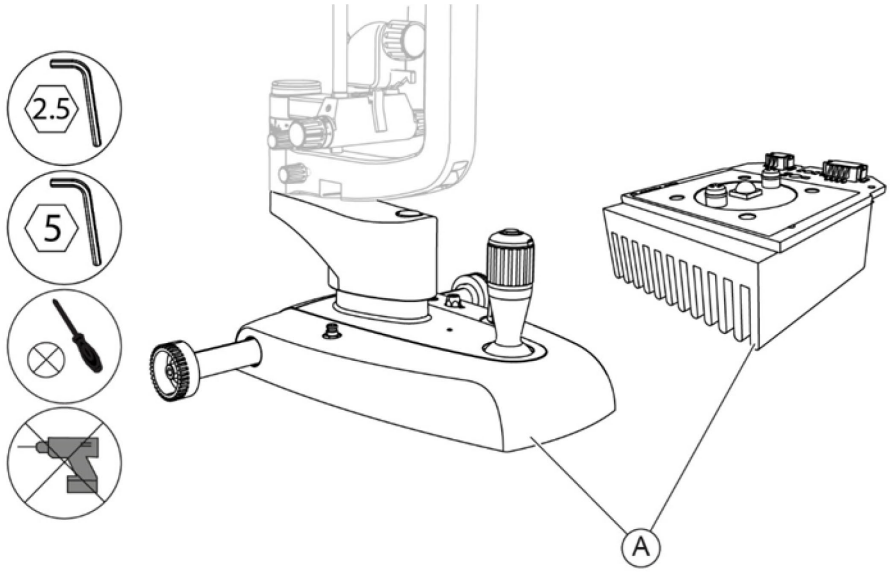


Fig. 316 - Base

Pos	Description	Code
A	Base for standard configuration [SL9900] + Lighting unit	100270410.R + 100259509
	Base for digital configuration [SL9900] + Lighting unit	100270410.D + 100259509
	Base for digital configuration [SL9900 ELITE] + Lighting unit	100271410.D + 100259509

Always replace the lighting unit together with the base.

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Base disassembling procedure:

1 Disconnect the connection cable (A) between the base and the lighting unit from the connector (B).
2 Disconnect the power cable (D) of the device from the connector (C).
3 Hold the lighting assembly.
4 Unscrew the screw (E) fastening the base to the arm of the magnification adjuster.

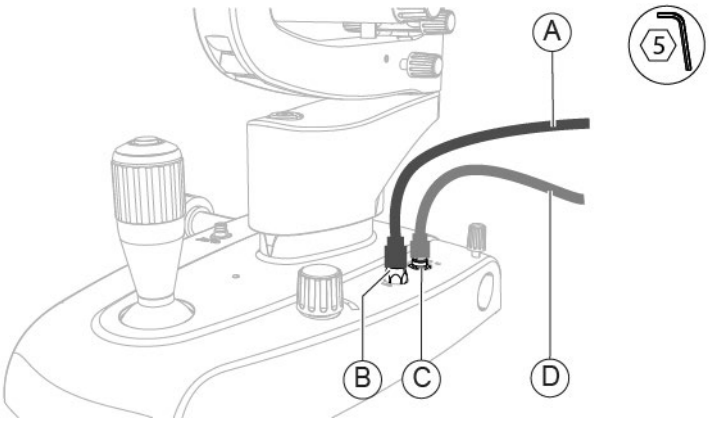


Fig. 317 - Disconnect the cables

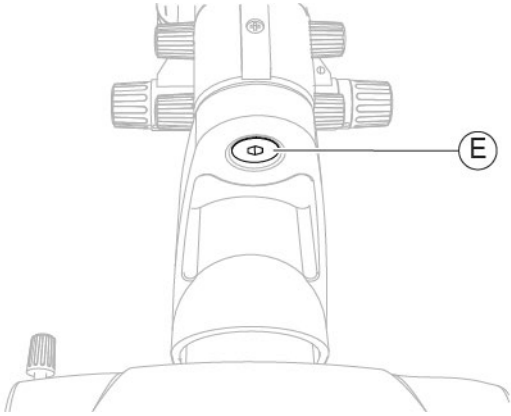


Fig. 318 - Unscrew the screw

5 Remove the structure assembly complete with lighting assembly from the base.

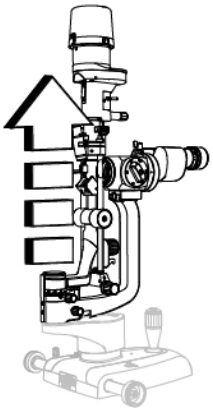


Fig. 319 - Remove the structure assembly complete with lighting assembly

6 Unscrew the screws (F).
7 Remove the lighting unit cover.

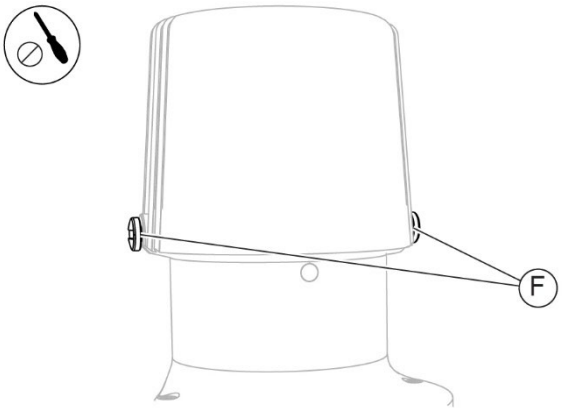


Fig. 320 - Unscrew the screws

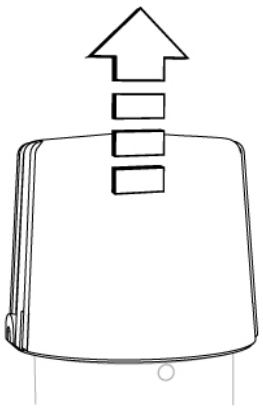


Fig. 321 - Remove the cover

8 Unscrew the screw (G) of the cable clamp.
9 If the device is equipped with illuminator, disconnect the connection cable (H) between the lighting unit and the illuminator from the connector (I).
10 Disconnect the connection cable (A) between the base and the lighting unit from the connector (J).

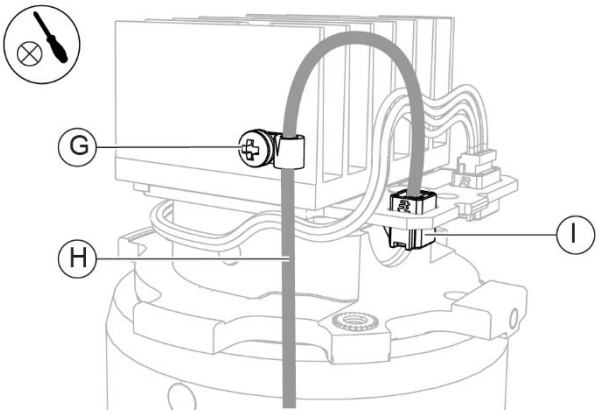


Fig. 322 - Disconnect the cable

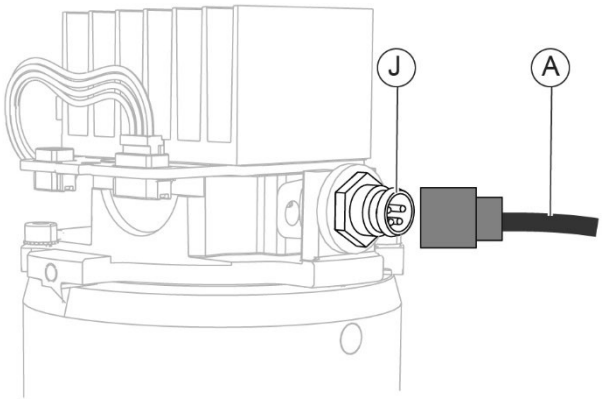


Fig. 323 - Disconnect the cable

11 Unscrew the screws (K).
12 Remove the lighting unit.

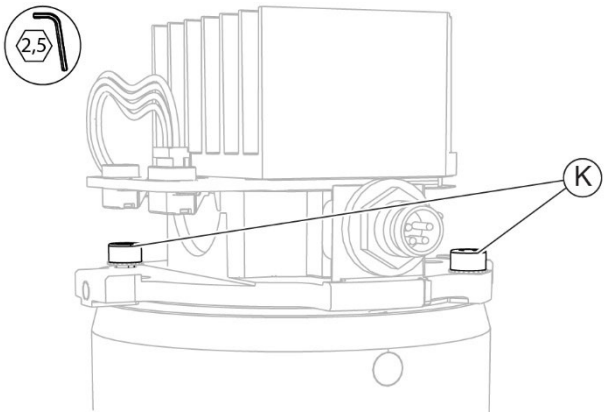


Fig. 324 - Unscrew the screws

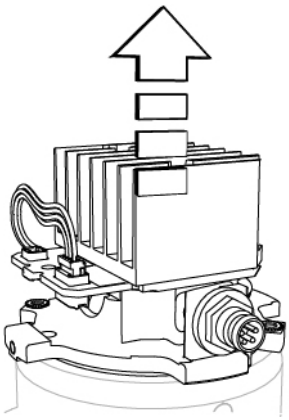


Fig. 325 - Remove the lighting unit

Assembling procedure for the base:

1 Place the lighting unit into its seat. Maintain the connector facing the front part of the device.
2 Screw in the screws (K) to fasten the lighting unit.

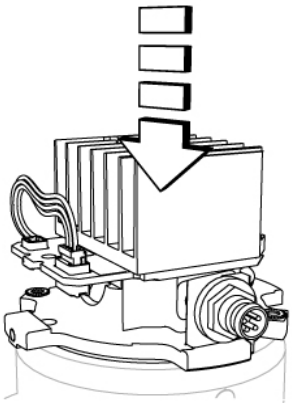


Fig. 326 - Place the lighting unit

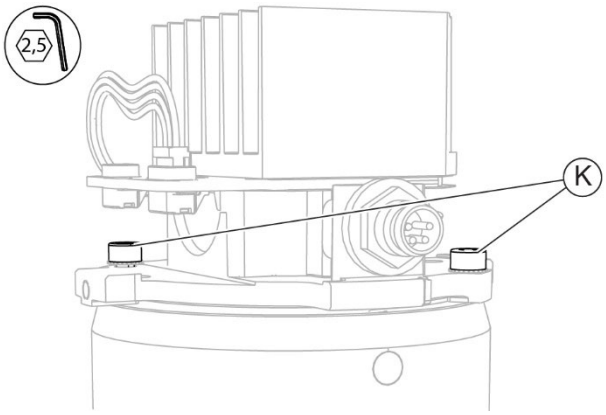


Fig. 327 - Screw in the screws

3 Connect the connection cable (A) between the lighting unit and the base to the connector (J).
4 If the device is equipped with illuminator, connect the connection cable (H) between the lighting unit and the illuminator to the connector (I).
5 Screw in the screw (G) of the cable clamp.

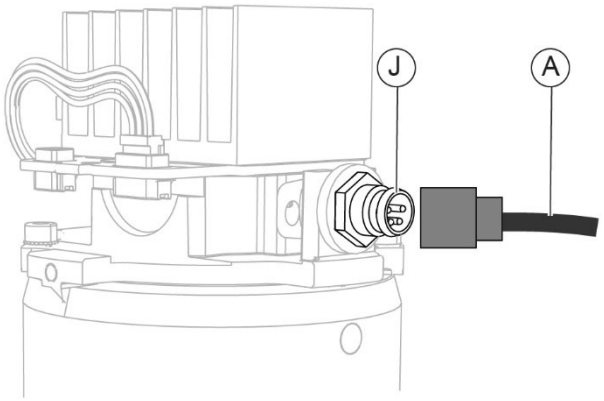


Fig. 328 - Connect the cable

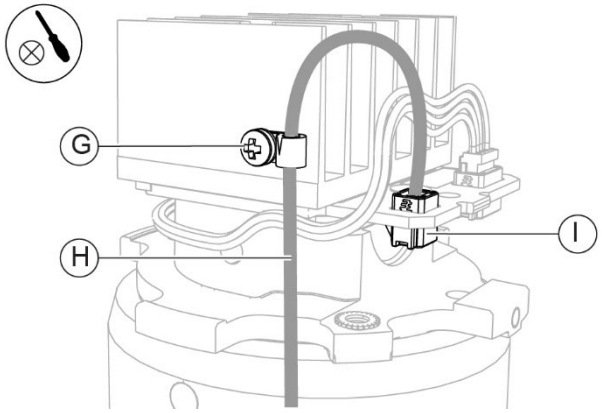


Fig. 329 - Connect the cable

6 Place the lighting unit cover on the lighting assembly.
7 Screw in the screws (F) to fasten the lighting unit cover.

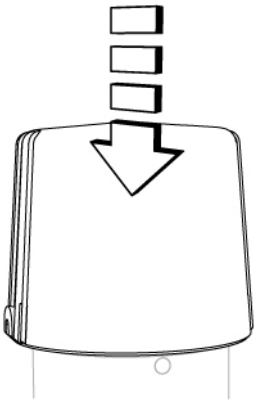


Fig. 330 - Place the cover

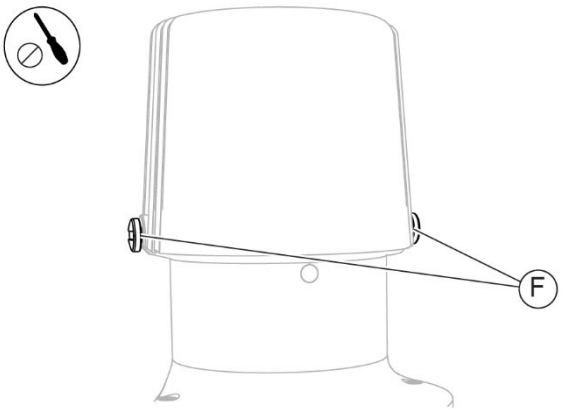


Fig. 331 - Screw in the screws

8 Insert the structure assembly complete with lighting assembly onto the base. Align the hole on the lighting assembly arm with the track on the base.

9 Screw in the screw (E) to fasten the base to the arm of the magnification adjuster.

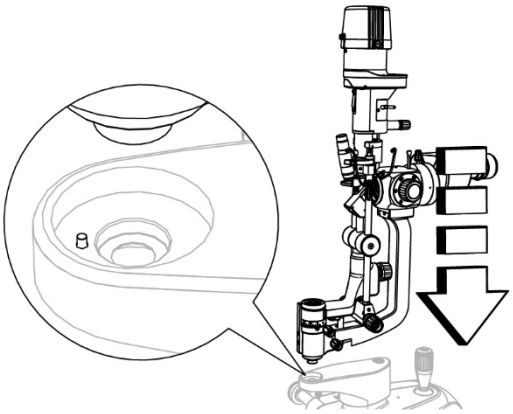


Fig. 332 - Insert the structure assembly complete with lighting assembly

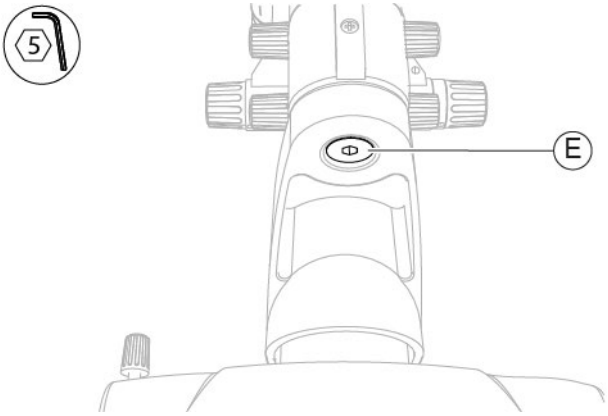


Fig. 333 - Screw in the screw

10 Connect the connection cable (A) between the base and the lighting unit to the connector (B).

11 Connect the power cable (D) of the device to the connector (C).

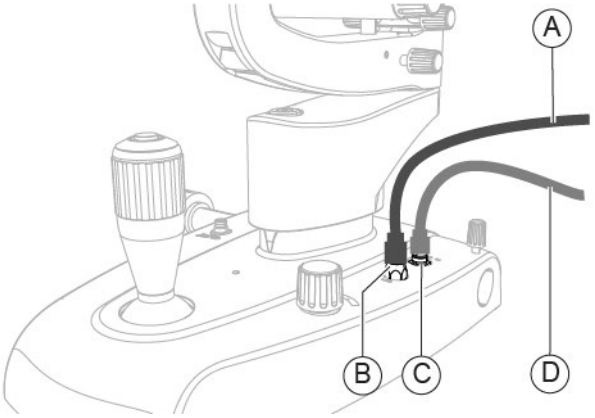


Fig. 334 - Connect the cables

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.26 REPLACEMENT OF THE LIGHTING ASSEMBLY COMPLETE WITH ARM - [SL9800]

Material and warnings:

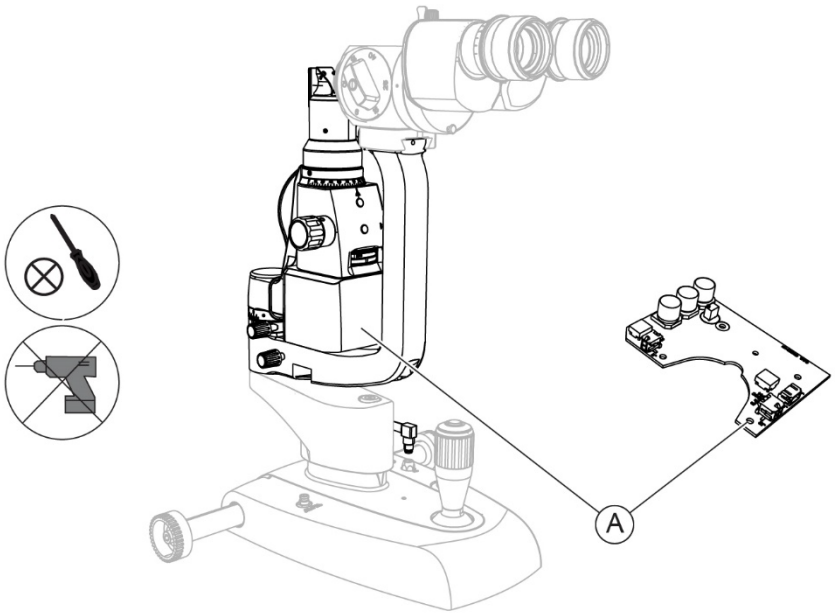


Fig. 335 - Lighting assembly

Pos	Description	Code
A	Lighting assembly complete with arm and circuit board	960274500

The code for the replacement of the lighting assembly complete with arm includes also the circuit board.
Always replace the lighting assembly complete with arm together with the circuit board.

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the lighting assembly complete with arm:

1 Remove the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**
2 Disconnect the connection cable (A) between the base and the lighting unit from the connector (B).
3 Disconnect the power cable (D) of the device from the connector (C).
4 Hold the lighting assembly complete with arm.
5 Unscrew the screw (E) fastening the base to the arm.

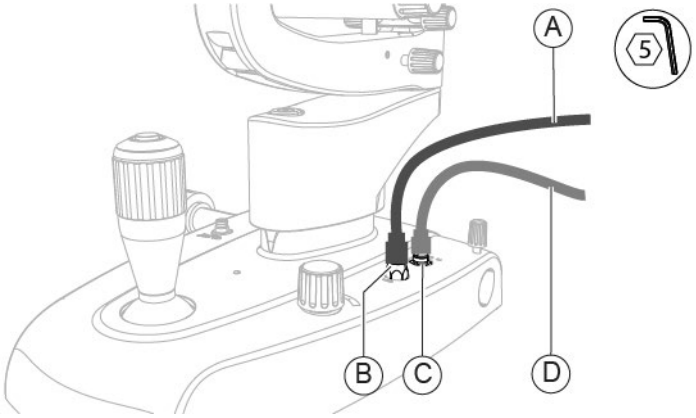


Fig. 336 - Disconnect the cables

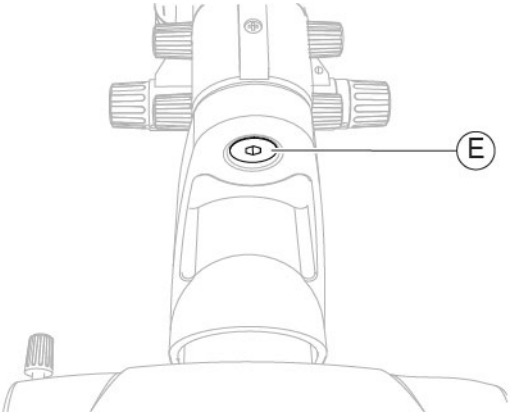


Fig. 337 - Unscrew the screw

6 Remove the lighting assembly complete with arm.

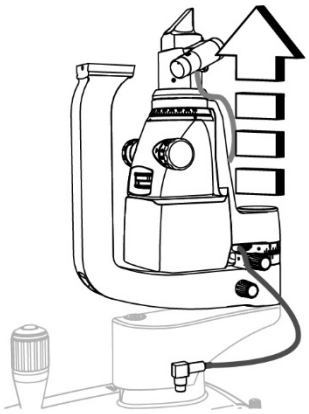


Fig. 338 - Remove the lighting assembly complete with arm

5 Remove the plate.
In case of standard configuration, follow the procedure described in the paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**
In case of digital configuration, follow the procedure described in the paragraph **"Replacement of the plate - [Digital configuration - SL9800]" on page 120.**
6 Access the underside of the base.

7 Unscrew the screws (F).
8 Remove the cogwheel (G).
9 Disconnect the connection cable (H) between the base and the circuit board from the connector J1 (I).
10 Disconnect the connection cable (J) between the base and the circuit board from the connector J2 (K).
11 Disconnect the connection cable (L) between the base and the circuit board from the connectors J3 and J4 (M).

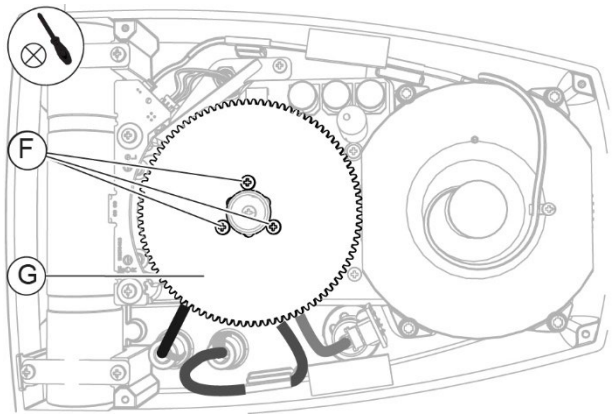


Fig. 339 - Unscrew the screws and remove the cogwheel

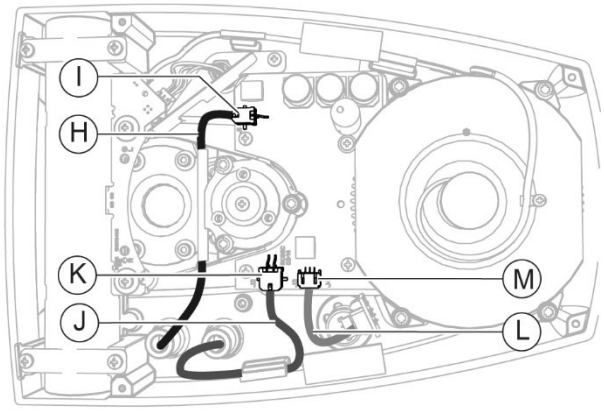


Fig. 340 - Disconnect the connection cables from the connectors

12 Unscrew the screws (N).
13 Remove the circuit board.

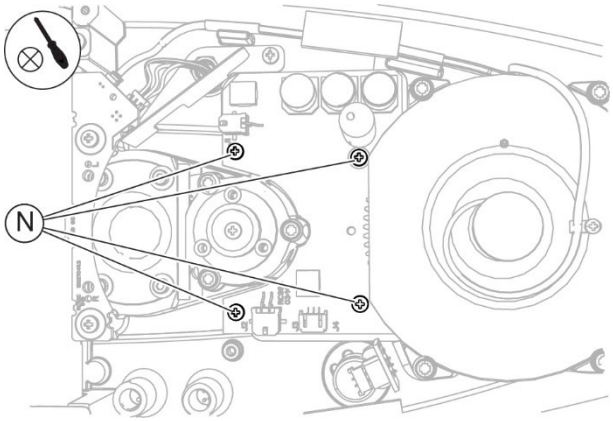


Fig. 341 - Unscrew the screws

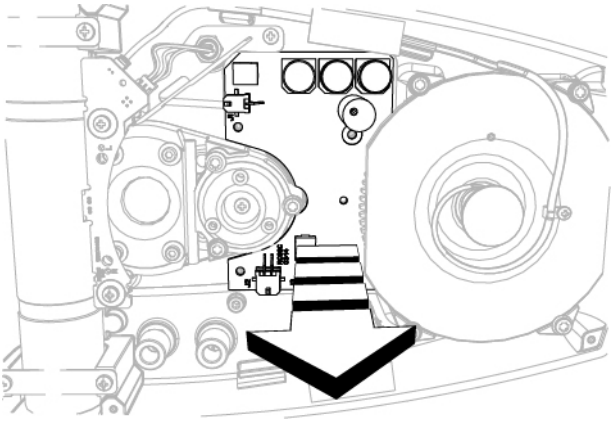


Fig. 342 - Remove the circuit board

Assembling procedure for the lighting assembly:

1 Place the circuit board.
2 Screw in the screws (N) to fasten the circuit board.

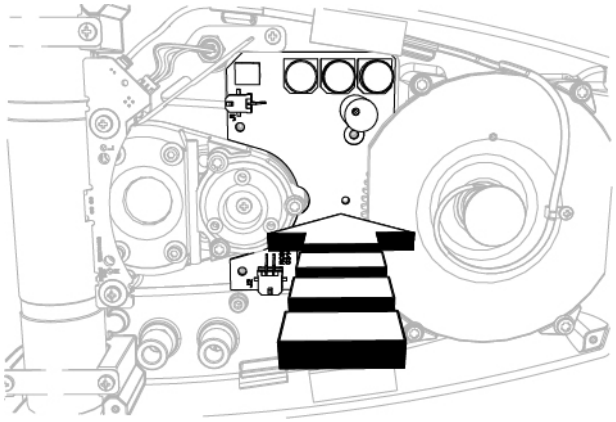


Fig. 343 – Place the circuit board

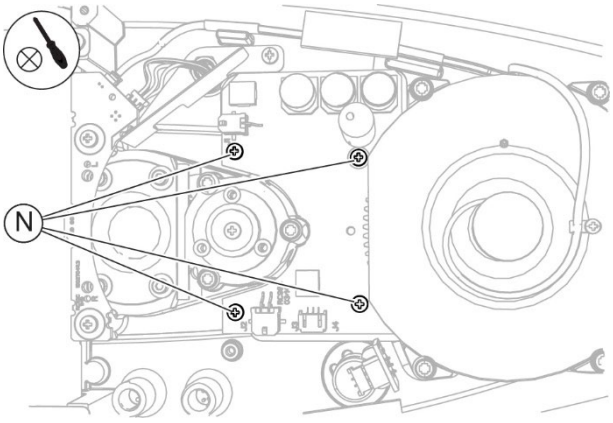


Fig. 344 - Screw in the screws

3 Connect the connection cable (L) between the base and the circuit board to the connectors J3 and J4 (M).
4 Connect the connection cable (J) between the base and the circuit board to the connector J2 (K).
5 Connect the connection cable (H) between the base and the circuit board to the connector J1 (I).
6 Place the cogwheel (G).
7 Screw in the screws (F) to fasten the cogwheel.

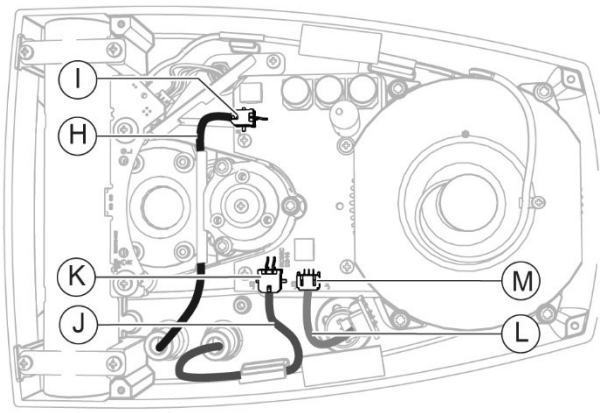


Fig. 345 - Connect the connection cables to the connectors

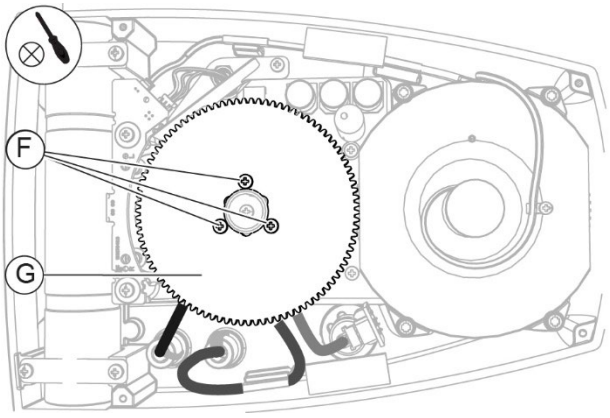


Fig. 346 - Place the cogwheel and screw in the screws

8 Install the plate.
In case of standard configuration, follow the procedure described in the paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**
In case of digital configuration, follow the procedure described in the paragraph **"Replacement of the plate - [Digital configuration - SL9800]" on page 120.**

9 Place the lighting assembly complete with arm.
10 Screw in the screw (E) fastening the base to the arm.

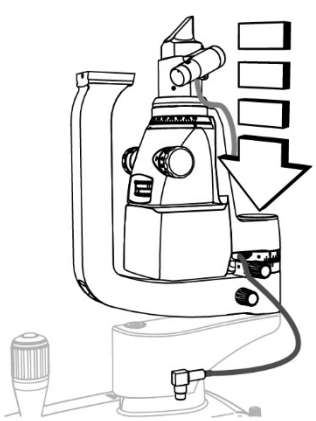


Fig. 347 - Place the lighting assembly complete with arm

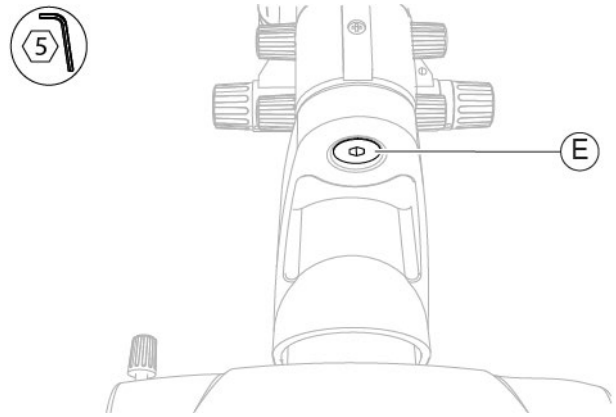


Fig. 348 - Screw in the screw

11 Connect the power cable (D) of the device to the connector (C).
12 Connect the connection cable (A) between the base and the lighting unit to the connector (B).
13 Install the magnification adjuster as described in the paragraph **"Replacement of the magnification adjuster" on page 83.**

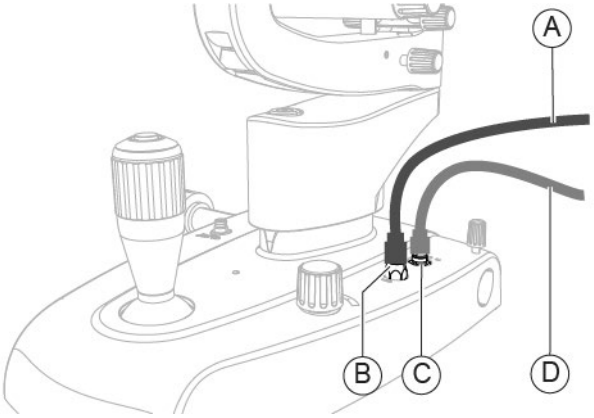


Fig. 349 - Connect the cables

When the operation is complete, test the lighting assembly calibration as described in the paragraph **"Testing the lighting assembly calibration - [SL9800]" on page 68.**

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.26.1 LIGHTING ASSEMBLY CALIBRATION - [SL9800]

The lighting assembly calibration (SL9800) shall only be carried out following a corrective maintenance activity for the **Replacement of the lighting assembly complete with arm - [SL9800].** Carry out the lighting assembly calibration only after **Testing the lighting assembly calibration - [SL9800]**, if the device is not calibrated.

Close attention shall be paid while performing the procedure. It is important to check device stability before starting with the procedure.
calibration is essential to obtaining precise measurements.

Material and warnings:

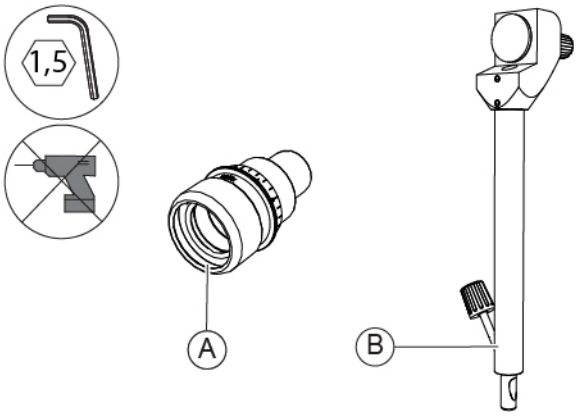


Fig. 350 - Eyepiece with reference cross and calibration rod

Pos	Description	Code
A	Eyepiece with reference cross	103005110
B	Calibration rod	200200100

Procedure for calibrating the lighting assembly:

1 Remove the eyepieces as described in the paragraph **"Replacement of the eyepieces" on page 78.**
2 Install the eyepiece with reference cross on the binoculars. Bring the orthogonal fiducial lines in vertical and horizontal position.
3 Turn the knob (A) on the calibration rod to adjust the focal distance (B). Keep the light diffusing filter (C) facing downwards.
4 While adjusting, observe the calibration rod through the eyepieces and swing the lighting assembly (D) by +/- 70°.

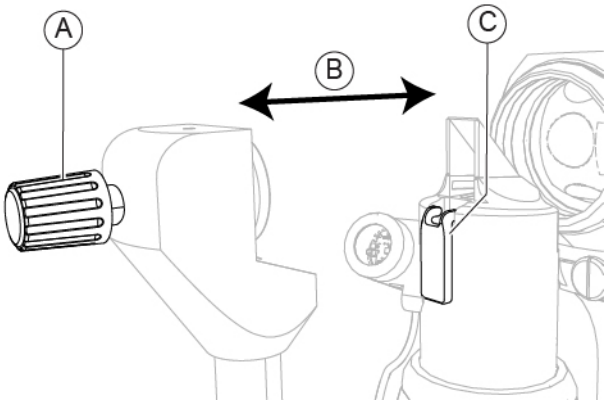


Fig. 351 - Turn the knob

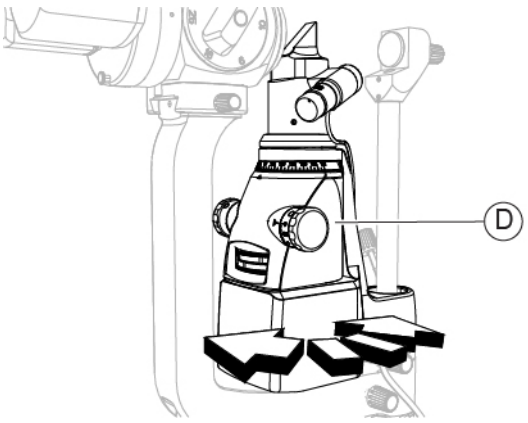


Fig. 352 - Swing the lighting assembly

5 While swinging the lighting assembly, check that the vertical projection of the slit remains centred in relation to the reference cross of the eyepiece.
6 If the slit projection is not centred, slightly loosen one of the two screws (E).

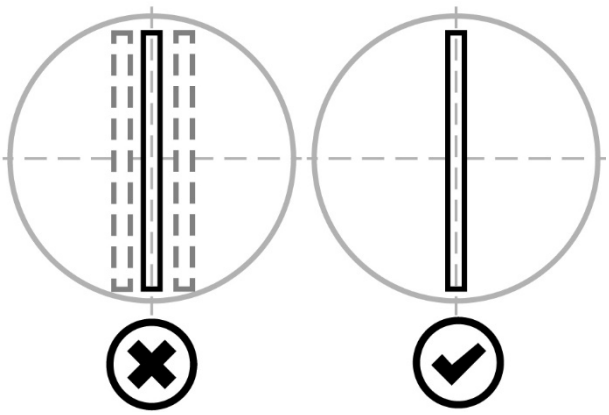


Fig. 353 - Check the vertical projection of the slit

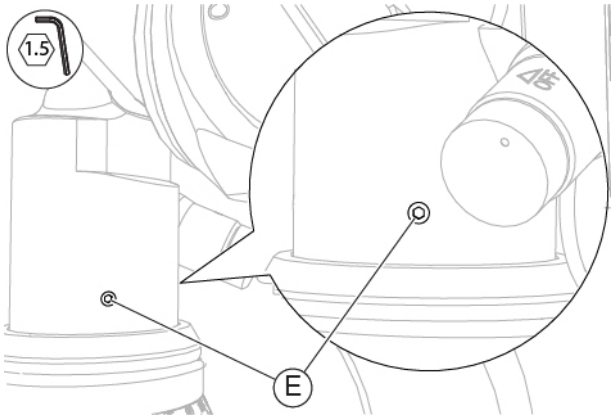


Fig. 354 - Slightly loosen one of the two screws

7 Turn the prism-holder head (F) to obtain the correct position of the slit projection.
8 Turn the lighting head (G) to the 180° position.

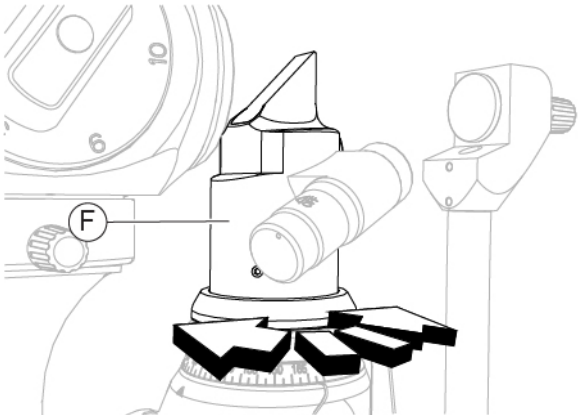


Fig. 355 - Turn the prism-holder head

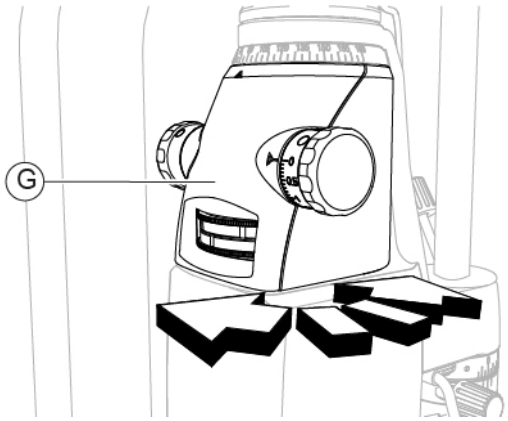


Fig. 356 - Turn the lighting head

9 Observe the calibration rod through the eyepieces and check the horizontal projection of the slit is centred in relation to the reference cross.
10 If the slit projection is not centred, slightly loosen the screws (E).

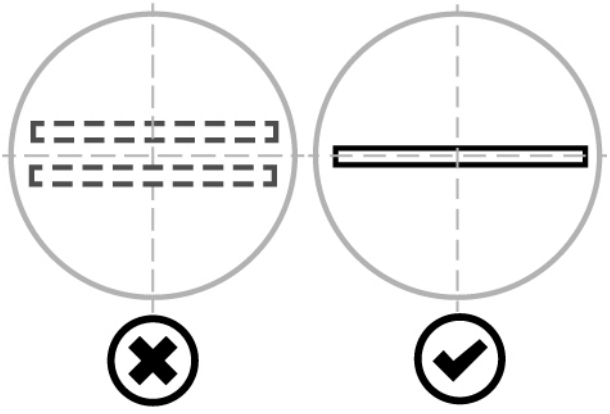


Fig. 357 - Check the horizontal projection of the slit

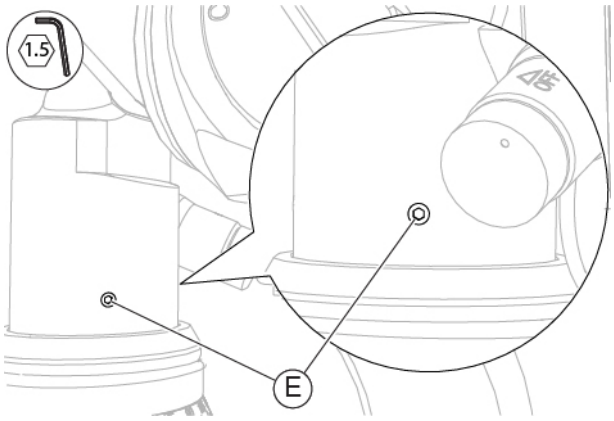


Fig 358 - Slightly loosen the screws

11 Slightly move the prism-holder head (F) up and down to make the slit projection stable when swinging the lighting assembly.
12 Tighten the screws (E) previously loosened.

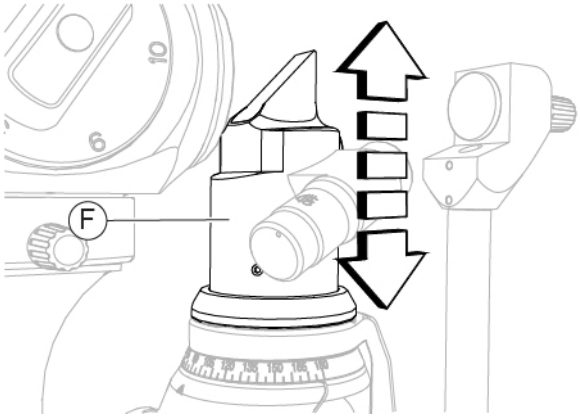


Fig. 359 - Move the prism-holder head

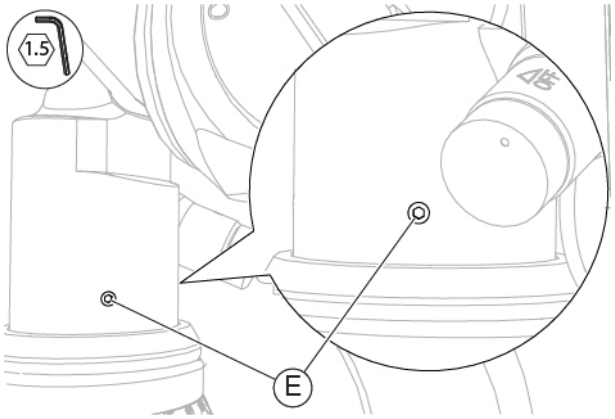


Fig. 360 - Tighten the screws

13 Remove the eyepiece with reference cross and install the eyepieces as described in the paragraph **"Replacement of the eyepieces" on page 78.**

6.5.27 REPLACEMENT OF THE LIGHTING ASSEMBLY - [SL9900 AND SL9900 ELITE]

Material and warnings:

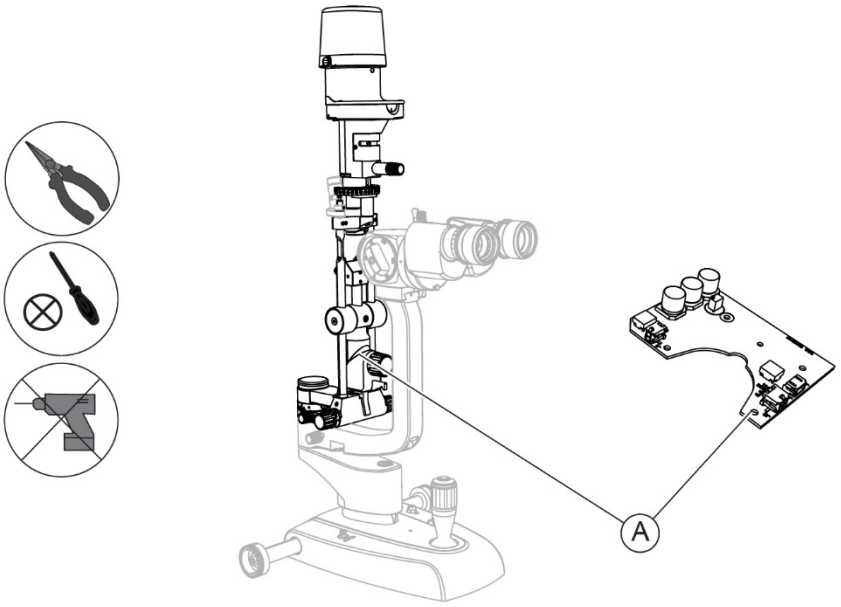


Fig. 361 - Lighting assembly

Pos	Description	Code
A	Lighting assembly [SL9900]	100270511
	Lighting assembly [SL9900 ELITE]	100271511

The code for the lighting assembly replacement includes also the circuit board.
Always replace the lighting assembly together with the circuit board.

CAUTION
Take appropriate precautions when handling components sensitive to electrostatic discharges (ESD).

Before carrying out the replacement, make sure you have all the tools and materials required for the installation.

It is prohibited to use a powered screwdriver during fixing or adjusting operations on the components.

Disassembling procedure for the lighting assembly:

1 Disconnect the connection cable (A) between the base and the lighting unit from the connector (B).
2 Remove the cap (C).

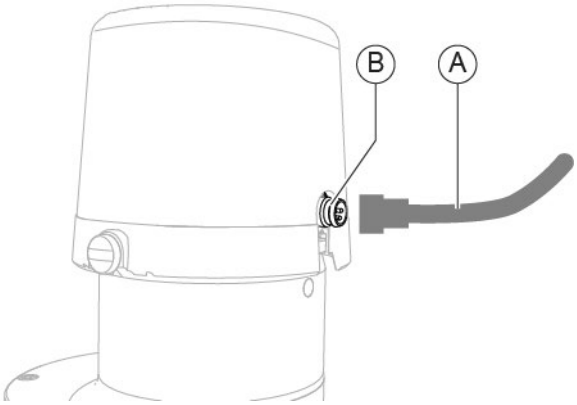


Fig. 362 - Disconnect the cable

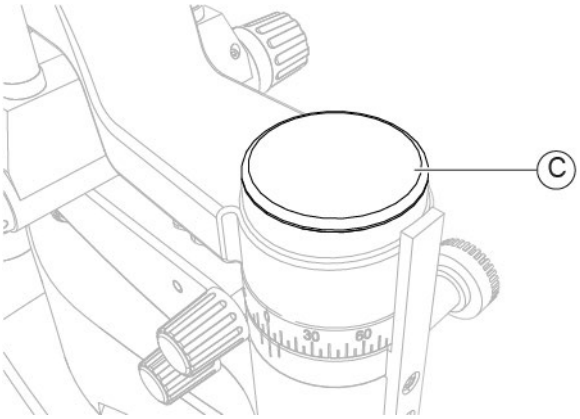


Fig. 363 - Remove the cap

3 Remove the Seeger ring (D).
4 Remove the lighting assembly.

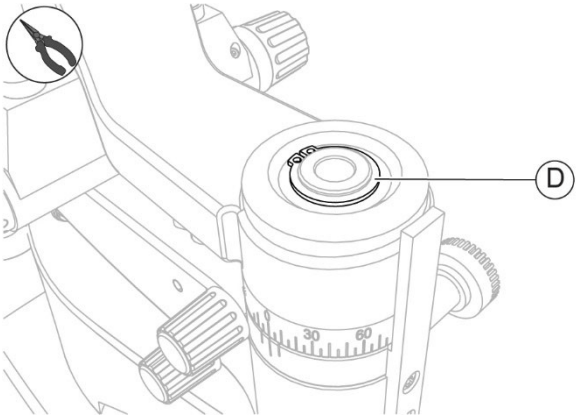


Fig. 364 - Remove the Seeger ring

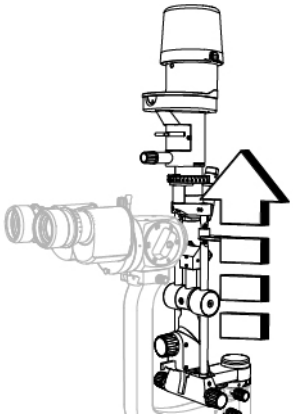


Fig. 365 - Remove the lighting assembly

5 Remove the plate.
In case of standard configuration, follow the procedure described in the paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**
In case of digital configuration, follow the procedure described in the paragraph **"Replacement of the plate - [Digital configuration - SL9900 and SL9900 ELITE]" on page 122.**
6 Access the underside of the base.

7 Unscrew the screws (E).
8 Remove the cogwheel (F).
9 Disconnect the connection cable (G) between the base and the circuit board from the connector J1 (H).
10 Disconnect the connection cable (I) between the base and the circuit board from the connector J2 (J).
11 Disconnect the connection cable (K) between the base and the circuit board from the connectors J3 and J4 (L).

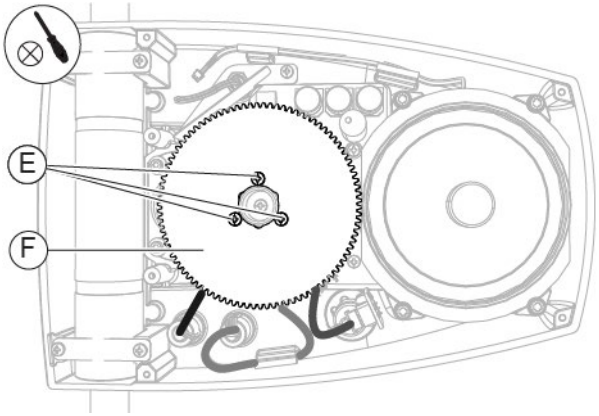


Fig. 366 - Unscrew the screws and remove the cogwheel

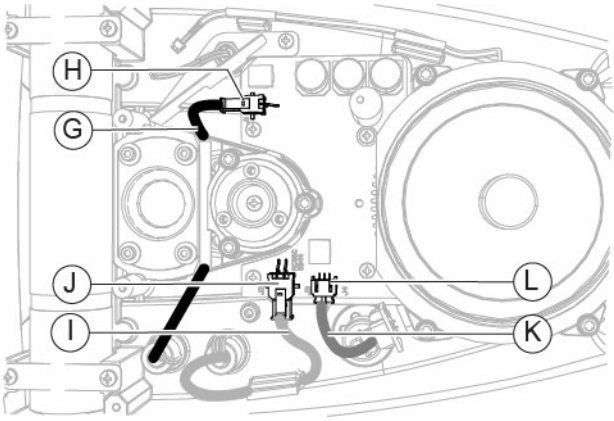


Fig. 367 - Disconnect the connection cables from the connectors

12 Unscrew the screws (M).
13 Remove the circuit board.

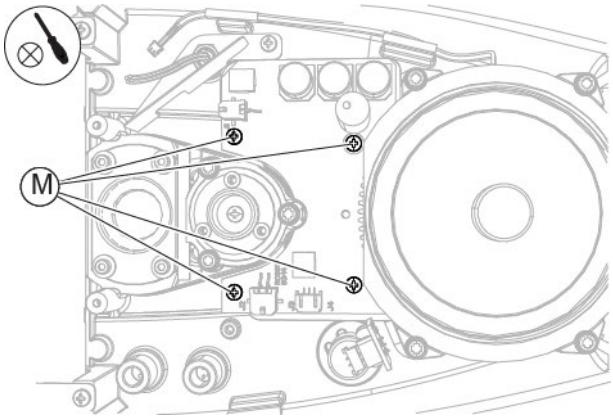


Fig. 368 - Unscrew the screws

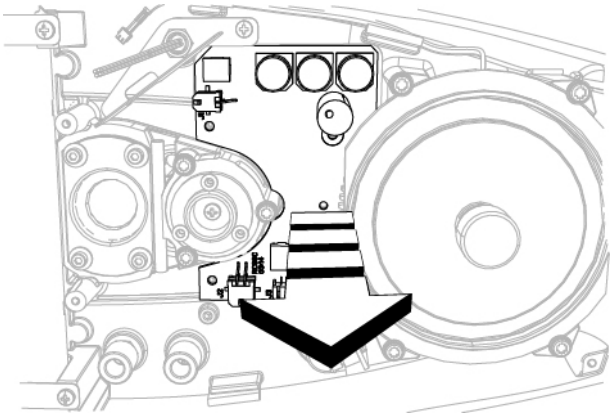


Fig. 369 - Remove the circuit board

Assembling procedure for the lighting assembly:

1 Place the circuit board.
2 Screw in the screws (M) to fasten the circuit board.

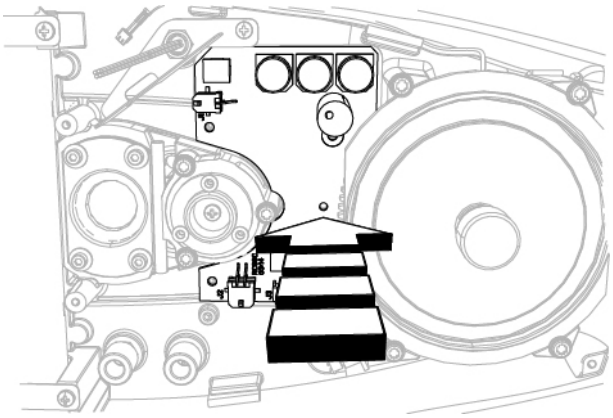


Fig. 370 – Place the circuit board

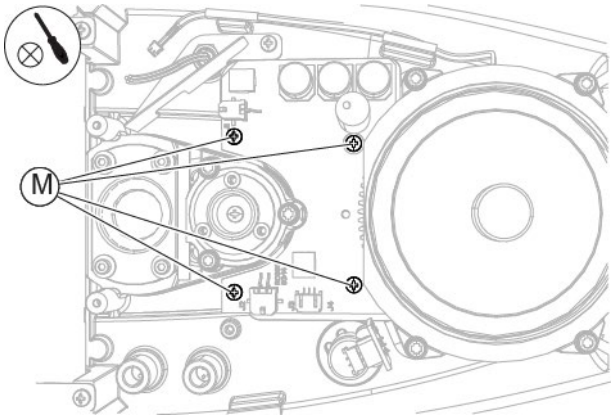


Fig. 371 - Screw in the screws

3 Connect the connection cable (K) between the base and the circuit board to the connectors J3 and J4 (L).
4 Connect the connection cable (I) between the base and the circuit board to the connector J2 (J).
5 Connect the connection cable (G) between the base and the circuit board to the connector J1 (H).
6 Place the cogwheel (F).
7 Screw in the screws (E) to fasten the cogwheel.

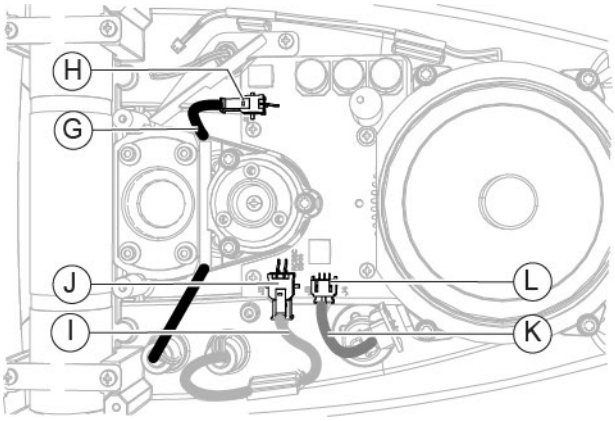


Fig. 372 - Connect the connection cables to the connectors

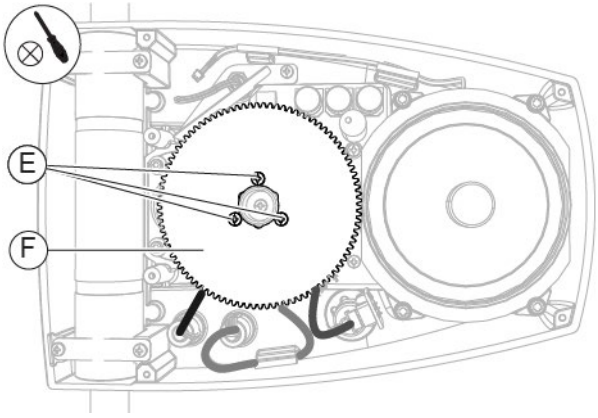


Fig. 373 - Place the cogwheel and screw in the screws

8 Install the plate.
In case of standard configuration, follow the procedure described in the paragraph **"Disassembling of the plate - [Standard configuration]" on page 118.**
In case of digital configuration, follow the procedure described in the paragraph **"Replacement of the plate - [Digital configuration - SL9900 and SL9900 ELITE]" on page 122.**

9 Place the lighting assembly on the structure assembly.
10 Place the Seeger ring (D).

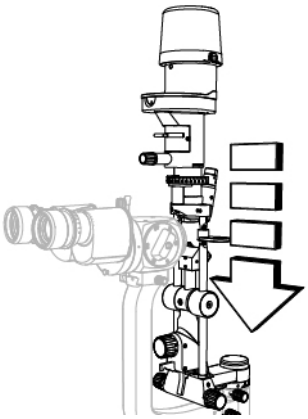


Fig. 374 - Place the lighting assembly

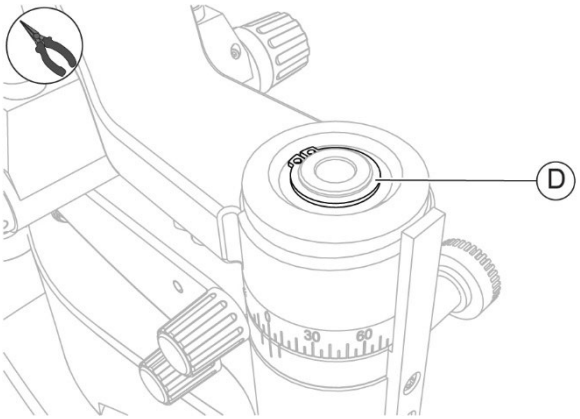


Fig. 375 - Place the Seeger ring

11 Place the cap (C).
12 Connect the connection cable (A) between the base and the lighting unit to the connector (B).

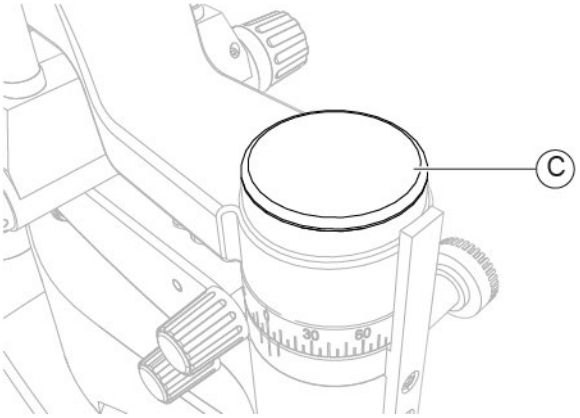


Fig. 376 - Place the cap

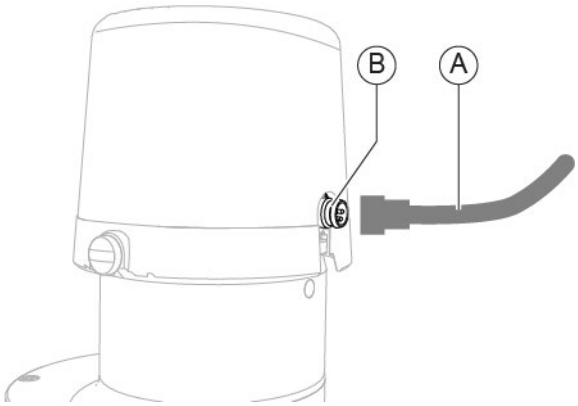


Fig. 377 - Connect the cable

When the operation is complete, test the lighting assembly calibration as described in the paragraph **"Testing the lighting assembly calibration - [SL9900 and SL9900 ELITE]" on page 71.**

When the operation is complete, carry out the electrical safety test as described in the paragraph **"Electrical safety test" on page 159.**

6.5.27.1 LIGHTING ASSEMBLY CALIBRATION - [SL9900 AND SL9900 ELITE]

The lighting assembly calibration (SL9900 and SL9900 ELITE) shall only be carried out following a corrective maintenance activity for the **Replacement of the lighting assembly - [SL9900 and SL9900 ELITE].**
Carry out the lighting assembly calibration only after **Testing the lighting assembly calibration - [SL9900 and SL9900 ELITE]**, if the device is not calibrated.

Close attention shall be paid while performing the procedure. It is important to check device stability before starting with the procedure.
calibration is essential to obtaining precise measurements.

Material and warnings:

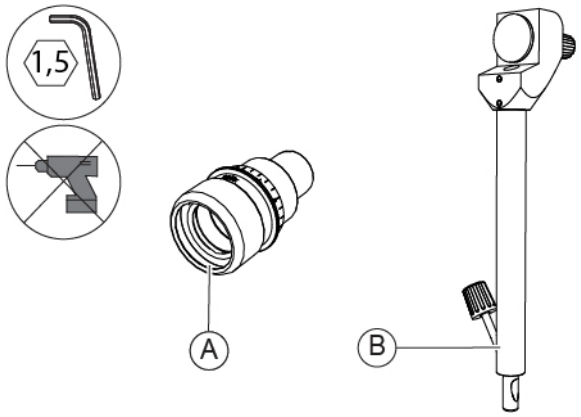


Fig. 378 - Eyepiece with reference cross and calibration rod

Pos	Description	Code
A	Eyepiece with reference cross	103005110
B	Calibration rod	200200100

Procedure for calibrating the lighting assembly:

1 Turn the knob (A) on the calibration rod to adjust the focal distance (B).
2 While adjusting, observe the calibration rod through the eyepieces and swing the lighting assembly (C) by +/- 70°.

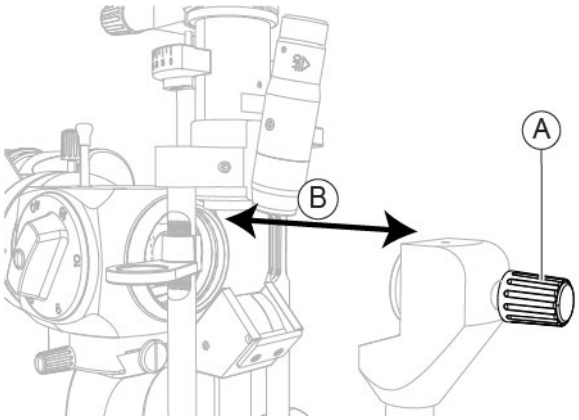


Fig. 379 - Turn the knob

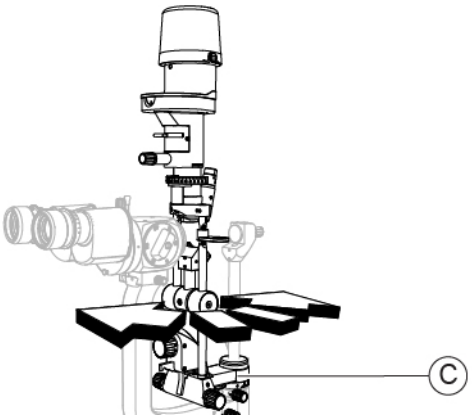


Fig. 380 - Swing the lighting assembly

3 While swinging the lighting assembly, check that the vertical projection of the slit remains centred in relation to the reference cross of the eyepiece.
4 If the slit projection is not centred, loosen the screws (D) and (E).

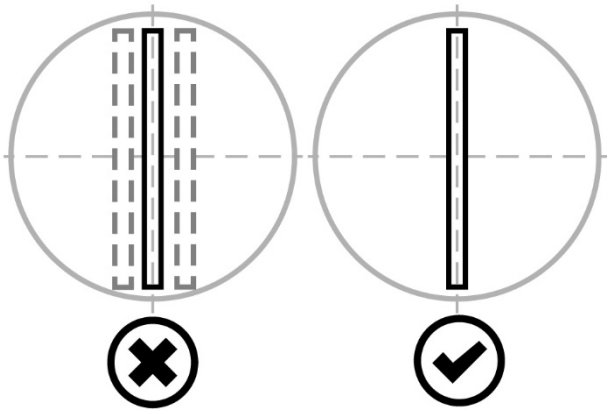


Fig. 381 - Check the vertical projection of the slit

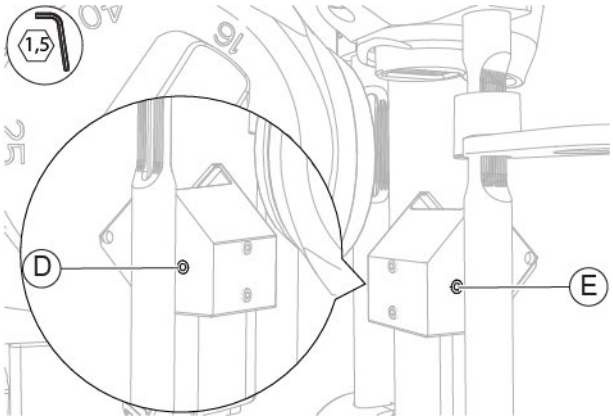


Fig. 382 - Loosen the screws

5 Slightly move the reflection mirror assembly (F) left and right to make the slit projection stable when swinging the lighting assembly.
6 Tighten the screws (D) and (E) previously loosened.

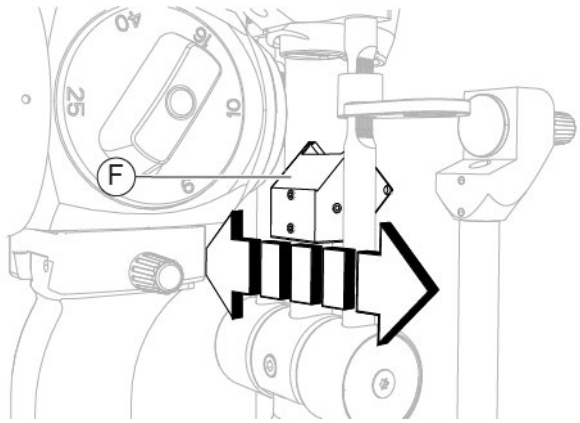


Fig. 383 - Move the reflection mirror assembly

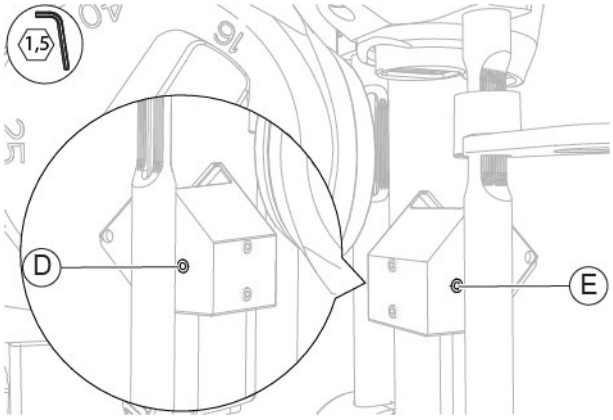


Fig. 384 - Tighten the screws

7 Turn the lighting head (G) to the 0°-180° position.

8 Observe the calibration rod through the eyepieces and check the horizontal projection of the slit is centred in relation to the reference cross.

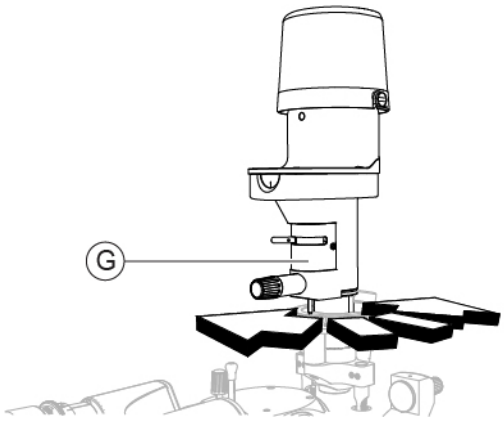


Fig. 385 - Turn the lighting head

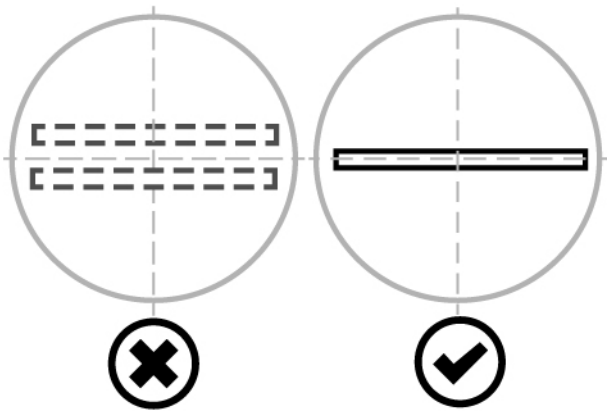


Fig. 386 - Check the horizontal projection of the slit

9 If the slit projection is not centred, first adjust the screw (H), then the screw (I) and vice versa, to obtain a vertical tilting of the reflection mirror assembly (F).

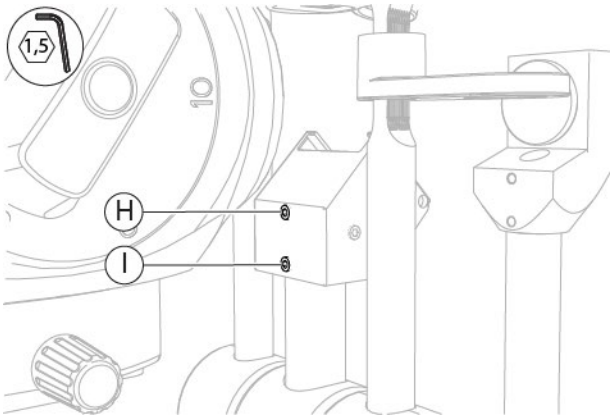


Fig. 387 - Adjust the screws

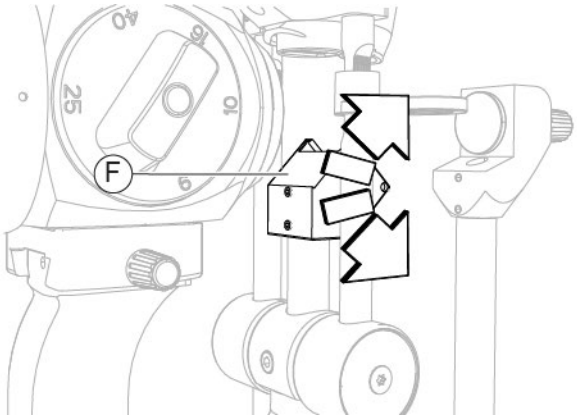


Fig. 388 - Tilting of the reflection mirror assembly

6.6 ELECTRICAL SAFETY TEST

6.6.1 SL9800 - [STANDARD CONFIGURATION]

The electrical safety test shall always be carried out after a technical intervention on the device, in compliance with EN 60601-1 standard.

For proper cable connection and test procedure read the instructions for tester use.

Do not touch the device during the test.

Medical device	SL9800	PSP1501
Description	Slit lamp	Power supply unit
Class	I	I
Type	B	B
Number of applied parts	1	1
IEC 60601-4th edition	Inspection - Enclosure Leakage Patient Leakage Isolation 500Vac	Inspection Ground Leakage Enclosure Leakage Patient Leakage Isolation 500Vac

Procedure to carry out the electrical safety test:

1 Before carrying out the test, check that all safety devices have been assembled correctly.
2 Connect the tester as shown in the following figure.

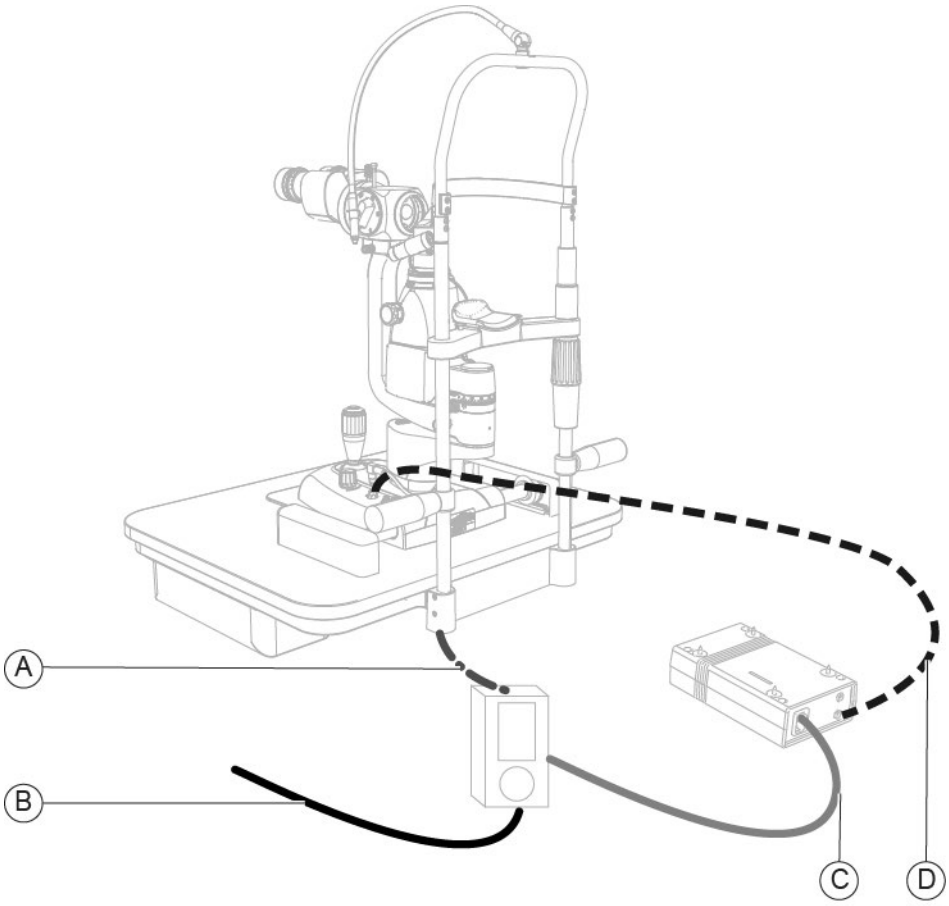


Fig. 389 - Connect the tester

Pos	Name
A	Connection between applied part and tester
B	Connection between tester and power socket
C	Connection between tester and power supply unit
D	Connection between the power supply unit and the device

3 Carry out the electrical safety test. Follow the instructions for use of the tester.
4 Print the test.
5 Check the test results are correct.
6 Include the test printing in the annexed documents of the activity report.

6.6.2 SL9800 - [DIGITAL CONFIGURATION]

The electrical safety test shall always be carried out after a technical intervention on the device, in compliance with EN 60601-1 standard.

For proper cable connection and test procedure read the instructions for tester use.

Do not touch the device during the test.

Medical device	**SL9800**	**PSP1501**
Description	Slit lamp	Power supply unit
Class	I	I
Type	B	B
Number of applied parts	1	1
IEC 60601-4th edition	Inspection - Enclosure Leakage Patient Leakage Isolation 500Vac	Inspection Ground Leakage Enclosure Leakage Patient Leakage Isolation 500Vac

Procedure to carry out the electrical safety test:

1 Before carrying out the test, check that all safety devices have been assembled correctly.
2 To properly connect the tester, check if the PC is placed inside or outside the patient area.

Patient area: any volume in which a patient with applied parts may intentionally or unintentionally come into contact with other electromedical devices or electromedical systems, masses or foreign masses, or other people in contact with these elements.

3 If the PC is placed inside the patient area, connect the tester as indicated in the following figure.

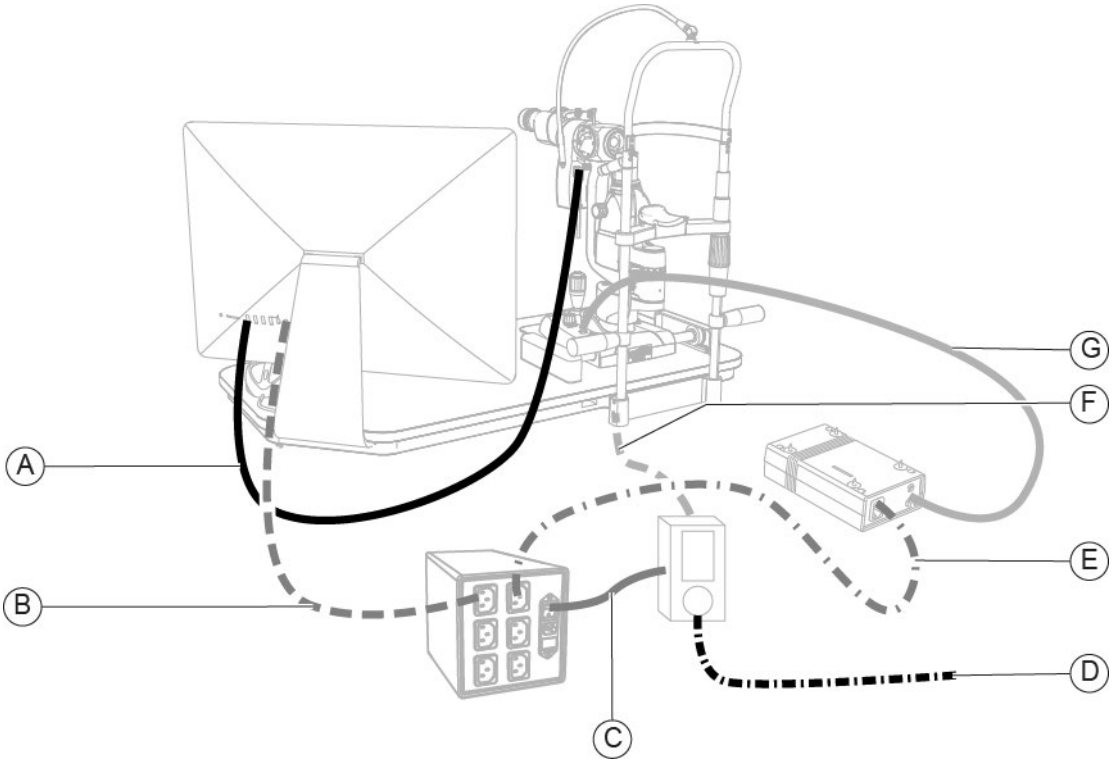


Fig. 390 - Connect the tester inside the patient area

Pos	Name
A	Connection between beam splitter and PC
B	Connection between PC and isolation transformer
C	Connection between isolation transformer and tester
D	Connection between tester and power socket
E	Connection between isolation transformer and power supply unit
F	Connection between applied part and tester
G	Connection between the power supply unit and the device

4 If the PC is placed outside the patient area, connect the tester as indicated in the following figure.

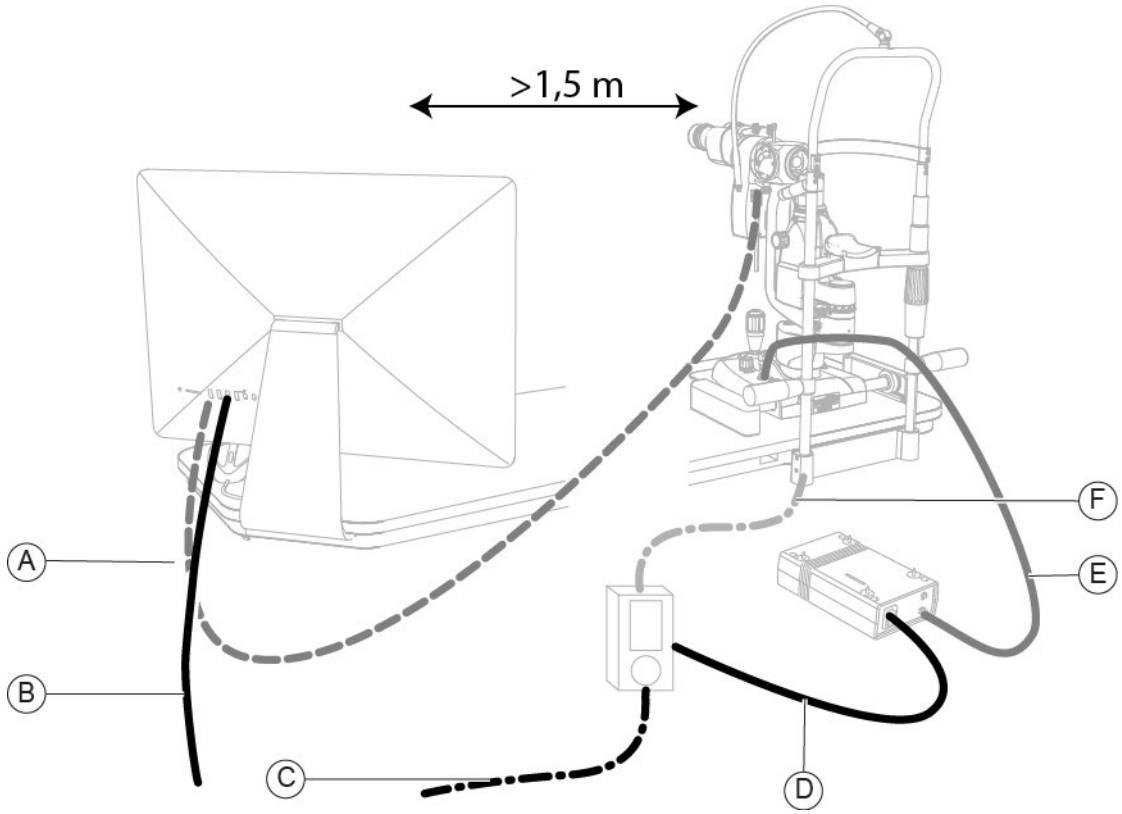


Fig. 391 - Connecting the tester outside the patient area

Pos	Name
A	Connection between beam splitter and PC
B	Connection between PC and power socket
C	Connection between tester and power socket
D	Connection between tester and power supply unit
E	Connection between the power supply unit and the device
F	Connection between applied part and tester

5 Carry out the electrical safety test. Follow the instructions for use of the tester.
6 Print the test.
7 Check the test results are correct.
8 Include the test printing in the annexed documents of the activity report.

6.6.3 SL9900 - [STANDARD CONFIGURATION]

The electrical safety test shall always be carried out after a technical intervention on the device, in compliance with EN 60601-1 standard.

For proper cable connection and test procedure read the instructions for tester use.

Do not touch the device during the test.

Medical device	**SL9900**	**PSP1501**
Description	Slit lamp	Power supply unit
Class	I	I
Type	B	B
Number of applied parts	1	1
IEC 60601-4th edition	Inspection - Enclosure Leakage Patient Leakage Isolation 500Vac	Inspection Ground Leakage Enclosure Leakage Patient Leakage Isolation 500Vac

Procedure to carry out the electrical safety test:

1 Before carrying out the test, check that all safety devices have been assembled correctly.
2 Connect the tester as shown in the following figure.

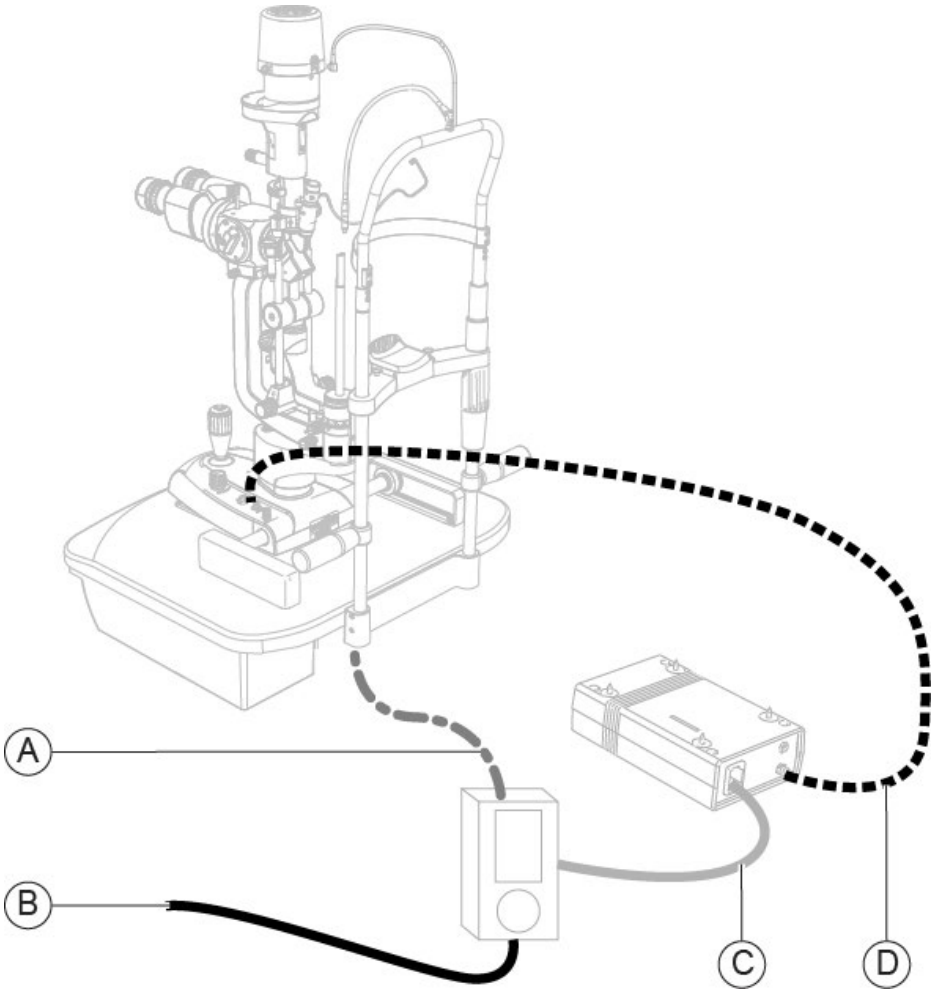


Fig. 392 - Connect the tester

Pos	Name
A	Connection between applied part and tester
B	Connection between tester and power socket
C	Connection between tester and power supply unit
D	Connection between the power supply unit and the device

5 Carry out the electrical safety test. Follow the instructions for use of the tester.
6 Print the test.
7 Check the test results are correct.
8 Include the test printing in the annexed documents of the activity report.

6.6.4 SL9900 AND SL9900 ELITE - [DIGITAL CONFIGURATION]

The electrical safety test shall always be carried out after a technical intervention on the device, in compliance with EN 60601-1 standard.

For proper cable connection and test procedure read the instructions for tester use.

Do not touch the device during the test.

Medical device	**SL9900** **SL9900 ELITE**	**PSP1501**
Description	Slit lamp	Power supply unit
Class	I	I
Type	B	B
Number of applied parts	1	1
IEC 60601-4th edition	Inspection - Enclosure Leakage Patient Leakage Isolation 500Vac	Inspection Ground Leakage Enclosure Leakage Patient Leakage Isolation 500Vac

Procedure to carry out the electrical safety test:

1 Before carrying out the test, check that all safety devices have been assembled correctly.
2 To properly connect the tester, check if the PC is placed inside or outside the patient area.

Patient area: any volume in which a patient with applied parts may intentionally or unintentionally come into contact with other electromedical devices or electromedical systems, masses or foreign masses, or other people in contact with these elements.

3 If the PC is placed inside the patient area, connect the tester as indicated in the following figure.

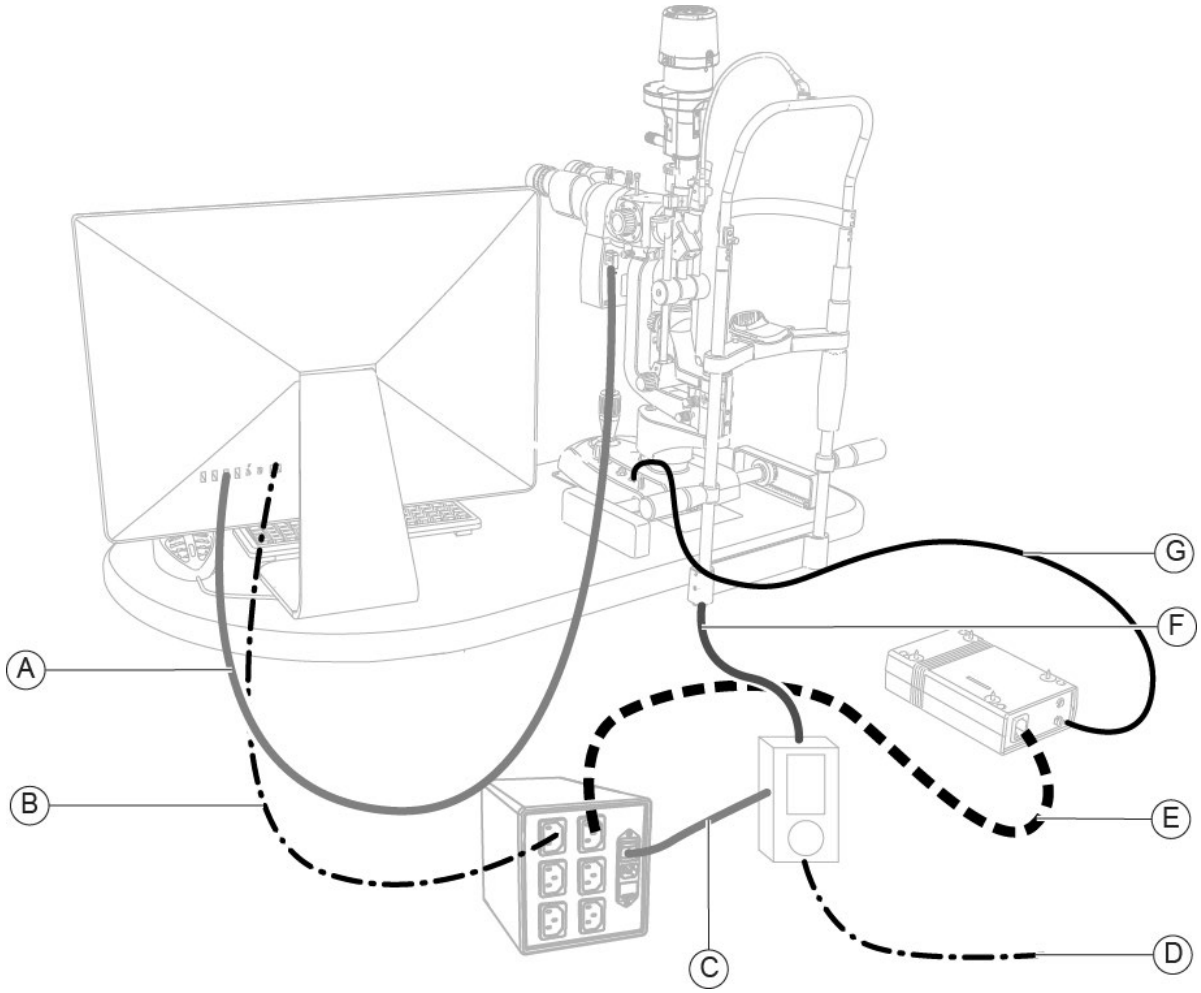


Fig. 393 - Connect the tester inside the patient area

Pos	Name
A	Connection between beam splitter and PC
B	Connection between PC and isolation transformer
C	Connection between isolation transformer and tester
D	Connection between tester and power socket
E	Connection between isolation transformer and power supply unit
F	Connection between applied part and tester
G	Connection between the power supply unit and the device

4 If the PC is placed outside the patient area, connect the tester as indicated in the following figure.

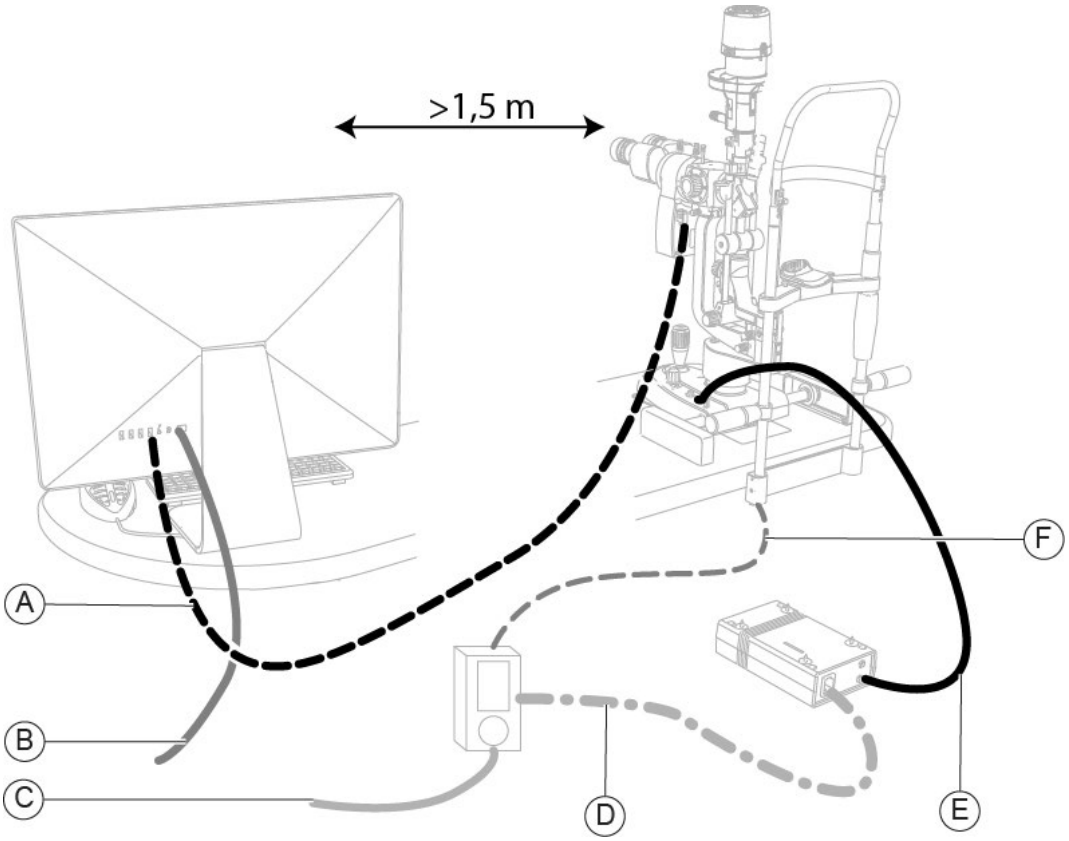


Fig. 394 - Connect the tester outside the patient area

Pos	Name
A	Connection between beam splitter and PC
B	Connection between PC and power socket
C	Connection between tester and power socket
D	Connection between tester and power supply unit
E	Connection between the power supply unit and the device
F	Connection between applied part and tester

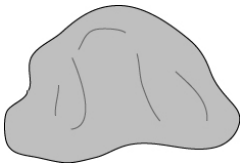
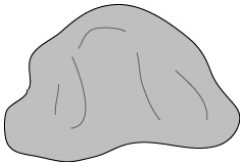
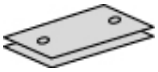
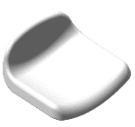
5 Carry out the electrical safety test. Follow the instructions for use of the tester.
6 Print the test.
7 Check the test results are correct.
8 Include the test printing in the annexed documents of the activity report.

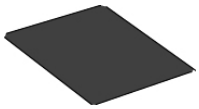
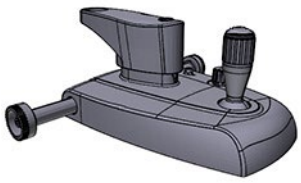
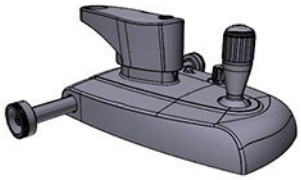
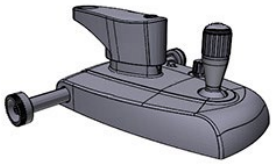
6.7 TESTING DEVICE OPERATION AFTER MAINTENANCE ACTIVITIES

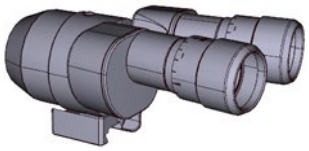
After any maintenance activity, always check the device operation following the table below.

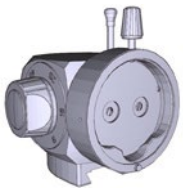
ID	Test type	Procedure	Acceptability criteria
1	**Check of the proper operation of the joystick button [Digital configuration]**	Perform an acquisition by pressing the joystick button.	Check an image has been saved.
2	**Check of the proper operation of the base**	When the device is on, move the joystick back and forth, then left and right.	Check the base moves smoothly.
3	**Check of the proper operation of the joystick**	Turn the joystick clockwise and counter-clockwise.	Check the device moves upwards and downwards smoothly.
4	**Check of the proper operation of the lighting unit**	When the device is on.	Check the lighting unit works properly.
5	**Check of the proper operation of the illuminator**	When the device is on.	Check the illuminator works properly.
6	**Check of right and left acquisition [Digital configuration]**	Carry out two acquisitions, one in the right position and one in the left position.	Check the two saved images show OD (Right eye), OS (Left eye) respectively.
7	**Check of the proper operation of the fixation point LED**	When the device is on.	Check the red fixation point LED is on.
8	**Check of the focusing of the magnification adjuster**	Place the magnification adjuster at the correct focal distance. Select all available magnifications and look through the binoculars.	For each magnification, check the image is sharp and in focus.
9	**Check of the proper insertion of the yellow filter**	Lift the yellow filter insertion rod.	Check the proper insertion of the yellow filter.
10	**Check of the eyepieces focusing**	Turn the eyepieces.	Check the observed image is in focus.
11	**Final check of the device [Digital configuration]**	Check the operation of the Phoenix application software as a further verification of the previous points.	Check for compliance.
12	**Check of the digital calibration of the device [Digital configuration]**	Follow the calibration instructions described in paragraph **"Digital calibration of the microscope - [Digital configuration]" on page 53.**	Check for compliance.

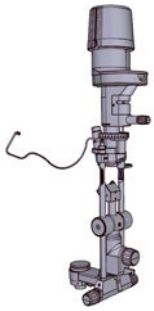
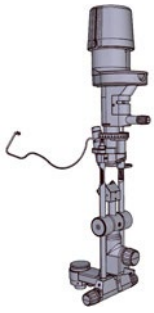
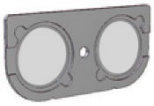
7 SPARE PARTS AND ACCESSORIES LIST

Code		Description
100259900		Power supply unit (PSP1501)
960206C00		Dust cover with CSO logo [SL9900 and SL9900 ELITE]
960102-00		Dust cover with CSO logo [SL9800]
4014010		Chin cup papers (100 pieces)
100258700		Chin rest [SL9800]
100257720		Chin rest [SL9900 and SL9900 ELITE]
4001050		Chin rest handle
100257731		Chin cup

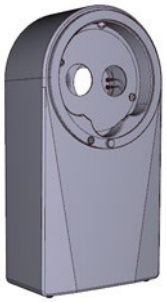
Code		Description
100232741		Forehead rest
100101136		Sticker pad
100210135		Wheel cover (1 piece)
100210415		Guide rail (1 piece)
100210414		Cogwheel (1 piece)
100272410.R **+** **100258527**	 	Standard base [SL9800] + Lighting unit
100274400.D **+** **100258527**	 	Digital base [SL9800] + Lighting unit
100270410.R **+** **100259509**	 	Standard base [SL9900] + Lighting unit
100270410.D **+** **100259509**	 	Digital base [SL9900] + Lighting unit
100271410.D **+** **100259509**	 	Digital base [SL9900 ELITE] + Lighting unit

Code		Description
100258402		Joystick button
100270404		Joystick [Standard configuration]
100113401		Joystick [Digital configuration - SL9800]
100270403		Joystick [Digital configuration - SL9900 and SL9900 ELITE]
100272600		Magnification adjuster 2x
100270613		Magnification adjuster 3x (without yellow filter)
100270613_f		Magnification adjuster 3x (with yellow filter)
100239615		Magnification adjuster 5x (without yellow filter)

Code		Description
100239615_f		Magnification adjuster 5x (with yellow filter)
100271601		Magnification adjuster Zoom
100250600		Binoculars (22 mm)
100226619		Eyepiece (12.5x)
100226627		Eyepiece cover
100226628		Sealing ring
100250610		Magnification adjuster lens
960258527	 	Lighting unit with circuit board [SL9800]
960259509	 	Lighting unit with circuit board [SL9900 and SL9900 ELITE]

Code		Description
960274500	 	Lighting assembly complete with arm and circuit board [SL9800]
100270511	 	Lighting assembly with circuit board [SL9900]
100271511	 	Lighting assembly with circuit board [SL9900 ELITE]
100272210		Illuminator [SL9800]
100270210		Illuminator [SL9900 and SL9900 ELITE]
960264601		Yellow filter
100250250		Additional light diffusing filter [SL9900 and SL9900 ELITE]
100257420		Plate [Digital configuration - SL9900 and SL9900 ELITE]

Code		Description
100270420		Plate [Digital configuration - SL9800]
100250711		Fixation point
960206021.O		Projection mirror [SL9900 and SL9900 ELITE]
100214602		Locking/unlocking knob of the binoculars
100214601		Locking/unlocking knob of the magnification adjuster
100257046V0		Lighting unit cover (colour V0)
330258528		Connection cable between the base and the lighting unit [SL9800]
100250090		Calibration testing tool
200200100		Calibration rod

Code		Description
103005110		Eyepiece with reference cross
200200160		Dioptometer
100258305		Beam splitter including USB 3.0 video camera [SL9800 and SL9900]
100259300		Beam splitter including USB 3.0 video camera [SL9900 ELITE]
100274310		Beam splitter including USB 3.0 videocamera **(*)** [SL9800 and SL9900]
330274300		USB 3.0 cable 2 m length for 5 MP video camera
330274310		USB 3.0 cable 5 m length for 5 MP video camera
330274303		Connection cable between the device base and the video camera 5 MP

Parts marked with **(*)** require the Phoenix application software to be upgraded to version 4.XX. Before ordering the part, check the compatibility of the software version.

For spare parts or accessories not included in the list, ask the Manufacturer or local Dealer.

The standards for medical devices quality management prescribe the obligation of traceability of each device placed on the market.
The same rule applies to critical components and replaced spare parts, which therefore require the obligation to notify the Manufacturer.

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