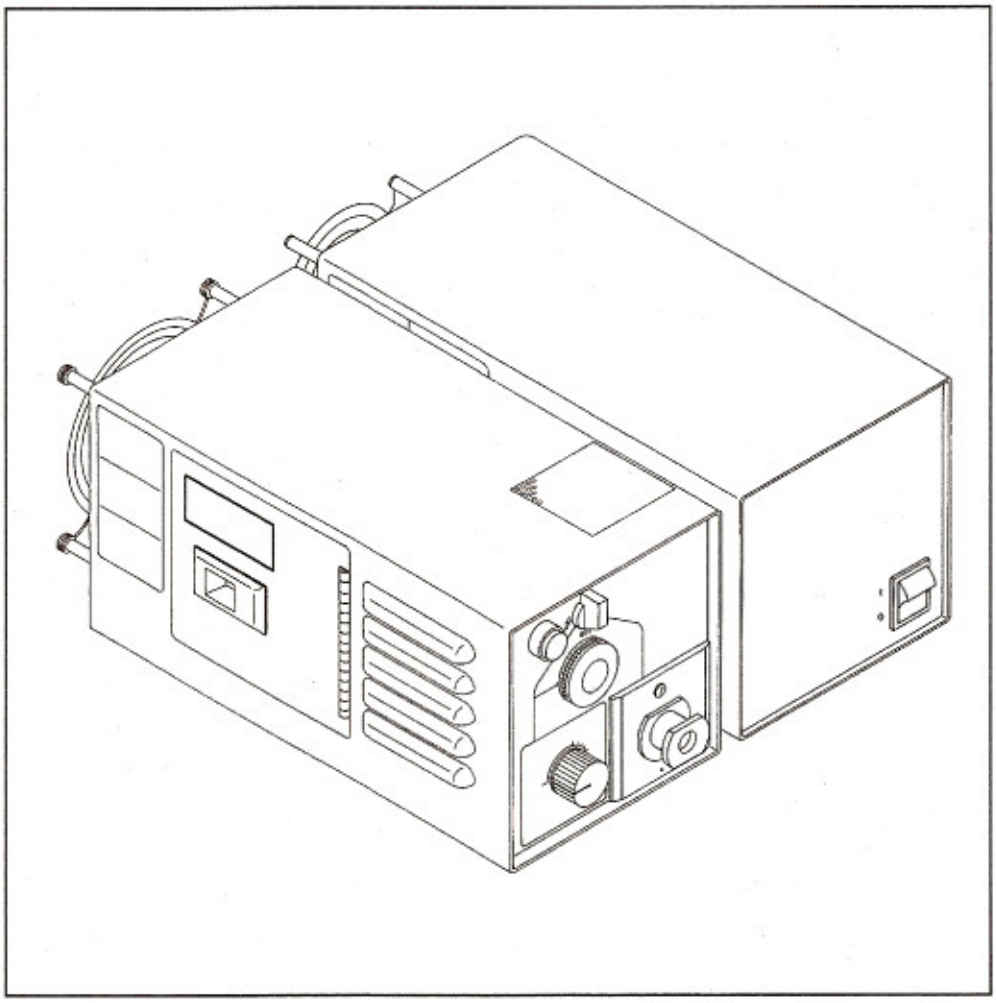
Superlux 300
High-intensity Light Source



Instructions for use

G 30-1109-e
1993-12-16

ZEISS

Important for safety

CAUTION:
Safety is only ensured when this instrument is operated properly. Please read through this manual carefully before turning the instrument on. You may obtain further information from our service organization or authorized representatives.

Notes on installation and usage

Regulations

- The Superlux 300 high-intensity light source was developed in accordance with the applicable IEC regulations. Manufacturing, inspection, installation and service are done in accordance with German and international regulations (Good Manufacturing Practice).
- It is the duty of the operator to ensure that applicable accident prevention regulations are observed.
- The instrument must be connected to an emergency backup line supply in accordance with the regulations or guidelines which apply in your country.

General

- Do not operate the instrument in explosion-risk areas. Its use in the presence of volatile anesthetics, alcohol or similar chemicals is prohibited.
- Do not station instruments in damp rooms. Do not expose the instrument to water splashes, dripping water or sprayed water.
- Modifications and repairs on this instrument and on instruments used with the Superlux 300 high-intensity light source may only be performed by our service technicians or by other authorized persons.

The manufacturer will not accept any liability for damage caused by unauthorized persons tampering with the instrument; such tampering will also forfeit any rights to claim under warranty.

- Only use this instrument with the accessories specified in this user's manual.
- It is the duty of the operator to train and instruct all staff using the equipment.
- The operator must carefully read the Superlux 300 user's manual together with the user's manuals of the other equipment. Keep the user's manuals where they are easily accessible at all times.
- The framed passages in this manual are safety notes and special information. Read these with special care and attention.
- Never pull at the light guide cable, at the power cord or at other cable connections.
- The Superlux 300 is a high-intensity light source which - if used improperly - can cause thermal damage to skin or tissue. Monitor the effects of the illumination closely, maintain moist surfaces and provide copious irrigation of all illuminated areas when the Superlux 300 is used:
  - during prolonged procedures/exposure
  - on skin and/or tissues at short focal distances and/or in close proximity to the focal lens
  - on tissues with compromised circulation
  - at or near maximum brightness settings
- This instrument is a high-grade technological product. In order to ensure perfect and safe working order of the instrument, our service technicians must inspect it at least once every 12 months.

Important before turning on instrument for first time

Our service technician will install the Superlux 300 high-intensity light source on the microscope stand. He will check the following points. The operator must ensure that these points are observed in future.

- Ensure that all mechanical connections (for example, screws, nuts, etc.) which serve to guarantee the safety of the instrument or perform a supporting function are correctly fitted and secure. Firmly tighten any parts which are loose or not tightened properly.

- Make sure the voltage at the voltage selector corresponds with the available line voltage.
- Only use the power cord supplied with this instrument.
- Only use cables and plugs which are in good working condition.

Important each time before turning on instrument and after re-equipping the instrument

- Go through the checklist on page 14.
- Make sure the instrument and all equipment is in good working condition.
- Make sure all securing elements such as screws, clamps and rings are properly installed and firmly secure.
- Re-attach or close any covers, panels or caps which have been opened or removed.
- Pay special attention to warning symbols on the instrument (triangular warning signs with exclamation marks) labels and parts (screws and surfaces) painted in red (see figure 1).
- Do not cover any ventilation grids or slits.
- Make sure the power cable is properly plugged in.

Important when you are finished using the instrument

- Always use the main power switch of the instrument to turn it off. In some cases, this may also be the power switch of the microscope stand, for example, the NC 2 floor stand.
- Be sure to turn off the main power switch when the instrument is not in use.

Xenon short-arc lamp

Improper handling of the Xenon short-arc lamp may lead to damages or injuries. Note the following points:

- Because of the high luminance of the lamp and its light spectrum, which is similar to natural daylight, do not use the lamp in ophthalmic applications.
- Never look directly into the light source, e.g. into the microscope objective or a light guide.
- If a light guide is not installed in one of the light-guide receptacles, there is a danger of fire or burn injuries when the illumination is on.
- Do not cover any ventilation grids or slits.

RISK OF EXPLOSION:
As for all pressurized vessels, there is a risk of explosion due to the high pressure within the xenon bulb.

HIGH VOLTAGE:
The lamp is ignited by high voltage generated by the ignition unit.

HOT SURFACES:
Some parts of the lamp may cause burn injuries when touched.

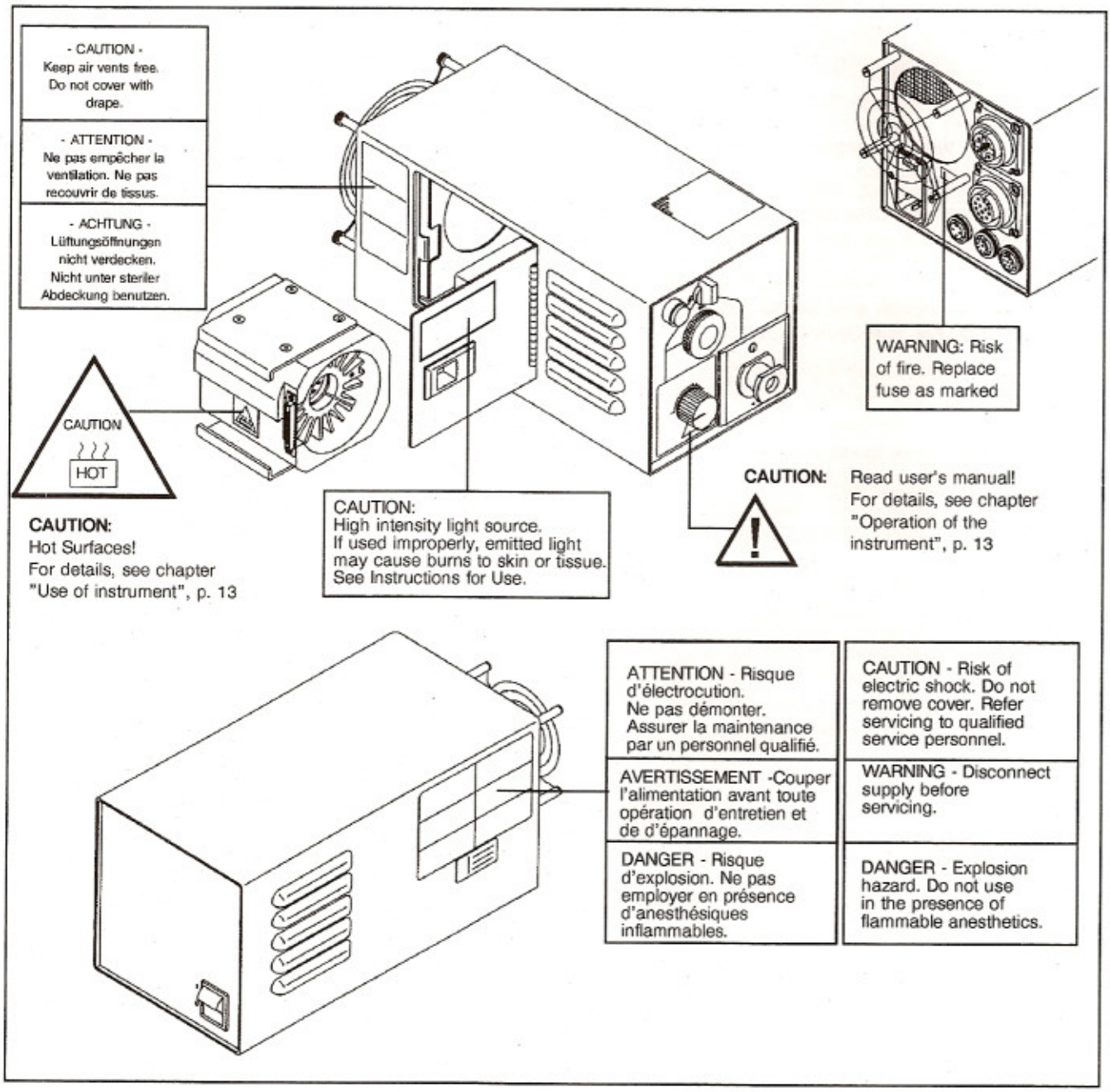
Safety system

- The instrument contains a halogen illumination system as a backup light source, which can be used if the xenon bulb goes out.

Warning signs and notes

CAUTION:
You must observe all warning signs and notes!

1



The Superlux 300 high-intensity light source consists of the lamp house (1) and the power supply unit (2). The light travels from the lamp house to the microscope or endoscope over a light guide.

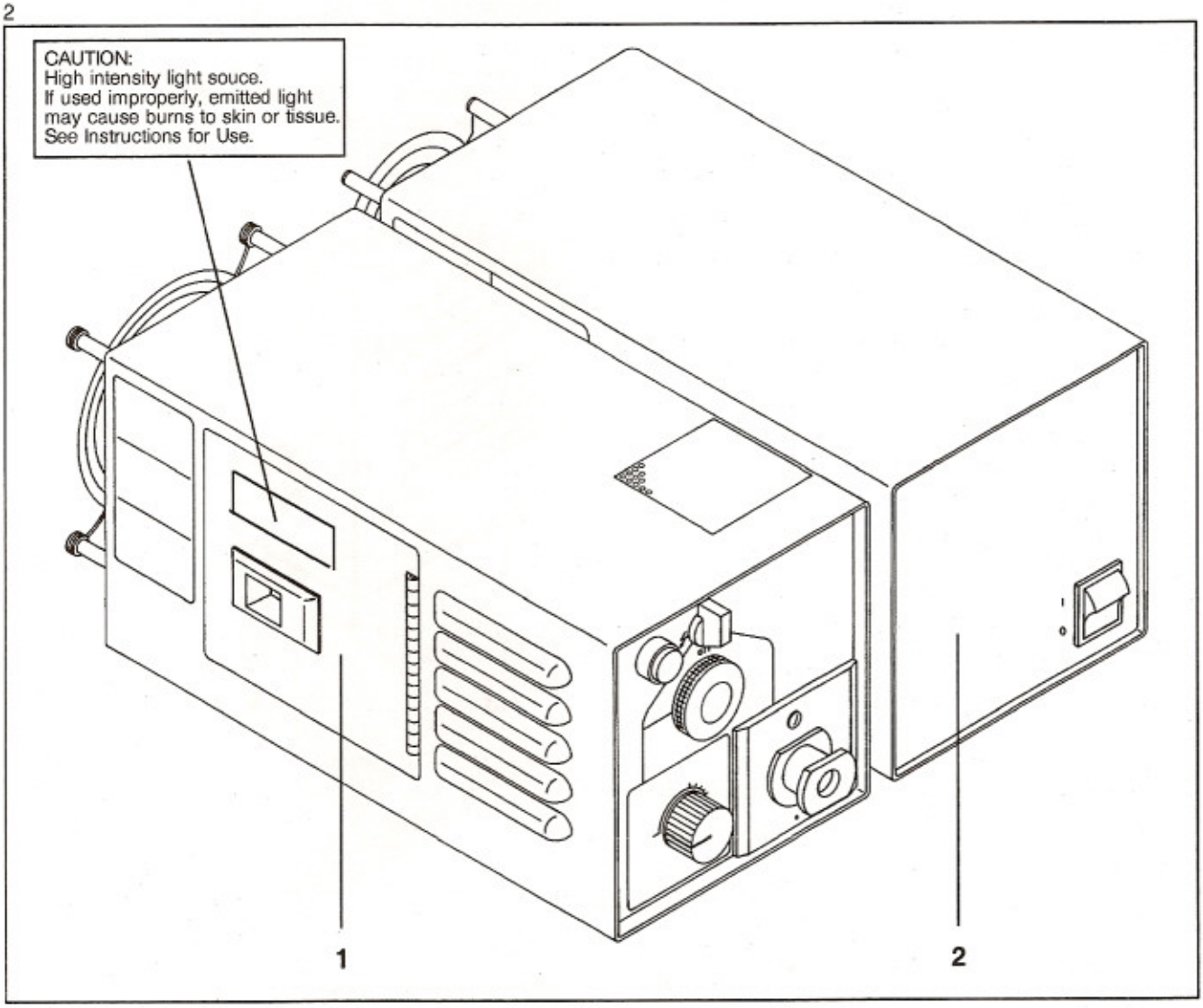
The xenon lamp of the Superlux 300 generates light whose spectrum is near that of natural daylight. The color temperature of the light remains constant regardless of the brightness setting. You may thus use daylight film in photographic documentation without additional conversion filters.

The brightness can be adjusted at the lamp house.

The xenon lamp can be made to "flash" to a higher intensity when making a photographic exposure.

The lamp house also contains a 12 V, 100 W halogen lamp as a backup illumination system. If the xenon lamp ever goes out, you can continue surgery without delay. All that you have to do is change the connection of the light-guide and switch the selector (1.2) on the lamp house to "HALOGEN". The electrical supply for the halogen lamp is provided on the microscope stand or from an external power supply unit. The on/off switch and the brightness adjustment element for the halogen lamp is located on the microscope stand or on the external power supply unit.

2



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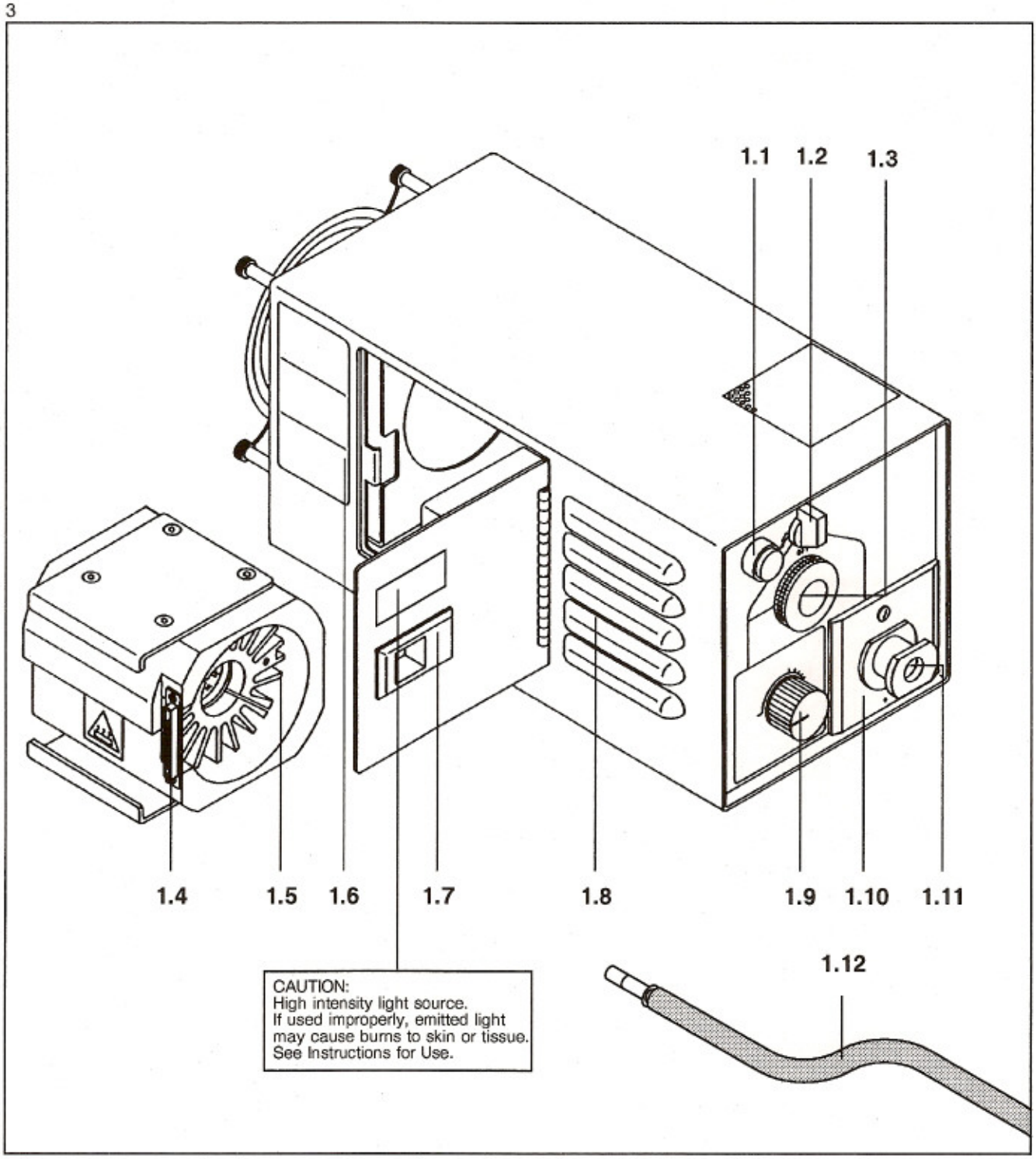

1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
1.10
1.11
1.12
CAUTION:
High intensity light source.
If used improperly, emitted light
may cause burns to skin or tissue.
See Instructions for Use.

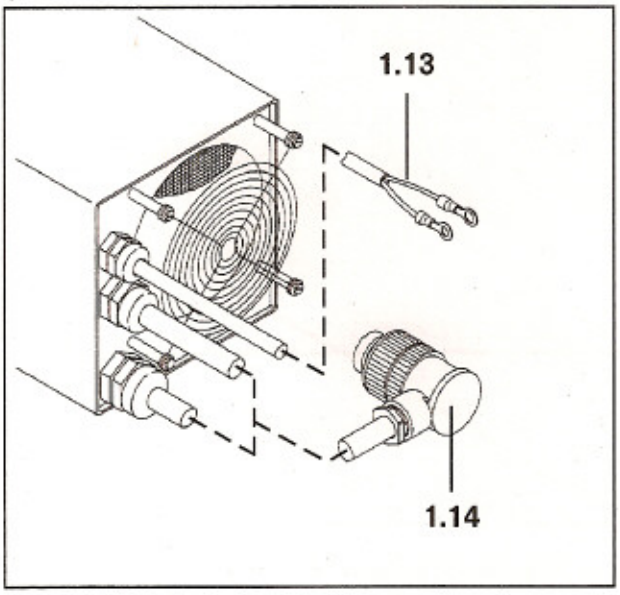
1 Lamp house (figures 3 and 4)

1.1 Ready lamp
This lamp lights when the xenon lamp is ready to ignite.

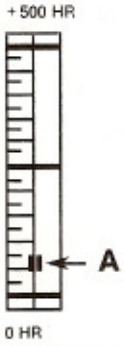
1.2 Selector
Select the xenon lamp by switching the selector to the "XENON" position. The ready lamp (1.1) must light before you can ignite the xenon lamp.
The xenon lamp is ignited by turning the selector (1.2) to the lightning symbol and holding it for up to ten seconds.
As soon as the xenon lamp ignites, release the selector (1.2).
In the "HALOGEN" position, the 12 V, 100 W halogen lamp is selected. This lamp is used when the microscopic application requires halogen illumination or when the xenon lamp fails during an operation. For the halogen illumination, you must also change the connection of the light guide to the light-guide receptacle (1.11) of Slide-in lamp unit (1.10).
The on/off switch for the halogen lamp and the brightness adjustment is located on the microscope stand.

1.3 Light-guide receptacle for xenon lamp

4



1.4 Hour counter



The hour counter for the operation of the xenon lamp can be read at marking A. The entire scale represents 500 hours of operation. The scale does not register more than 500 hours. The example shown here corresponds to approx. 65 hours.
This counter should be checked before each use of the xenon lamp. A spare lamp should always be avaiable.

1.5 Xenon lamp module
The procedure for exchanging the lamp is described on page 16.

1.6 Safety notes

1.7 Housing door
The xenon lamp cannot be ignited when the housing door is open.
When the door is opened when the xenon lamp is on, the xenon lamp is automatically turned off for safety reasons. Re-ignite the xenon lamp after closing the door.

1.8 Ventilation slits

1.9 Brightness regulation for the xenon lamp
The brightness is indicated in percent.

1.10 Slide-in lamp unit for halogen illumination
Exchanging the lamp is described on p. 16.

1.11 Light-guide receptacle for halogen lamp

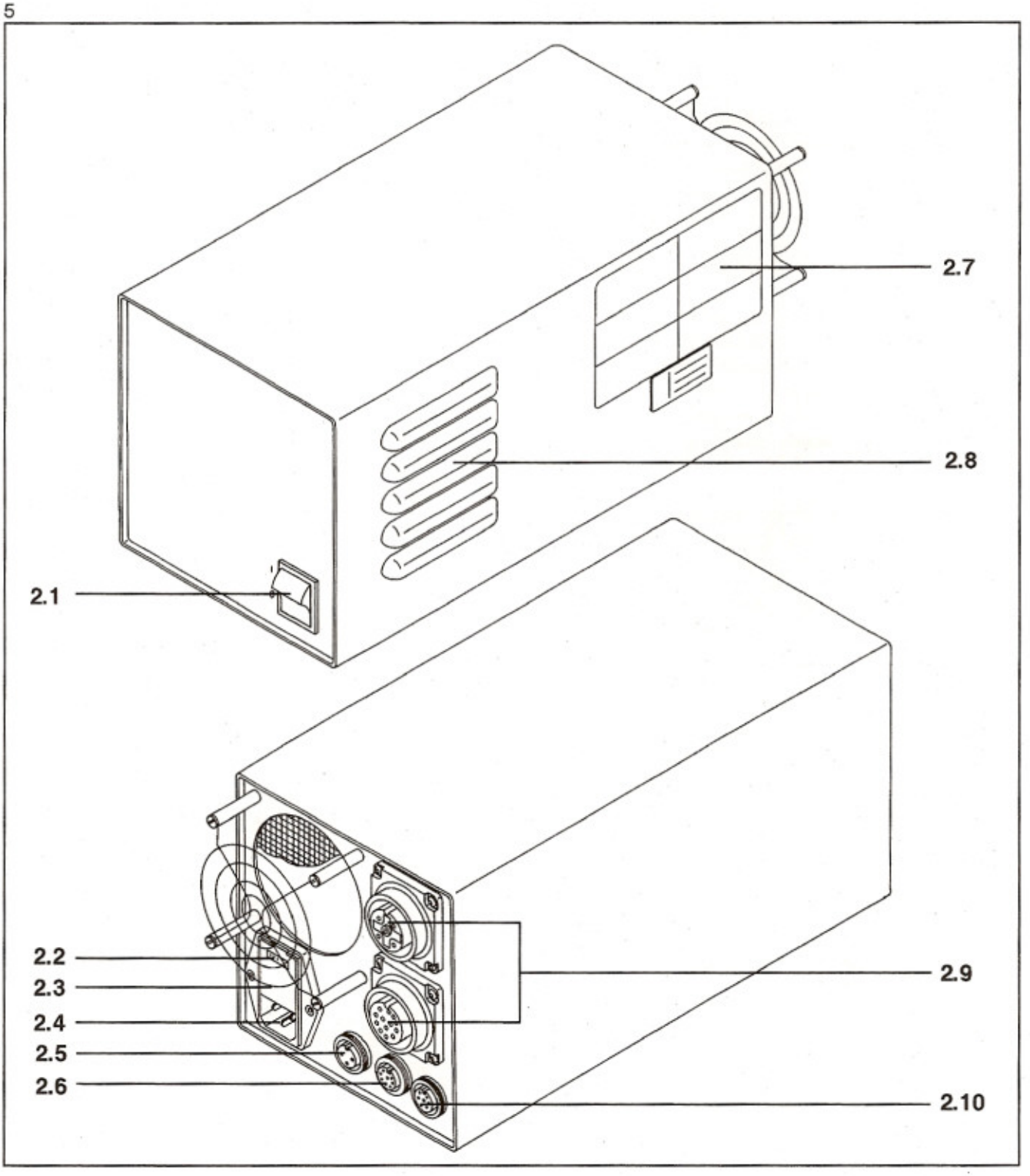
1.12 S Light guide
The light guide is available in 2.5, 3.0 and 3.6 m versions. Only use light guides which contain the number 90 in the catalog number. Example:
Catalog number: 30 34 81- 9030.

1.13 Cable eyelets for electrical supply of the halogen lamp
Our service technician will connect these eyelets.

1.14 Instrument connector
The 5 pin and 13 pin connectors plug into connection sockets (2.9) on the power supply unit.

CAUTION:
Use only insulated light guide # 30 34 81- 9530 for all endoscopic procedures.

5



2 Power supply unit (fig. 5)

2.1 Power switch
This switch turns on the power supply to the lamp house.

2.2 Voltage indicator
The voltage to which the instrument is set is given here. For details see "Preparations for use", page 12.

2.3 Cover
Open this cover when you want to change the line voltage the instrument is set to or change a fuse. For details, see "Setting the instrument to the available line voltage / Changing fuses", page 17.

2.4 Power inlet socket

2.5 "Switch" connection socket (J 3)
Connection socket for a switch for "flash" mode and synchronous triggering of a 35 mm camera.

2.6 "Camera" connection socket (J 4)
Connection socket for cable for triggering a 35 mm camera.

2.7 Safety notes

2.8 Ventilation slits

2.9 Connection sockets (J1 and J2)
For instrument connectors (1.14).

2.10 Connection socket (J 5)
This connection socket is only used by service technicians when working on the instrument.

Our service technician will mount the lamp house (1) and the power supply unit (2) on the stand. When preparing the instrument for use, he will proceed as described below.

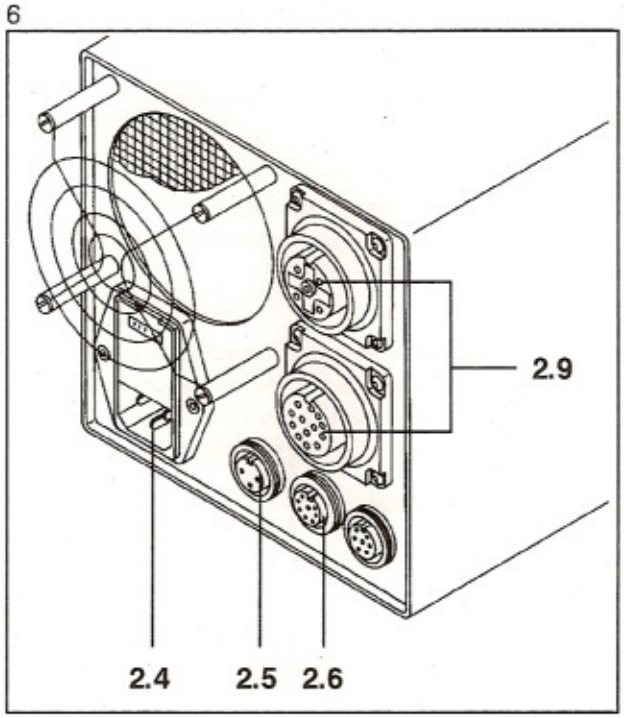
- Check the voltage given on the voltage indicator.
  Note: The instrument is set in the factory for the line voltage used in the destination country. The voltage given must correspond to the line voltage at the place of installation. If not, you must set the instrument for use with the voltage which is present. The fuses may also have to be changed.
  For details see "Setting the instrument for line voltage / changing voltages" (page 17).
- Connect the instrument connector (1.14) to connection socket (2.9).
- Insert the light guide into light-guide receptacle (1.3).

CAUTION:
Only use light guides which contain the number 90 in the catalog number.
Example: Catalog number: 30 34 81- 9030

- Connect the power cable to (2.4) and to a line outlet socket.
- Connect the footswitch for triggering the camera to connection socket (2.5).
- Connect the connection cable for triggering the camera to connection socket (2.6).

It is the duty of the customer to ensure that these operative requirements remain satisfied.

6



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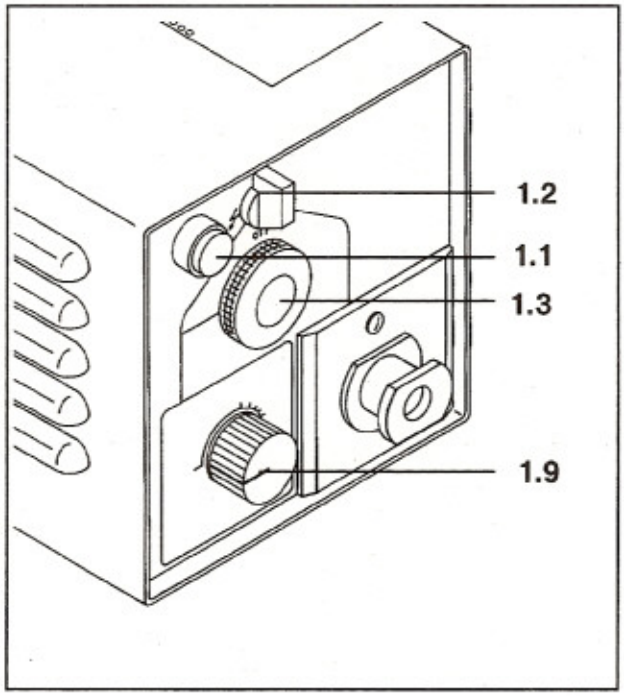
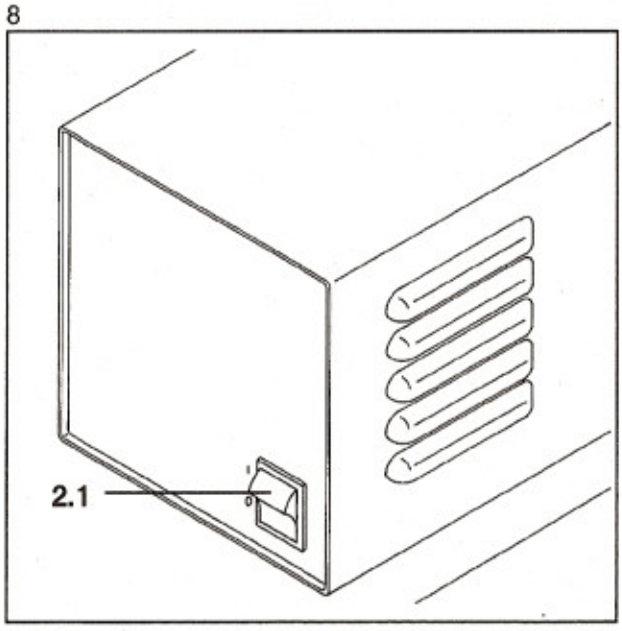


CAUTION:
Observe the following points when using the Superlux 300:

- Because of the high luminance of the xenon lamp and its light spectrum, which is similar to natural daylight, you must not use it in ophthalmic applications.
- Never look directly into the light source, e.g. into the microscope objective, endoscope, or a light guide.
- The Superlux 300 is a high-intensity light source which - if used improperly - can cause thermal damage to skin or tissue.
- Never cover the ventilation slots.
  Make sure that there is sufficient ventilation.

8



Xenon illumination

Before switching on the xenon lamp, make sure the proximal light-guide end is inserted in the light-guide receptacle in the Superlux 300 high-intensity light source and the distal end in the illumination component of the surgical microscope or endoscope. If it is not, there is a danger of fire or of burn injuries caused by the concentrated light of the xenon lamp, especially at the distal end of the light guide.

- Switch on the power at the stand and at power switch (2.1).
- Switch selector (1.2) to "XENON". When the lamp is ready for ignition, the ready lamp (1.1) lights.
- Turn selector (1.2) to the lightning symbol and hold it for up to ten seconds. As soon as the xenon lamp ignites, release selector (1.2).
  Note:
  It takes a bit longer to ignite the xenon lamp when it is warm
- Using brightness adjustment knob (1.9) adjust the xenon lamp to the brightness desired for the surgical procedure. Do not illuminate the tissue excessively.

Halogen illumination

Note: If the xenon lamp fails during an operation, or if only the halogen illumination can be used, you may immediately switch to the halogen illumination.

- Turn selector (1.2) to "HALOGEN".
- Insert the proximal light-guide end into the light-guide receptacle (1.11).
  Note: The electrical supply for the halogen lamp is from the microscope stand.
- Turn on the halogen illumination at the stand and adjust the brightness.
- Changing the halogen lamp is described on page 17.

Triggering the camera

In order to automatically generate a "flash" of light from the xenon lamp when making a photograph, the camera must be connected to connection socket (2.6), "camera", over a camera control cable.

The camera is triggered in one of the following manners:

- by pressing a button in the handles of the NC 2 floor stand or ceiling mount.
- using the hand or foot control unit
- using the double footswitch.

You must press the switch once for each exposure. The shortest flash interval is 2 seconds.

Notes: The xenon lamp of the Superlux 300 generates light whose spectrum is near that of natural daylight. The color temperature of the light remains constant regardless of the brightness setting. Use daylight film for photographic documentation.

When using the halogen lamp, trigger the camera at the footswitch. The first stage switches the halogen light to maximum brightness and the second stage triggers the exposure.

Pre-surgery checklist

Check through the following points before every operation (without the patient!):

- All cables are connected.

Xenon lamp

- Check the ignition and brightness adjustment.
  Check the illuminated field of the microscope or endoscope.
  Check the hour counter.
  Have a spare lamp avaiable.

Halogen lamp

- Turn it on and check the brightness adjustment.
  Check the illuminated field of the microscope.

Note:
Check **both** illumination systems **before** the operation begins.

CAUTION:
If one of the functions prove to be faulty, do not operate using this instrument. If possible, correct the fault (see the trouble-shooting table, page 18), otherwise contact our service department.
If a function fails during an operation, observe the emergency instructions on page 15. If possible, correct the fault using the trouble-shooting table on page 18.

Using the instrument during an operation

- Switch the Superlux 300 on at the power switch (2.1). If the Superlux 300 is used with a stand equipped with a line voltage power outlet, power switch (2.1) may remain on. The power switch of the stand then automatically turns the Superlux 300 on and off together with the stand. An example is the NC 2 floor stand.
- Select the xenon lamp and ignite it using selector (1.2).
- Adjust the brightness at the surgical field using the xenon lamp brightness adjustment (1.9). Always use the minimum brightness required for adequate illumination.

Caution:
The Superlux 300 is a high-intensity light source which - if used improperly - can cause thermal damage to skin or tissue. Monitor the effects of the illumination closely, maintain moist surfaces and provide copious irrigation of all illuminated areas when the Superlux 300 is used:
- during prolonged procedures/exposure
- on skin and/or tissues at short focal distances and/or in close proximity to the focal lens
- on tissues with compromised circulation
- at or near maximum brightness settings

Caution:
To ensure proper insulation of the patient from the equipment, use insulated light guide # 30 34 81-9530 for all endoscopic procedures.

Xenon lamp backup procedure

- Switch to the halogen illumination using selector (1.2).
- Change the connection of the light guide to the halogen light-guide receptacle (1.11).
- Switch on the halogen lamp at the microscope stand or external power supply unit and adjust the brightness.
- After it has cooled down, exchange the xenon lamp module and switch back to the xenon lamp. See "Exchanging the xenon lamp module", page 16.
- Re-connect the light guide to the xenon light guide receptacle and re-ignite the xenon lamp.

A xenon lamp which has failed must not be used again even though it may be possible to re-ignite the lamp after it has cooled down. The lamp will normally fail again after a short period of time.

Exchanging the xenon lamp module

CAUTION:

- Hot surfaces:
  Never touch the slide in unit when it is hot.
- Risk of explosion:
  The xenon lamp is a high-pressure vessel. When it is cold, the pressure is approx. 1400 kPa, and it rises to approx. 3000 kPa when the lamp is on.

Always wait until the lamp has cooled down completely (approx. 5 min.) before exchanging the module.

- Switch selector (1.2) to "off".
- Slide the housing door lock (1.7) in the direction shown in the figure and open the door.
- Use grips (1.15) to pull the entire xenon lamp module out of the lamp housing.
- Install the new xenon lamp in reverse order.

A xenon lamp which has failed must not be used again even though it may be possible to re-ignite the lamp after it has cooled down. The lamp will normally fail again after a short period of time.

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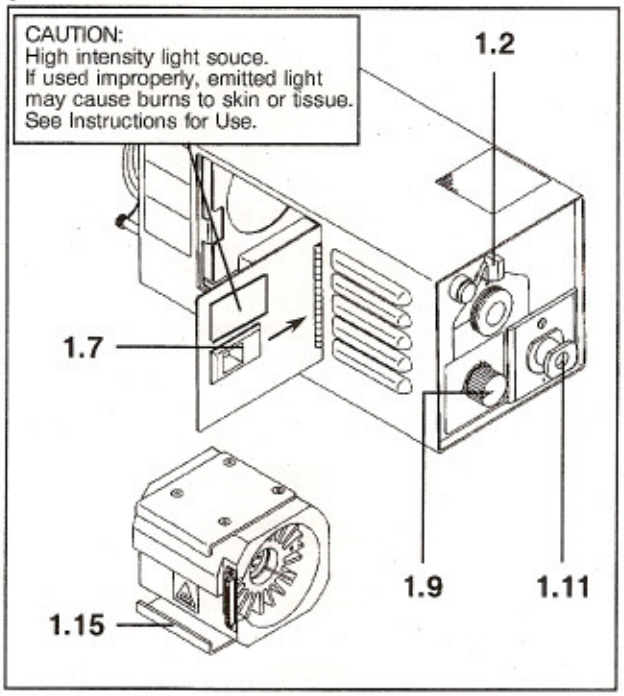


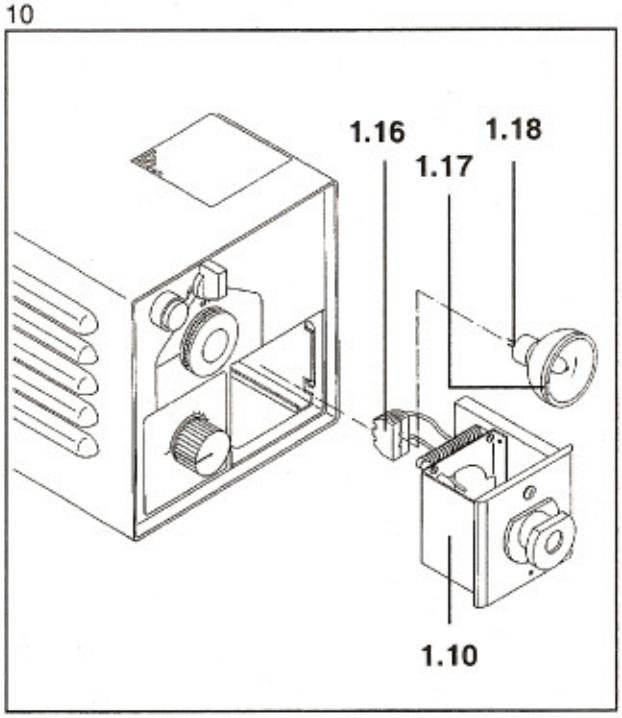
Exchanging the halogen lamp (figure 10)

CAUTION:
When you exchange the halogen lamp shortly after it is gone out, wear heat-protection gloves to prevent burns.

- Pull the lamp unit (1.10) out of the instrument.
- Take the halogen lamp out of the lamp unit and pull the ceramic mount (1.16) off of the contact pins (1.18).
- Install the new halogen lamp. Note the following:
  - The centering tongue (1.17) must fit into the hole for it in the lamp unit.
  - Do not touch the lamp bulb or the interior of the lamp reflector.
- Attach the ceramic mount (1.16) to the contact pins (1.18).
- Re-insert the lamp unit into the instrument.

Note: Only 12V, 100W halogen lamps may be used. Cat. no. 38 00 79- 9040.

10



Setting the instrument to the available line voltage / Changing fuses (figure 11)

- Open cover (2.3) at part (2.12) and remove the selector unit (2.11).
- Turn the selector unit (2.11) to the voltage (see figure) required and re-insert it.
- Pull out the fuse holders (2.13) and exchange the fuses (2.14) in accordance with labeling on the rating plate (for fuse ratings, see page 22).
- Re-insert the fuse holders and close the cover (2.3).

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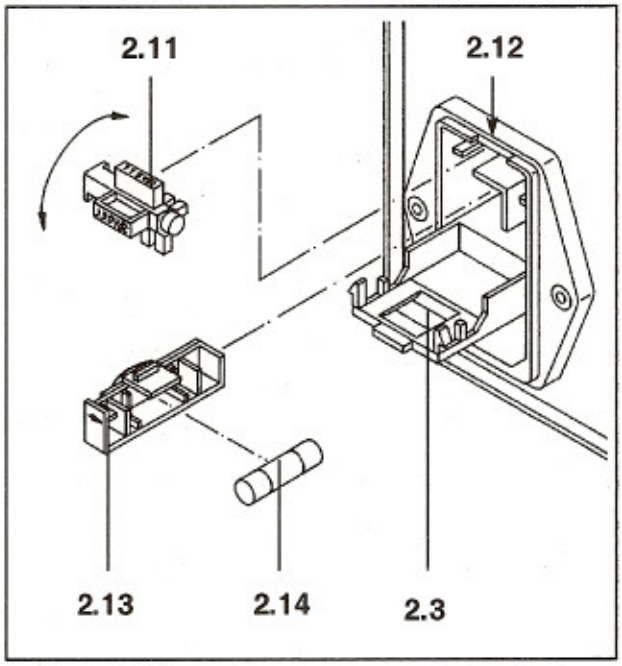

Troubleshooting table

If there is a malfunction, use this trouble-shooting table to find the cause.

Malfunction	Possible cause	Remedy
No function at all:	Power cord not properly connected at power supply unit or stand.	Connect power plug.
	Main power switch (2.1) not pressed.	Press main switch. Green pilot light must come on.
	Defective fuse in stand or power supply unit (2).	Change power fuse.
	Power failure.	Contact in-house electrician.
	Failure of stand electronics.	Contact service technician.
Xenon illumination not functioning:		
Lamp does not ignite:	Switch (1.2) on lamp housing in position HALOGEN.	Switch to XENON and re-ignite.
	Door of lamp housing open.	Close door and re-ignite Xenon lamp.
	Defective lamp.	Insert new lamp module.
	Defective power supply.	Contact service technician.
Lamp goes out during operation:	Door of lamp housing open.	Close door and re-ignite Xenon lamp.
	Power cable not properly plugged in.	Connect power plug. Reignite xenon lamp.
	Covered ventilation slots.	Uncover slots.
	Thermal circuit breakers activated.	Switch to halogen lamp and plug light guide into halogen lamp unit; switch on halogen lamp at stand and adjust brightness. After a few minutes, the light guide can be plugged back into the xenon lamp unit and the xenon lamp re-ignited.
	Defective xenon lamp.	Switch to halogen lamp or insert new xenon lamp module.
	Defective power supply.	Switch to halogen lamp.
No light: (xenon lamp has ignited)	Light guide not inserted or in wrong receptacle.	Plug light guide into illumination component on microscope or endoscope and into xenon lamp light-guide receptacle on Superlux 300.
	Defective light guide.	Change light guide.

Malfunction	Possible cause	Remedy
Light too low:	Shutter in lamp housing closed.	Open shutter using (1.9), avoid excess illumination.
	Light guide not inserted as far as it will go.	Insert both ends of light guide as far as they will go.
	Defective light guide.	Change light guide.
	Defective lamp.	Change lamp unit.
	Defective power supply.	Contact service technician.
Light is flickering:	Defective lamp.	Switch to halogen lamp. If necessary, replace lamp unit. Contact service technician.
	Defective power supply.	Switch to halogen lamp. Contact service technician.
Halogen illumination not functioning: Lamp does not come on:	Main power switch on stand OFF.	Switch on.
	Switch (1.2) on lamp housing in position XENON.	Switch to halogen lamp.
	Brightness adjustment knob on stand in position 0.	Use knob to adjust to brightness required.
	Lamp unit does not fit tightly in lamp housing.	Push in lamp unit as far as it will go.
	Defective lamp.	Change lamp.
	Defective power supply.	Contact service technician.
Lamp goes out during operation:	Defective lamp.	Change lamp.
	Incorrect connection of power cable.	Connect power cable.
	Defective power supply.	Contact service technician.
No light: (lamp operative)	Light guide not inserted or in wrong receptacle.	Insert light guide in receptacle of halogen lamp unit.
	Brightness adjustment knob on stand in position 0.	Use knob to adjust to brightness required.
	Light guide not inserted as far as it will go.	Insert both ends of light guide as far as they will go.
Light too low	Defective light guide.	Change light guide.
	Defective lamp.	Change lamp unit.
	Defective power supply.	Contact service technician.

Superlux 300

Catalog number 30 49 53-0000

Stands / mounts	Retrofit kits for stands / mounts
Floor stand NC 1 re-equipped for use with OPMI-CS	Retrofit kit Catalog number: 30 49 53-9054
Floor stand NC 1 not re-equipped for use with OPMI-CS	Retrofit kit Catalog number: 30 49 53-9054 and Retrofit kit Catalog number: 30 49 53- 9059
Ceiling mount NC 1 re-equipped for use with OPMI-CS	Retrofit kit Catalog number: 30 49 53-9055
Ceiling mount NC 1 not re-equipped for use with OPMI-CS	Retrofit kit Catalog number: 30 49 53-9055 and Retrofit kit Catalog number: 30 49 53- 9059
Floor stand NC 2	A retrofit kit is not required.
Ceiling mount NC 2	Retrofit kit Catalog number: 30 49 53-9057
Floor stand S2 / S3 / S4	Retrofit kit Catalog number: 30 49 53-9050
Ceiling mount S2 / S3 / S4	Retrofit kit Catalog number: 30 49 53-9052

Superlux 300
Catalog number 30 49 53-0000

Stands / mounts	Control units for photography	Catalog number
Floor stand NC 1 with surgical microscope OPMI CS	Footswitch control cable, 4 m, for Contax RTS	39 35 02-0000 30 49 53-9056
Ceiling mount NC 1 with surgical microscope OPMI CS	Footswitch control cable, 4 m, for Contax RTS	39 35 02-0000 30 49 53-9056
Floor stand NC 1 without surgical microscope OPMI CS	Footswitch control cable, 4 m, for Contax RTS	39 35 02-0000 30 49 53-9056
Ceiling mount NC 1 without surgical microscope OPMI CS	Footswitch control cable, 4 m, for Contax RTS	39 35 02-0000 30 49 53-9056
Floor stand NC 2 with surgical microscope OPMI CS	The hand triggering element is integrated in stand / mount. Optional:	
Ceiling mount NC 2 without surgical microscope OPMI CS	Footswitch Ft. control unit 8 functions and: control cable, 800 mm, for Contax RTS 167 MT	39 35 02-0000 30 49 81-0000 30 97 34-0000
Floor stand S2 / S3 / S4	Footswitch control cable, 4 m, for Contax RTS	39 35 02-0000 30 49 53-9056
Ceiling mount S2 / S3 / S4	Footswitch control cable, 4 m, for Contax RTS	39 35 02-0000 30 49 53-9056

Spare parts

Catalog number

Light guides

3.6 m S light guide for NC 1/NC 2 floor stands / ceiling mounts 30 34 81-9036
3.0 m S light guide for S2, S3, S4 ceiling mounts . . . 30 34 81-9030
2.5 m S light guide for S2, S3, S4 floor stands 30 34 81-9025
3.0 m insulated light guide for endoscopy 30 34 81-9530

Catalog number

Spare lamp unit 0148.197
12 V, 100 W halogen lamp 0079.904
Power fuses for 115 V
T 6.3 A SLO BLO 0146.811
Power fuses for 220 V
T 3.15 A SLO BLO 0127.026

Electrical

Line voltage::	115/230 V~ ± 15% Class I, Type B
Frequency:	50...60 Hz
Power consumption:	500 VA
Fuse ratings of line power fuses:	for 115 V: T 6,3 A SLO BLO Catalog number 0146.811 for 230 V: T 3,15 A SLO BLO Catalog number 0127.026

Operative data

Flash interval:	Shortest flash interval: 2 s
Lamp output power of xenon lamp:	280 W
Maximum illumination in surgical field with f = 200 mm objective:	850 to 1000 kLx

Dimensions and weights

Weight:	Lamp house without lamp module: 4.7 kg Xenon lamp module: 0.9 kg Power supply unit: 8.9 kg
Dimensions (HxWxD) :	Lamp house 150x150x300 mm Power supply unit 150x150x300 mm

Illumination

Illumination system via fiber-optics light-guide cables

300 W xenon lamp with near daylight spectrum (daylight film can be used)

12 V, 100 W halogen lamp as backup light source.

Subject to change.