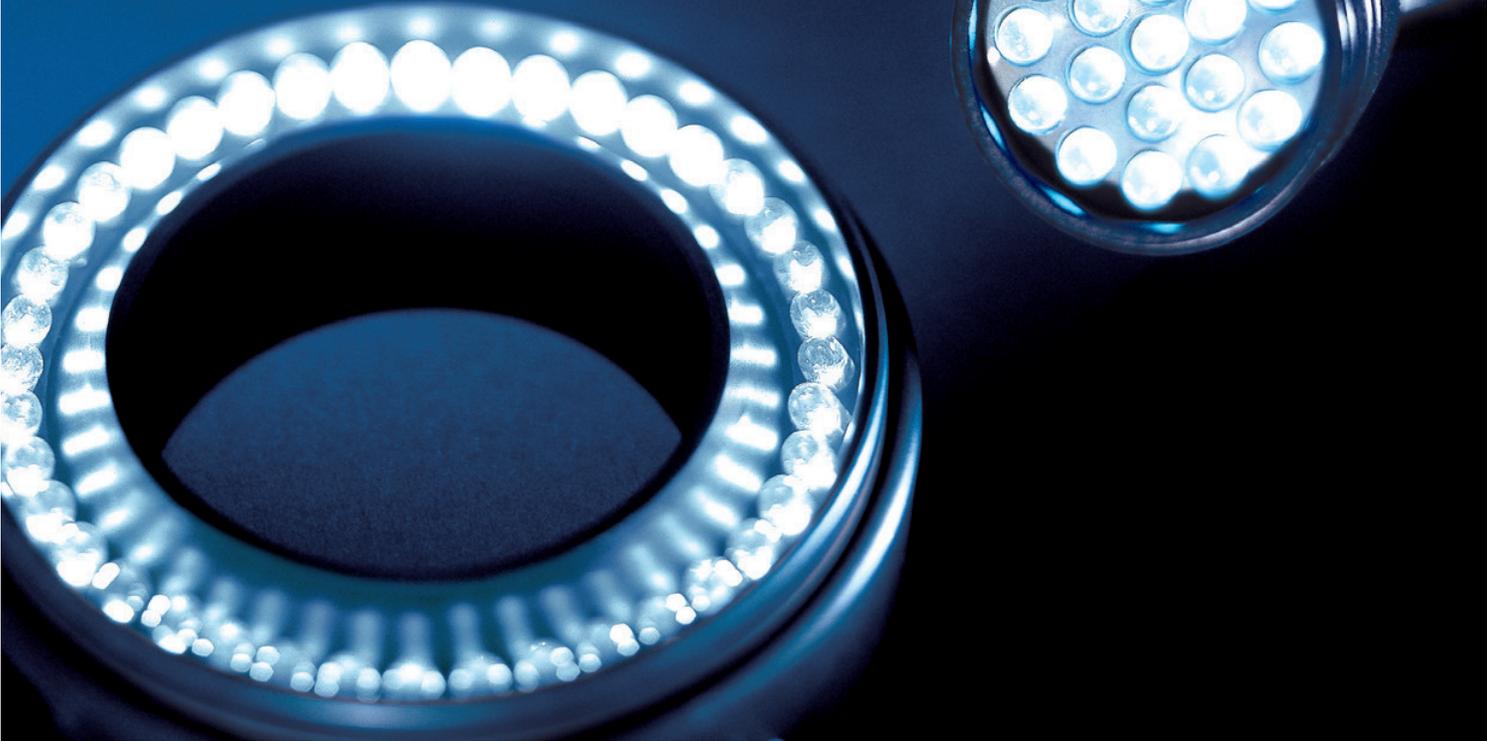
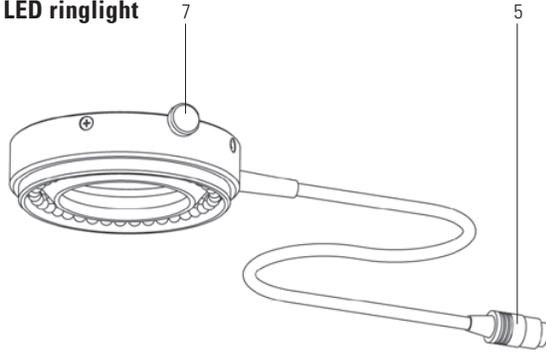


LED ILLUMINATION

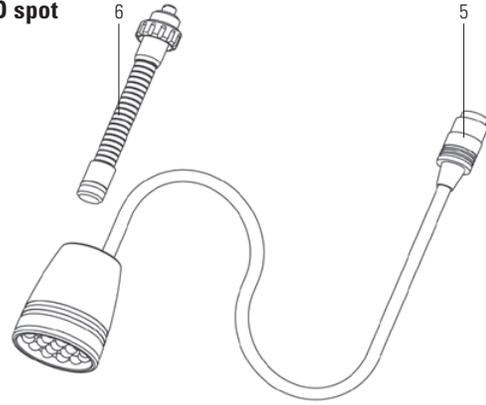
OPERATING INSTRUCTION



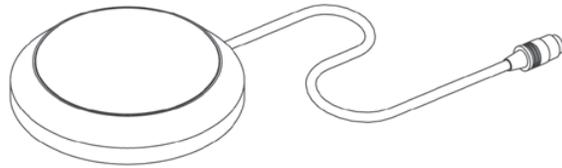
LED ringlight



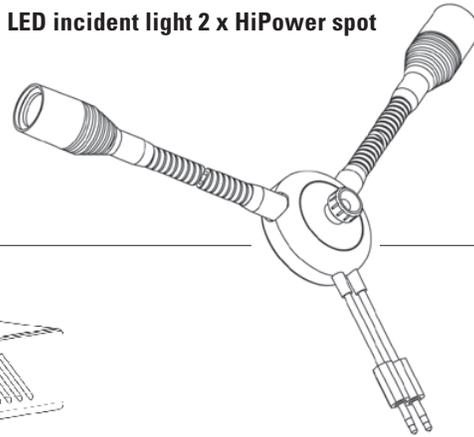
LED spot



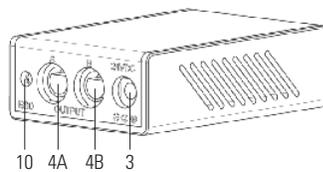
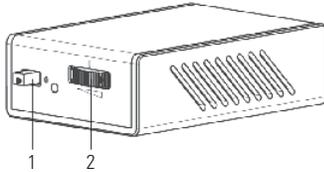
LED backlight universal



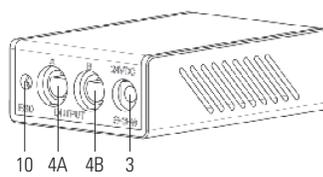
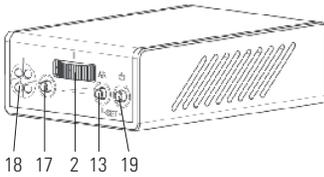
LED incident light 2 x HiPower spot



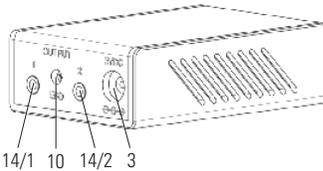
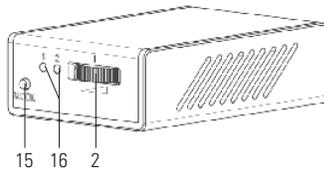
Standard control unit



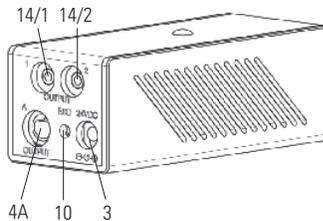
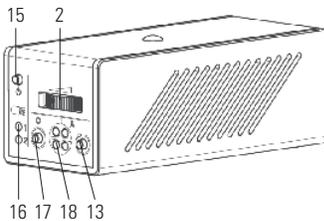
Segment control unit (40 LEDs) and segment control unit (80 LEDs) (same outward appearance)



HiPower spot control unit



Combi control unit



- 1 On-Off Switch
- 2 Brightness control
- 3 DC power supply
- 4 A/B Port A/B for spot/ringlight
- 5 Plug for 4
- 6 Spotholder
- 7 Fixing screw
- 10 ESD connectors
- 13 segment rotation
- 14 Port 1/2 for HiPower spot
- 15 Port 1/2/on/off button
- 16 Operating mode display Hi Power spot
- 17 Segment pushbutton
- 18 Operating mode display segment
- 19 On/Off/rotation anti-clockwise

OPERATING INSTRUCTIONS FOR LED ILLUMINATION UNIT

Please read all the operating instructions before operating the LED illumination unit!

Technical data

Illumination	LED ringlight 66/40	LED ringlight 66/80	LED ringlight 38/20
Diodes	40 white LEDs	80 white LEDs	20 white LEDs
Color temperature	5,000 K	5,000 K	5,000 K
Dimensions	outer: Ø 94 mm x 25 mm inner: Ø 66 mm	outer: Ø 112 mm x 23,5 mm inner: Ø 66 mm	outer: Ø 60 mm x 25 mm inner: Ø 38 mm
Attachment	Circumferential clamp with spring and screw		
Working Distance	55–120 mm, measured from ringlight	40–100 mm, measured from ringlight	50–100 mm, measured from ringlight

Beleuchtung	LED spot	LED incident light, 2 arms	LED backlight universal
Diodes	19 white LEDs	19 white LEDs per arm	40 white LEDs
Colour temperature	5,000 K	5,000 K	5,500 K
Dimensions	Ø 34 mm x 45 mm	Ø 34 mm x 45 mm, arm length approx. 480 mm	Ø 120 mm x 19 mm
Attachment	using spotholder	using incident light adapter	
Object holder			milk glass, Ø 90 mm
Illuminated surface			Ø 55 mm

Illumination	HiPower spot	LED incident light 2 x HiPower spot
Diodes	1 x HiPower LED	2 x HiPower LED
Dimensions	Ø 25 mm x 51 mm	
Connections	M6 thread for bracket	
Attachment		using incident light adapter

Steuereinheit	Standard	Segment (40 LEDs)	Segment (80 LEDs)
Supply	24 V DC ± 5 %, hollow plug 5.5 x 2.1 mm		
	250 mA	250 mA	500 mA
Dimensions (D x W x H)	95.5 x 64 x 29 mm		
Total of max. single LEDs	40	40	80
Connections	2 x 9-pin miniature DIN socket		
On/Off switch	●		
Segment rotation pushbutton	–	2 (incl. autorotation)	2 (incl. autorotation)
Potentiometer wheel	approx. 1–25 mA, with index markers		
ESD connection	4 mm banana connector		
Operating ambient temperature	10–40 °C (*)		
Rel. humidity	30–70 %		
Mark of conformity	CE		

Control unit	HiPower spot for max. 2 HiPower spots	Combi for max. 2 HiPower spots and 1 LED ringlight
Supply	5 V DC ± 5 %, hollow pin 5.5 x 2.5 mm, 1.2 A	24 V DC ± 5 %, hollow pin 5.5 x 2.1 mm, 0.75 A
Dimensions (D x W x H)	95.5 x 64 x 29 mm	126 x 52 x 45 mm
Connections	2 x 3.5 mm jack (stereo)	2 x 3.5 mm jack (stereo) and 1 x mini-DIN
Total of max. single LEDs		40
ESD connector	4 mm banana plug	4 mm banana plug
Operation	Potentiometer, Pushbutton for Port1/Port2/ON/OFF with LED display	Potentiometer, 3 pushbuttons with LED display

(*) LEDs are suitable for use at temperatures up to 40 °C. However, increasing temperature and humidity results in a reduction in lifetime. For optimal use, the ambient temperature should be 25 °C (or lower) and the relative humidity 50 % (or lower).

 CE Mark of conformity: Certifies that the control unit conforms to the EMC directive 89/336/EEC

DESCRIPTION

This new type of LED illumination device (Light Emitting Diode) has been developed for stereomicroscopy illumination purposes in industrial and laboratory settings.

In purchasing this product, you have acquired a high-quality LED illumination unit for all applications requiring intensive light with minimal heat generation. LEDs are employed as the illuminant.

SAFETY INFORMATION

Two danger symbols are used throughout this document.



Caution: Risk of electrical shock



Caution: Dangerous area.

Warning: Refer to accompanying documentation.

This section contains safety information which must be observed strictly when using this device.

IT IS IN YOUR OWN INTERESTS TO PAY ATTENTION TO ALL WARNINGS on the unit and in this manual.

Target audience

People working with the device must read the sections which are relevant to their work. This applies especially to the chapter entitled "Safety information".

Duty of observation with respect to product

The operator must report all operational irregularities or changes to components which are relevant to device safety immediately to the responsible supervisor or the manufacturer.

Location of operating instructions

We recommend storing these operating instructions near the device to ensure quick access by operating staff.

Legal provisions

National and local safety and accident prevention regulations which are in force must be strictly observed in addition to the operational guidelines issued by the operating entity.



Do not make any technical modifications to the device under any circumstances!

Refer to specifications in "Technical Data" section for binding operational limits.

DO NOT USE this unit near water or in any area with excessive moisture.

WARNING: In order to prevent electric shock, do not expose this appliance to rain or high humidity.

NEVER SPILL LIQUID ON THE UNIT OR INSERT OBJECTS INTO THE UNIT! This could result in electric shock or damage to the unit.

DO NOT PLACE FLAMMABLE MATERIALS on or near the unit at any time. Keep unit AWAY from other sources of HEAT. The device has not been approved for operation in areas subject to explosion hazards!

The device may only be operated using the mains voltage indicated.

NEVER OPEN THE APPLIANCE OR ANY COMPONENTS, unless instructed expressly to do so by these instructions.



Never look directly at the LEDs when switched-on, otherwise you risk eye injuries.

In accordance with the EN 60825-1 these LED illuminations are classified as products of laser class 2.

Cleaning

Disconnect unit from the mains power supply before cleaning and only clean with a damp cloth. Never use combustible or flammable liquids. If fluids accidentally enter the device, unplug the mains cable and let the unit dry thoroughly before using again.

Spare parts

Use only original spare parts. If this is not done, it can lead to personal injury and material damage.

Responsibility

As the ultimate legal entity, the operating institution is responsible for ensuring the proper use of the device and for providing other operators with the necessary information and it specifies the competencies required to operate the device.

DISCONNECT THE MAINS CABLE when the unit is not being used for an extended period of time.

ONLY USE THE ORIGINAL MAINS CABLE. Route cable so that it cannot be jammed or severed.

FOR REASONS OF SAFETY only use the grounded 3-pin plug.

Repairs which are not described in this document must only be carried out by authorized workshops!

The manufacturer is not liable for any damage resulting from a failure to comply with the above instructions!

Current technology

These LED illumination devices constitute state-of-the-art technology and employ recognized safety standards.

This instrument was designed and built in accordance with the following regulations and standards:

- ▼ EEC/89/336: Electromagnetic compatibility (CE)
- ▼ ISO 9001/2: Quality systems for development and production

INSTALLATION AND CONNECTION

Remove the individual system components from their packaging and place them onto a horizontal surface.

To obtain optimal functionality, the LED illumination system must be positioned correctly.

Observe the following criteria:

- ▼ No high atmospheric humidity (cf. Technical data)
- ▼ No high room temperature (cf. Technical data)



The device may only be operated at the rated mains voltage. Only connect the unit to grounded sockets.



Keep air vents free!

The control unit must only be operated with the power-supply provided!

Supply controller with attached power supply. If necessary, use the ESD connector (10) for potential equalisation.



Plug the LED lighting into the control unit. Only use Port A of the control unit for the LED ringlight 66/40 (and all future products with 40 LEDs). LED spot, backlight and ringlight 38/20 (and all future products with 20 LEDs) can be used on Port A and B. The total number of LEDs connected on port A and B must not exceed the maximum allowed LEDs (ref. technical data)!

The LED ringlight can now be mounted directly onto the objective of all microscopes with 66 mm diameter by means of a clamping ring which does not damage the surface of the objective. For objectives with any other diameter there is a wide range of adapters available.

For mounting the LED spot, spotholder (6) of different lengths and threads are available, allowing the LED spot to be pointed in any desired direction.

The one end (with the O-ring) of the spotholder is inserted into the opening of the LED spot. The other end can be screwed directly onto the microscope or optionally into a base plate.

OPERATION

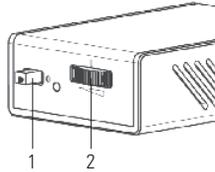


Do not open the unit or its individual components.

The potentiometer wheel (2) is used to control the brightness. Please note that the current level influences not only the brightness, but also the service life of the LEDs.

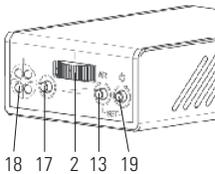
The approximate potentiometer wheel setting can be read from the scale on the wheel.

Standard control unit



The LED illumination unit can be switched on (I: On; 0: Off) using the switch located on the control unit (1).

Segment control unit (40 LEDs)



Press (19) to turn on the control unit. Segments can be selected using (17), which can be rotated clockwise using (13) and anticlockwise using (19). Pressing down (13) rotates the segments automatically in a clockwise direction (AR...Autorotation), briefly press (13) again to stop autorotation. Holding down (19) for longer switches off the control unit and saves the current setting.

Set-up mode:

Holding down buttons (13) + (19) simultaneously takes one into the set-up mode, where the following settings can be made (This mode is indicated by a flashing upper LED on the left):

1/8 Segment size: Press (17) to switch from 1/4 segment size (lower left LED OFF) to 1/8 segment size (lower left LED ON).

1/8 Segment increment: Press (13) to switch from 1/4 segment increment (lower right LED OFF) to 1/8 segment increment (lower right LED ON).

Activation mode = Start up upon application of supply voltage:

Pressing (19) switches from activation mode OFF (= Safety mode, upper right LED OFF) to activation mode ON (= Multipoint connector mode, upper right LED ON). In this mode, the most recently saved segments light up immediately after the supply voltage is applied.

Holding down the buttons (13) + (19) simultaneously terminates Set up mode and saves the current state.

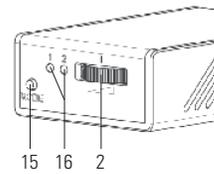
Although this control unit is only designed for 40 LEDs, it is possible to operate for example a RL66/40 on Port A and a backlight with 40 LEDs on Port B, albeit with the following limitations (this also applies to the standard control unit):

- ▼ The luminance diminishes as the control unit has to operate 80 LEDs.
- ▼ It is possible that the luminance of the LED products on Port A and B diminish at a different rate.
- ▼ It is possible that the brightness of single segments (groups with 5 LEDs) differ.

Segment control unit for LED RL66/80 (80 LEDs)

This control unit looks identical to the "Segment control unit (40 LEDs)" and its operation is identical. The difference lies in the fact that you can ONLY plug in the LED RL66/80 with 80 LEDs ONLY into Port A and Port B must remain free. With this control unit, the Ports A and B are not compatible with the Ports A and B on the segment control unit (40 LEDs).

HiPower spot control unit



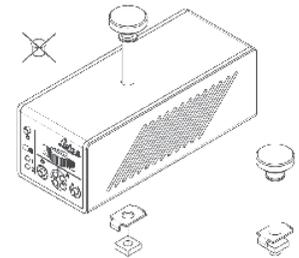
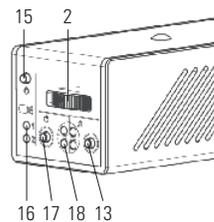
Connect one or two LED spots to port 1 and 2 (14) of the control unit. Connect low voltage cable (9) to control unit (3) and apply mains power to the power supply unit provided. Use only the power supply provided with the control unit, which has a matching output voltage, as power supply voltage and power ratings may vary for other types of control units.



Caution: Use of unsuitable power sources can cause damage to both control unit and LED spots. Always use the control unit supplied to operate the LED spots.

With the brightness control (2) the desired brightness can be set. Using the push button (15) the following modes can be selected: "both ports on" – "port 2 on and 1 off" – "port 1 on and 2 off" – "both ports off". The LED spot connected to port 1 is toggled on and off alternately with each push of the button, so preferably use port 1 when working with only one LED spot. The indicator LEDs (16) show the currently selected mode of operation for port 1 and 2.

Combi control unit



Up to 2 HiPower spots and 1 LED product with 40 LEDs (e.g. Ringlight 66/40 or backlight) can be connected to this control unit. It can be used as a table mounted device or with special microscopes by fastening it to the column by means of the screw included.

Normal mode:

Switch on the HiPower spots with button (15) and also switch between the ports (Port1/Port2/both). Similarly, switch the ringlight on with button (17) and then switch the segment image. The active segments can be rotated using button (13). Holding down the buttons (15) or (17) deactivates the HiPower spots or Port A respectively and pressing them briefly switches them on again. If the power supply has not been disconnected in the meantime, the last state set appears after switching it on, otherwise all the ports/segments are illuminated. The potentiometer wheel (2) sets the brightness for all three ports simultaneously.

Memory mode:

Make the desired adjustments in normal mode first and then hold down the buttons (13) and (17) for a few seconds at the same time. Memory mode is indicated by x3 blinking. Apart from the brightness setting, no other settings can be undertaken in this mode. Holding down the button (15) or (17) deactivates it, while pressing the same button briefly switches it on. The way the device behaves when it is switched on in the event of disconnection from supply can be set by holding down the button (13). Switch it as often as required until the desired state is achieved (ON or OFF). It can be switched between: "Memory fluorescent pattern ON" or "OFF" when the supply is connected. This can be practical if the control unit is switched off by disconnecting the supply and is meant to illuminate again automatically after supply reconnection or is intentionally meant to remain switched off. To exit memory mode, press buttons (13) and (17) for a couple of seconds, indicated by x2 blinking.

LIFETIME

LED chips have a typical lifetime of about 100,000 hours. The actual service life depends to a great extent upon the ambient temperature and the operating current of the LEDs. A higher operating current produces not only more light but also more heat, which reduces the life span of the LEDs.

Depending on the brightness setting a service life of up to 25,000 hours can be achieved, meaning a decrease to 50 % of the original brightness level.

To increase the lifetime of the LEDs, the brightness should be adjusted to the actual level required at any point in time.

Faulty LEDs can be replaced. Contact your dealer or the manufacturer with respect to this matter.

The design of the product is under constant review, and although every effort is made to keep this manual up to date, we reserve the right to change specifications at any time without prior notice. Not responsible for typographical and misprint errors.