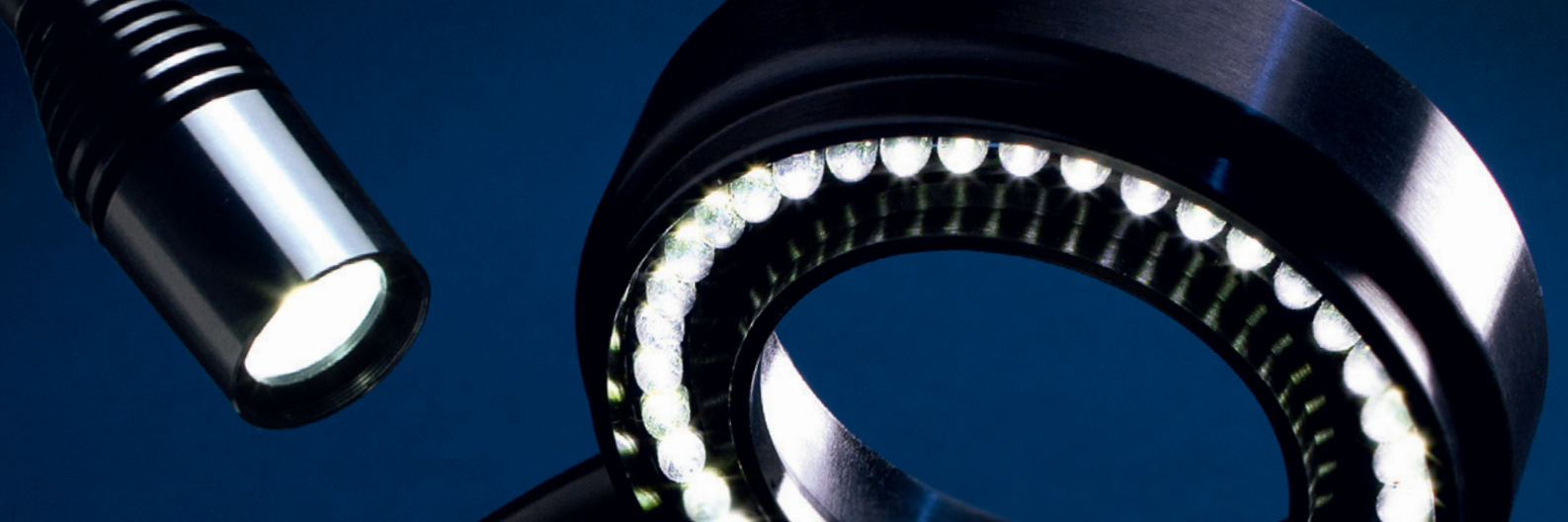




LED LIGHTING



MODULAR LED LIGHTING SYSTEM

PHOTONIC develops LED lighting systems for numerous applications in order to offer our customers the very latest technologies. Photonic contributes innovative ideas to secure our customers' success. Our comprehensive modular system for microscopy includes light sources for almost every task, and is compatible with all standard microscopes. Photonic attaches particular importance to combining intelligent solutions with high product quality in order to ensure a good price/performance ratio.

Photonic's LED product line for direct object illumination has been specially developed to meet the needs of stereo microscopy. A modular system, it permits expandable and cost-effective lighting solutions for the following areas of application:

- ▶ the automotive sector
- ▶ industry
- ▶ forensics
- ▶ schools/universities
- ▶ life science
- ▶ laboratories
- ▶ measurement and control technology
- ▶ quality assurance.

LED ILLUMINATION V. FIBRE OPTICS

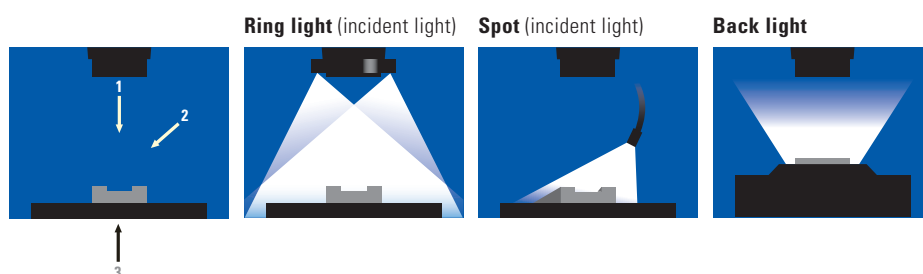
The advantages of Photonic's LED ring lights, compared to fibre-optic lighting systems, include the option to switch parts of the ring light on or off and to rotate selected segments. This allows homogeneous illumination as well as directed lighting. In addition, the resulting shadows offer excellent contrasting options for surface structures.



The following product properties are further advantages compared to fibre optics:

- ▶ daylight quality (5 000 K)
- ▶ long service life (up to 25 000 hours)
- ▶ no noise, no vibrations
- ▶ cold light
- ▶ homogeneous, shadow-free illumination.

THE TYPE AND DIRECTION of lighting are crucial for good results. To achieve the desired optical image contrast, three approaches are followed: incident light (with ring light [1] or spots [2] for the greatest light intensity with maximum flexibility and the widest range of lighting systems), and back light [3].







LED RING LIGHTS



LED RING LIGHT 38/20

This LED ring light (20 LEDs), with an inside diameter of 38 mm, is ideal for objectives in video systems and image processing. The ring light 38/20 can be combined with both the standard control unit and the segment control unit. When used with the segment control unit, different lighting scenarios can be created.

Working distance: 50–100 mm.



LED RING LIGHT 66/40

This slender-build LED ring light (40 LEDs) with an outside diameter of only 94 mm permits extraordinary bright homogeneous object illumination. It can be used with microscopes with an objective diameter of 66 mm, and adapters for other microscopes are also available. The ring light is attached to the objective with spring and screw, thus protecting the objective.

LED ring lights 66/40 can be combined with both the standard control unit and the segment control unit. When used with the segment control unit, different lighting scenarios can be created.

Working distance: 55–120 mm.



LED RING LIGHT 66/80

This ring light has 80 diodes. Its light output is comparable to a 150 W halogen light source with a fibre-optic light guide. LED ring lights 66/80 can be combined with both the standard control unit and the segment control unit. When used with the segment control unit, it is possible to select, illuminate and rotate individual segments. This ensures the best possible identification of contrasts on different surface structures.

Working distances: 35–120 mm or 120–300 mm.

ACCESSORIES

As accessories for the LED ring lights, polarising filter sets consisting of an analyser and a polariser are available. The polariser is attached to the outside of the ring light, and the analyser is integrated into the ring light. The sets are available for LED ring lights 66/40 and 66/80.

Polarising filter set for suppressing undesired reflections, for ring lights 66/40 and 66/80.



Diffuser for light scattering, for ring lights 66/40 and 66/80.



Adapters for attaching the LED ring lights to various microscope objectives (see Accessories, page 13).







LED HI-POWER SPOTS



LED HI-POWER SPOT

This compact spot is needed for all microscopy applications in which a smaller area (15 mm) is to be illuminated. Its extremely bright light is transmitted directly to the object. Another highly useful feature of the LED Hi-Power spot is its colour temperature of either 5 900 K (+/-5%) or 4 000 K. The light output is comparable to a 150 W halogen light source with a fibre-optical light guide. One or two Hi-Power spots can be connected with the Hi-Power control unit. If two spots are used, either one or both spots can be activated alternately or simultaneously.



LED HI-POWER SPOT 2-ARM

This spot is used for direct attachment to microscope stands. As it is mounted on the stand, it is perfect for use in small spaces, and it is compatible with the compact Hi-Power control unit.

- ▶ cable fed into the flexible arms
- ▶ neutral white light, 5 900 K (+/-5%) or equivalent to halogen, 4 000 K
- ▶ homogeneous illumination
- ▶ high-quality flexible arms
- ▶ stable mounting on microscope stand.

ACCESSORIES

Diffuser for light scattering.
Polarising filter for suppressing undesired reflections.



Spot holders: available in the lengths 85, 200 and 300 mm.

Base plate for attaching spot holders on which LED spot lights can be mounted.



Adapters for attaching the 2-armed spot to round columns and various stands (see *Accessories*, page 13).





LED SPOT



LED SPOT 19

This LED spot (19 LEDs) has a spot holder for direct attachment to the microscope and, with the spot holder and the base plate, it can be positioned anywhere.

Two LED spots can be simultaneously attached to, and operated by, one standard control unit.

ACCESSORIES

Colour filters are available in blue, green, yellow and red.



Spot holders: available in the lengths 85, 200 and 300 mm.



Base plate for attaching spot holders on which LED spot lights can be mounted.





LED BACK LIGHTS



LED BACK LIGHT UNIVERSAL

This back light (40 LEDs) can be attached to the work surface of a stereo microscope and provides illumination in daylight quality, ensuring perfect uniform illumination with low-build LEDs of a long service life.

The standard control unit permits infinitely variable brightness control of the back light.



LED BACK LIGHT 90, LED BACK LIGHT 100

This LED back light (equivalent to 40 LEDs) has an outside diameter of 90 mm/100 mm and ensures extraordinarily bright, homogeneous illumination at a colour temperature of 5 500 K.

The standard control unit permits infinitely variable brightness control of the back light.

ACCESSORIES

Glass plate for flat positioning of Petri dishes.



CONTROL UNITS



STANDARD CONTROL UNIT

This compact control unit includes an on/off switch, infinitely variable brightness control, as well as two socket connections for LED lighting units.



SEGMENT CONTROL UNIT

The segment control unit now has a button for segment selection, which is displayed by four LEDs.

- ▶ separate buttons for left/right rotation of the segment
- ▶ auto-rotation
- ▶ rotation in 45° or 90° steps (segment size: semi, quarter or one-eighth circles)
- ▶ infinitely adjustable dimmer
- ▶ no flickering with cameras due to direct-current excitation
- ▶ permits operation of two light heads
- ▶ wide-range power supply 100–240 V, ESD socket.



HI-POWER CONTROL UNIT

The Hi-Power control unit can be connected with up to two Hi-Power spots. Either only one spot is activated or both spots can be used alternately or simultaneously (with the selected setting shown on the display). This control unit permits infinitely variable brightness control.



COMBI CONTROL UNIT

Up to two Hi-Power spots plus one LED component (e.g. a ring light) with a maximum of 40 LEDs can be connected to this control unit. The LED combination control unit can be operated in normal or storage mode. In normal mode, any desired position can be entered, while in the storage mode, the selected positions are stored for use at a later time.

Segment control: using this button, different segments can be activated.





ALL DEVICES: DATA AND EQUIPMENT

COMPONENTS

LIGHTING	LED ring light 66/40 (619-20-002)	LED ring light 66/80 (619-20-060 working distance 35–120 mm 619-20-061 working distance 120–300 mm)	LED ring light 38/20 (619-20-006)
Diodes	40 white LEDs	80 white LEDs	20 white LEDs
Colour temperature	5 000 K	5 000 K	5 000 K
Dimensions	outside: Ø 94 mm x 25 mm inside: Ø 66 mm	outside: Ø 112 mm x 27 mm inside: Ø 66 mm	outside: Ø 60 mm x 22 mm inside: Ø 38 mm
Connections	circumference clamping with spring and screw		
Working distance	55–120 mm from ring light	35–120 mm or 120–300 mm from ring light	50–100 mm from ring light

LIGHTING	LED Hi-Power spot (619-20-037 5 900 K, 619-20-053 4 000 K)	LED Hi-Power spot 2-arm (619-20-057 5 900 K, 619-20-055 4 000 K)	LED spot 19 (619-20-011)
Diodes	1 x Hi-Power LED	2 x Hi-Power LED	19 white LEDs
Colour temperature	5 900 K ± 5% / 4 000 K	5 900 K ± 5% / 4 000 K	5 000 K
Dimensions	Ø 25 mm x 51 mm		Ø 35 mm x 45 mm
Connections	M6 thread for holder		
Attachment	via spot holder	via incident light adapter	via spot holder

LIGHTING	LED back light universal (619-20-052)	LED back light 90 (619-20-056)	LED back light 100 (619-20-033)
Diodes	40 white LEDs	LED cluster (equivalent to 40 LEDs)	LED cluster (equivalent to 40 LEDs)
Colour temperature	5 500 K	5 500 K	5 500 K
Dimensions	Ø 120 mm x 19 mm	Ø outside 90 mm, thickness 3 mm total height 16 mm	Ø outside 100 mm, thickness 5 mm total height 16 mm
Illuminated area	Ø 55 mm	Ø 55 mm	Ø 55 mm

CONTROL UNIT	Standard (619-30-001.99)	Segment (619-30-020.99)
Power supply	24 V DC ± 5%, hollow pin 5.5 x 2.1 mm	
	250 mA	250 mA
Dimensions (D x W x H)	95.5 x 64 x 29 mm	
Connections	2 x 9-pin mini DIN socket	
On/off switch	●	
Buttons for segment rotation	–	2 (incl. auto-rotation)
Potentiometer wheel	approx. 1–25 mA, with index marks	
ESD connection	4 mm banana plug	
Ambient temperature	10–40 °C	
Rel. humidity	30–70%	
Conformity mark	CE	

CONTROL UNIT	Hi-Power (619-30-024.99) max. 2 Hi-Power spots	Combi (619-30-025.99) max. 2 Hi-Power spots + 1 ring light / incident light
Power 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 sockets (stereo)	2 x 3.5 jack sockets (stereo) and 1 x mini DIN
ESD connection	4 mm banana plug	4 mm banana plug
Operation	Potentiometer buttons for Port 1, Port 2, on/off with LED display	Potentiometer 3 buttons with LED display

ACCESSORIES

RING LIGHT

Adapters

66/58 for ring light 66 mm to objective Ø 58 mm	595-32-258
66/60 for ring light 66 mm to objective Ø 60 mm	598-32-043
66/62 for ring light 66 mm to objective Ø 62 mm	598-32-127
universal adapter for objectives Ø 38–58 mm	598-30-022
66 mm to thread M48 x 0.75 (SZ 51 and SZ 61, SMZ 445/SMZ-1)	598-32-049
66 mm to thread M55 x 0.75 (SMZ 645/660/745)	598-32-050

Diffusers

for ring light 66/40	619-20-040
for ring light 66/80	619-20-044

Polarising filter sets

analyser and polariser 66/40	595-20-166
analyser and polariser 66/80	619-20-022

BACK LIGHT

Glass table for stand	619-30-051
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HI-POWER SPOT / HI-POWER SPOT 2-ARM

Diffuser	OPP-00006
Polariser	OPP-00007
Spot holders	
M6/M5, L = 85 mm	619-30-041
M6/M5, L = 200 mm	619-30-042
M6/M5, L = 300 mm	619-30-043
Base plate with M5 thread	619-30-007
Adapters (for 2-armed spot)	
adapter for round columns Ø 25, 30, 32, 35 mm	619-20-049
SZ2-ST, C-PS, C-DS	619-20-048
S stand	619-20-050
SMZ-1500	598-30-024

SPOT 19

Filters

blue	619-30-010
green	619-30-011
yellow	619-30-012
red	619-30-013

Spot holders

L = 85 mm	619-30-003
L = 200 mm	619-30-004
L = 300 mm	619-30-005
Base plate for M5 thread	619-30-007

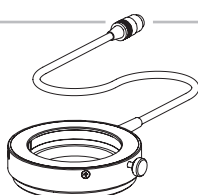
OVERVIEW OF THE ENTIRE SYSTEM

LIGHTING

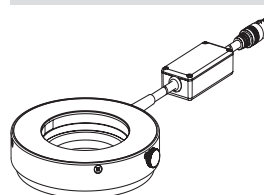
LED ring light 38/20
619-20-006



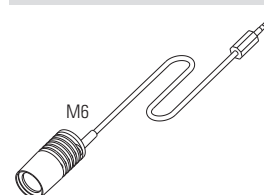
LED ring light 66/40
619-20-002



LED ring light 66/80
619-20-060 (35–120 mm)
619-20-061 (120–300 mm)

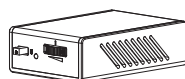


LED Hi-Power spot
619-20-037 (5 900 K)
619-20-053 (4 000 K)

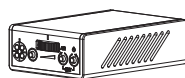


CONTROL UNITS

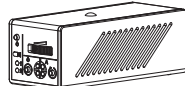
Standard (619-30-001.99)



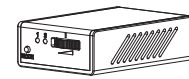
Segment (619-30-020.99)



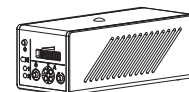
Combi (619-30-025.99)



Hi-Power (619-30-024.99)



Combi (619-30-025.99)



ACCESSORIES

Diffuser 66/40 (619-20-040)



Diffuser 66/80 (619-20-044)



Polarising filter set 66/40
(595-20-166)



Polarising filter set 66/80
(619-20-022)



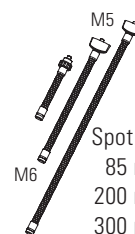
Adapters (see p. 13)



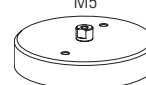
Adapters (see p. 13)



Spot holders M5/M6:
85 mm (619-30-041)
200 mm (619-30-042)
300 mm (619-30-043)



Base plate M5
(619-30-007)



Diffuser (OPP-00006)
(no illustration)
Polarising filter (OPP-00007)
(no illustration)

SETS

(incl. control unit as
specified and international
plug-in power supply
100–240 V)

10009 Set: ring light 38/20
working distance 50–100 mm
incl. standard control unit

10001 Set: ring light 66/40
working distance 55–120 mm
incl. standard control unit

**10049 Set: ring light 66/40
segment**
working distance 55–120 mm
incl. segment control unit

10099 Set: ring light 66/80
working distance 35–120 mm
incl. segment control unit

10100 Set: ring light 66/80
working distance 120–300 mm
incl. segment control unit

**10035 Set: 1 Hi-Power spot
5 900 K**

**10059 Set: 1 Hi-Power spot
4 000 K**

**10037 Set: 2 Hi-Power spots
5 900 K**

**10043 Set: 1 Hi-Power spot
5 900 K**

incl. spot holder and base plate

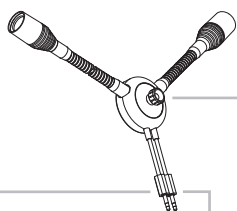
**10044 Set: 2 Hi-Power spots
5 900 K** incl. 2 spot holders
and 2 base plates

all incl. Hi-Power control unit

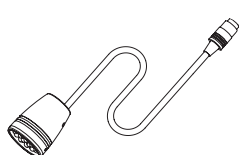
LED Hi-Power spot 2-arm

619-20-057 (5 900 K)

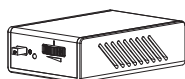
619-20-055 (4 000 K)

**LED spot 19**

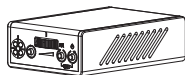
619-20-011



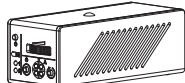
Standard (619-30-001.99)



Segment (619-30-020.99)



Combi (619-30-025.99)



(2-arm only:)

Adapters

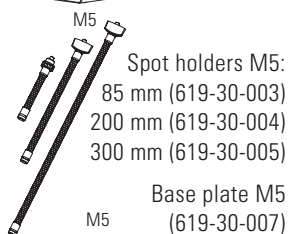
619-20-048



619-20-049



619-20-050



Colour filters (see p. 13):

blue

green

yellow

red

**10068 Set: Hi-Power spot 2-arm 5 900 K**

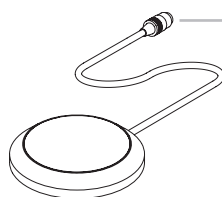
incl. Hi-Power control unit

10063 Set: Hi-Power spot 2-arm 4 000 K

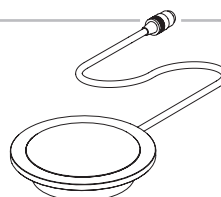
incl. Hi-Power control unit

LED back light universal

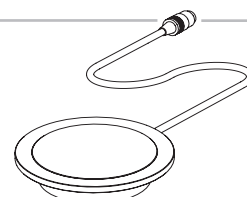
619-20-052

**LED back light 90**

619-20-056

**LED back light 100**

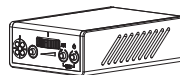
619-20-033



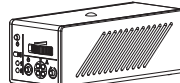
Standard (619-30-001.99)



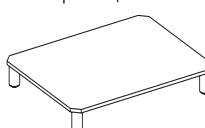
Segment (619-30-020.99)



Combi (619-30-025.99)



Glass plate (619-30-051)

**10056 Set: back light universal**

incl. standard control unit

10064 Set: back light 90

incl. standard control unit

10095 Set: back light 100

incl. standard control unit



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