# LED ILLUMINATION

PHOTONIC OPTICS

# MODULAR LED LIGHTING SYSTEM

**PHOTONIC** develops LED lighting systems for numerous applications with the constant aim of offering customers „up to date" technologies.
Photonic secures the success of its customers with innovative ideas. The comprehensive modular system for microscopy covers light sources for just about every task and is compatible with all current microscopes. The interaction between intelligent solutions and high product quality is of particular importance to Photonic as this achieves a balanced price-performance ratio.

The LED product line for direct object illumination was developed specifically by Photonic for stereomicroscopy illumination tasks. The modularity of this system enables an upgradable and cost-effective light solution for the following application areas:

- Automotive industry
- Industry
- Forensics
- Schools and universities
- Life Sciences
- Laboratories
- Measurement and control engineering
- Quality assurance

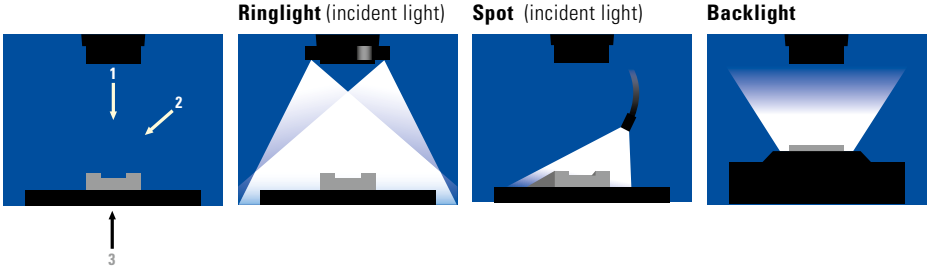
## LED ILLUMINATION VS. FIBRE OPTICS

One advantage of Photonic LED ringlights compared to fibre optic lighting systems is the possibility of switching segments of the ringlight on/off and to rotate the segments selected in this manner.
In addition to homogeneous illumination, this also makes it possible to achieve directed lighting. Resulting shadow formation also gives rise to excellent contrasting options for surface structures.

The following product properties also offer further advantages compared to fibre optics:

- Daylight quality (5,000 K)
- Long service life (up to 25,000 hours)
- Noise and vibration-free operation
- Cold light
- Homogeneous and shadow-free illumination

**TYPE AND DIRECTION** of lighting are decisive for results. Three approaches are used for the required optimal image contrast:
Incident light (with ringlight [1] or spot [2], offers highest light intensity with maximum flexibility and largest choice of lighting systems) and backlight [3].



# LED RINGLIGHTS

**LED RINGLIGHT 38/20**
This LED ringlight (20 LEDs), with an internal diameter of 38 mm, is suitable for video system and image processing lenses. Using the control unit with segment control provides additional lighting variants.
Working distance: 50–100 mm.

**LED RINGLIGHT 66/40**
The LED ringlight (40 LEDs) provides exceptionally bright and homogeneous object illumination and is suitable for microscopes with a lens diameter of 66 mm as well as for other microscopes in combination with an adapter. The ringlight is attached with spring and screw, protecting the lens. In combination with the control unit and segment control, various illumination scenarios can be implemented.
Working distance: 55–120 mm.

**LED RINGLIGHT 66/80**
This LED ringlight has 80 diodes and a correspondingly high light output. Different segments can be selected, lighted and even rotated in combination with the control unit 80. This guarantees optimal detection of contrasts on different surface structures.
Working distance: 35–120 mm or 120–300 mm.

## ACCESSORIES

Photonic offers polarizing filter sets as accessories for LED ringlights, comprising an analyzer and a polarizer. The polariser is fastened outside the ringlight and the analyser is integrated in the ringlight. The sets are available for the LED ringlights 66/40 and 66/80.

**Polarizing filter set** for suppressing unwanted reflections, for ringlights 66/40 and 66/80

**Diffuser** for light scattering for ringlights 66/40 and 66/80

**Adapter** for attaching LED ringlights to various microscope lenses *(see Accessories on Page 13).*


1
2
MODE

# LED HI-POWER SPOTS

**LED HI-POWER SPOT**
This compact spot is required for all microscopy applications where a small area (15 mm) needs to be illuminated. The very bright light is directly transmitted to the object and the Hi-Power spot is also impressive with a colour temperature of 5,500 K. The light output is comparable to that of a 150 W halogen light source and a fibre-optic cable. One or two Hi-Power spots can be connected to the control unit. If two spots are attached, it is possible to actuate one spot, alternating spots or both spots at the same time.

**LED HI-POWER 2-ARM SPOT**
Can be attached directly to the microscope stand. Attachment to the stand results in a space-saving application.

- Cable fed into the flexible arms
- Neutral white light 5,500 K
- Homogenous illumination
- High quality flexible arms
- Stable mounting on the microscope stand

## ACCESSORIES

**Diffuser** for light scattering, **polarizing filter** for suppressing unwanted reflections

**Spot holder** available in 85, 200 and 300 mm lengths
**Base plate** for attaching spot holder on which the LED spot lights can be mounted

**Adapter** for attaching 2-arm spots to columns and various stands *(see Accessories on Page 13)*

# LED SPOTS

**LED SPOT 19**
The LED spot (19 LEDs) can be directly attached to the microscope with a spot holder or positioned anywhere with a spot holder and base plate. Two LED spots can be connected to and controlled by a single control unit.

**LED SPOT 19 2-ARM**
This 2-arm LED spot (19 LEDs each) consists of two connected spot holders, each with an LED spot 19 attached to the end. The lighting system can also be directly attached to the microscope stand with an adapter.

## ACCESSORIES

**Colour filters** available in blue, green, yellow and red

**Spot holder** available in 85, 200 and 300 mm lengths
**Base plate** for attaching spot holder on which the LED spot lights can be mounted

**Adapter** for attaching 2-arm spots to columns and various stands *(see Accessories on Page 13)*

# LED BACKLIGHTS

**LED UNIVERSAL BACKLIGHT**
This backlight (40 LEDs) can be attached to the working surface of a stereomicroscope and is characterised by daylight quality illumination, a particularly uniform illumination, high LED service life and low construction height.
The brightness of the backlight can be infinitely adjusted with the control unit.

**LED NIKON BACKLIGHT**
This Nikon LED backlight (equivalent to 40 LEDs) can be inserted into the bases of the Nikon SMZ 600, SMZ 800, SMZ 1000 (C-PS, C-DS stand ) and SMZ 1500 (C-PS160, C-DSS, C-DSD and C-BD stands, with adapter ring) microscopes. It provides particularly bright and homogenous illumination (maximum light intensity 26,500 cd/m$^2$) at a colour temperature of 5,500 K.

## ACCESSORIES

**Glass plate** for flat surfaces for Petri dishes

**Adapter ring** for the use of the backlight for the SMZ-1500

*(not illustrated:)* Self-adhesive **stand feet** for raising the microscope stand

# CONTROL UNITS

**STANDARD CONTROL UNIT**
This compact control unit has an on/off switch, an infinitely variable brightness control with "turbo range", two connection sockets for the LED lighting units.

**SEGMENT CONTROL UNIT**
The segment control unit also has a switch for segment control; segment selection is indicated by 4 LEDs.

- Separate button for right or left rotation of the segment
- Autorotation
- Rotation steps selectable in 45° or 90° steps (segment sizes: semi, quarter or one-eight circles)
- Infinitely adjustable brightness
- No flicker with cameras due to direct current excitation
- Operation of two light heads possible
- Variable voltage power supply 100–240 V, ESD socket

**SEGMENT CONTROL UNIT 80**
This control unit enables segment selection with an on/off switch, buttons can be used to rotate the selected segments with two buttons available for direction changes. The rotary potentiometer can be used to infinitely adjust the brightness level. Compatibility is only possible with the LED ringlight 66/80. The following segments can be selected:

- Semicircle
- Quadrant
- Two opposing quadrants
- Full circle

**Segment control:** Different segments can be actuated by pushbutton.

**HI-POWER CONTROL UNIT**
Up to two Hi-Power spots can be connected to the Hi-Power control unit. It is possible to activate one spot, both spots alternatively or both spots simultaneously (the selection is shown on the display). This control unit offers infinitely variable brightness control.

**COMBI CONTROL UNIT**
Up to two Hi-Power spots and an LED component (e.g. a ringlight) with maximum 40 LEDs can be connected to this control unit. The LED Combi control unit can be operated in normal mode or storage mode. Any position can be entered in normal mode, while the selected positions are stored in storage mode and can be used an a later time.

# ALL DEVICES – DATA AND EQUIPMENT

## COMPONENTS

| **ILLUMINATION** | **LED ringlight 66/40** (619-20-002) | **LED ringlight 66/80** (619-20-039) | **LED ringlight 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 | External: Ø 94 mm x 25 mm<br>Internal: Ø 66 mm | External: Ø 112 mm x 23,5 mm<br>Internal: Ø 66 mm | External: Ø 60 mm x 25 mm<br>Internal: Ø 38 mm |
| Attachment | Circumference clamping with spring and screw | | |
| Working distance | 55–120 mm, measured from ringlight | 35–120 mm or 120–300 mm, measured from ringlight | 50–100 mm, measured from ringlight |

| **ILLUMINATION** | **LED Hi-Power spot** (619-20-037) | **LED Hi-Power spot 2-arm** (619-20-047) |
|---|---|---|
| Diodes | 1 x Hi-Power LED | 2 x Hi-Power LED |
| Dimensions | Ø 25 mm x 51 mm | |
| Connections | M6 thread for holder | |
| Attachment | | Via incident light adapter |

| **ILLUMINATION** | **LED spot 19** (619-20-011) | **LED spot 19 2-arm** (619-20-012) |
|---|---|---|
| Diodes | 19 white LEDs | 19 white LEDs per arm |
| Colour temperature | 5,000 K | 5,000 K |
| Dimensions | Ø 34 mm x 45 mm | Ø 34 mm x 45 mm, arm length approx. 480 mm |
| Attachment | With spot holder | With incident light adapter |

| **ILLUMINATION** | **LED universal backlight** (619-20-052) | **LED Nikon backlight** (619-20-036) |
|---|---|---|
| Diodes | 40 white LEDs | LED cluster (equiv. to 40 LEDs) |
| Colour temperature | 5,000 K | 5,000 K |
| Dimensions | Ø 120 mm x 19 mm | Ø internal 54 mm, external 59.5 mm; external + adapter 178 mm |
| Slides | Frosted glass, Ø 90 mm | Flashed glass |
| Illuminated area | Ø 55 mm | Ø 55 mm |

| **CONTROL UNIT** | **Standard** (619-30-001.99) | **Segment (40 LEDs)** (619-30-020.99) | **Segment (80 LEDs)** (619-30-022.99) |
|---|---|---|---|
| Power supply | | 24V 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 | | 102 x 106 x 39 mm |
| Sum of max. individual LEDs | 40 | 40 | 80 |
| Connections | 2 x 9-pin Mini-DIN-socket | | D-Sub (25-pin) |
| On/Off switch | ● | | |
| Segment rotation pushbutton | – | 2 (incl. auto-rotation) | 2 |
| Potentiometer wheel | Approx. 1–25 mA, with index holes | | |
| ESD connection | 4 mm banana plug | | |
| Ambient temperature | 10–40 °C | | |
| Rel. humidity | 30–70 % | | |
| Mark of conformity | CE | | |

| **CONTROL UNIT** | **Hi-Power spot** (619-30-024.99)<br>for max. 2 Hi-Power spots | **Combi** (619-30-025.99)<br>for max. 2 Hi-Power spots and 1 ringlight/backlight |
|---|---|---|
| Power supply | 5 V DC ± 5 %, hollow plug 5.5 x 2.5 mm, 1.2 A | 24 V DC ± 5 %, hollow plug 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 mm jack sockets (stereo) and 1x mini-DIN |
| Sum of max. individual LEDs | | 40 |
| ESD connection | 4 mm banana plug | 4 mm banana plug |
| Operation | Potentiometer,<br>pushbutton für Port 1 / Port 2 / On/Off with LED display | Potentiometer,<br>3 pushbuttons with LED display |

# ACCESSORIES

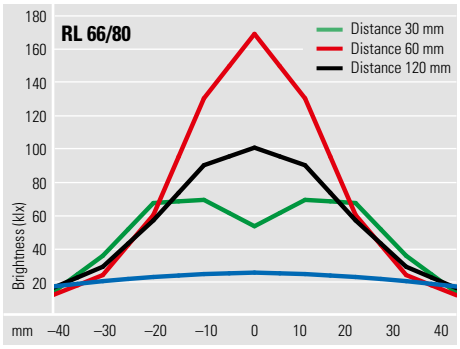
| RINGLIGHT | |
|---|---|
| Adapter: | |
| 66/58 for RL 66 mm on lens Ø 58 mm | 595-32-258 |
| 66/60 for RL 66 mm on lens Ø 60 mm | 598-32-043 |
| 66/62 for RL 66 mm on lens Ø 62 mm | 598-32-127 |
| Universal adapter for RL 66 mm on lenses Ø 38-58 mm | 598-30-022 |
| 66 mm on thread M48 x 0.75 (Olympus SZ 51 and SZ 61, Nikon SMZ 445/SMZ-1) | 598-32-049 |
| 66 mm on thread M55 x 0.75 (Nikon SMZ 645/660/745) | 598-32-050 |
| 66/60 mm for Meiji | 598-32-183 |
| 66/54 mm for Olympus SZ-III + SZ-60, SZ-1145 | 598-30-002 |
| 66/47 mm for Nikon (except SMZ-1) | 598-30-004 |
| 66/50 mm for Olympus SD, SF, SZ with auxiliary lens | 598-30-017 |
| Diffusers: | |
| For ringlight 66/40 | 619-20-040 |
| For ringlight 66/80 | 619-20-044 |
| Polarizing filter sets: | |
| Analyser and polariser 66/40 | 595-20-166 |
| Analyser and polariser 66/80 | 619-20-022 |

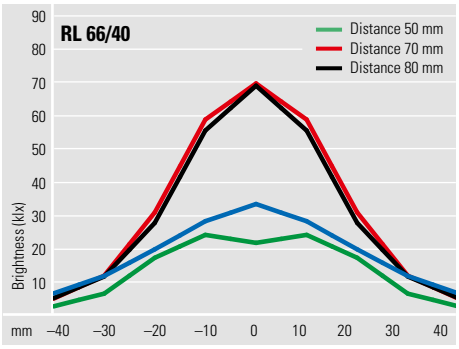
| NIKON BACKLIGHT | |
|---|---|
| Self-adhesive stand foot | 619-30-050 |
| Carrier plate | 619-32-121 |
| Glass table for stand | 619-30-051 |

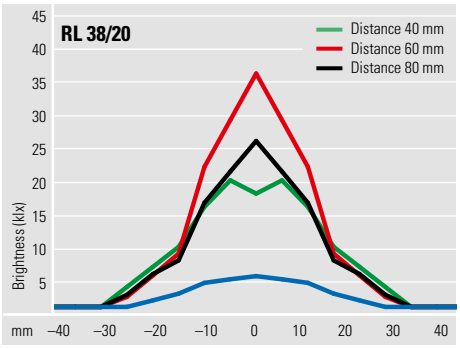
| HI-POWER SPOT / HI-POWER SPOT 2-ARM | |
|---|---|
| Diffuser | OPP-00006 |
| Polariser | OPP-00007 |
| Spot holder: | |
| M6/M5, L= 85 mm | 619-30-041 |
| M6/M5, L = 200mm | 619-30-042 |
| M6/M5, L = 300mm | 619-30-043 |
| Base plate with M5 thread | 619-30-007 |
| Adapter (for 2 arms): | |
| Round column adapter Ø 25, 30, 32, 35 mm | 619-20-049 |
| Olympus SZ2-ST, Nikon C-PS, C-DS | 619-20-048 |
| Leica-S-stand (for 2 arms only) | 619-20-050 |
| Nikon SMZ-1500 | 598-30-024 |

| SPOT 19 / SPOT 19 2-ARM | |
|---|---|
| Filter: | |
| Blue | 619-30-010 |
| Green | 619-30-011 |
| Yellow | 619-30-012 |
| Red | 619-30-013 |
| Spot holder: | |
| L = 85 mm | 619-30-003 |
| L = 200 mm | 619-30-004 |
| L = 300 mm | 619-30-005 |
| Base plate with M5 thread | 619-30-007 |
| Adapter (for 2 arms): | |
| Round column adapter Ø 25, 30, 32, 35 mm | 619-20-049 |
| Olympus SZ2-ST, Nikon C-PS, C-DS | 619-20-048 |
| Leica-S-stand (for 2-arms only) | 619-20-050 |
| Nikon SMZ-1500 | 598-30-024 |

# BRIGHTNESS DISTRIBUTION



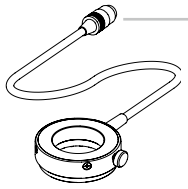



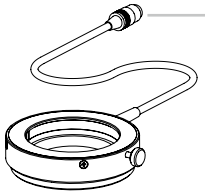
# THE COMPREHENSIVE SYSTEM AT A GLANCE

## ILLUMINATION

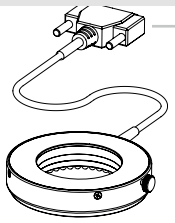
**LED ringlight 38/20**
619-20-006



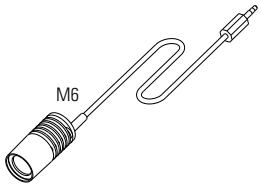
**LED ringlight 66/40**
619-20-002



**LED ringlight 66/80**
619-20-039 *(35–120 mm)*
619-20-046 *(120–300 mm)*

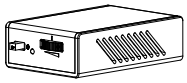


**LED Hi-Power spot**
619-20-037

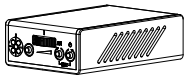



## CONTROL UNITS

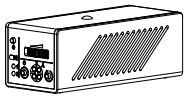
Standard (619-30-001.99)



Segment (619-30-020.99)

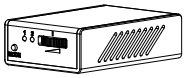


Combi (619-30-025.99)

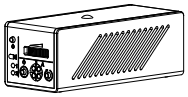


Segment 80 (619-30-022.99)

Hi-Power (619-30-024.99)



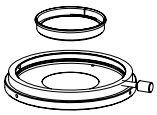
Combi (619-30-025.99)



## ACCESSORIES

Diffusor 66/40 (619-20-040)

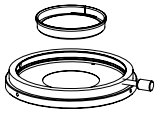
Polarizing filter set 66/40 (595-20-166)



Adapter *(see Page 13)*

Diffusor 66/80 (619-20-044)

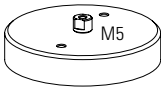
Polarizing filter set 66/80 (619-20-022)



Adapter *(see Page 13)*

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

Base plate M5 (619-30-007)




Diffusor (OPP-00006)
*(not illustrated)*
Polarizing filter (OPP-00007)
*(not illustrated)*

## SETS

*(incl. specified control unit and internal plug-in power supply unit 100-240 V)*

10009 **Set Ringlight 38/20**
Working dist. 50–100 mm
*incl. control unit standard*

10001 **Set Ringlight 66/40**
Working dist. 55–120 mm
*incl. control unit standard*

10049 **Set Ringlight 66/40 Segment**
Working dist. 55–120 mm
*incl. control unit segment*

10032 **Set Ringlight 66/80**
Working dist. 35–120 mm

10041 **Set Ringlight 66/80**
Working dist. 120–300 mm

*all incl. control unit segment 80*

10035 **Set 1 Hi-Power Spot**

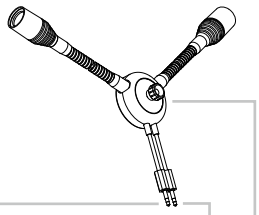
10037 **Set 2 Hi-Power Spots**

10043 **Set 1 Hi-Power Spot**
*incl. spot holder and base plate*

10044 **Set 2 Hi-Power Spots**
*inkl. 2 spot holders and 2 base plates*

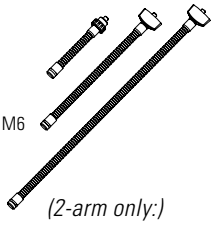
*all incl. control unit Hi-Power*

**LED-Hi-Power spot 2-arm** 619-20-047



M5

M6



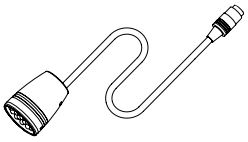
*(2-arm only:)*
Adapter
619-20-048

619-20-049

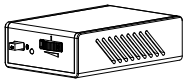
619-20-050

10045 **Set Hi-Power Spot 2-arm**
*incl. control unit Hi-Power*

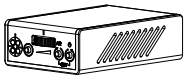
**LED spot 19** 619-20-011



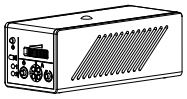
Standard (619-30-001.99)



Segment (619-30-020.99)

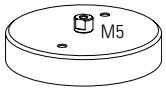


Combi (619-30-025.99)



Spot holder M5:
85 mm (619-30-003)
200 mm (619-30-004)
300 mm (619-30-005)

Base plate M5 (619-30-007)



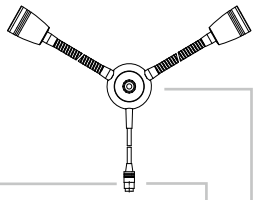

Colour filter *(see Page 13):*
blue
green
yellow
red

10002 **Set 1 Spot 19**

10003 **Set 2 Spots 19**

*all incl. control unit standard*

**LED spot 19 2-arm** 619-20-012



Standard (619-30-001.99)



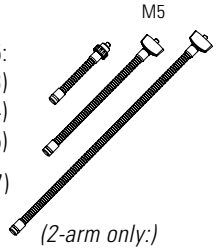
Segment (619-30-020.99)



Combi (619-30-025.99)



M5



*(2-arm only:)*
Adapter
619-20-048

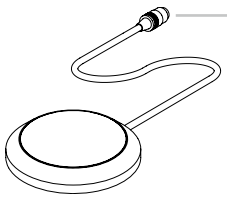
619-20-049

619-20-050

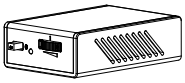
10025 **Set Spot 19 2-arm**
*incl. control unit standard*

10027 **Set Segment Spot 19 2-arm**
*incl. control unit stegment*

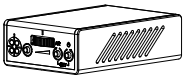
**LED universal backlight** 619-20-052



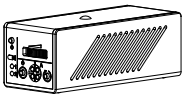
Standard (619-30-001.99)



Segment (619-30-020.99)

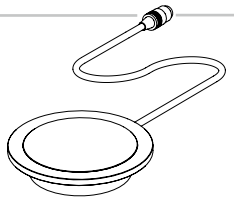


Combi (619-30-025.99)

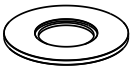


10056 **Set Universal Backlight**
*incl. control unit standard*

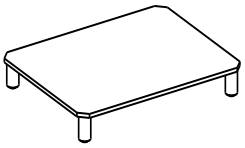
**LED Nikon backlight** 619-20-036



Adapter ring (619-32-121)



Glass plate (619-30-051)



10023 **Set Backlight Nikon**
*incl. control unit standard*

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**PHOTONIC** Optische Geräte GmbH & Co KG
Austria, A-1160 Vienna, Seeböckgasse 59
☎ +43-1-486 56 91-0
🖷 +43-1-486 56 91-47
✉ sales.fo@photonic.at
www.photonic.at