

# SCHOTT

## EasyLED Series

LED illumination system for  
stereomicroscopy



# OPERATING INSTRUCTIONS



## Contents

1.	System description. ....	3
2.	System overview.....	4
3.	Important information.....	5
4.	Start-up procedure and operation.....	7
5.	Maintenance.....	13
6.	Technical data.....	13
7.	Replacement parts and accessories.....	15

## 1. System description

The EasyLED Series is an illumination system using white LEDs, specially developed for the field of stereomicroscopy, in industrial and laboratory applications.

The series comprises:

- Ringlight / Ringlight Plus (A)
- Transmitted Light Stage (B)
- Spot Illumination / Double Spot Illumination (C)

### Comment:

The systems Ringlight / Ringlight Plus, Transmitted Light Stage and Spot Illumination / Double Spot Illumination can be operated separately. The respective operating is described in the suitable part of this users manual.

With the help of cutting edge technology, high brightness LEDs are integrated with control electronics in the head of the ringlight and transmitted light stage illumination units. The spot illumination / double spot illumination is controlled via a compact minicontroller (D / H). The product range makes its mark with easy and ergonomic operation.

The EasyLED System operates with direct current and is, therefore, suitable for use with digital cameras. Continuous dimming is possible and the system has a separate mains switch, meaning brightness settings can be stored. Thanks to neutral, white LEDs (approx. 5600 K), images with excellent color fidelity can be produced.

The power supplies with wide range input (E, F), which can be used in the 100-240 V voltage range, can power the ringlight, transmitted light range and spot illumination at any one time and are supplied with clip-in connectors, making operation worldwide possible.

The black anodized metal housing and effectively designed heat sinks keep the LEDs cool and provide for a lifetime of over 30,000 hours.

The EasyLED System can be integrated into the stereomicroscopes of all leading manufacturers by way of a practical ringlight adapter and holding arm (G) for the spot illumination (see Point 7 of these operating instructions).

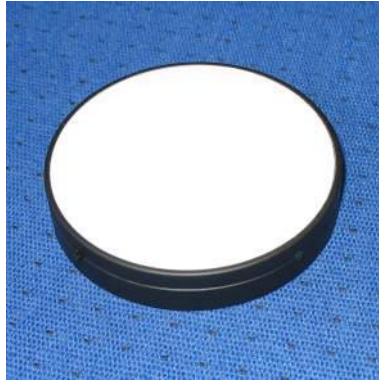
In addition, suitable polarizing filters and color filters as well as protection glasses and diffusors are available for relevant applications (see Point 7 of these operating instructions).

The SCHOTT EasyLED Series stands for excellent quality and remarkable design.

## 2. System overview



**A**



**B**



**C**



**D**



**E**



**F**




**G**



**H**

- A Ringlight / Ringlight Plus
- B Transmitted light stage
- C Spot illumination
- D Controller for spot illumination
- E 5 V DC power supply for spot system
- F 12 V DC power supply for ringlight and transmitted light stage
- G Holding arm for spot illumination
- H Controller for double spot illumination

### 3. Important information

In these operating instructions the symbol  warns of a danger spot. CAUTION - obey documentation!

#### Intended use

The EasyLED Series is an innovative illumination system using white LEDs, developed for the fields of stereomicroscopy and macroscopy. The system is intended for use in industrial and laboratory applications.

#### Safety information

Please read and follow these instructions carefully. The appliance's safety cannot be guaranteed if they are not obeyed!

In accordance with the EN 60825-1 standard the LED illuminations of the EasyLED Series are classed as products under Laser Class 1M.

The EasyLED Series illumination system conforms to the requirements of the following European directives:

2006/95/EG (Low Voltage Directive)

2004/108/EG (EMV Directive)

The technical documentation and full compliance to the standards listed below proves the conformity of the illumination system with the essential requirements of the above-mentioned:

EN 61010-1

EN 60825 + A1 + A2

EN 61326-1 : 2006

LEDs feature a very high luminance. For this reason, do not look directly into the LEDs (also with optical devices) when the illumination is switched on (danger of ophthalmic injury)!

To avoid unnecessary stressing of your specimen by illumination with visible light, reduce the brightness and duration of illumination to the minimum required!

### **Important information**

Please ensure the appliances are only used with the power supplies and cables specified by SCHOTT – only then are faultless operation and conformity with standards guaranteed!

Please take care that the power supplies with wide range input are only operated with the specified mains voltage!

The illumination units have been developed for operation in dry rooms only!

The system must not be used in explosive areas!

Safe disconnection from the power supply takes place only by pulling out the mains plug!

Before setting up, dismantling or modifying the system always switch off the appliances and pull out the mains plug!

Neither the power supplies nor the illumination units should be opened or dismantled. Technical modifications are forbidden. Repairs must only be carried out by the manufacturer or by its authorized customer service agency!

Please ensure that every user of the system has quick access to these operating instructions!

The manufacturer is not liable for damage caused by failure to obey these instructions!

### **Information for operating the transmitted light basis**

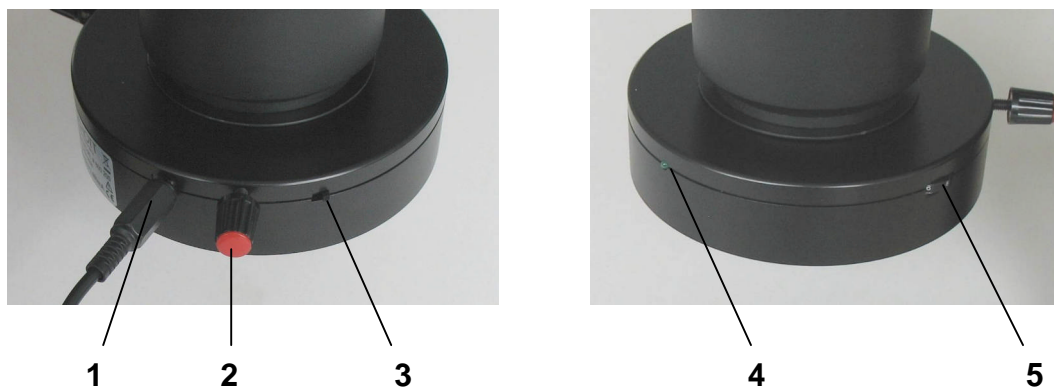
The transmitted light stage has been developed for operation in a microscope stand or in another metallic heat sink.

If the transmitted light stage is operated without the heat sink the metal housing can heat up to approx. 50°C. However, the diffuser disc and the specimen field do not heat up to the same level.

If the housing is accidentally touched the temperature may seem unpleasantly warm, but it is technically safe. The operation of the illumination is in no way affected!

## 4. Start-up procedure and operation

### Ringlight

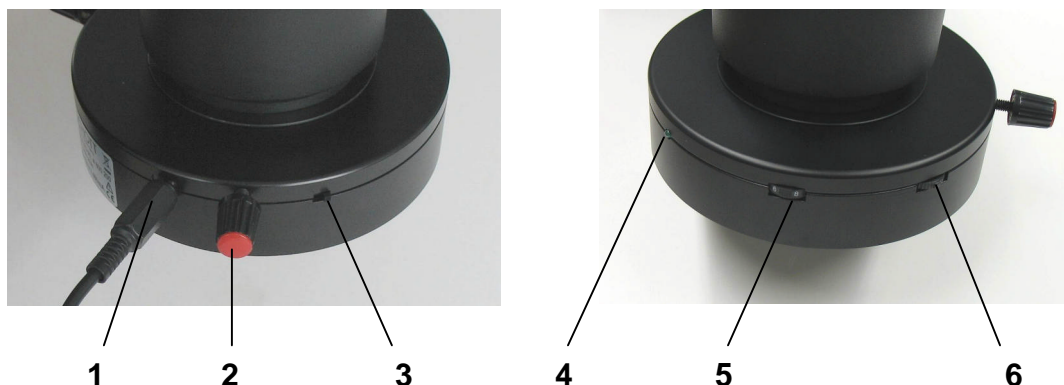


Insert the hollow plug (1) of the power supply (F) into the DC socket provided on the ringlight (A). The plug connection of the power supply is interchangeable for the EU, UK, US or AU. This is connected to the mains supply (100-240 V AC, 50-60 Hz).

Attach the ringlight (A) to the microscope objective by tightening both thumb screws (2) so that the green control light (4) is facing the user. The inner diameter of the ringlight (A) is 66 mm. To connect objectives with other diameters, corresponding adapters are available (see Point 7 of these operating instructions).

Switch on the ringlight by flicking the switch (3) and set the required brightness by adjusting the thumb wheel (5). When the appliance is switched on the green control light (4) is lit.

## Ringlight Plus



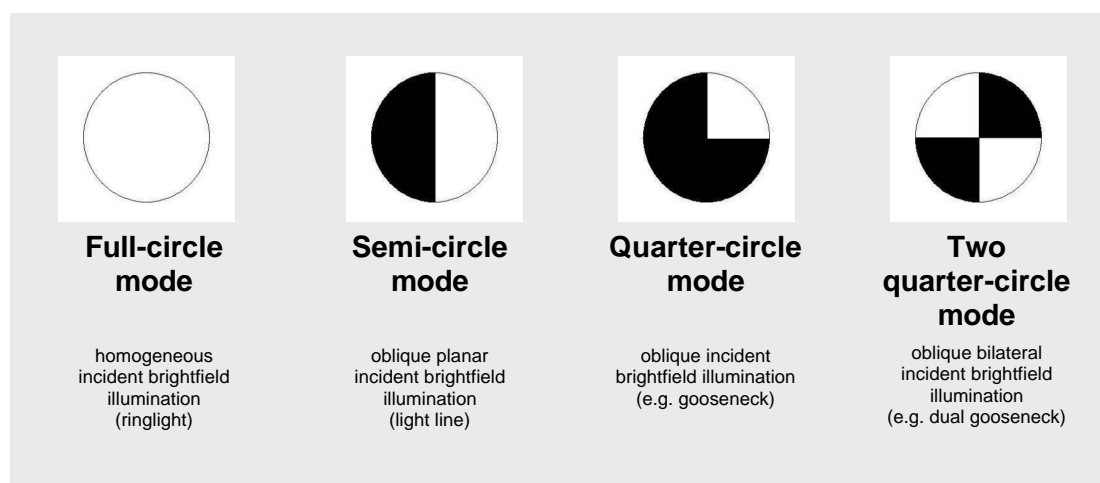
Attachment to the microscope objective, the power connection, on/off switching and brightness adjustment do not differ from the basic version. See the description in the above section entitled “Ringlight”.

### Additional functions

The EasyLED Ringlight Plus has an additional function for controlling segments, which makes it possible to regulate the LED ring individual segments, each with 12 LEDs, using a “jog dial switch” (6). In this way, full-circle, semi-circle, quarter-circle and two quarter-circles illumination, as well as rotation in both directions can be achieved.

#### Adjustment of segment mode

Pressing the “jog dial switch” (6) once changes the illumination to semi-circle mode; twice to quarter-circle mode, three times to two quarter-circle mode and a final time back to full-circle mode. When first switched on the ringlight always starts in full-circle mode.





### Manual rotation

Each “seesawing” of the “jog dial switch” (6) to the right rotates the illuminated LED circle segment in 1/8 steps to the right.

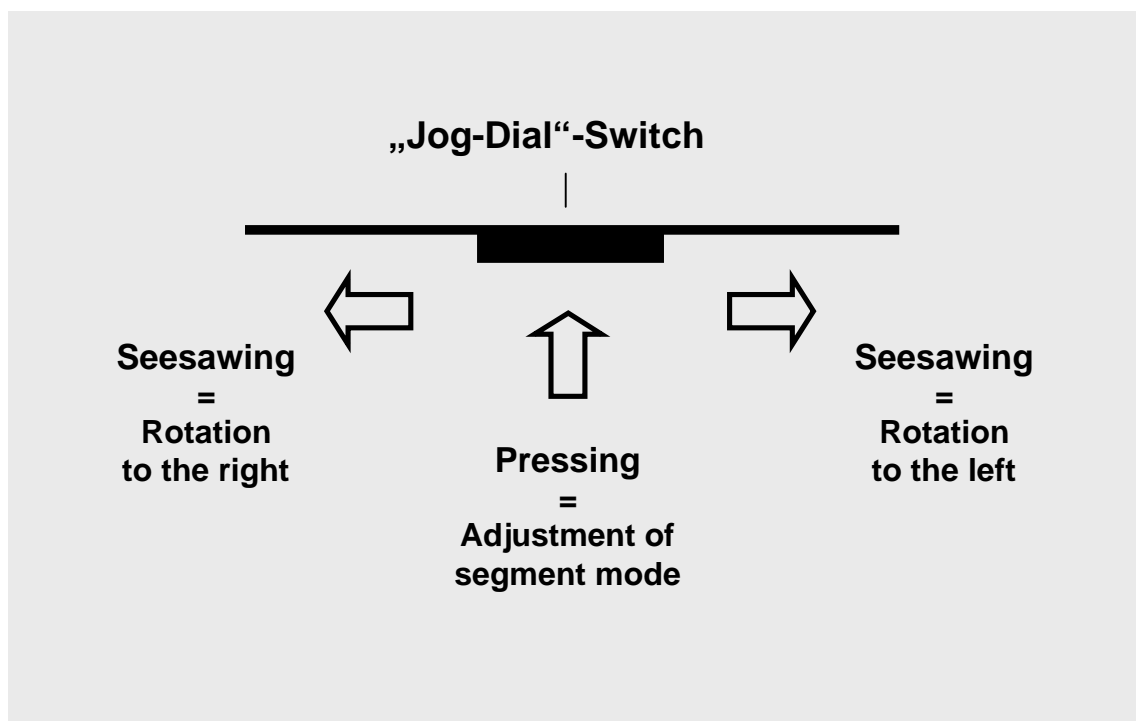
Each “seesawing” of the “jog dial switch/wheel” (6) to the left rotates the illuminated LED circle segment in 1/8 steps to the left.

### Automatic rotation

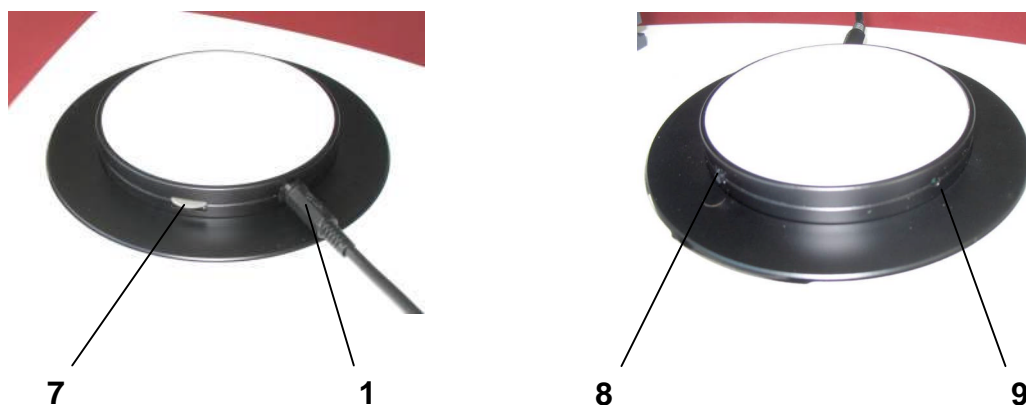
When the “jog dial switch” (6) is pressed for more than 2 seconds to the right, the illuminated LED circle segment begins to automatically rotate in 1/8 circle steps to the right.

When the “jog dial switch” (6) is pressed for more than 2 seconds to the left, the illuminated LED circle segment begins to automatically rotate in 1/8 circle steps to the left.

Automatic rotation stops as soon as the “jog dial switch” is switched arbitrarily.



## Transmitted Light Stage

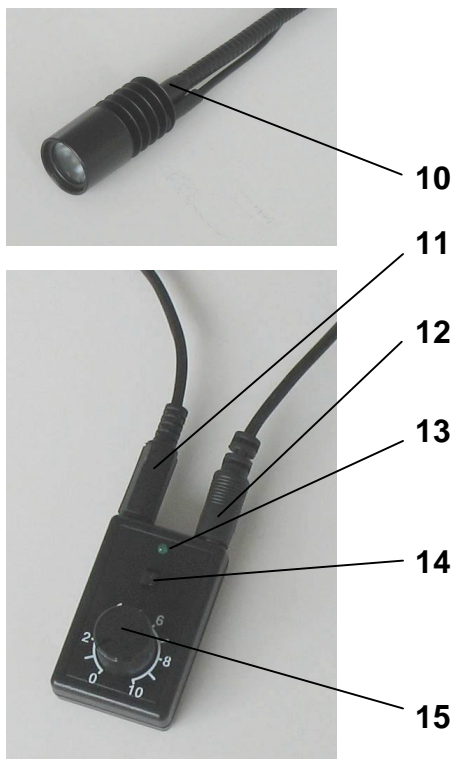


Insert the hollow plug (1) of the power supply (F) into the DC socket provided on the Transmitted Light Stage (B). The plug connection of the power supply is interchangeable for the EU, UK, US or AU. This is connected to the mains supply (100-240 V AC, 50-60 Hz).

Position or attach the Transmitted Light Stage (B) in the notch provided on the microscope stand so that the green control light (9) is facing the user. The basic version of the transmitted light stage (B) has an 84 mm diameter. To connect stands with different notch diameters, Transmitted Light Stages with correspondingly matched adapter feet are available (see Point 7 of these operating instructions).

Switch on the Transmitted Light Stage (B) by flicking the switch (8) and set the required brightness by adjusting the thumb wheel (7). When the appliance is switched on the green control light (9) is lit.

## Spot illumination



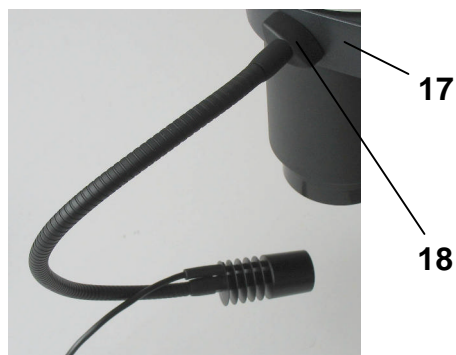
Screw one end of the holding arm (G) with M6 thread (10) as far as it will go into the M6 thread provided on the housing of the spot illumination (C).

Screw the other end of the holding arm (G) as far as it will go either into the M6 thread provided on the foot stand (16) or into a suitable thread on the stand or mount of the microscope (17). By turning the fixing nut (18) clockwise, a removing of the holding arm (G) during application is avoided. Holding arms (G) with different threads are available for different microscopes (see Point 7 of these operating instructions).

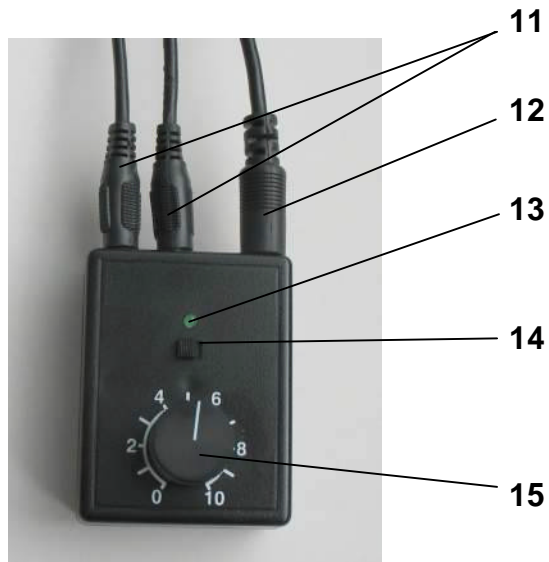
Insert the jack plug (11) of the spot illumination (C) into the socket provided on the controller (D).

Insert the hollow plug (12) of the power supply (E) into the DC socket provided on the controller (D). The plug connection of the power supply is interchangeable for the EU, UK, US or AU. This is connected the the mains supply (100-240 V AC, 50-60 Hz).

Switch on the spot illumination by flicking the switch (14) and set the required brightness by turning the knob (15). When the appliance is switched on the green control light (13) is lit.



## Double Spot Illumination

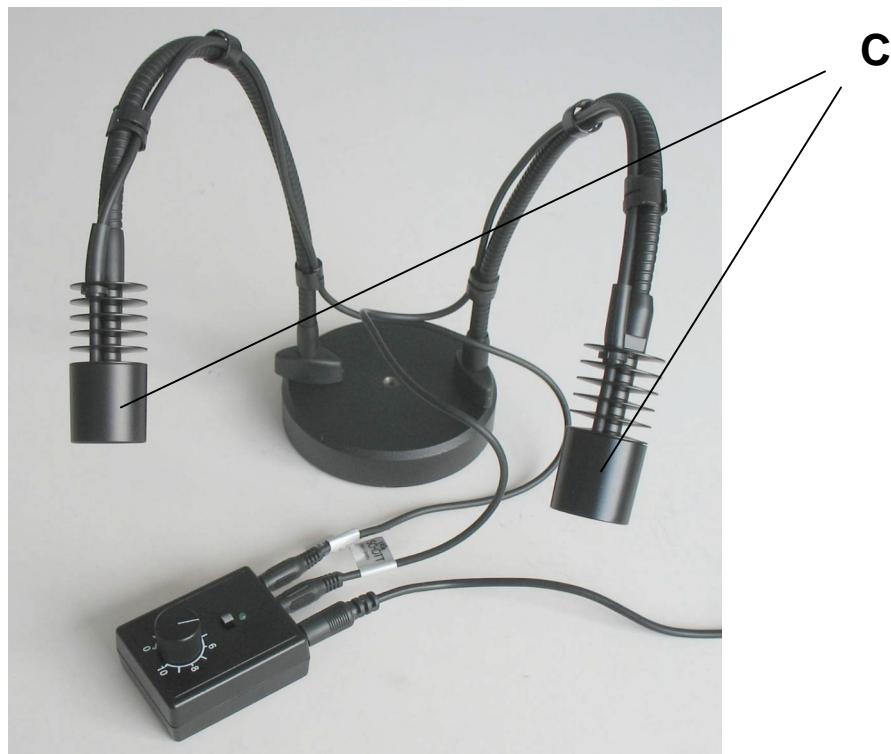


Use the same procedure as for the individual spot illumination (see page 11).

The double spot controller (H) has connector sockets for each jack (11).

After turning on the double spot illumination at the switch (14), the brightness of both spots (C) can be adjusted by turning the knob (15).

It is not possible to separately control the individual spots.



## 5. Maintenance

The EasyLED Series is maintenance-free.

To clean the outside of the components please use a soft dry cloth or commercially available plastic cleaning cloths.

The use of cleaning agents, alcohol or any other chemicals is not permitted.

## 6. Technical data

Ringlight (A)	
Diodes	45 High Brightness LEDs
Color temperature	ca. 5600 K
Life time	ca. 50,000 h
Working distance	55 mm ... 135 mm
Max. illuminance	90 klx (at 75 mm working distance)
Dimensions	outerØ: 114 mm / innerØ: 66 mm / height: 29 mm
Controller	integrated, dimmable 0% ... 100%
Supply voltage	12 V DC
Current	460 mA
Connection	DC socket for pinØ 1.7 mm (+)
Ambient temperature	+ 5°C ... + 40°C
Relative air humidity	up to 31°C ambient temperature: 85% up to 40°C ambient temperature: 75%
Air pressure	700 hPa ... 1060 hPa
Conformity	CE

Ringlight Plus (A)	
Diodes	48 High Brightness LEDs
Color temperature	ca. 5600 K
Life time	ca. 50,000 h
Working distance	50 mm ... 130 mm
Max. illuminance	140 klx (at 65 mm working distance)
Dimensions	outerØ: 114 mm / innerØ: 66 mm / height: 29 mm
Controller	integrated, dimmable 0% ... 100%
Supply voltage	12 V DC
Current	460 mA
Connection	DC socket for pinØ 1.7 mm (+)
Ambient temperature	+ 5°C ... + 40°C
Relative air humidity	up to 31°C ambient temperature: 85% up to 40°C ambient temperature: 75%
Air pressure	700 hPa ... 1060 hPa
Conformity	CE

## EasyLED - Operating Instructions

### Transmitted Light Stage (B)

Diodes	39 SMD LEDs
Color temperature	ca. 5600 K
Life time	ca. 50,000 h
Illuminated surface	Ø 50 mm
Max. luminance	12,000 cd/m <sup>2</sup>
Dimensions	Ø 84 mm / height: 16 mm
Controller	integrated, dimmable 0% ... 100%
Supply voltage	12 V DC
Current	400 mA
Connection	DC socket for pinØ 1.7 mm (+)
Ambient temperature	+ 5°C ... + 40°C
Relative air humidity	up to 31°C ambient temperature: 85% up to 40°C ambient temperature: 75%
Air pressure	700 hPa ... 1060 hPa
Conformity	CE

### Spot Illumination (C)

Diode	1 High Brightness Power LED
Color temperature	ca. 5600 K
Life time	ca. 50,000 h
Max. light flux	40 lm
Dimensions	Ø 24 mm / height: 50 mm
Connection	Ø 2.5 mm Stereo jack plug
Fitting	M6 thread
Ambient temperature	+ 5°C ... + 40°C
Relative air humidity	up to 31°C ambient temperature: 85% up to 40°C ambient temperature: 75%
Air pressure	700 hPa ... 1060 hPa
Conformity	CE

### Controller for Spot Illumination (D)

Dimensions	54 x 35 x 30 mm
Connection	DC socket for pinØ 2.1 mm (+) Ø 2.5 mm Stereo jack plug socket
Supply voltage	5 V DC
Current	600 mA
Ambient temperature	+ 5°C ... + 40°C
Relative air humidity	up to 31°C ambient temperature: 85% up to 40°C ambient temperature: 75%
Air pressure	700 hPa ... 1060 hPa
Conformity	CE

### Power supply unit for spot system (E)

Plug connection	interchangeable for EU, UK, US, AU
Input voltage	100 - 240 V
Input current	0.25 A
Mains frequency	50 - 60 Hz
Power input	12 - 18 VA
Output voltage/current	5 V DC, 1.0 A
Output	5 W
Protection class	II
Conformity	CE, UL PSE

### Power supply unit for ringlight and transmitted light stage (F)

Plug connection	interchangeable for EU, UK, US, AU
Input voltage	100 - 240 V
Input current	0.5 A
Mains frequency	50 - 60 Hz
Output voltage/current	12 V DC, 0.84 A
Output	11 W
Protection class	II
Conformity	CE, UL, PSE

Controller for Double Spot Illumination (H)	
Dimensions	61 x 47 x 38 mm
Connection	DC socket for pinØ 2.1 mm (+) 2 x Ø 2.5 mm Stereo jack plug socket
Supply voltage	5 V DC
Current	1000 mA
Ambient temperature	+ 5°C ... + 40°C
Relative air humidity	up to 31°C ambient temperature: 85% up to 40°C ambient temperature: 75%
Air pressure	700 hPa ... 1060 hPa
Conformity	CE

The right is reserved to make changes in the design and supplied items within the scope of on-going technical development.

## 7. Replacement parts and accessories

Product	Description	Art.-Nr.
Spot illumination	including controller and power supply, M6 thread	600100
Double spot illumination	including controller and power supply, M6 thread	600120
Ringlight	incl. controller and power supply, thumb screws with plastic points	600200
Ringlight Plus	incl. controller and power supply, thumb screws with plastic points	600300
Transmitted Light Stage	Ø 84 mm, including controller and power supply	600400
	Ø 90 mm, including controller and power supply	600413
	Ø 100 mm, including controller and power supply	600414
	Ø 120 mm, including controller and power supply	600416
	Ø 180 mm, including controller and power supply	600412
Holding arms for Spot illumination	300 mm, M6/M4x0.5	600520
	300 mm, M6/M5	600522
	300 mm, M6/M6	600524
	300 mm, M6/M8	600526
	foot stand, M6 thread	158340
Filters	Polarization filter for spot system, rotatable	600600
	Polarization filter system for ringlight (polarizer and analyzer)	400550
	Polarisation filter attachment for transmitted light stage	158500
	Color filter for spot, red	600650
	Color filter for spot, blue	600660
	Color filter for spot, green	600670
	Color filter for spot, yellow	600680
Accessory	Diffusor for ringlight	400570
	Protection glass for ringlight	400560
	Battery box	600800
	Charger for NiMH mignon cells	600810
	Controller for spot system	600900
	Power supply, 5 V, for spot system	600910
	Power supply, 12 V for ringlight and transmitted light stage system	600920

Adapters for different microscope objectives and stands are available upon request.

**SCHOTT AG**  
Business Unit Lighting and Imaging  
Otto-Schott-Strasse 2  
55127 Mainz  
GERMANY  
Tel. +49 / (0)6131 / 66 -0