

# SCHOTT

## KL 1600 *LED*



## Operating instructions



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## Instrument overview





(1)	Electronic light intensity setting	2.4
(2)	On/off switch	2.3
(3)	Locking screw	2.1
(4)	Light guide socket	2.1
(5)	Carrying handle	
(6)	Mains connection socket (back of instrument)	2.2
(7)	Ventilation grid (back of instrument)	1.
(8)	Filter slide	2.5
(9)	Air vents (base of instrument)	1.
(10)	Model plate (base of instrument)	1.
(11)	Indicator light	2.3

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## 1. Important information

### Symbols used

Symbol	Meaning
	Warning of danger (caution, obey documentation)
	Mains supply on/off

### Intended use

The KL 1600 LED cold light source is intended for industrial and laboratory applications.

Cold light sources are used for the intensive illumination of all types of objects. High-intensity visible light is guided to the object using flexible or self-supporting, movable light guides.

In accordance with the EN 62471:2008 standard the KL 1600 LED is a product of Risk Class 2.

The KL 1600 LED fiber optic light source conforms to the following European directives:

2006/95/EC (Low Voltage Directive)

2004/108/EC (EMC Directive)

2002/95/EC (RoHS)

The technical documentation and full compliance with the standards listed below proves the conformity of the illumination system with the essential requirements of the following EC Directives:

EN 61010-1 :2001

EN 61326-1:2006

EN 55011:2009

EN 61000-3-2:2006 + A1:2009 + A2:2009

EN 61000-3-3:2008



### Safety information:

**Please read and obey these instructions carefully. The instrument's safety cannot be guaranteed if they are not obeyed.**

**Never look directly into the open light guide socket or the light guide exit during operation (danger of ophthalmic injury)!**

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The KL 1600 LED emits high-intensity visible light. Because light-absorbing materials have the physical property of converting incident light into heat, damage can arise to heat-sensitive or flammable light-absorbing materials. To avoid such thermal damage and the potential danger of fire or burns, please obey the following instructions:

- Never cover up the light guide socket or light guide exit (danger of fire)!
- Never cover up the open light guide socket or light guide exit with your hands or other parts of the body (danger of burns)!
- When illuminating heat-sensitive or flammable light-absorbing objects (e.g. in microscopy), special care must be taken to ensure that an appropriate suitable distance between light guide and object, and a suitable lamp brightness level are selected so that no thermal damage occurs.
- When the light source is switched on, all light guide exists not being used in the working procedure must always be a safe distance – at least 10 cm – away from heat-sensitive or flammable light-absorbing materials (prevention of possible danger of fire). Care must, therefore, be taken that each light guide exit is at the above-mentioned safe distance away from, for example, dark/colored textiles and dark/colored wooden or plastic surfaces.
- To avoid unnecessary stressing of biological tissue by illuminating with visible light, reduce the brightness and duration of illumination to the absolute minimum required level.

**Please make sure that your KL 1600 LED cold light source is operated at the voltage stated on the model plate (10).**

- ◆ The light source has been developed for operation in dry rooms only! (see Point 6 “Technical data”)!
- ◆ The instrument must not be used in explosive areas.
- ◆ Please ensure the air vents (7, 9) are always kept free. In the case of insufficient cooling an integrated thermo switch continuously regulates the light intensity (see Point 4 “Troubleshooting”)
- ◆ Safe disconnection from the power supply occurs only by pulling out the mains plug.
- ◆ The instrument may neither be opened nor 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.

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## 2. Operation

### 2.1 Light guide connection



First loosen the locking screw (3) on the light guide socket (4) by turning it anti-clockwise. Insert the light guide as far as the stop and tighten the locking screw (3) by turning it clockwise.

Please note: When inserting light guides with a locating pin, care must be taken to ensure that the pin fits into one of the two guide slots.

### 2.2 Power connection

Insert the hollow plug of the supplied power cord into the plug-in socket (6) of the light source.

Please take care to ensure that you only operate your KL 1600 LED light source with the power cord provided.

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).



### 2.3 Start-up procedure



Switch on/off the KL 1600 LED by pressing the on/off switch (2).

When the instrument is switched on the green control light (11) is lit.

Please disconnect power by pulling out the power plug!

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### 2.4 Light intensity setting

The brightness can be adjusted continuously by turning the light intensity setting knob (1).

Six-step intensity control is possible, from 0 – 5.

The highest brightness is reached at the end stop at position 5.

When the brightness control is set at 0 there is no more brightness, i.e. the lamp is off.

**Attention:** Please note that when the brightness control is set at 0 the instrument is not switched off. When the instrument is switched on the green control light (11) is lit. To switch off the KL 1600 LED by pressing the on/off switch (2) once (see point 2.3 “Start-up procedure”). Please ensure safe power disconnection by pulling out the power plug!



### 2.5 Filter slide



The KL 1600 LED has a filter slide (8) which can be fitted with an insert filter from the filter set (available as accessory).

When operating the light source the filter slide must always be engaged in one of the end positions or in the rest position. This is the only way to guarantee optimum air cooling of the light source. Operating the light source with the filter slide in an intermediate position can cause damage to the slide.

#### Fitting the filter slide

Please ensure the filter slide (8) has cooled down before fitting the insert filter.

Completely pull out the filter slide (8) from the light source and slot the required filter from the filter set into the provided holder, ensuring the filter is lying flat in the holder.

Push the filter slide as far as the stop to ensure the filter is positioned in the optical light path.

If you wish to operate the light source for a short time without a filter then only pull the slide out to the first rest position. In this position the filter is still in the light source, but no longer in the light path.

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### 3. Maintenance

Your KL 1600 LED is maintenance-free.

The light source should not be disinfected for use in medical applications.

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

### 4. Troubleshooting

Should you be unable to rectify the faults by the measures listed below, please contact your specialist dealer or the nearest SCHOTT agency. More extensive repairs must be carried out by an authorized after sales service.

Fault	Possible cause	Remedial action
Lamp out	Instrument not switched on	Switch instrument on
	Plug not in socket	Plug in socket
	No mains electricity voltage	Check mains voltage
Light intensity dropping	Electronics overheated	Switch off instrument. Ensure adequate cooling, switch on again after prolonged cooling time.

### 5. KL 1600 LED accessories

A wide range of accessories is available for your KL 1600 LED. Please see our separate catalogue for further details (contact address for additional requirements can be found on page 10).

Proper functioning, safety and optimum luminous efficiency can only be guaranteed with SCHOTT light guides and accessories.

Self-supporting and flexible light guides are available in various lengths and diameters, as well as spot and slit illuminations.

Optical filters can either be inserted in the filter slide or used as screw-in or clip-on filters in conjunction with a focusing attachment (accessory) in front of the light guide exit.

Details on the focusing attachment and available standard filter types can be found in our catalogue.



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## 6. Technical data for KL 1600 LED

Properties		Values
<b>General information</b>		
Type description		KL 1600 LED
Dimensions (W x D x H)	mm	approx. 231 x 114 x 137
Weight	kg	approx. 2.45
Cooling		Axial fan
Ambient temperature*	°C	+ 5 ... + 40
Relative air humidity*	%	Up to 31°C ambient temperature: 85% From 31°C to 40°C ambient temperature: decreasing linearly to 75%
Air pressure*	hPa	700 ... 1060
Transport and storage		
Temperature	°C	-20 ... +70
Rel. air humidity	%	10 ... 95 (non-condensing)
Air pressure	hPa	500 ... 1200
Contamination level		2
<b>Electrical information</b>		
Operating voltage, frequency		90 – 264 V ~ 47 - 63 Hz
Input Voltage	V	24, DC
Power consumption, max.	VA	max. 37
Protection class		II
Overvoltage category		II
Diodes		Osram Ostar Compact
LED nominal output	W	7 x 4.5
Average LED lifetime LED Level 5	h	50,000 (luminous flux reduced to 70%)

\* Test conditions of DIN EN 61010-1 and UL61010-1 standards

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<b>Lighting information</b>		
Maximum effective light guide bundle diameter mm		9
Total light flux at light guide exit (SCHOTT light guide Ø 9 mm, typical value)		
Level 5 lm		650
Color temperature K		Approx. 5,600
Light exit angle ( $2\alpha_{\text{eff}}$ )		Approx. 40°
Conformity		CE
EMC emission class		(power supply CE, UL, PSE) B

We reserve the right to make changes in the design and supplied items within the scope of on-going technical improvements.



### WEEE declaration

Your SCHOTT product was produced and developed with high quality materials and components. The symbol indicates that electrical and electronic devices must be separated from domestic waste and appropriately disposed of after useful life.

SCHOTT AG Lighting and Imaging has arranged a waste management system for recycling. Please use this system for removal and help to protect the environment we live in.

Further information regarding our waste management system, please refer to

[www.schott.com/lightingimaging/recycle](http://www.schott.com/lightingimaging/recycle)

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