KL Series
Fiber optic illumination for stereo microscopy

KL 1500 HAL
SCHOTT is a leading international technology group in the areas of specialty glass and glass-ceramics. With more than 130 years of outstanding development, materials and technology expertise we offer a broad portfolio of high-quality products and intelligent solutions that contribute to our customers’ success.

Light is a key element in stereo microscopy. By using the correct illumination it can make hidden details visible and enhance the contrast of the objects to distinguish the feature of interest. A wide variety of tasks from life science to industrial applications require very different illumination techniques. SCHOTT is able to offer the full range of fiber optic and LED lighting products with an extensive range of accessories to meet your specific needs.
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KL 300 LED

Compact LED light source for fiber optics

The KL 300 LED offers simple operation combined with excellent value for money. It is an innovative fiber optic light source that uses cold light to illuminate all types of objects in life science and industrial applications.

Employing state of the art technology, SCHOTT has developed and designed a single LED driven light source to provide an attractive alternative to conventional halogen cold light sources.

The brightness is equivalent to a 30-watt halogen lamp and therefore ideal as a standard illumination system for the requirements of routine inspections and education.

Due to its smart design, the KL 300 LED can be mounted to any microscope stand or column. The dimming control is ergonomically placed to the focus control of the microscope. As the chosen LED has a long lifetime of at least 50,000 hours it is maintenance free for the user and avoids service and downtime costs. The ripple free illumination is perfect for digital imaging applications. The color temperature of 5,600 K of the emitted neutral white light does not change when the light source is dimmed.

The KL 300 LED combines all advantages of LED light with the illumination through fiber optics: All types of light guides in the KL 200 series can be connected to the KL 300 LED. This allows full flexibility to realize all common illumination techniques.

Like all KL light sources the KL 300 LED is designed for a wide range of power supply (100-240 V; 50-60 Hz). It has been approved and certified as laboratory equipment and is in compliance with the CE regulations.

Features

- 80 lm lightflux
- No fan, silent operation
- Compact ergonomical design
- Mountable direct to the stand or column
- Wide range power supply with international clip plug system

The KL product line offers modular fiber optic illumination for stereo microscopy so that it always matches to the desired application. Therefore the SCHOTT KL product line is not just an accessory but a professional illumination system for even specialized tasks.
KL 1600 LED

Standard LED light source for fiber optics

The KL 1600 LED is an innovative fiber optic light source which uses cold light to illuminate all types of objects in industrial and life science applications. SCHOTT has developed and designed a multiple LED driven light source to provide an attractive alternative to conventional halogen cold light sources. The brightness is equivalent to a 150-watt halogen lamp and therefore ideal as a powerful illumination system for the requirements of all modern stereo microscopes.

Due to its slim design, the KL 1600 LED can be placed close to microscope stand or pillar. The dimming control is then ergonomically placed to the microscope. As the chosen LEDs have a long lifetime of at least 50,000 hours it is maintenance free for the user and avoids service and downtime costs. The ripple free illumination is perfect for digital imaging applications and the color temperature of 5,600 K of the emitted neutral white light does not change when the light source is dimmed.

The KL 1600 LED combines all advantages of LED light with illumination through fiber optics: All different types of light guides of the KL 1500 series can be connected to the KL 1600 LED. This allows the full flexibility to realize all common illumination techniques.

Like all KL light sources the KL 1600 LED is designed for a wide range of power supply (100-240 V; 50-60 Hz). It has been approved and certified as laboratory equipment and is in compliance with the CE regulations.
The KL 2500 LED is an innovative fiber optic light source which uses cold light to illuminate all types of objects in industrial and life science applications. The brightness is equivalent to a 250-watt halogen lamp and therefore ideal as a powerful illumination system for the requirements of state of the art high end stereo microscopes.

The extra fine dimming and display fits to the highest optical magnifications and far advanced applications. As the chosen LEDs have a long lifetime of at least 50,000 hours it is maintenance free for the user and avoids service and downtime costs.

The ripple free illumination is perfect for digital imaging applications and the color temperature of 5,600 K of the emitted neutral white light does not change when the light source is dimmed. In addition all features can be externally controlled via USB from the microscope software.

The KL 2500 LED combines all advantages of LED light with the advantages of illumination through fiber optics: All different types of light guides of the KL 1500 series can be connected to the KL 2500 LED. It enables the full flexibility to realize all common illumination techniques. Like all KL light sources the KL 2500 LED is designed for a wide range of power supply (100-240 V; 50-60 Hz). It has been approved and certified as laboratory equipment and is in compliance with the CE regulations.

Features

- 1100 lm light flux
- Slim ergonomic design
- Extra fine dimming
- Filter slider
- LCD Display
- Controllable via USB
- Wide range power supply
SCHOTT has developed and designed a light source with the full 150 Watt halogen spectrum CRI 100 offering the best performance when it comes to color critical measurements in life science and industrial applications.

With the classic design the KL 1500 HAL can replace all SCHOTT halogen light sources of the last decades. A switchable optic ensures uniform, high intensity illumination even when using light guides with a small diameter.

An ultra low noise fan and an optimized airflow facilitate relaxed working conditions. The LCD display with various parameters enables comfortable operations control and reproducible results. The ripple free illumination is perfect for digital imaging applications.

The KL 1500 HAL combines all features with the advantages of illumination through fiber optics: All different types of light guides of the KL 1500 series can be connected to the KL 1500 HAL. This allows the full flexibility to realize all common illumination techniques.

Like all KL light sources the KL 1500 HAL is designed for a wide range of power supply (100-240 V; 50-60 Hz). It has been approved and certified as laboratory equipment and is in compliance with the CE regulations.

### Features

- 600 lm lightflux
- Switchable optic
- Sensor interlock at the light guide socket
- Ultra low noise fan
- LCD Display

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**KL 1500 HAL**

Professional halogen light source for fiber optics
Objective adapter for ringlights onto microscope objectives of major microscope manufacturers available.
For details refer to system diagrams of microscope manufacturer or referenced SCHOTT datasheets.

Diffuse facelight
active area 78 x 30 mm
fitting light guides
P/N 155 103

Polarization filter
for annular ringlight
Øi = 66 mm P/N 158 430
for annular ring light
Øi = 58 mm P/N 158 440

Power cord EU P/N 400 051
Power cord US P/N 400 052
Power cord UK P/N 400 053
Power cord CH P/N 400 054

Insert filter Ø 28 mm
daylight filter P/N 258 306

Annular ringlight for incident darkfield
flexible length approx. 1000 mm
P/N 157 406

Mini ringlight
flexible length approx. 1000 mm
with changeable adapter
for connecting on KL 300, KL 1500, KL 1600, KL 2500
Øi = 40.0 mm P/N 157 040

Annular ringlight
flexible length approx. 1000 mm
Øi = 58 mm P/N 157 410
Øi = 66 mm (slim) P/N 157 066

Flexible light guide 1-branch
Ø = 4.5 mm/1000 mm
P/N 155 100
Ø = 4.5 mm/1600 mm P/N 155 102
Ø = 5.0 mm/1000 mm P/N 155 103
Ø = 5.0 mm/1600 mm P/N 155 104

Flexible light guide 2-branch
Ø = 4.5 mm/1000 mm
P/N 155 204
Ø = 4.5 mm/1600 mm P/N 155 205

Flexible light guide 3-branch
Ø = 4.5 mm/1000 mm
P/N 155 206

Lightline with adjustable front lens
flexible length approx. 1000 mm
Slit 50 x 1.2 mm P/N 160 100
Slit 100 x 0.6 mm P/N 160 110
Slit 200 x 0.3 mm P/N 160 120

Gooseneck light guide 1-branch
Ø = 4.5 mm/600 mm
P/N 154 101

Gooseneck light guide 2-branch
Ø = 4.5 mm/600 mm
P/N 154 202

Gooseneck light guide 3-branch
Ø = 4.5 mm/600 mm
P/N 154 302

Flexible light guide 1-branch
Ø = 5.0 mm/1000 mm P/N 155 100
Ø = 5.0 mm/1600 mm P/N 155 102
Ø = 8.0 mm/1000 mm P/N 155 103
Ø = 9.0 mm/1000 mm P/N 155 104

Flexible light guide 2-branch
Ø = 4.5 mm/1000 mm
P/N 155 204
Ø = 4.5 mm/1600 mm P/N 155 205

Flexible light guide 3-branch
Ø = 4.5 mm/1000 mm
P/N 155 206

Double combi light guide
Ø = 4.5 mm/500 mm
+ 800 mm
flexible P/N 170 402

KL 1500 HAL
P/N 150 700

Polarization filter
Øi = 66 mm  P/N 158 430
for annular ring light
Øi = 58 mm  P/N 158 440

Polarization filter
Øi = 66 mm  P/N 258 306
for annular ring light
Øi = 58 mm  P/N 258 304
for annular ring light
Øi = 58 mm  P/N 258 305

KL 1600 LED | KL 2500 LED | KL 1500 HAL
System diagram

KL 300 LED

Flexible light guide 1-arm
4.5 mm optic fiber bundle, 600 mm
P/N 121 101

Flexible light guide 1-arm
4.5 mm optic fiber bundle, 1000 mm
P/N 171 101

Flexible light guide 2-arms
4.5 mm optic fiber bundle, 1000 mm
P/N 171 202

Combi light guide 2-arms
4.5 mm flexible, 600 mm
3.5 mm gooseneck, 500 mm
P/N 120 402

Gooseneck light guide 1-arm
3.5 mm optic fiber bundle, 500 mm
P/N 170 101

Gooseneck light guide 2-arm
3.5 mm optic fiber bundle, 500 mm
P/N 170 202

6-point ringlight
Ø = 66 mm, flexible length 900 mm
P/N 172 601

Mini ringlight
flexible length, approx. 1000 mm
with changeable adapter
for connecting on KL 300,
KL 1500, KL 1600, KL 2500
Øi = 40.0 mm P/N 157 040

Analyzer M 49 x 0.75,
type CZ
P/N 158 505
Analyzer M 52 x 1,
type LEICA
P/N 158 510
Polarizing filter
attachment for TL
P/N 158 500

Transmitted light stage;
insert diameter
84 mm,
for flexible light guide
up to Ø 5 mm
P/N 122 150
KL light sources at a glance

<table>
<thead>
<tr>
<th>Feature</th>
<th>KL 300 LED</th>
<th>KL 1600 LED</th>
<th>KL 2500 LED</th>
<th>KL 1500 HAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamp type</td>
<td>LED</td>
<td>LED</td>
<td>LED</td>
<td>HAL</td>
</tr>
<tr>
<td>Lightflux (lm)</td>
<td>80</td>
<td>680</td>
<td>1100</td>
<td>600</td>
</tr>
<tr>
<td>Max. active light guide Ø (mm)</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Wide range power supply</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Continuous dimming</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Extra fine dimming</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>LCD display</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Filter slider</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Fan cooling</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>USB port</td>
<td>●</td>
<td></td>
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<td></td>
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<tr>
<td>Lamp replaceable by user</td>
<td>●</td>
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</tbody>
</table>
Choose from our extensive range of light guides and accessories. These are only some examples.
In all its microscopy light guides, SCHOTT uses the new environmentally friendly glass optical fibers PURAVIS®. Not just the fibers themselves, but also the entire proprietary manufacturing process are lead free and avoid the use of arsenic and antimony. Due to superior physical and chemical properties, the new PURAVIS® glass optical fibers provide a high performance, superior longevity, improved transmission in the near UV and outstanding transmission of white light.

This new milestone in the development of environmentally friendly technologies will not only benefit the environment, but also our customers.

**Puravis® eco-friendly glass optical fibers**

The heart of all fiber optic light guides

**Improved Properties**

- Environmentally friendly
- Superior optical performance
- Long-term stability