

SCHOTT
glass made of ideas

KL Series

Fiber optic illumination
for stereo microscopy

2800 K

0 100

1500 HAL

SCHOTT

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. Reliable illumination solutions are necessary to make hidden details visible and results reproducible. SCHOTT's Lighting and Imaging division offers a complete portfolio in fiber optic and direct LED illumination to provide the most suitable contrasting solution for a variety of industrial applications and life science.



Contents

- | | | | |
|-----------|------------------------------|-----------|----------------------|
| 4 | Discover our KL Series | 16 | Light Guide Variants |
| 6 | KL Fiber Optic Light Sources | 20 | Accessories |
| 8 | Light Source Variants | 21 | System Diagrams |
| 14 | KL Fiber Optic Light Guides | | |

Discover our KL Series

SCHOTT's KL series combines fiber optic light sources with a broad range of light guides that use PURAVIS® glass fibers to offer high levels of flexibility and light quality. Taken with specialist light guides such as line lights, the illumination portfolio provides solutions for all applications.



Intense light for high magnification

Combining the high light output of SCHOTT's light sources with our light guides offers significantly higher intensities compared to direct LED light. Our KL models are favourable for intense lighting for magnifications over 30x.

**Uniform light quality**

The KL series demonstrates its full strength in situations where uniform light quality is crucial. Carefully matched components deliver homogeneous illumination, while consistent color temperature, controllable features and a variety of accessories enable our light sources to deliver accurate results every time.

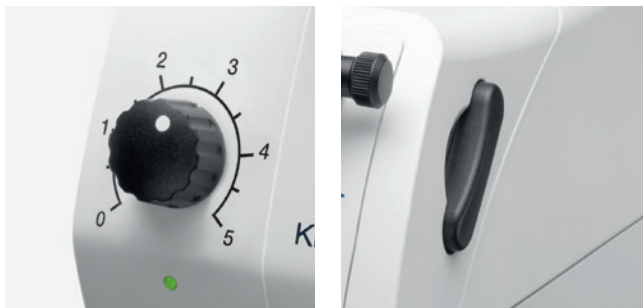
KL Fiber Optic Light Sources

SCHOTT's KL Fiber Optic Light Sources with LED or halogen illumination are widely used in stereo microscopy for a broad range of applications. As cold light sources, they are ideal in heat-critical situations, and with a halogen light option, natural color reproduction is available across the full spectrum.



Reduced heat influx

SCHOTT launched its first cold light source in 1970, and these sources were quickly established as a market standard. As the light is guided from the cold light source via light guides, heat at the specimen is reduced to a minimum.





Smart design

SCHOTT KL Fiber Optic Light Sources are ergonomically designed for efficiency and performance. Their small footprint opens up more workspace, while the high quality materials and production offers near-silent operation for distraction-free working.

Benefits



Quiet operation

Fan-less or low-noise fan with air vent at the rear of the casing.



Maintenance-free

LED lifetime of 50,000 hours.



Remote control

Options for USB connectivity for remote control.

Light Source Variants

Our light sources are available in a number of models, each with their own set of properties and features to give you the widest choice of intensity, options and accessories. Whether it's the compact KL 300 LED or the powerful KL 1500 HAL for color-critical applications, high performance comes as standard across the range.



KL 2500 LED

The KL 2500 LED is the performance leader in advanced cold light sources with an LED light engine. With a highest light output and wide range of special features, it's ideal for customers with specialist requirements.

Characteristics

- Patented white light engine
- USB connectivity
- Electronic shutter function
- LCD display indicating brightness, operation mode or error code
- Intensity control with three sensitivities
- Two-position filter slider

Advantages

- Maximum light intensity of 1,100 lm
- Connection for foot switch
- PC-controllable via USB connection
- Continuous dimming from 0-100 %
- Extra-fine dimming option, down to 0.1 % steps
- Maintenance-free LED engine with 50,000 operating hours



KL 1600 LED

A standard LED cold light source for fiber optics, the KL 1600 LED is an ideal option for all objects and applications. Its multiple-chip white LED light engine offers an attractive alternative to conventional halogen cold light sources.

Characteristics

- Patented white light engine
- Easy to use fixture mechanism with clamping screw
- Two-position filter slider

Advantages

- Maximum light intensity of 680 lm
- Continuous dimming from 0-100 %
- Maintenance-free LED engine with 50,000 operating hours



KL 1500 HAL

The KL 1500 HAL is a color-neutral professional halogen light source for fiber optic illumination. With the full 150-Watt halogen spectrum of CRI 100, it's designed to deliver optimum performance for color-critical measurements.

Characteristics

- High frequency illumination of 20 kHz
- Sensor interlock at the light guide socket
- LCD display to monitor color temperature and light intensity
- Swing-in optics for homogenization of light output
- Two-position filter slider

Advantages

- Maximum light intensity of 600 lm
- Color rendering index of 100 for excellent performance
- Continuous dimming from 0-100 %





KL 300 LED

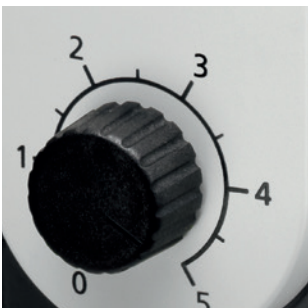
The KL 300 LED is a compact LED light source for fiber optics, offering simple operation combined with excellent value for money. These qualities make it ideally suited to routine inspections and education.

Characteristics

- Compact design
- Directly mountable to stand or column
- Wide range power supply with international clip plug system

Advantages

- Maximum light intensity of 80 lm
- Continuous dimming from 0-100 %
- Maintenance-free LED engine with 50,000 operating hours
- Fan-less convection cooling enables silent operation





Features

An at-a-glance guide to the features of SCHOTT's range of KL Fiber Optic Light Sources.

Feature	KL 300 LED	KL 1600 LED	KL 2500 LED	KL 1500 HAL
Lamp type	LED	LED	LED	HAL
Lightflux (lm)	80	680	1100	600
Max. active light guide Ø (mm)	6	9	9	9
Wide range power supply	●	●	●	●
Continuous dimming	●	●	●	●
Extra fine dimming			●	
LCD display			●	●
Filter slider		●	●	●
Fan cooling		●	●	●
USB port			●	
Lamp replaceable by user				●

KL Fiber Optic Light Guides

SCHOTT's KL Fiber Optic Light Guides offer modular fiber optic illumination for stereo microscopy and are the ideal match for our KL Light Sources. Made using high quality PURAVIS® glass fibers in a tough metal housing, they deliver strong performance, superior longevity and outstanding transmission of white light.



High white light transmission

All SCHOTT microscopy light guides use PURAVIS® glass optical fibers to offer high light transmission and low color shift. And thanks to an improved numerical aperture, the light guides capture more light at their source, leading to a brighter, more intense output.



Mechanical stability

Our light guide designs are light-weight yet offer strong protection against pressure and other mechanical challenges for improved fiber longevity. The bundles also have extremely small bending radii, as well as high flexural capabilities.

Benefits



Mechanical stability

Our light guides design includes protection against pressure and other mechanical challenges for improved longevity.



Homogeneous lighting

Perfectly harmonized system with SCHOTT KL Fiber Optic Light Sources.



Specialized design

60 years of experience gives SCHOTT the edge in light guide design.



High compatibility

A broad portfolio of adapters ensures SCHOTT light guides fit almost all microscopes.

Light Guide Variants

The optimal illumination of objects under examination is the most decisive factor for accurate results in stereo microscopy. The range of products and accessories in SCHOTT's Fiber Optic Light Guide series ensures that you receive the very best contrast for your application.



Gooseneck Light Guides

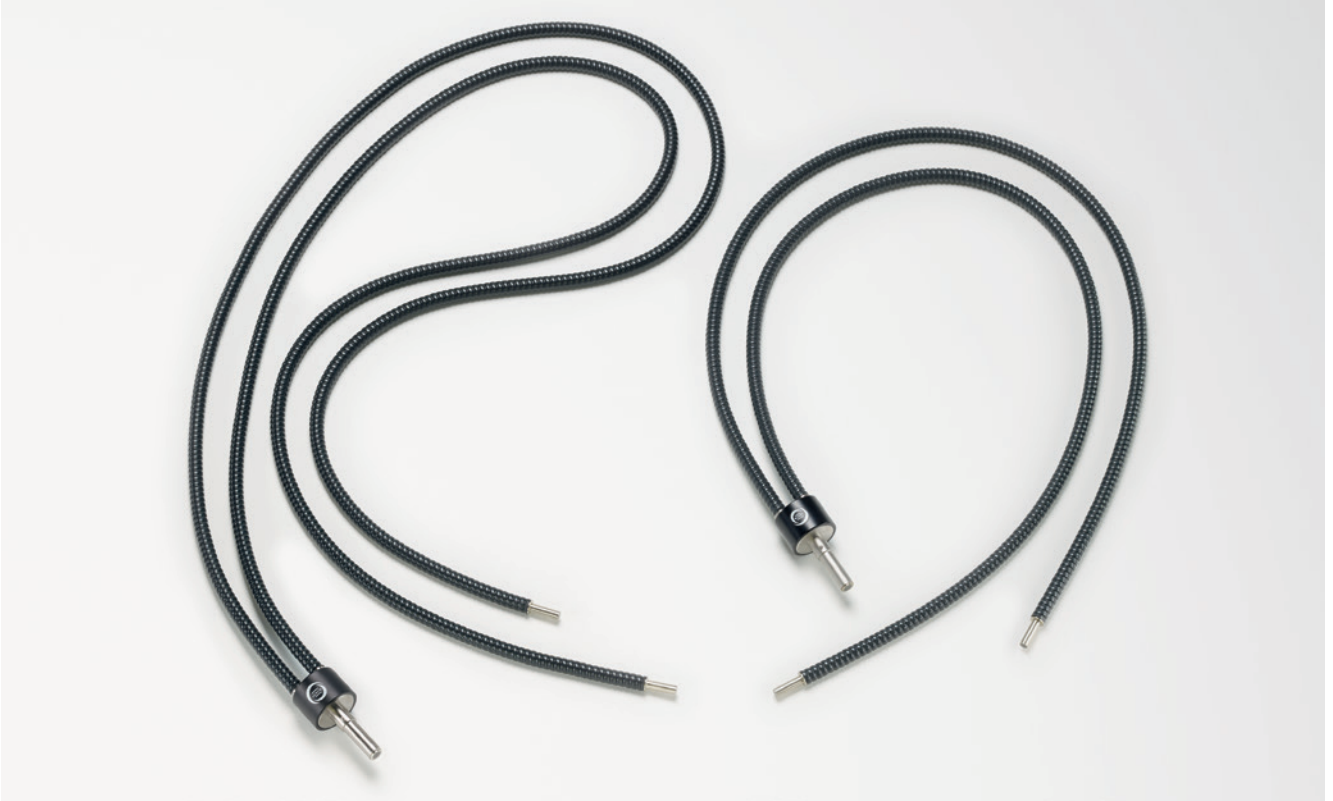
SCHOTT Goosenecks are flex-and-stay light guides that remain in place after positioning, providing flexible and obedient incident illumination for space-constrained applications.

Characteristics

- Available with one, two or three branches
- Available as two-branch Gooseneck with flexible input bundle (Combi Light Guide)
- Focusing optics and filter accessories available
- High white light transmission thanks to the use of SCHOTT PURAVIS® fibers

Advantages

- Perfect trade-off between flexibility and mechanical stability
- Mechanical stability enables long-term usability and precise positioning for complete control of light placement
- The Combi Light Guide can be fixed stationary at the microscope stand



Flexible Light Guides

SCHOTT Flexible Light Guides are highly bendable. In contrast to goosenecks, they allow a higher flexibility and need to be held.

Characteristics

- Flexible Light Guides are available in different lengths and diameters
- Available with one, two or three branches
- Focusing optics, filters and mechanical accessories are available
- High white light transmission thanks to the use of SCHOTT PURAVIS® fibers

Advantages

- High flexibility for different lighting
- Extra long lengths available





Ring Lights

SCHOTT Fiber Optic Ring Lights are available as six-point, annular or darkfield versions with specific advantages. For all ring lights we offer adaptors for a variety of objective series.

Characteristics

- Mounts directly to the objective using a thumb screw
- Housing made of rugged, black, anodized aluminum
- Fiber bundle protected by flexible metal PVC sheathing
- High white light transmission thanks to the use of SCHOTT PURAVIS® fibers

Advantages

- Annular ring lights offer absolute shadow-free illumination
- Six-point ring lights offer a cost-effective alternative to annular ring lights
- Darkfield ring lights offer low-angle illumination for shiny, reflective surfaces





Line Lights

SCHOTT Line Lights are used to increase the visibility of fine surface structures on flat samples. When illuminated with line light, the sample is lit from the side at a flat angle, resulting in contrast being enhanced by grazing light and its shadow effects.

Characteristics

- Line lights offer intense homogeneous slit illumination
- Adjustable cylindrical lens to reduce the illumination angle by up to three degrees
- Housing made of rugged, black, anodized aluminum
- Fiber bundle protected by flexible metal PVC sheathing

Advantages

- Three different slit slices available according to sample size
- Line lights offer low-angle illumination for objectives with flat structures
- Mechanically stable configuration when combined with a separate articulated arm



See SCHOTT's line lights in action and learn about typical areas of application.



Accessories

SCHOTT provides a wide range of mechanical and optical accessories to increase the flexibility of its KL Light Sources and Light Guides.

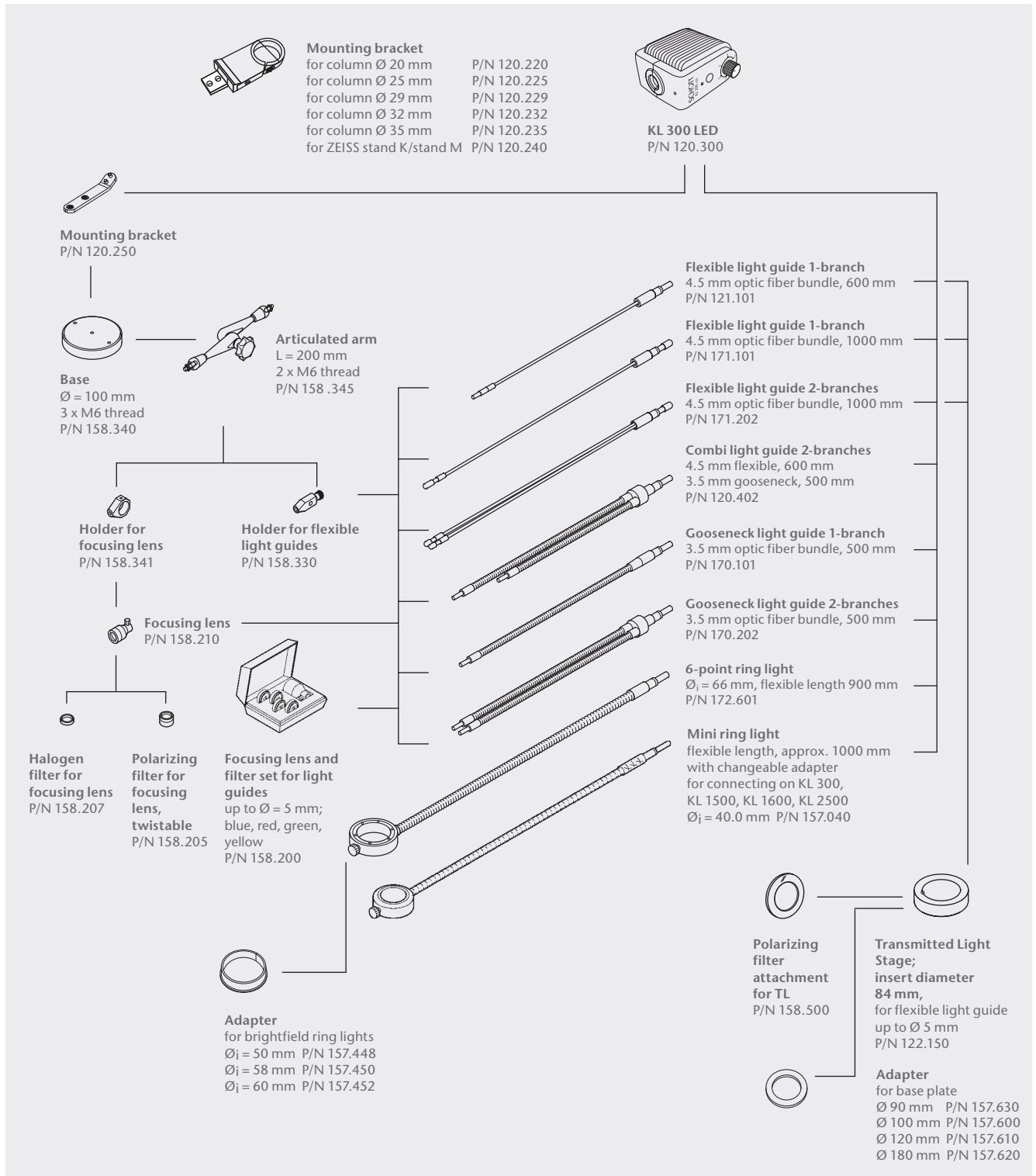
Examples



- 1 | Color Filters
- 2 | Transmitted Light Stage
- 3 | Mounting Brackets for Column
Ø from 25-35 mm
- 4 | Adapter for Combi Light Guide
- 5 | Focusing Lens and Filter Set
- 6 | Articulated Arm
- 7 | Base
- 8 | Holders

System Diagrams for KL Series

KL 300 LED



KL 1600 LED | KL 2500 LED | KL 1500 HAL

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
 blue P/N 258.302 green P/N 258.304
 red P/N 258.303 yellow P/N 258.305

KL 1500 HAL
 P/N 150.700

Light guide adapter
 for Volpi and Photonic
 P/N 158.320

Insert filter Ø 28 mm
 daylight filter P/N 258.306

A Adapter for working
 Distance (WD)
 WD 30-50 mm P/N 157.569
 WD 30-80 mm P/N 157.567
 WD 30-110 mm P/N 157.562

Polarization filter
 for annular ring light
 Ø_i = 66 mm
 P/N 158.430

A Adapter
 for brightfield ring lights
 Ø_i = 50 mm P/N 157.448
 Ø_j = 58 mm P/N 157.450
 Ø_j = 60 mm P/N 157.452

B Diffuse facelight
 active area 78 x 30 mm
 P/N 500.100
 fitting light guides
 P/N 155.103

Annular ring light
 for incident darkfield
 flexible length
 approx. 1000 mm
 P/N 157.406

Mini ring light
 flexible length
 approx. 1000 mm
 with changeable adapter
 for connecting on KL 300,
 KL 1500, KL 1600, KL 2500
 Ø_i = 40.0 mm P/N 157.040

Annular ring light
 flexible length
 approx. 1000 mm
 Ø_i = 58 mm P/N 157.410
 Ø_j = 66 mm P/N 157.420

Annular ring light
 flexible length
 approx. 1000 mm
 Ø_i = 66 mm (slim) P/N 157.066
 Ø_i = 81 mm P/N 157.081
 Ø_i = 86 mm P/N 157.086

Line light 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

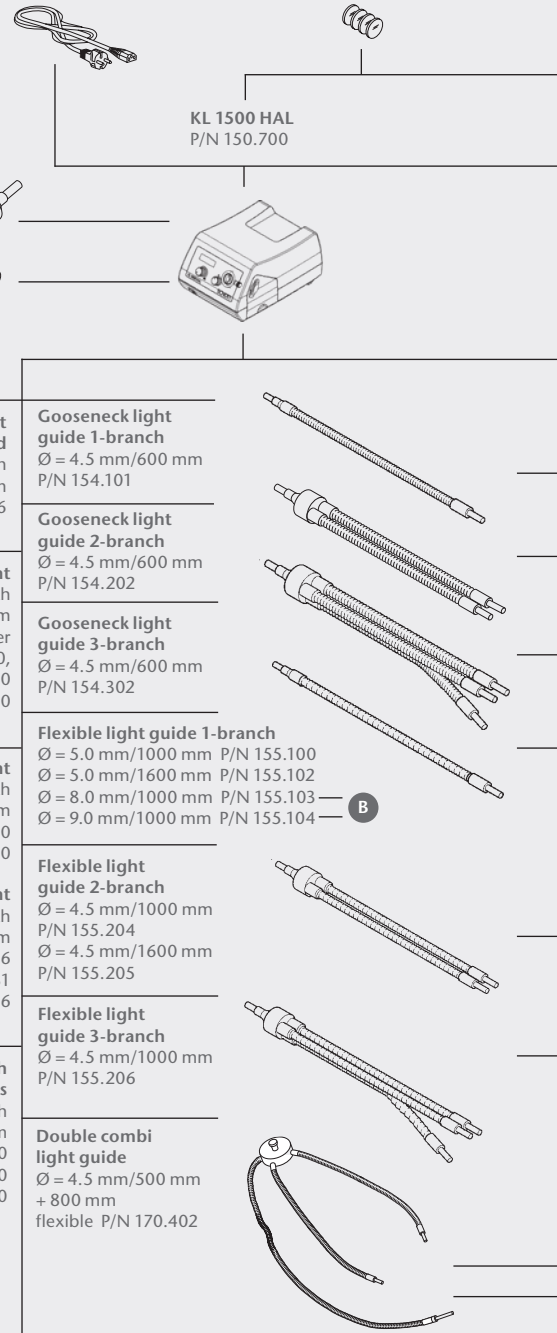
Gooseneck light
 guide 3-branch
 Ø = 4.5 mm/600 mm
 P/N 154.302

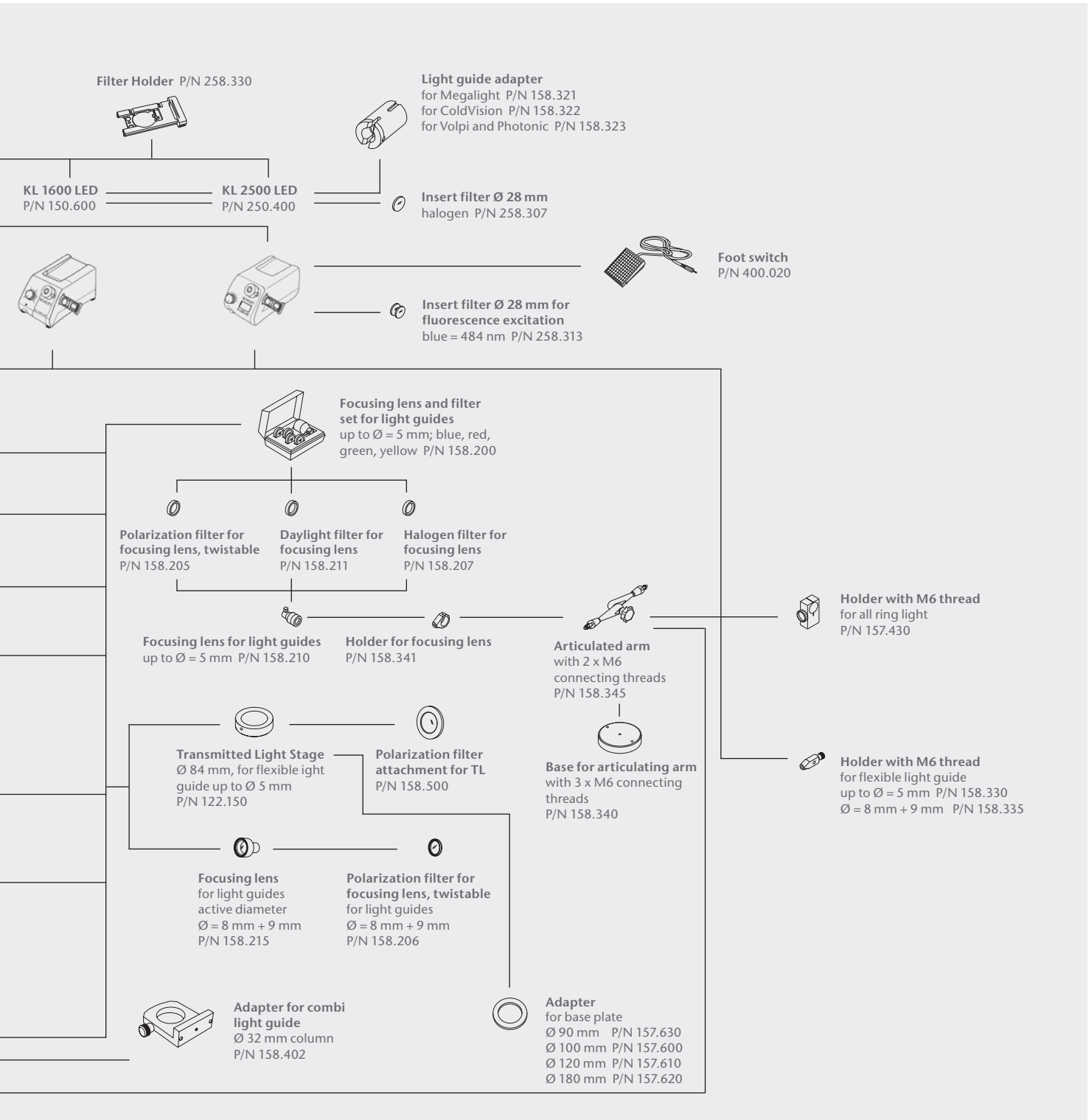
Flexible light guide 1-branch
 Ø = 5.0 mm/1000 mm P/N 155.100
 Ø = 5.0 mm/1600 mm P/N 155.102
 Ø = 8.0 mm/1000 mm P/N 155.103
 Ø = 9.0 mm/1000 mm P/N 155.104

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





SCHOTT North America, Inc.

122 Charlton Street
Southbridge, MA 01550

USA

Phone + 1 (508)765-9744

Fax + 1 (508)764-6273

info.microscopy@us.schott.com

www.schott.com/microscopy