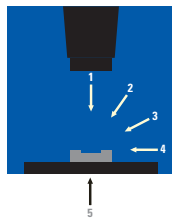


COLD LIGHT TECHNOLOGY

THE INNOVATIVE LIGHTING SY

PROPER LIGHTING is a basic need for precision work. In microscopy cold light sources constitute an essential piece of equipment in order to optimally illuminate specimens under examination. Photonic's fibre optic lighting is a highly innovative lighting system that is designed specifically to fulfil the complex scientific and engineering needs.

The light guide is supplied with "cold" light by perfectly coordinating the heat protection filter and the halogen lamp and by spatially isolating the halogen lamp from the surface being illuminated. The light is transported by bundles of glass fibres and guided to the object in the form of concentrated cold light, virtually free of heat-bearing infrared wavelengths.



THE TYPE AND DIRECTION of the illumination are critical for the outcome. Three approaches are used for the desired optimum image contrast: Incident light (offers highest light intensity with maximum flexibility and greatest selection of lamps), dark field ringlight and transmitted light.

1 Ringlight (incident light)

The aim is to provide shadow-free and homogenous illumination of the specimen. The accessories available help produce polarised, diffused and fluorescent light.



2 Flexible, incident and gooseneck lightguides (incident light)

Flexible light guides, incident light guides and gooseneck light guides produce direct illumination. Light output is increased by up to 40% thanks to the use of the patented optical elements.



3 Dark field ringlight

The light has a very low angle of incidence at the surface of the object, ensuring improved recognition of surface structures. Minimal working distance, optimum representation of edges and vertical structures.



4 Line converter (incident light)

Using fibre optic line converters or line converter adapters visually enhances the structure of the surface being illuminated as a result of the extremely low angle of incidence of the light, particularly in forensic applications.



5 Transmitted light

Transmitted light illumination systems serve to illuminate objects from below.



SYSTEM

PHOTONIC is one of the leading companies in the optics and opto-electronics industry and has a high level of expertise in the field of light projection and fibre optics. It has been accruing knowledge and skills since the birth of the optics industry. Today, Photonic is one of the world's major providers of fibre optic technology.

Photonic lighting systems excel by virtue of their

- ▶ Precise object illumination
- ▶ High light output
- ▶ Even illumination without a dark spot
- ▶ Individual structuring of the light beam with light guides, lens attachments and filter/filter combinations
- ▶ Variety of illumination options even in inaccessible places
- ▶ Increased lamp life thanks to the newly developed soft start electronics
- ▶ Unexpected voltages are discharged in combination with ESD light guides



Stackable

The stackability of the units is of great benefit for a number of applications and logistics.



Ergonomic design

Photonic cold light sources are constructed from an ergonomic standpoint. From the handle to their light weight, everything is designed to facilitate "optimum" operation.



Side filter insert

The filter insert is located on the side of the unit. This means that filters can easily be exchanged, even when units are stacked. A wide range of different adapters are available. The filter frames have also been designed for easy filter glass exchange at any time.



Simple lamp replacement

The ergonomic design of the light source and the ease of access to the lamp socket mean that lamps and lamp sockets can be replaced without the need for any other tools.



PHOTONIC
PL 3000

LIGHTSOURCES

PHOTONIC COLD LIGHT SOURCES guarantee a new dimension in terms of light output, light quality and system costs. They are compatible with all microscopes from leading manufacturers.

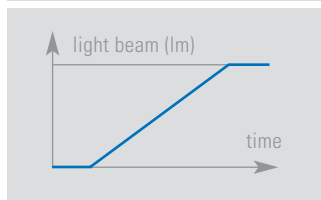
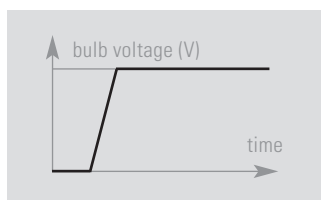
Quiet vibration-free operation

Thanks to their optimised ventilation systems, Photonic cold light sources are equipped with more compact ventilators than other light sources providing the same output and in the case of minimal electric rated capacity they are not fitted with any active cooling at all. Cushion mounted ventilators, a special plastic housing, and absorption elements on the base plate of the light source reduce the level of noise and vibration to a minimum or eliminate them completely.



Electrical brightness control and turbo mode

The electrical brightness control permits the infinitely variable regulation of light intensity. In turbo mode, the lamp is operated at excessive voltage to increase brightness and output further. In many cases lamp life can be extended considerably using the appropriate setting based on the actual functional requirements.



Soft Start

The integrated switch mode power supply gently increases lamp voltage after activation, increasing lamp life.

Long lamp life

The life span of the halogen lamp is maximised through optimal cooling, the electronic brightness control, and the soft start facility. All these measures result in a significant increase in the life of the lamps, while maintaining high light output.

Heat absorbing filter

A so-called heat absorbing filter is installed in the light path of the cold light source to minimise the level of heat. This means that a large percentage of the thermal radiation is already transformed into heat and dissipated in the light source before it enters the light guide.

Model	Specs	Lifespan
EKE	150 W/21 V	200 h
EJA	150 W/21 V	50 h
DDL	150 W/20 V	500 h

Lamps

Lamps offering different lifespans are available to suit your individual needs.

PERFECT LIGHT FOR EVERY N



PL 1000

- ▶ Most economical option
- ▶ Electronic brightness control
- ▶ No ventilator
- ▶ For applications requiring absolutely noise-less, vibration free operation

PL 1000 B

- ▶ Additional mechanical brightness control



PL 2000

- ▶ High economical output
- ▶ Electronic brightness control
- ▶ Long lamp life
- ▶ Ventilator-cooled light source

PL 2000 B

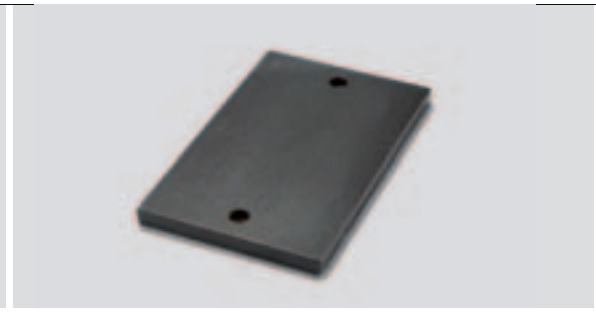
- ▶ Additional mechanical brightness control

ZUBEHÖR LICHTQUELLEN



Slot-in filters

Colour and daylight filters allow the light path to be structured in many various ways. The filter frame is designed for exchanging filters easily and also for using one's own appropriately modified filters. Additional effects can be achieved in combination with the light guide filters.



Base plate

Firmly attaching it to the underside of the light source, especially when using gooseneck light guides, greatly improves overall stability.



PL 3000

- ▶ Optimal light output
- ▶ Electronic brightness control
- ▶ Maximum cost effectiveness
- ▶ Ventilator-cooled light source

PL 3000 B

- ▶ Additional mechanical brightness control



PL 3000 R

- ▶ Lamp with universal voltage range (100–240 V)
- ▶ Ripple free power supply (PFC)
- ▶ Electronic brightness control
- ▶ Connection for manual remote-control
- ▶ Remote socket for serial interface (RS 232) for computerised control (for PL 3000 R and RB)

PL 3000 RB

- ▶ Additional mechanical brightness control



Serial interface (RS 232) for PL 3000R to support control and **remote control** with memory function for electronic brightness control





LIGHT GUIDES



FIBRE OPTICS from Photonic deliver outstanding transmission speeds and optimum light distribution. The luminous flux is unrivalled in comparison with that of its competitors. High-quality fibre sheathing prevents fibre breakage, while the light guide connection is exceptionally heat resistant. This guarantees the highest quality in each particular application and exceptionally long optical fibre life.

- ▶ Highest transmission speed
- ▶ High-quality sheathing protects fibres
- ▶ Stable aluminium end-piece design
- ▶ Optimal light distribution
- ▶ High temperature resilience
- ▶ Long fibre durability combined with intense light sources



Focusing lens attachment for ringlights

Larger working distances can reduce light output considerably. The newly developed focusing lens attachment (standard ring-light component) ensures optimal illumination regardless of the working distance.

Working distance	Increase in brightness with focusing lens
60 mm	1.5 x
75 mm	2 x
100 mm	3 x
300 mm	7 x



Optical element to eliminate dark spot

The development of a special optical element eliminates the dark spot in the middle of the illuminated work surface (occurs primarily with standard light guides with smaller light guide cross sections, see small upper image), resulting in an increase in the light output of up to 40 % (lower image)

FLEXIBLE, SEMI-FLEXIBLE AND



Flexible lightguides can be moved freely and are available as one or two armed designs. They allow single-point illumination.



Gooseneck lightguides with one or two arms also allow single-point illumination. A semi-flexible protective/encasing sleeve means the light guide can be positioned in any direction. Gooseneck light guides are also available as **ESD versions**, i.e. any charge that may occur will be dissipated via/through the light source.

Incident lights consist of a flexible lead to a dual gooseneck which can be attached to the rear of the microscope tripod. This means that the gooseneck can be affixed to the microscope and the light source positioned wherever required.



The transmitted light illuminator is attached to the work surface of a stereo microscope and connected to the light source by means of a flexible light guide.

D COMBINED



Fibre optic line converter for extreme incident light illumination. The high light output of the integrated adjustable cylinder lens allows the optimal detection of diverse surface structures and is available in different lengths and diameters



Patented line converter attachment for all flexible light guides, incident light guides and gooseneck light guides. Permits the optimal detection of various surface structures.

ACCESSORIES LIGHTGUIDES, GOOSENECK LIGHTGUIDES AND INCIDENT LIGHTGUIDES



Filter and focusing lens holder

The filter and focusing lens holder consists of a frame onto which the focusing lens and/or suitable filter can be screwed. A huge range of filters is available for mastering the most diverse tasks.



Adjustable stand for flexible lightguides

Consists of a heavy base plate and an articulated arm that can be swivelled in all directions. It is attached by only one locking screw and is fitted with a universal and protective light guide holder. Alternatively, the articulated arm can also be attached by means of an M6 thread or an M8 adapter, without the base plate.



Incident light adapter for attaching incident light guides to microscope tripods

MANY RINGLIGHTS DESIGNS



Standard ringlights (66 mm with focusing attachment) can be attached directly onto the stereo microscope lens, providing homogenous, shadow-free illumination. They are available as **4-point ringlights** and **continuous ringlights** with a range of long, flexible leads. Adapter 66/58 mm and other adapters for different lens diameters are also available.

Various sizes

The ringlights are available in 18 mm, 25 mm and 40 mm diameters.

High light output thanks to focusing attachment

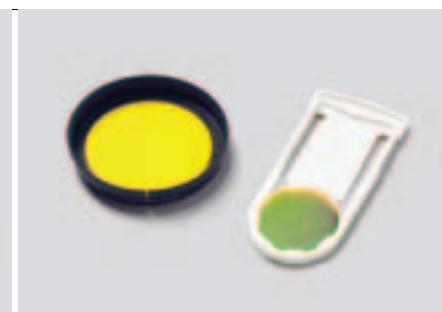
A special patented focusing attachment is available to increase light intensity at the object by means of adjustments in relation to the working distance. By twisting this easily installed element, optimal illumination can be guaranteed, irrespective of the working distance. It is available for continuous and 4-point ringlights with 66 mm internal diameters.

ACCESSORIES FOR RINGLIGHTS



Polarising filter set for ringlights

The polarising filter set, consisting of a polarizer and analyser, suppresses reflection. It is used to examine highly reflective or transparent materials and is installed in the ringlight.



Fluorescence filter sets for ringlights

This filter set consists of an excitation filter installed in the light source, and a cut-off filter installed in the light path of the lens. The set is employed to examine fluorescence in the visible range.



Customised solutions for lightguides in response to customer's special requirements, e.g. 66 mm continuous ringlight with 90° angled lightguide and focusing attachment or maxi-ringlight with 188 mm internal diameter.

Continuous ringlights 66 mm are also available in **ESD versions** (without focusing attachment), i.e. any charge that may occur will be dissipated via/through the light source.

Dark field ringlight

Depending on the illumination distance, the low angle of reflection allows various illumination intensity distributions. Positioned directly over the object.



Diffuser

Generates diffuse light for homogenous and shadow-free illumination

Segment shutter

Moving the positioning slide masks a segment of the ringlight.

Ringlight adapters

For microscope lenses that do not allow ringlights with a standard diameter of 66 mm to be attached, a large number of adapters is available. Adapters can be individually customised in response to customer needs.

ALL PRODUCTS - SPECIFICATI

LIGHTSOURCES

Model		PL 1000	PL 2000	PL 3000	PL 3000 R
Article number	230–240 V	596-20-15099	596-20-25099	596-20-35099	–
	230–240 V B*	596-20-15199	596-20-25199	596-20-35199	–
	100–120 V	596-20-16099	596-20-26099	596-20-36099	–
	100–120 V B*	596-20-16199	596-20-26199	596-20-36199	–
	100–240 V R	–	–	–	596-20-38099
	100–240 V RB*	–	–	–	596-20-38199
Light intensity max. (at light guide input)		8 Mlx	18 Mlx	26 Mlx	26 Mlx
Halogen bulb		30 W/10.8 V	100 W/12 V	150 W/21 V	150 W/21 V
Power input max.		50 VA	150 VA	200 VA	200 VA
Brightness control		continuous	continuous	continuous	continuous
Turbo range		•	•	•	•
Color temperature	at max. standard position	3200 K	3250 K	3250 K	3250 K
	with daylight filter	5400 K	5400 K	5400 K	K 5400 K
Color temperature display		–	–	–	–
Lamp life	at max. standard position	770 h	3000 h	1500 h	1500 h
	at max. turbo position	70 h	360 h	160 h	160 h
Electric control increases lamp life		•	•	•	•
Elimination of dark spot		•	•	•	•
Heat protection filter		–	•	•	•
Filter insert at side		•	•	•	•
Filter exchange in frame possible		•	•	•	•
Stackable		•	•	•	•
Soft start		•	•	•	•
Optimised cooling		•	•	•	•
Cool plastic housing		•	•	•	•
Overheating protection		•	•	•	•
Soundproofing		No noise	•	•	•
Vibration damping		No vibration	•	•	•
Breeze-free workplace		•	•	•	•
Handle		•	•	•	•
Easy bulb replacement		•	•	•	•
Easy bulb socket replacement		•	•	•	•
Easy fuse replacement		•	•	•	•
Fuses (230/240 V, 100/120 V) T ... mA		500/800	1250/2500	1250/2500	2500
Mains cable, plug-in		•	•	•	•
Light guide connection (Ø)		15 mm	15 mm	15 mm	15 mm
Housing material		PC + ABS	PC + ABS	PC + ABS	PC + ABS
Fire resistance V-0 (UL)		•	•	•	•
Color		RAL 9001	RAL 9001	RAL 9001	RAL 9001
Dimensions in mm		168/120/268 mm	168/120/268 mm	168/120/268 mm	168/120/268 mm
Weight		1.3 kg	1.5 kg	1.6 kg	1.6 kg
No frontal light emission		•	•	•	•
CE certifications		•	•	•	•

*B = Version with additional mechanical brightness control

ONS AND EQUIPMENT

LIGHTGUIDES / RINGLIGHTS

FLEXIBLE LIGHTGUIDES		Length LG	LG Ø** 3 mm	LG Ø** 4,5 mm	LG Ø** 7 mm
1-arm		800 mm	598-20-001	598-20-011	598-20-021
		1200 mm	598-20-002	598-20-012	598-20-022
		1600 mm	598-20-003	598-20-013	598-20-023
2-arm		800 mm	598-20-031	598-20-041	598-20-051
		1200 mm	598-20-032	598-20-042	598-20-052
		1600 mm	598-20-033	598-20-043	598-20-053
GOOSENECK LIGHTGUIDES		Length LG	LG Ø** 4 mm		
1-arm		550 mm	598-20-061		
2-arm		550 mm	598-20-062		
2-arm ESD		550 mm	598-20-068		
INCIDENT LIGHTGUIDES		Length flex. LG / Gooseneck	LG Ø** 4 mm		
2-arm		800 / 550 mm	598-20-071		
		1200 / 550 mm	598-20-072		
		1600 / 550 mm	598-20-073		
RINGLIGHTS		Length flex. LG	LG Ø** 6,3 mm	LG Ø** 8,3 mm	
4-Point-RL 66 mm*		800 mm	598-20-091		
		1200 mm	598-20-092		
		1600 mm	598-20-093		
Cont. RL 66 mm*		800 mm		598-20-081	
		1200 mm		598-20-082	
		1600 mm		598-20-083	
Cont. RL 66 mm* ESD		800 mm		598-20-088	
	Length flex. LG		LG Ø** 6 mm	LG Ø** 7 mm	LG Ø** 9 mm
Cont. RL 66 mm* with 90° angled LG		1000 mm			595-20-130
Cont. RL 18 mm		1000 mm		598-20-101	
Cont. RL 25 mm		1000 mm	598-20-102		
Cont. RL 40 mm		1000 mm		598-20-103	
Darkfield RL		1000 mm		595-20-143	
LINE CONVERTER		Length x Ø Cyl. / Length flex. LG			
		30 x 0,50 mm / 800 mm	595-20-088		
		50 x 0,50 mm / 800 mm	595-20-083		
		50 x 1,00 mm / 800 mm	595-20-127		
		80 x 0,50 mm / 800 mm	595-20-089		
		100 x 0,50 mm / 800 mm	595-20-090		
		120 x 0,50 mm / 800 mm	595-20-073		
		300 x 0,45 mm / 800 mm	595-20-072		
Line converter attachment			595-20-140		
BACKLIGHT					
		(suitable for all flexible light guides)	595-30-075		

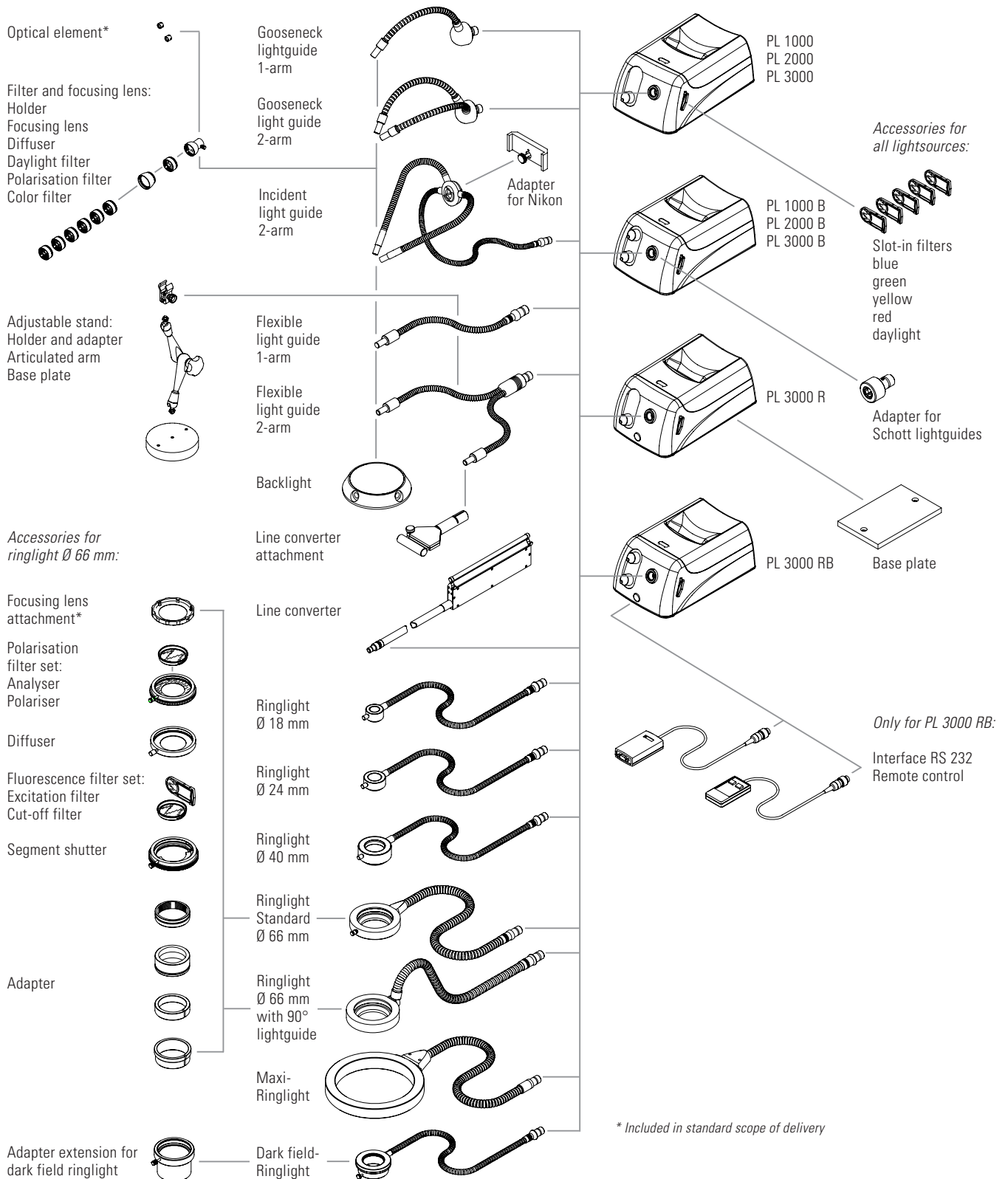
* Adapter 66/58 mm available upon request

** active diameter fibre bundle

ACCESSORIES

LIGHTSOURCES		RINGLIGHTS	
Filter frame without filter	593-37-006	Polarising filter set	598-20-027
Filter holder with blue filter	593-30-001	Polariser	595-30-001
with green filter	593-30-002	Analyser	595-30-002
with yellow filter	593-30-003	Fluorescence filter sets:	
with red filter	593-30-004	420/500 nm	595-20-058
with daylight filter	593-30-005	470/540 nm	595-20-065
with grey filter	593-30-221	505/580 nm	595-20-066
Remote control for PL 3000R	593-30-006	530/600 nm	595-20-067
Serial interface (RS 232) for PL 3000 R	593-30-008	570/640 nm	595-20-068
Base plate	596-30-051	Excitation filter 420 nm	593-30-030
Adapter for Schott standard light guides	593-30-007	470 nm	593-30-031
LIGHTGUIDES / GOOSENECKS / INCIDENT LIGHTGUIDES		505 nm	593-30-032
Articulated support arm	595-30-029	530 nm	593-30-033
Base plate	595-30-028	570 nm	593-30-034
Light guide holder	595-30-005	Cut-off filter 500 nm	595-30-004
Filter and lens holder	595-30-006	540 nm	595-30-041
Focusing lens 20	595-30-007	580 nm	595-30-042
Focusing lens 26	595-30-056	600 nm	595-30-060
Filter blue	595-30-008	640 nm	595-30-043
green	595-30-009	Segment shutter	595-30-080
yellow	595-30-010	Diffuser	595-30-024
red	595-30-011	Adapter 66/58	595-32-258
daylight	595-30-012	66/54	598-30-002
polarisation	595-30-013	66/50	598-30-017
Incident light adapter for Nikon SMZ 600, 800, 1000	598-30-023	66/47	598-30-004
Incident light adapter for Nikon SMZ 1500	598-30-024	66/60	598-32-043
		66/62	598-32-127
		66/M48 x 0.75	598-32-049
		66/M55 x 0.75	598-32-050
		Universal 38–58 mm	598-30-022
		Adapter extension for dark field ringlight	595-30-083

VERSATILE SYSTEM





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