

FALYCON®



LED LIGHTING FOR MACHINE VISION



Image Processing solutions always start with the correct choice of light

Loan service

Loan service arrangements for LED lights for hands-on **testing** at your facility can be quickly and conveniently made on short notice for a service fee. You have use of the lights for two weeks, with an option to extend for an additional two weeks. This gives you the certainty that you have chosen the right lights for your project.

It could not be easier to get a loaner:

- Give us a call at +49 7132 99169-0 or
- send us an email to: info@falcon-illumination.de

Assuming the goods are in stock, the requested lights will be shipped to you on the same day.



Having Falcon test my object

You have an object but are not certain about the correct lights? In this case, send us your object under test, a description of your inspection task, and information about the processing environment (available space, lights, working distance to the camera, speed). This allows us to reproduce the tests as much as possible under the same ambient conditions.

We will then send you the test images we prepared for your evaluation.

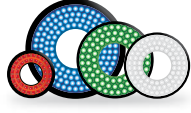
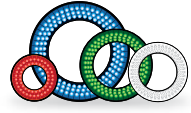
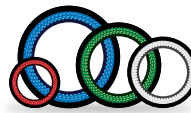
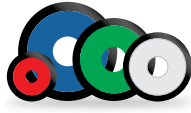
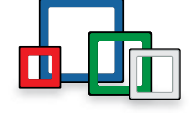
Testing my object in the test lab with FALCON support

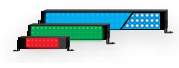
You have the option to use our lab to thoroughly test your object together with our specialists. You can do so with any lights we carry in stock.

- Simply arrange an appointment with us.



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Useful information

LED types

FALCON installs LEDs optimized for the particular light application. The FLDR-LA1 series is for example by default equipped with SMD LEDs, which have a large radiation angle. The FLDR-LA3 series is by contrast equipped with through-hole-LEDs, which have a narrower radiation angle. The background is that the FLDR-LA1 series calls for diffused light, whereas the FLDR-LA3 series needs more directional light due to the larger working distance. The following description can be used as a basic guide for LED types.



Through-hole-LEDs are available in 3mm and 5mm versions. The 3 mm LED is the standard configuration, whereas the 5 mm LED is intended for more cost-effective and slightly lower performing EASY versions. The radiation angle of wire LEDs is narrow, resulting in high light intensity. The high intensity can be used to generate optimized surface reflections.

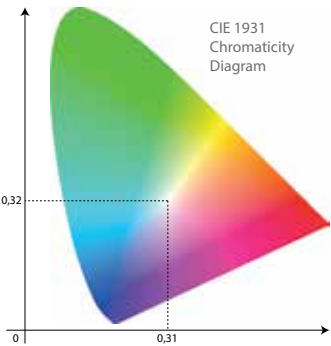
As implied by the name, **SMD-LEDs** (surface-mounted device) are soldered onto the surface of circuit board. SMD LEDs generally have a larger radiation angle and therefore appear less bright than wire LEDs. So-called high-power SMD LEDs are the solution for lack of light output. They generate high light output at a large radiation angle.

Superflux LEDs are next-generation developments of through-hole-LEDs. They consist of several semi-conductor crystals and therefore also have several connections. They are also equipped with a lens that focuses the wide radiation angle of the light, resulting in high light intensity with homogeneous ambient illumination.

The CIE color space

The horseshoe-shaped color space specified by CIE (International Commission on Illumination) was originally created in 1931. It emulates the color perception of the human eye and is recognized as a reference color system. It applies to monochromatic light with wavelengths between 380 nm and 700 nm.

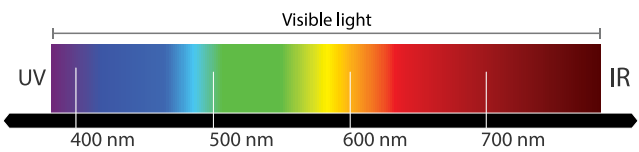
The CIE color space model has its origins in the three color model. The three color model states that all other colors can be generated by mixing the primary colors red, green, and blue. The triangle for the three-color model is frequently still shown in the horseshoe for the CIE color space.



Wave length

The human eye can only see the wave length range between approx. 380 nm and 780 nm. The UV range is below, and IR range is above this. The human eye cannot fully perceive these two ranges.

- UV(A): 315 - 380 nm
- Blue: 450 - 490 nm
- Green: 490 - 560 nm
- Red: 630 - 700 nm
- IR (A,B): 780 - 1400 nm



Lights with or without series resistor?	
Lights can be ordered from FALCON with or without series resistor. By default, lights are shipped with a series resistor installed. These two options are compared as follows:	
Lights with series resistor	Lights without series resistor
Are primarily operated on constant voltage sources.	Are exclusively operated on constant current sources.
Can be overdriven by applying a higher voltage.	Can be overdriven by applying a higher current.
Can be operated on constant current power sources, but cannot be overdriven.	Are destroyed when operated on constant voltage sources since the current is not limited.
Provides protection against destruction when operated at 24 V since the current flow is limited by the resistor.	

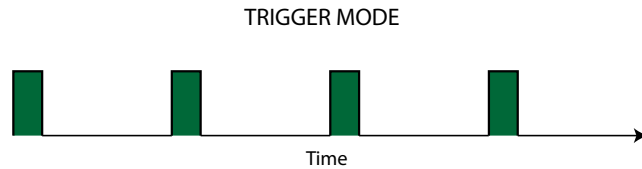
Useful information

Service life

Some manufacturers of LEDs specify the service life at approx. 50,000 to 100,000 hours before the brightness declines to 50% of the original value. The service life is based on the **continuous mode**. In order to achieve such a service life, both the working environment and ambient temperature must be optimized in the application. We therefore specify a realistic service life of approx. 20,000 hours, assuming premium LEDs are used. These values apply for LEDs of type T1, T3, and SMD. Due to the high reflections and energy density, other values apply for LEDs in the **UV range**: A service life of up to 10,000 hours is realistic for UV LEDs of type T1 and T3, and up to 25,000 hours for SMD LEDs.



The **service life** of LEDs can be **extended** to save costs by using the **LIC** light intensity controller. The LIC can operate lights in TRIGGER mode, therefore extending their service life by several factors. The service life can be additionally extended by oversizing the light output already during the planning phase, and then readjusting any loss of intensity with the LIC. Use of the LIC to extend the service life is particularly recommended for high-output lights applications and custom solutions.

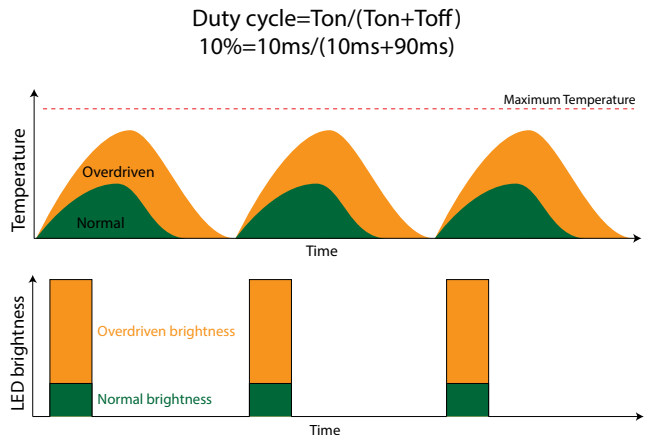


Observe the following to maximize the LED service life:

- PCB material (aluminum PCB for high-power LEDs).
- Thermal protection (polymer) between PCB and housing.
- Housing design chosen to bring the operating temperature to approx. 40 °C.
- Strobe mode helps to extend the LED service life.
- Active cooling can be used to dissipate heat from housing.

Overdriving (STROBE MODE)

The option to overdrive the lights is available if the light output is insufficient in standard mode. All FALCON standard lights can be overdriven! Overdriving the LEDs generates a considerable amount of heat as an undesirable side effect. Sufficient cool-down time must be allowed in order to prevent irreparable damage to the LEDs due to overheating. This time is defined by the duty cycle. The duty cycle is the ratio of time 'ON' to 'Full Cycle Length' (On+OFF). A maximum duty cycle of 10% is set for STROBE mode.

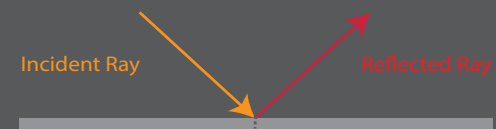


Two different overdriving methods are available:

- Overdriving by applying a higher **operating voltage**. This method is supported by the **PSD** power supply and the **LIC** controller. Both units supply the lights with output voltages of up to 48V. The "On" time is internally limited to 7.5 ms to prevent overheating.
- Overdriving by applying a higher **current**. Support for this method is provided by lights supplied **without series resistor**. This method is generally suited for professional users.

Illumination angle

The primary function of lights is to maximize the contrast differentiation between the defect attribute and component. The illumination angle and light form have a significant influence on how inspection and defect attributes are rendered visible in the image.

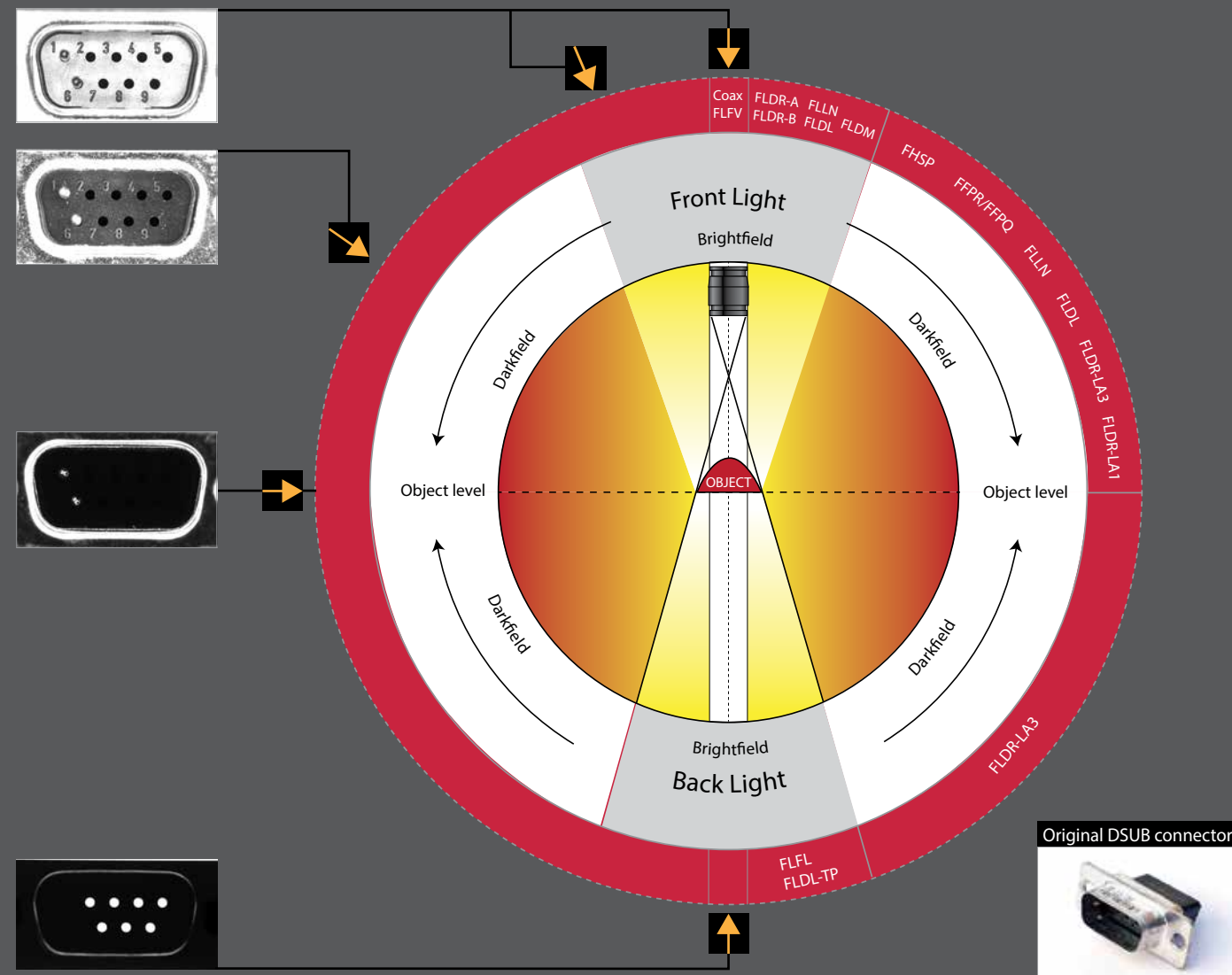


The law of reflection is the fundamental rule for arranging lights:

Angle of incidence = Angle of reflection

The light can be arranged to illuminate from above, at an angle from the side, from both sides, horizontally, or from below onto the inspected object. Depending on the surface texture, material properties and form, the inspected object and its defect attributes reflect, diffuse, absorb, or transmit the light, or throw a shadow. Other than the illumination angle, it is also important whether the light shines directly onto the inspected object or is diffused.

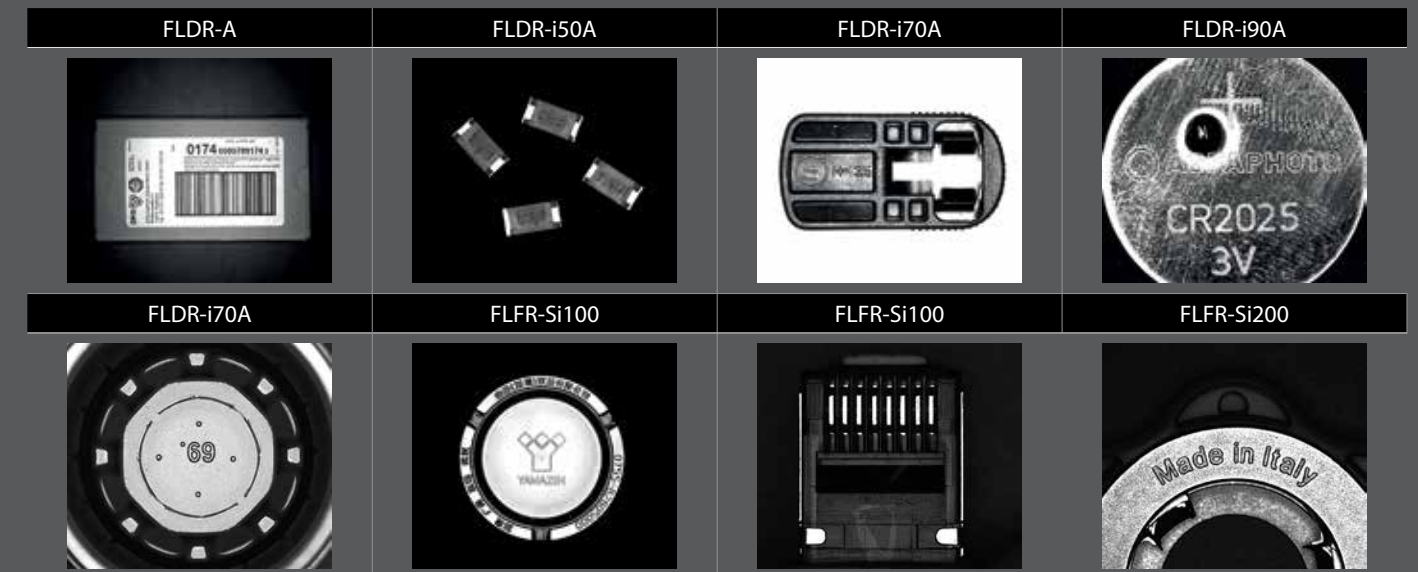
Depending on how the light is positioned, the same object will generate completely different results in the camera image. The following graphic shows images of an objects using various illumination angles.



Illumination angle

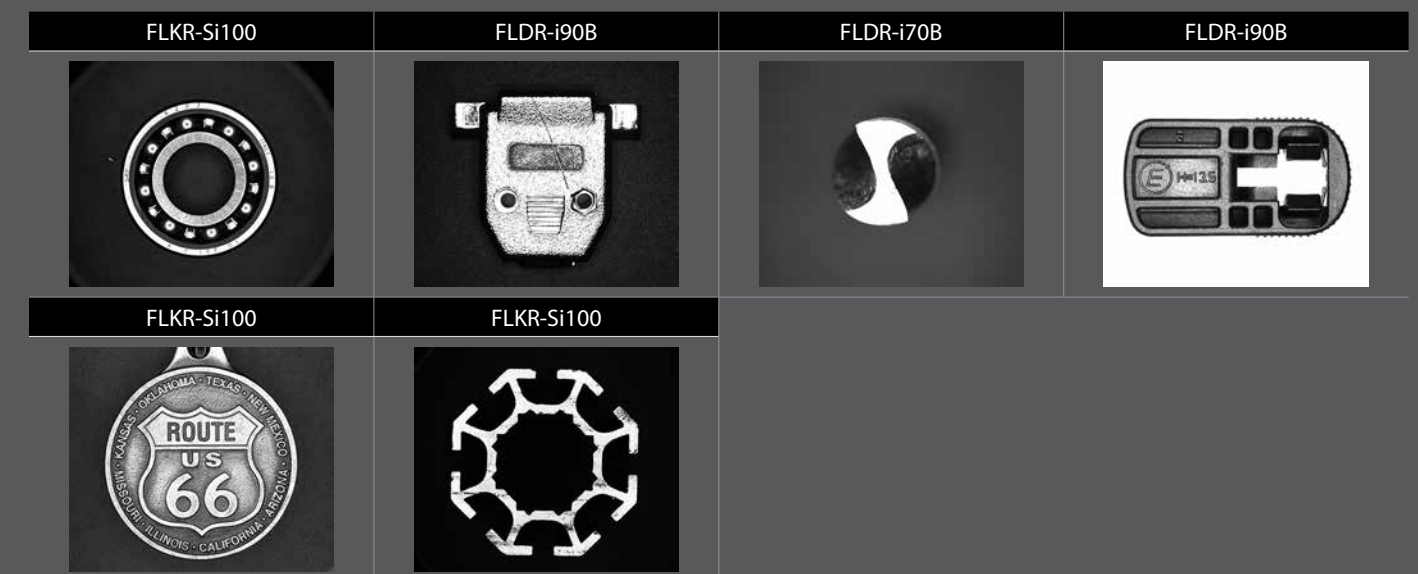
 Incident light, direct

Direct incident light can be used when highly-reflective surfaces are inspected on embossing or engraving, or when less reflective colors are inspected.



 Incident light, angled

Similar to direct incident light, angled incident light is highly suited for inspecting surface textures. The slight tilt of the LEDs highlights edges better and shadows are created in depressions.



For questions:

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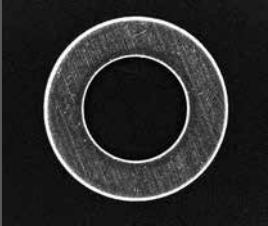
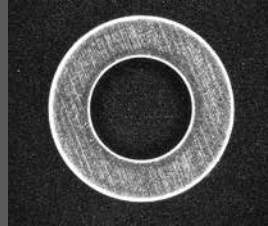
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www.falcon-illumination.de

Illumination angle

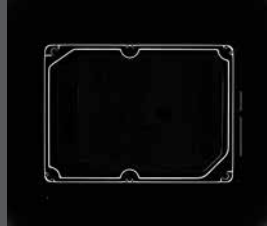
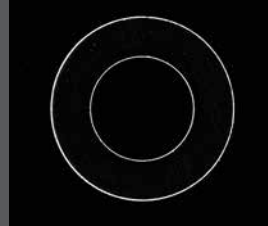
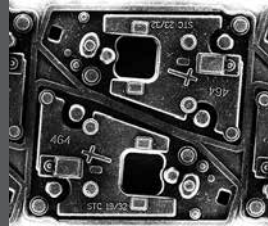
Dark field, tilted

Dark field lights accentuate beveled edges and scratches while at the same time giving the flat surface within a depression a dark appearance.

FFPR-Si100	FLDR-i100-LA3	FLDR-i100-LA3	FLDR-i100-LA3
			
FLDR-i100-LA3	FLDR-i100-LA3	FLDR-i100-LA3	
			

Dark field, horizontal

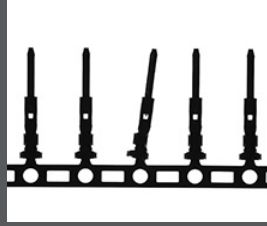
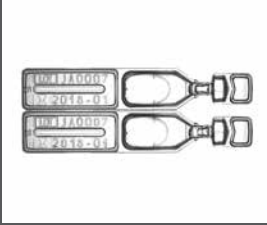
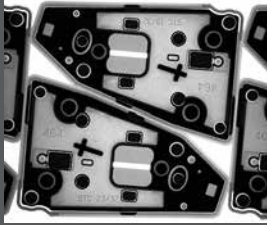
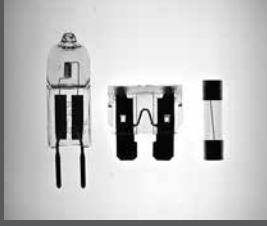
Horizontal dark field lights are frequently used for position control. They create enormous contrast between brightly lit edges and surfaces rendered in black.

FLDR-Si130-LA1	FLDR-Si130-LA1	FLDR-i220-LA1	FLDR-Si100-LA1
			
FLDR-Si100-LA1	FLDR-Si100-LA1	FLDR-Si100-LA1	FLDR-Si100-LA1
			
FLDR-Si100-LA1	FLDR-Si120-LA1	FLDR-Si130-LA1	FLDR-Si220-LA1
			

Illumination angle

Back light

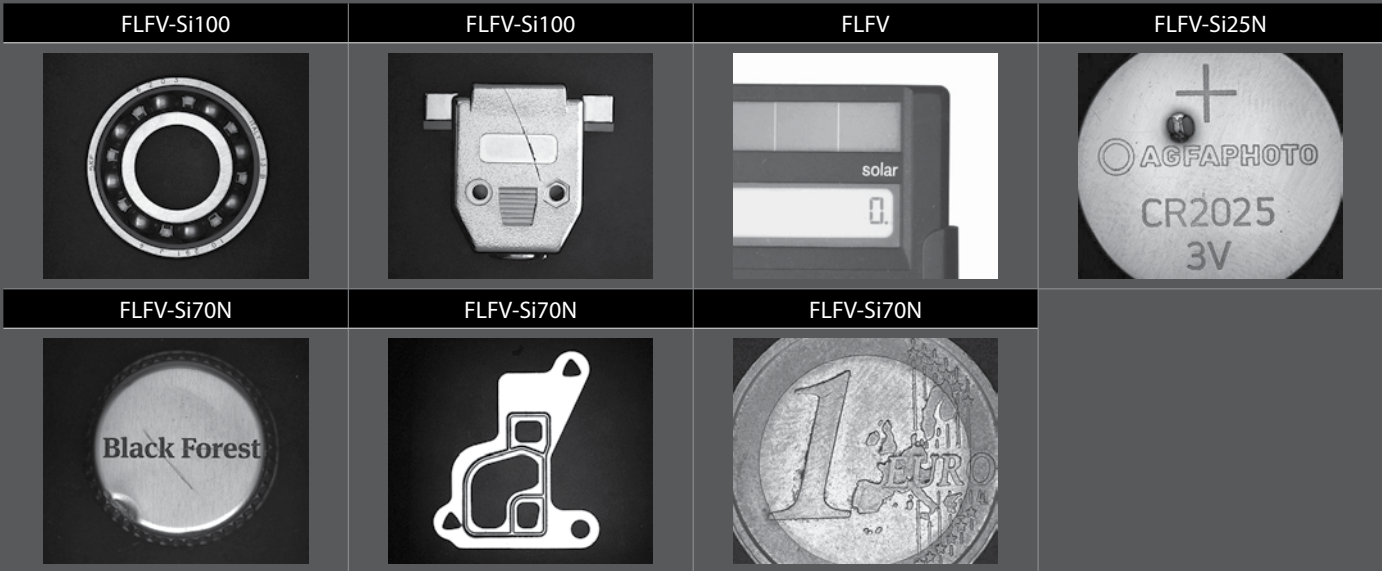
Back light is used to shine through thin materials in order to detect inclusions. Position controls for opaque parts are also easily implemented.

FLDL	FLDL-TP	FLDL-TP	FLDL-TP-Si100
			
FLDL-TP-Si100	FLDL-TP-Si200x100	FLDL-TP	FLFL
			
FLDL-TP	FLDL-TP		
			

Illumination angle

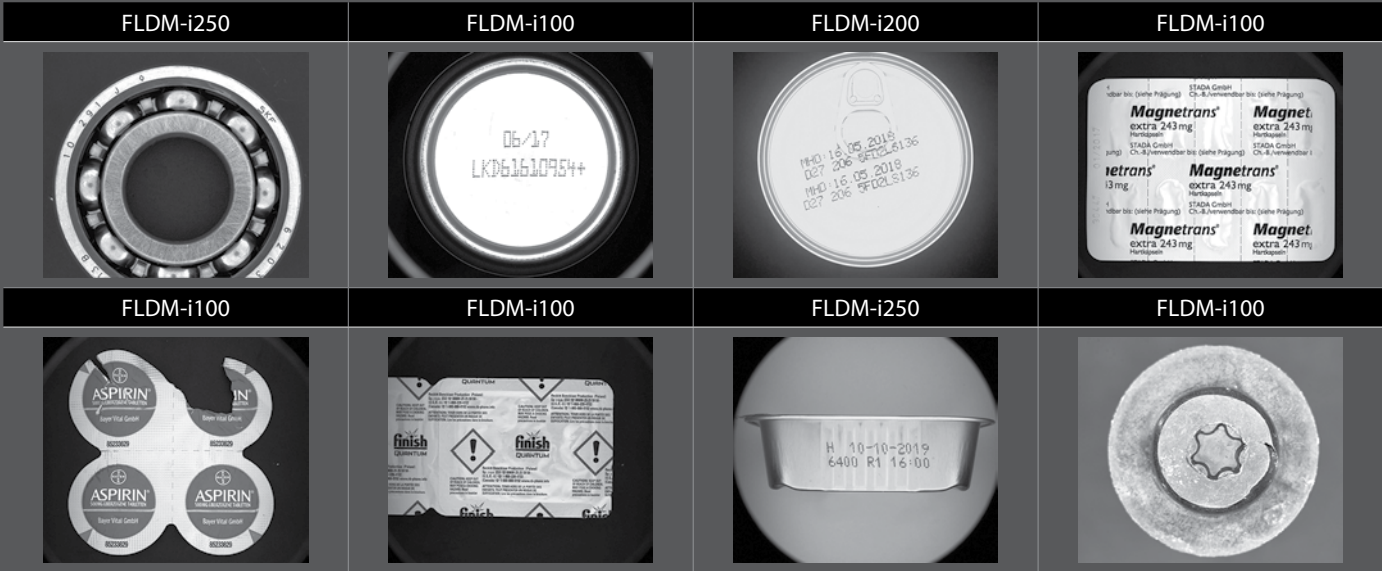
Coaxial

Coaxial lights create a homogeneous illumination of highly-reflective surfaces, while the internally installed one-way mirror permits illumination without a camera aperture.



Dome

Dome lights allow uneven textures to be fully illuminated, thus eliminating height differences. The indirect and extremely diffused light also gives shiny surfaces a more matte appearance than with direct light.



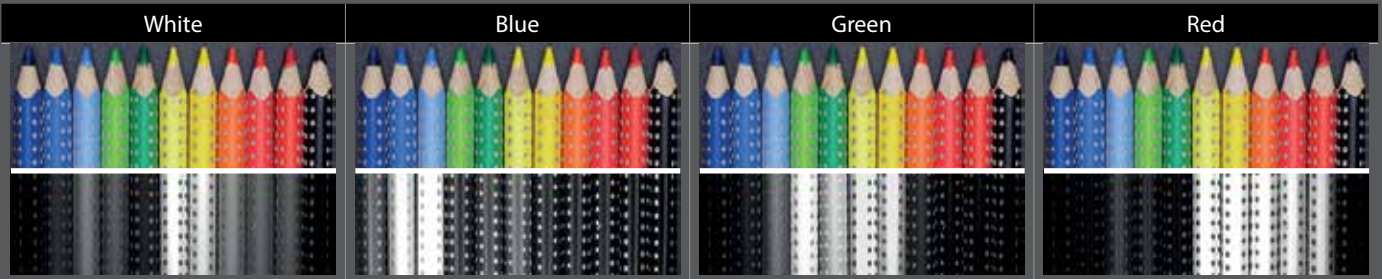
Illumination color

The use of colored lights is of elementary importance in industrial image processing applications. Different light colors have various effects on colored objects.

When the wave length of the object approximately matches the light color (e.g. red light color and red object), the two cancel each other, rendering the objects or print very bright to white. Conversely, a complementary color (opposing color) can be used to render the object very dark to black (e.g. blue light color and red object). A skilled match of colored light with the color of the inspected object can then be used to achieve an increase or decrease of contrast.

Colored pens

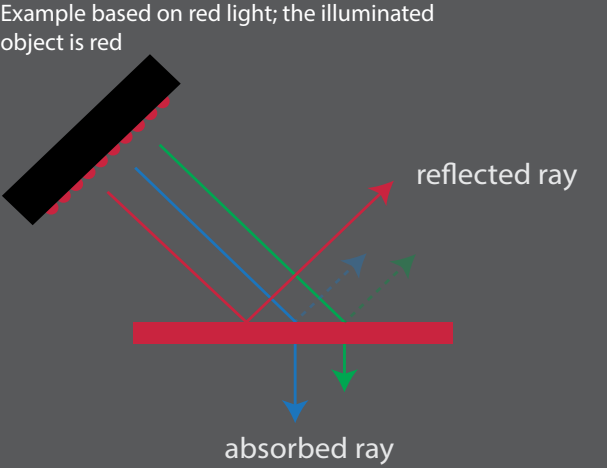
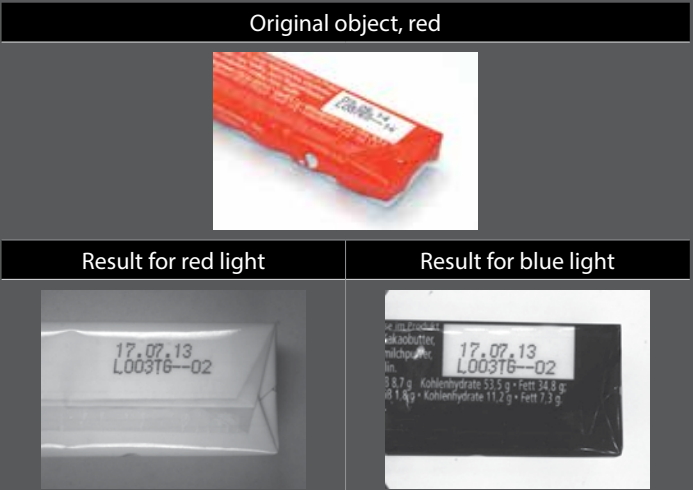
The image on the left shows colored pens illuminated with white light. This creates reflections on colored pens with large white content, such as yellow. The reflection then results in bright image sections. By contrast, the color black has a small content of white light. The white light is therefore absorbed and no reflection is generated and a dark image section is captured. Complementary colors act in the same manner as black and white, Complementary colors are located opposite to each other in the color wheel; for instance red and green. The reflection and absorption properties as it relates to light colors can be exploited for inspection tasks.



The light colors ultraviolet (UV) and infrared (IR) must be treated separately. They are in the not visible spectrum and are therefore also not shown in the color wheel. There is nevertheless a guideline for using UV and IR light. UV light is generally used to illuminate fluorescent substances. Due to its short wave radiation, UV light also generates enormous reflections on metal surfaces. By contrast, IR light generates less reflection due to its long wave radiation. It penetrates materials or can even shine through these. Colors are then blended out and textures are rendered visible.

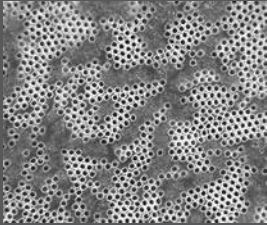
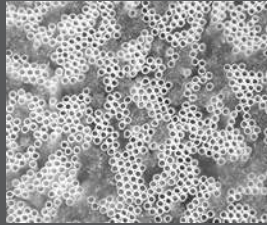
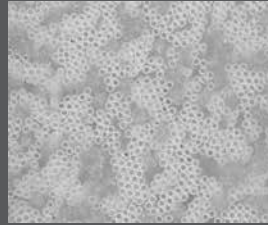
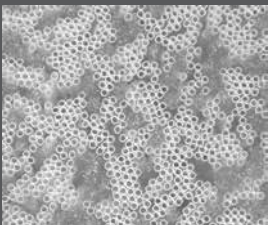
Chocolate bars

The effects of complementary colors are first shown using chocolate bars as an example. When illuminated with red light, the red packaging appears white. When it is illuminated with the complementary color blue, the same image section appears dark. The rule of thumb is: Equivalency is reflected/returned, opposites are absorbed.



Illumination color

This task involved inspecting the tubes of the blood filter for blockages. This calls for creating a strong contrast differential between the tubes and the remaining surface. The greatest possible contrast differential is achieved with UV light. Due to the short wavelength, the material is reflected or absorbed even for minimal penetration depths. The deeper levels of the material are then filtered out, whereas the surface is highlighted. Higher wave lengths such as red or infrared are suited for penetrating deeper into the material to highlight foreign objects within the material.

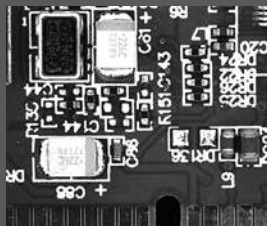
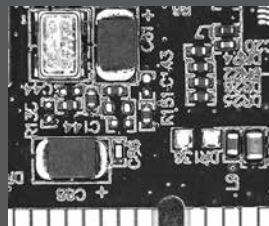
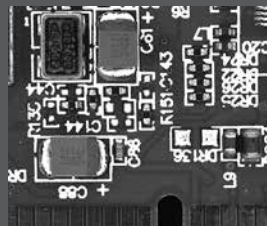
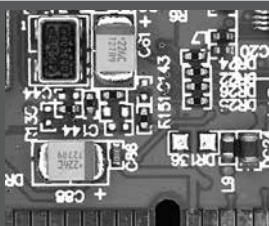
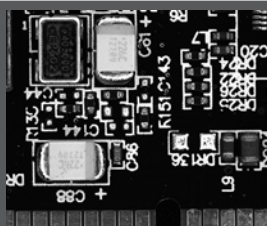
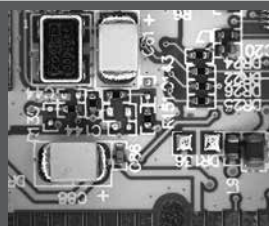
Original blood filter	UV	Blue	Red
			
White			

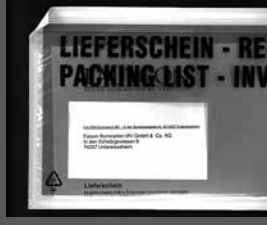
The following illustration shows a yogurt lid illuminated with various colors. Depending on the light color, the contrast for certain colors is increased or decreased.

Original	Blue	Green	Red	
				
White	IR			

Illumination color

Original	White	Blue	Red
			
IR			

Original	White	UV	Blue			
						
Green	Red	IR				

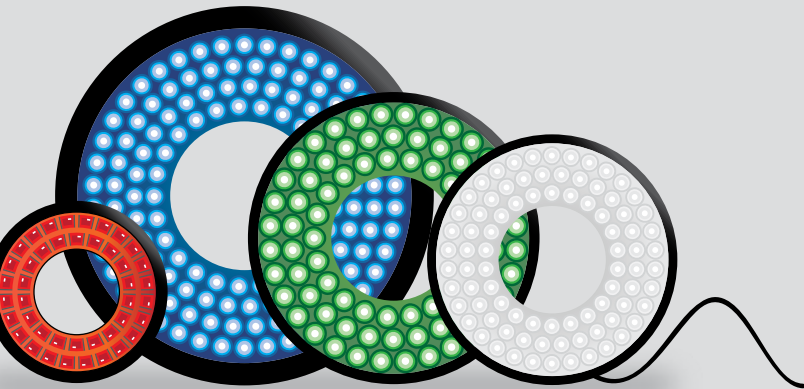
Original	White	Blue	Red
			
IR			

For questions:

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FLDR-A

Direct incident light illumination, ring light



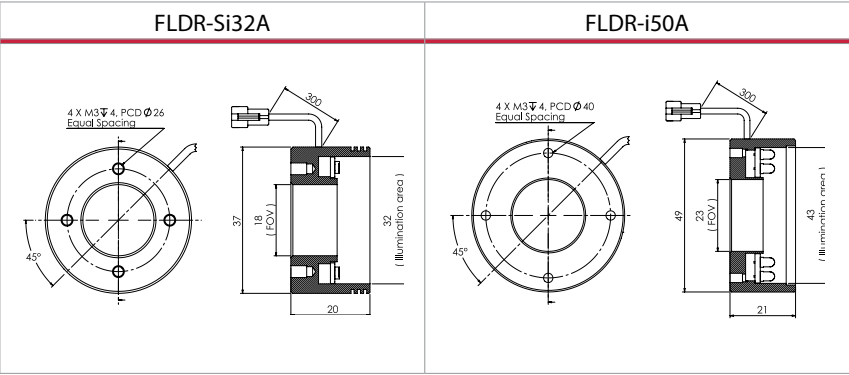
- 5-250 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- without diffuser (optional)
- Housing: Al (optional stainless steel)
- LED angle: 0°

Properties
The FLDR-A series is classified as incident light. The vertical alignment of the LEDs allows the FLDR-A series to be used with highly variable working distances. It is ideally suited for illuminating round and matte inspection objects, but at the same time frequently also gives outstanding results on other surfaces and shapes. Attributes can then also be detected on reflective materials by using the optionally available diffuser or polarization filter. High-power versions are available for applications with high light requirements.

Application examples
Distinguish matte and reflective partial areas, for instance on embossed stamps, metal contacts, solder joints, circuit board inspections.
Distinguish printing with different reflection strengths, for instance for barcodes.

- Options**
- Colors: R, G, B, SR, IR 850, W, UV375, UV400,
 - Protection class: IP 30 as standard, available up to IP 67
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor (page 7)

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Diffusers
 - Polarization filter
 - Mounting brackets



FLDR-A

FLDR-A

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FLDR-Si32A	■	24	1,92	SMD	Ø 37	Ø 32	Ø 18
	IR		0,60				
	■ ■ □		1,44				
FLDR-i50A	SR	24	2,88	T1 3mm	Ø 49	Ø 43	Ø 21
	IR		1,80				
	■ ■ □		2,88				
FLDR-i56A	SR	24	5,04	T1 3mm	Ø 56	Ø 52	Ø 23,5
	IR		3,00				
	■ ■ □		5,76				
FLDR-i70A	SR	24	7,20	T1 5mm	Ø 70	Ø 65	Ø 30
	IR		3,60				
	■ ■ □		7,68				
	UV		3,84				
FLDR-i90A	■	24	10,08	T1 3mm	Ø 102	Ø 90	Ø 40
	IR		6,00	T1 5mm			
	■ ■ □		11,52				
FLDR-i120A	SR	24	-	-	Ø 120	Ø 108	Ø 48
FLDR-i192A	■ ■ □	24	33,60	P4	Ø 192	Ø 180	-

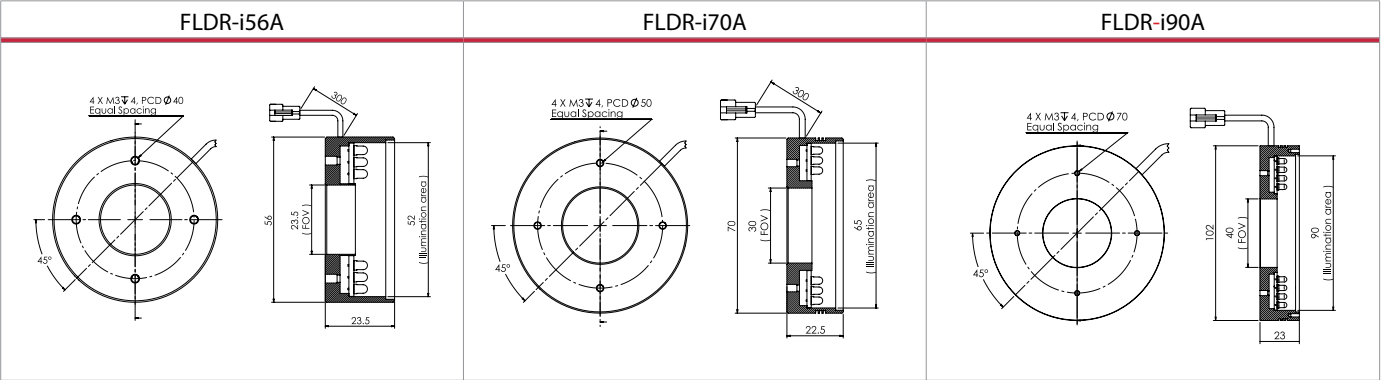
FHDR-A High-Power

FHDR-Si90A	UV	24	24	SMD	Ø 100	Ø 84	Ø 50
FHDR-i120A-IP65	■	24	25,20	T1 3mm	Ø 100	Ø 84	Ø 50
	UV		24	SMD			
FHDR-Si426A	■ ■ □	24	57,60	SMD	Ø 426	Ø 410	Ø 330

FLDR-A Half models

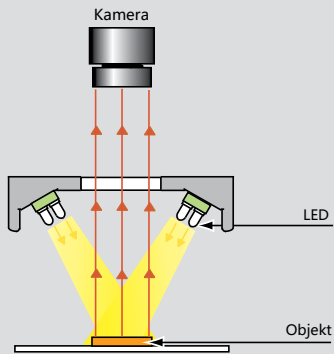
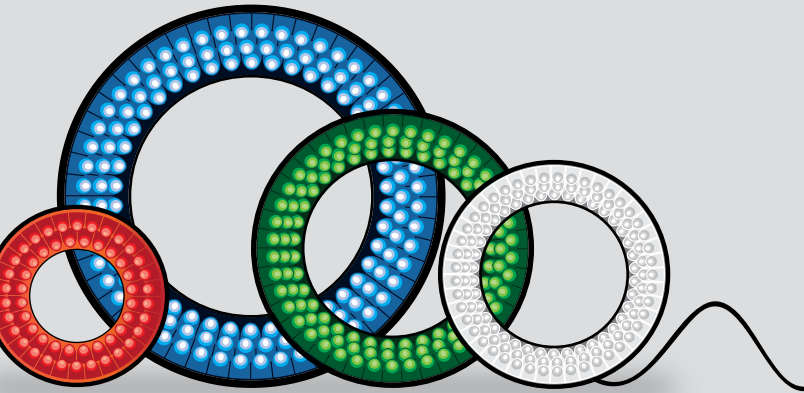
FLDR-i90A-HC180	■ ■ □	24	-	T1 3mm	-	-	-
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Other sizes available on request.



FLDR-B

Direct incident light with angle



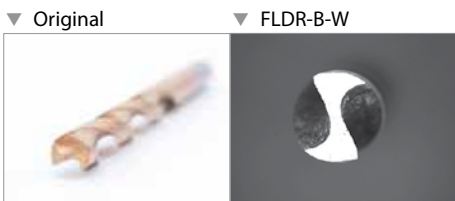
- Working distance: approx. 1-100 mm
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- without diffuser (optional)
- Housing: Al (optional stainless steel)
- LED angle: 19°-45°

Properties
The FLDR-B series represents angled incident lights. The LED tilt depends on the illumination size and ranges between 19° and 45° to the horizontal. The FLDR-B series is ideally suited for illuminating round and matte inspection objects, but at the same time frequently also gives outstanding results on other surfaces and shapes. Reflective inspected objects can also be detected by using the optionally available diffuser. High-power versions are also available for applications with particularly high light requirements.

Application examples
Highlighting slightly beveled edges or round depressions, such as engraving. Print inspections, orientation detection

- Options**
- Colors: UV365, UV 375, UV 400, B, G, R, SR, IR 875, W, RGB
 - Protection class: IP 30 as standard, IP 67 available
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor
 - Custom solutions: Segment lights
 - Falcon Easy

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Diffusers
 - Polarization filter
 - Mounting brackets



FLDR-B

FLDR-B

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FLDR-Si20B		24	0,96	SMD	Ø 20	Ø 17	Ø 6
	  		0,96				
FLDR-Si32B		24	1,92	SMD	Ø 32	Ø 28	Ø 10
	IR		0,60				
	  	1,44					
	UV	12	1,44				
FLDR-i38B	SR	24	1,44	T1 3 mm	Ø 38	Ø 32	Ø 15
	IR		1,20				
	  		2,40	T1 5 mm			
	UV		0,96				
FLDR-i50B	SR	24	3,60	T1 3 mm	Ø 49	Ø 47	Ø 25
	IR		2,40				
	  		3,84	T1 5 mm			
	UV		1,44				
FLDR-Si50B		24	3,84	SMD	Ø 49	Ø 47	Ø 25
	  		2,88				
FLDR-i70B	SR	24	6,48	T1 3 mm	Ø 70	Ø 65	Ø 30
	IR		3,60				
	  		7,20				
FLDR-Si70B	RGB	24	R:2,40 B:3,30 G:3,36	RGB-LED	Ø 70	Ø 65	Ø 30
FLDR-i75B	UV	24	1,92	T1 5 mm	Ø 75	Ø 69	Ø 45
FLDR-i90B	SR	12	12,24	T1 3 mm	Ø 93,5	Ø 87	Ø 50
	IR	24	9,60				
		24	7,20				
	  	12	13,44	T1 5 mm	Ø 90	Ø 86	Ø 54
UV	24	5,76					
FLDR-Si90B-RGB	RGB	24	10,32	RGB-LED	Ø 93,5	Ø 87	Ø 50
FLDR-Si90B-AOI	  	24	6,24	SMD	Ø 90	Ø 82	Ø 50
FLDR-i100B-UV	UV	12	3,12	T1 5 mm	Ø 103	Ø 99	Ø 65
		24	6,24				
FLDR-i100B-UV-W5	UV/W	24	W= 3,36 UV= 2,88	T1 5 mm	Ø 103	Ø 98	Ø 65
FLDR-i120B	SR	24	28,80	T1 3 mm	Ø 128	Ø 112	Ø 63,5
	IR		20,40				
	  		32,64				
FLDR-Si120B-RGB	RGB	24	R:9,60 B:6,72 G:6,72		Ø 122	Ø 112	Ø 63,5

FLDR-B**FLDR-B**

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FLDR-i230B		24	36,00	P4	Ø 235	Ø 220	Ø 145
	IR		31,20	T1 5 mm			
	  		48,00	P4			
	UV		-				
FLDR-i230B-4		24	28,80	P4	Ø 235	Ø 220	Ø 145
FLDR-i230B-8		24	28,80	P4	Ø 235	Ø 220	Ø 145
	  		48,00				
FLDR-i300B	  	24	-	P4	Ø 305	Ø 286	Ø 200
FLDR-i300B-4		24	33,60	P4	Ø 305	Ø 286	Ø 200
FLDR-i300B-8	  	24	48,00	P4	Ø 305	Ø 286	Ø 200
FLDR-i420B	  	24	76,80	P4	Ø 430	Ø 408	Ø 325
FLDR-i420B-8	  	24	76,80	P4	Ø 430	Ø 408	Ø 325

FHDR-B High Power

FHDR-Si75B	UV	24	25,20	SMD	Ø 75	Ø 69	Ø 45
FHDR-Si90B	IR	24	50,40	SMD	Ø 93,5	Ø 87	–

FLDR-B Half models

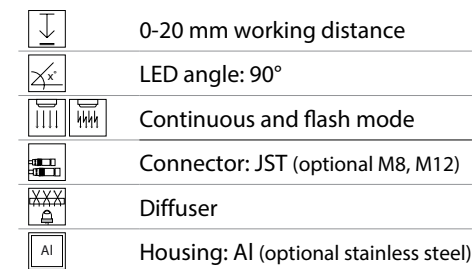
FLDR-i38NB-HC180	  	24	0,96	T1 3mm	Ø 38x18	Ø 35	Ø 13
FLDR-i45NB-HC180	  	24	1,44	T1 3mm	Ø 45x18	Ø 42	Ø 20
FLDR-i50NB-HC180	  	24	1,44	T1 3mm	Ø 50x18	Ø 47	Ø 25
FLDR-i55NB-HC180	SR	24	1,44	T1 3mm	Ø 55x18	Ø 52	Ø 30
	  						

Other sizes available on request.

FLDR-B

FLDR-Si20B	FLDR-i32B	FLDR-i38B
FLDR-i50B	FLDR-i70B	FLDR-i90B
FLDR-Si90B-RGB	FLDR-i100B	FLDR-i120B
FLDR-i230B	FLDR-i300B-8	FLDR-i420B-8

Horizontal dark field lights



FLDR-LA1 series strictly represents dark field lights. LEDs are tilted 90° to the horizontal. The light emission is correspondingly oriented parallel to the illumination centerpoint. The ring shape of the light and the high homogeneity specifically highlight the edges of round inspection objects, whereas level surfaces below the edge are rendered completely dark. The FLDR-LA1 series is by default equipped with diffuser (excluding UV). High-power versions are also available for applications with particularly high light requirements.

Ideal for edge inspections and for inspecting embossing
Inspecting surface for scratches or nonconformances
UV suited for microscopy applications

- Colors: UV375, UV 400, B, G, R, SR, IR 850, W
- Protection class: IP 30 as standard, available up to IP 55
- Material: Aluminum (standard), stainless steel (on request)
- Without series resistor or with series resistor

- Industrial-strength M8 & M12 connectors
- Mounting brackets



Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FLDR-Si31-LA1		24	0,96	SMD	Ø 31	Ø 20	Ø 20
			0,96				
FLDR-Si35-LA1		24	1,92	SMD	Ø 35	Ø 17	Ø 17
			0,96				
FLDR-Si49-LA1		24	2,88	SMD	Ø 49	Ø 26	Ø 26
	IR		1,20				
			1,92				
FLDR-Si75-LA1		24	3,60	SMD	Ø 75	Ø 50	Ø 50
	IR		2,40				
			3,36				
FLDR-Si100-LA1	SR	24	3,60	SMD	Ø 102	Ø 65	Ø 65
			6,72			Ø 65	Ø 65
	IR	12	3,00				
		24	4,80				
	UV		4,80				
FLDR-i100-LA1-UV	UV 400	24	2,88	T1 5mm	Ø 105	Ø 65	Ø 65
FLDR-i120-LA1	UV 400	24	4,32	T1 5mm	Ø 105	Ø 65	Ø 65
FLDR-Si130-LA1		24	9,60	SMD	Ø 130	Ø 94	Ø 94
	IR		4,20				
			6,72				
FLDR-Si150-LA1		24	9,60	SMD	Ø 150	Ø 110	Ø 110
			6,72				
FLDR-Si180-LA1		24	11,52	SMD	Ø 180	Ø 150	Ø 150
	IR		5,40				
			9,12				
FLDR-Si220-LA1		24	15,36	SMD	Ø 220	Ø 185	Ø 185
	IR	12	7,20				
		24	11,52				
FLDR-Si255-LA1		24	13,44	SMD	Ø 255	Ø 220	Ø 220
FLDR-i350-LA1		24	16,80	P4	Ø 346	Ø 286	Ø 286

FLDR-Si70-LA1-HC150		24	-	SMD	-	-	-
FLDR-Si70-LA1-HC220		24	1,92	SMD	Ø 70	Ø 34	-
FLDR-Si75-LA1-HC120		24	16,80	SMD	Ø 75	Ø 50	-
FHDR-Si75-LA1-HC120		24	16,80	SMD	Ø 75	Ø 50	-
FLDR-Si75-LA1-HC180		24	1,92	SMD	Ø 75	Ø 50	-
FLDR-Si130-LA1-HC180		24	5,76	SMD	Ø 130	Ø 94	-
		24	3,84				

Other sizes available on request.

FLDR-LA3

Flat angle dark field lights

The diagram on the left shows four overlapping rings, each with a different color and internal structure: a red ring with a dotted pattern, a blue ring with a dotted pattern, a green ring with a dotted pattern, and a white ring with a dotted pattern. A black line extends from the right side of the white ring. The diagram on the right shows a cross-sectional view of an optical setup. A camera is positioned above a sample. A light source (orange rectangle) emits a beam (yellow) that reflects off two mirrors (green) and is directed towards the sample. The sample is labeled 'Objekt'.

Properties

The FLDR-LA3 series represents dark field lights. Depending on lights size, its LEDs are arranged at angles between 60° and 75° to the horizontal. The flat irradiation angle allows objects to be illuminated without a total reflection in the direction of the camera. However, on scratches or engraving, the light is projected directly to the camera sensor. The FLDR-LA3 series supports a wide range of uses due to its enormous light intensity in combination with the flatly radiated and widely scattered light.

The LA3 series is predominantly used for surface inspections. The flat intramission angle of the light highlights scratches, engraving, or edges of and on objects. The enormous light output and the flat radiation angle allow relatively large surfaces to be illuminated in the UV spectrum. Invisible barcodes, type identifiers, or safety attributes are then preferably inspected with this type of light.

- Colors: UV 375, UV 400, B, G, R, SR, IR 875 , W
- Protection class: IP 30 as standard, available up to IP 55
- Material: Aluminum (standard), stainless steel (on request)
- Without series resistor or with series resistor
- Custom solutions: Segment lights

- Industrial-strength M8 & M12 connectors
- Mounting brackets
- Diffuser
- Polarization filter

FLDR-LA3

FLDR-LA3

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FLDR-i49-LA3 2-reihig	SR	24	2,88	T1 3mm	Ø 49	Ø 40	Ø 23
	IR		1,80				
			3,36				
FLDR-Si49-LA3	UV	24	2,40	SMD	Ø 49	Ø 40	Ø 23
FLDR-i74-LA3 2-reihig	SR	24	5,76	T1 3mm	Ø 74	Ø 65	Ø 48
	IR		3,60				
			6,24				
	UV		4,80	T1 5 mm			
FLDR-Si74-LA3 2-reihig		24	6,72	SMD	Ø 74	Ø 65	Ø 48
	IR		2,40				
			4,80				
FLDR-i74-LA3-4		24	-	T1 3 mm	Ø 80	Ø 65	Ø 48
			5,76				
FLDR-i100-LA3		24	12,96	T1 3mm	Ø 115	Ø 97	Ø 76
	IR		8,40				
			13,92	T1 5 mm			
	UV		7,20				
FLDR-i100-LA3-4		24	14,40	T1 3 mm	Ø 115	Ø 97	Ø 76
			13,44				
FLDR-i132-LA3	SR	24	15,12	T1 3mm	Ø 132	Ø 113	Ø 98
	IR		10,80				
			17,28				
	UV		8,16	T1 3/4 5 mm			
FLDR-i132-LA3-4		24	17,28	T1 3 mm	Ø 132	Ø 113	Ø 98
FLDLR-i132-LA3-RGB	RGB	24	R=3,36 B=5,76 G=5,76	T1 3 mm	Ø 132	Ø 113	Ø 98
FLDR-i170-LA3	SR	24	25,20	T1 3mm	Ø 172	Ø 163	Ø 134
	IR		13,80				
			24,00				
	UV		12,00				
FLDR-i170-LA3-4		24	23,04	-	Ø 172	Ø 134	Ø 163
FLDR-i170-LA3-8		24	23,04	T1 3mm	Ø 172	Ø 134	Ø 163
FLDR-i220-LA3	SR	24	30,24	T1 3 mm	Ø 220	Ø 205	Ø 180
	IR		16,80				
			28,80				
FLDR-i220-LA3-4		24	-	T1 3 mm	Ø 220	Ø 205	Ø 180
FLDR-i250-LA3	SR	24	30,24	T1 3mm	Ø 250	Ø 230	Ø 210
	IR	12	21,60				
		24	34,56	T1 5 mm			
	UV		15,36				
FLDR-i250-LA3-4		24	31,68	T1 3 mm	Ø 250	Ø 230	Ø 210
			34,56				
FLDR-i280-LA3	SR	24	33,12	T1 3mm	Ø 280	Ø 240	Ø 240
	IR		-				
			33,12				
FLDLR-i280-LA3-RGB	RGB	24	R=12,96 B=12,48 G=12,48		Ø 280	Ø 240	Ø 240
FLDR-i300-LA3		24	40,32	T1 3mm	Ø 300	Ø 278	Ø 260

FLDR-LA3

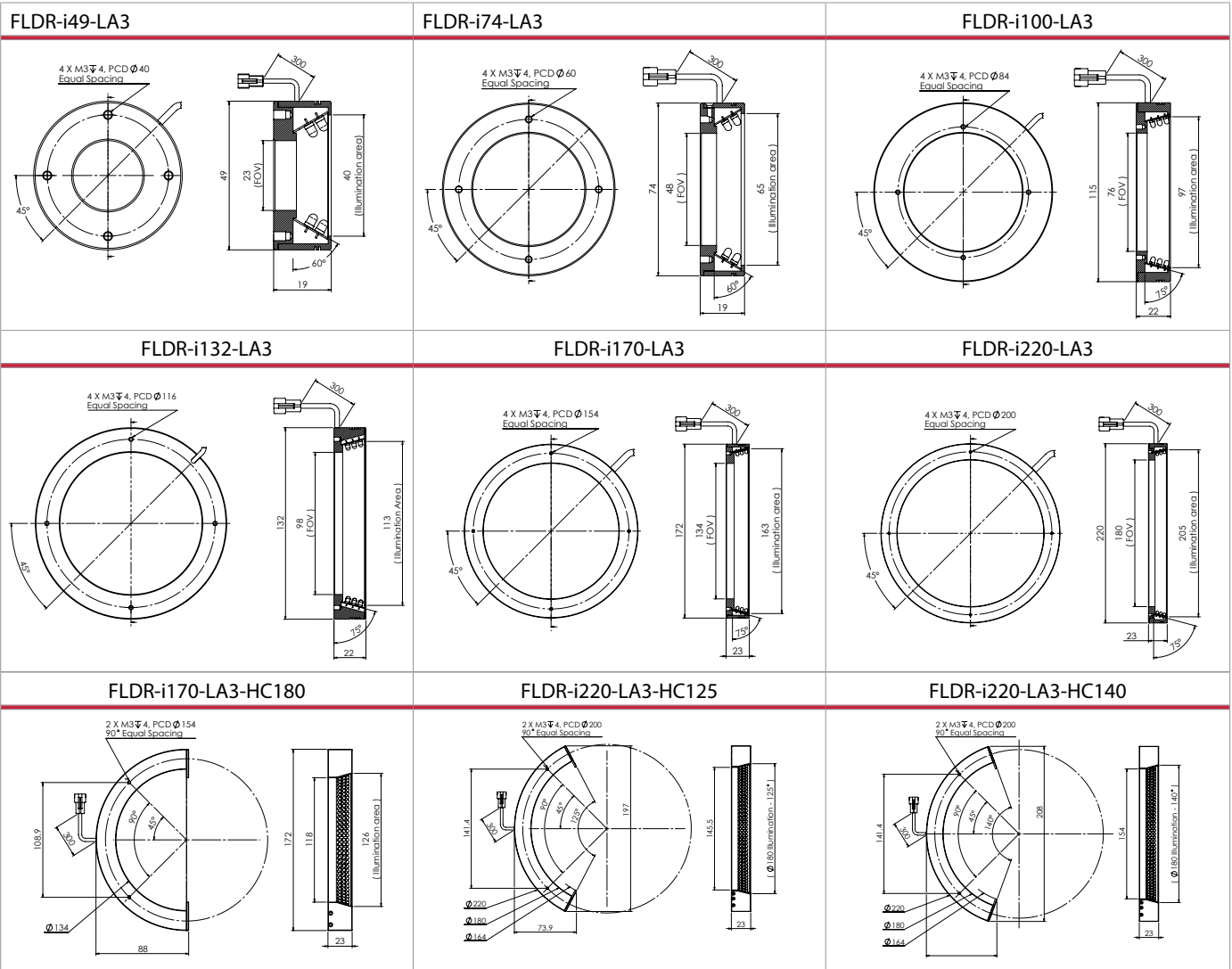
FHDR-LA3 High-Power

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FHDR-Si45-LA3	UV	24	2,88	SMD	Ø 45	Ø 38	Ø 30
FHDR-Si74-LA3	■ ■ □	24	42,00	SMD	Ø 74	Ø 65	Ø 48
FHDR-Si426-LA3	■ ■ □	24	96,00	SMD	Ø 467	Ø 404	Ø 386

FLHC-LA3 Half models 125-180 degrees dark field lights

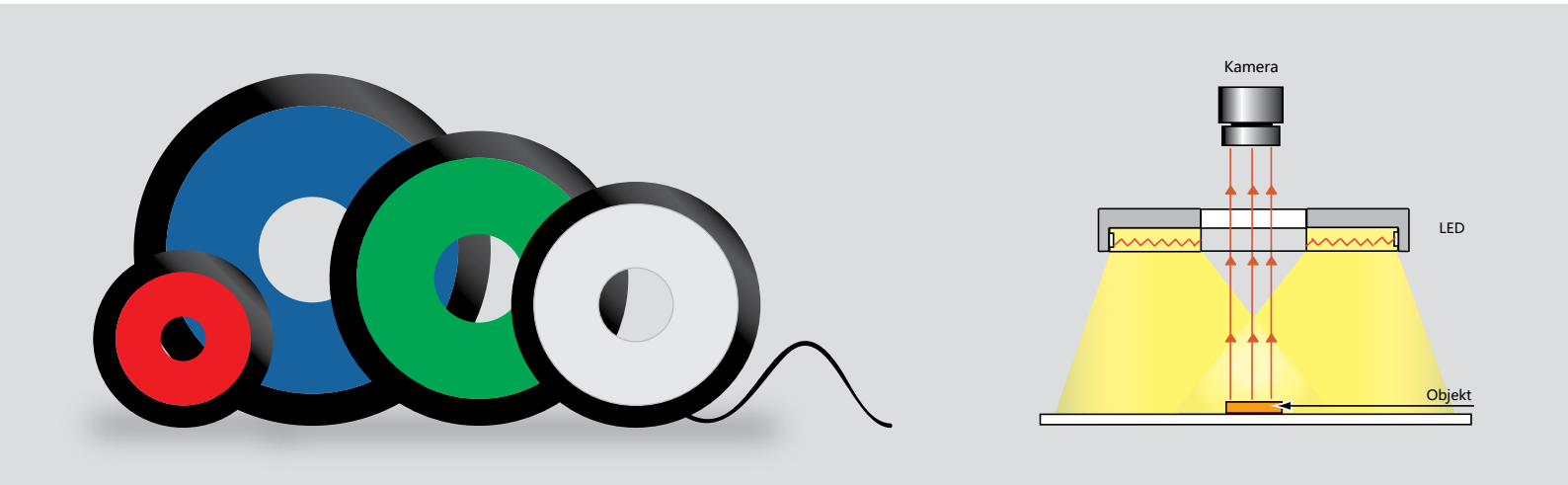
FLDR-i170-LA3-HC180	SR	24	7,20	T1 3mm	Ø 172	Ø 126/2	Ø 118/2
	■ ■ □		12,0				
FLDR-i220-LA3-HC125	SR	24	10,08	T1 3mm	Ø 220	Ø 180x125°	Ø 145,5
FLDR-i220-LA3-HC140	SR	24	11,52	T1 3mm	Ø 220	Ø 180x140°	Ø 154
FLDR-i220-LA3-HC180	SR	24	13,68	T1 3mm	Ø 220	Ø 180x180°	Ø 164
	■ ■ □		14,40				

Other sizes available on request.



FLFR, FLFQ

Diffused incident lights



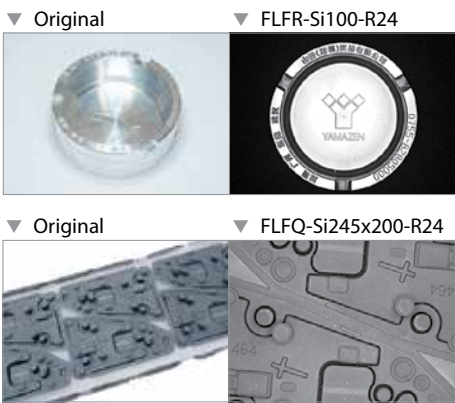
- 50-200 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- Diffuser
- Housing: Al (optional stainless steel)
- LED angle: 90°

Properties
Because of the standard configuration with diffuser and the horizontally oriented SMD LEDs, the FLFR series is able to generate highly diffused light. Even extremely reflective surfaces can be illuminated without rendering individual LEDs visible.

Application examples
Inspecting shiny materials for grooves
Detecting printing on the interior of lids
Inspecting assembled circuit boards

- Options**
- Colors: B, G, R, IR 850, W
 - Protection class: IP 30 as standard, available up to IP 65
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor
 - Custom solutions: Segment lights

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Mounting brackets



FLFR, FLFQ

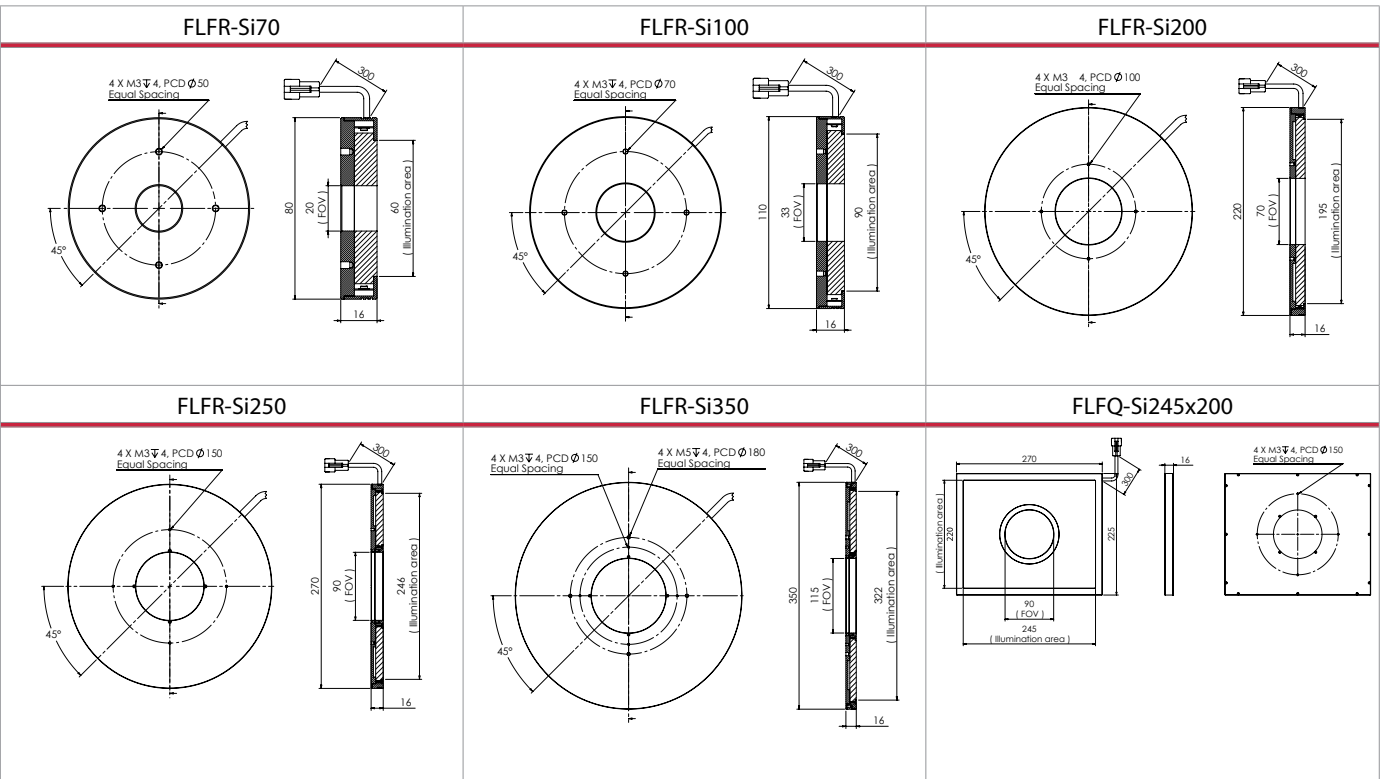
FLFR Round version

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FLFR-Si70	■	24	4,80	SMD	Ø 80	Ø 60	Ø 20
	IR		2,40				
	■ ■ □		3,84				
FLFR-Si100	■	24	7,68	SMD	Ø 110	Ø 90	Ø 33
	IR		3,00				
	■ ■ □		5,28				
FLFR-Si200	■	24	15,36	SMD	Ø 220	Ø 195	Ø 70
	IR		7,20				
	■ ■ □		11,52				
FLFR-Si250	■	24	26,88	SMD	Ø 270	Ø 246	Ø 90
	IR		19,20				
	■ ■ □		25,92				
FLFR-Si350	■	24	31,68	SMD	Ø 350	Ø 322	Ø 115
	IR		25,92				
	■ ■ □		25,92				

FLFQ Rectangular version

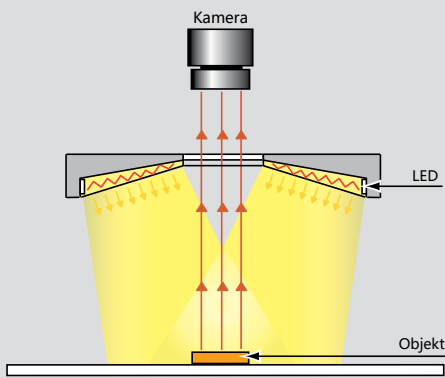
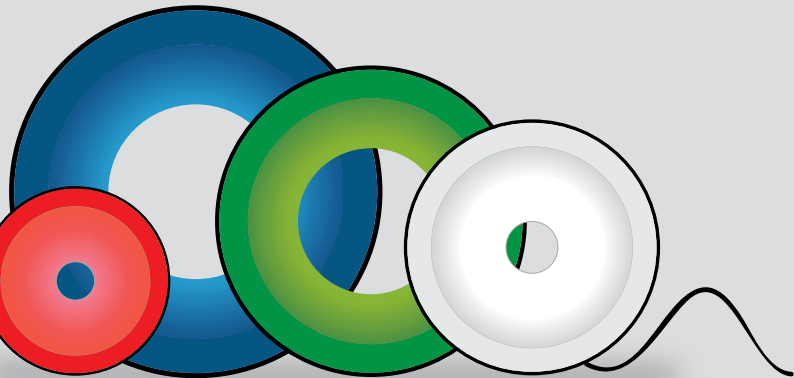
FLFQ-Si245x200-C90	■	24	32,64	SMD	270x225	245x200	Ø 90
	IR		14,40				
	■ ■ □		23,04				

Other sizes and colors available on request.



FLKR

Diffused incident light with angle



- 0-50 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- Diffuser
- Housing: Al (optional stainless steel)
- LED angle: 90°

Properties
Due to the 90° angular alignment of its SMD LEDs the FLKR series generates extremely homogeneous, slightly angled light intromission. Its primary application is to illuminate shiny components and to highlight beveled edges. Its small height also allows the FLKR series to be used when installation space is restricted.

Application examples
Blister packaging
Data matrix codes
Solder joints

- Options**
- Colors: Red, green , blue,white, RGB, IR (875 nm)
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor
 - Custom solutions: Segment lights

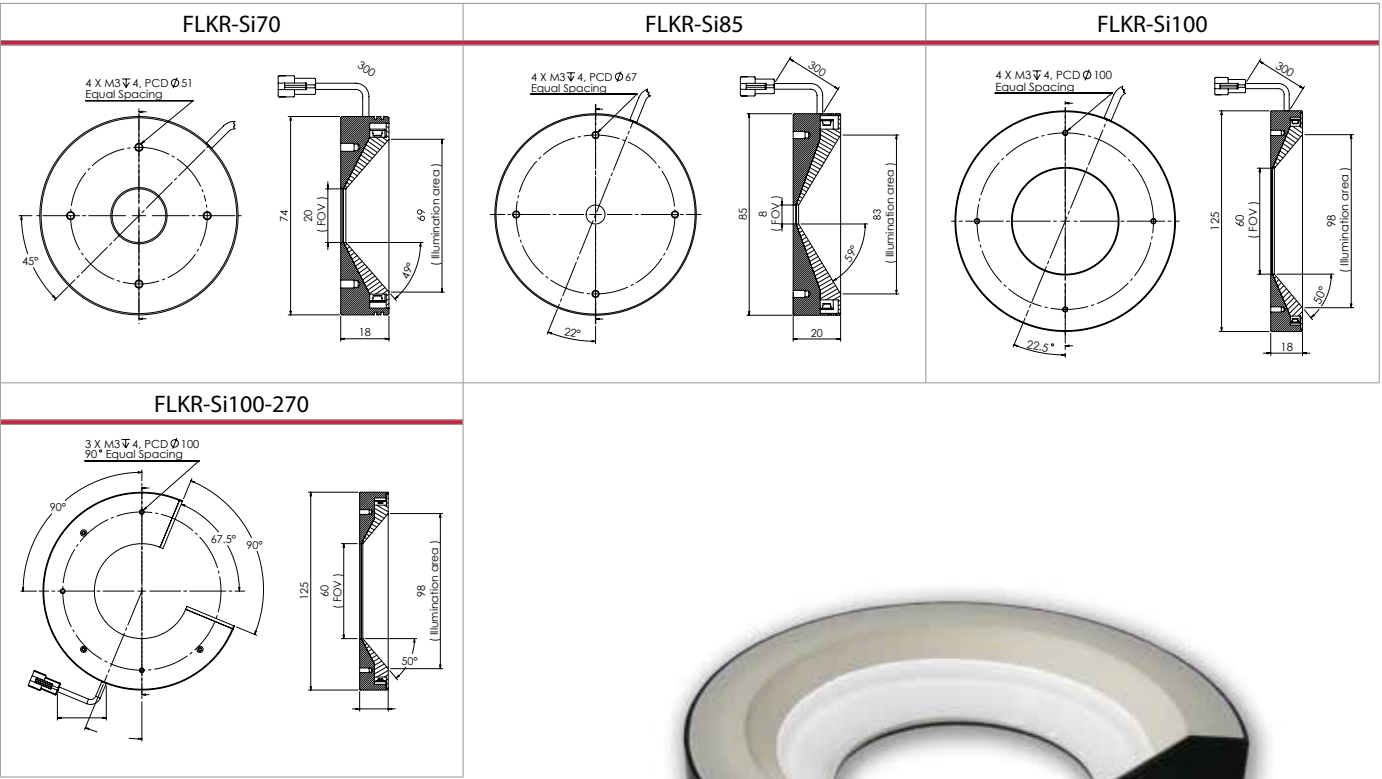
- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Mounting brackets



FLKR

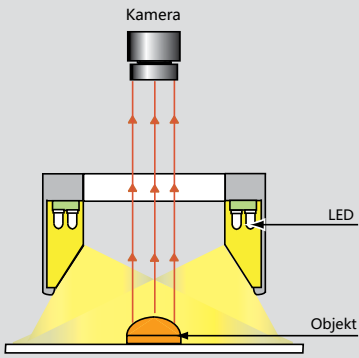
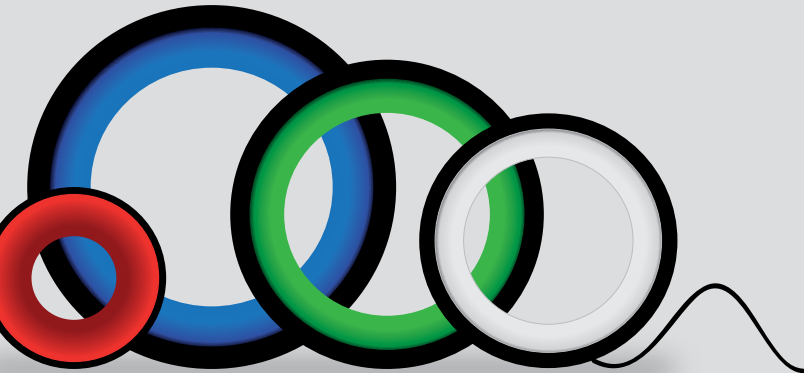
Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FLKR-Si70	■	24	4,80	SMD	Ø 74	Ø 69	Ø 20
	■ IR		2,40				
	■ ■ ■		3,36				
FLKR-Si85	■	24	6,72	SMD	Ø 85	Ø 83	Ø 8
	■ ■ ■		4,80				
FLKR-Si87-4	■	24	3,84	SMD	Ø 87	Ø 57	Ø 20
FLKR-Si100	■	24	9,60	SMD	Ø 125	Ø 98	Ø 60
	■ IR		9,60				
	■ ■ ■		6,72				
FLKR-Si100-4	■	24	7,68	SMD	Ø 130	Ø 98	-
	■ ■ ■		5,76				
FLKR-Si100-270 270° illumination	■	24	8,64	SMD	Ø 125	Ø 98	Ø 60
	■ ■ ■		5,76				

Other sizes available on request.



FFPR

Round dark field light



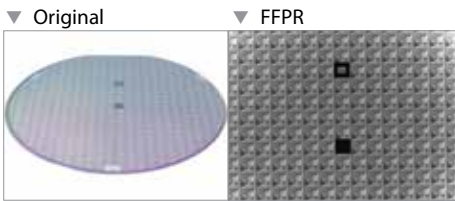
- 0-30 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- Diffuser
- Housing: Al (optional stainless steel)
- LED angle: 0°

Properties
The FFPR series generates highly-diffuse and homogeneous light with a low angle. This allows shiny and flat surfaces to be inspected for defects. The FFPR series is an alternative when the FLDR-LA3 series generates excessive reflections.

Application examples
Wafer inspection
metal surfaces

- Options**
- Colors: Red, green , blue,white, RGB, IR (875 nm)
 - Protection class: IP 30 as standard, IP 67 available
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Mounting brackets



FFPR

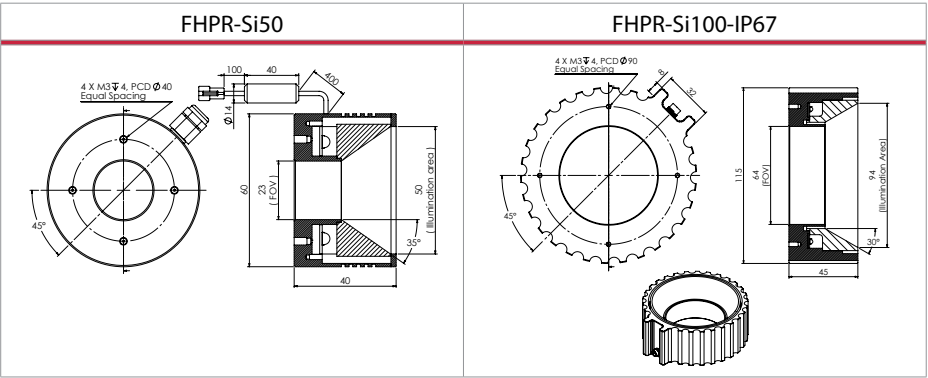
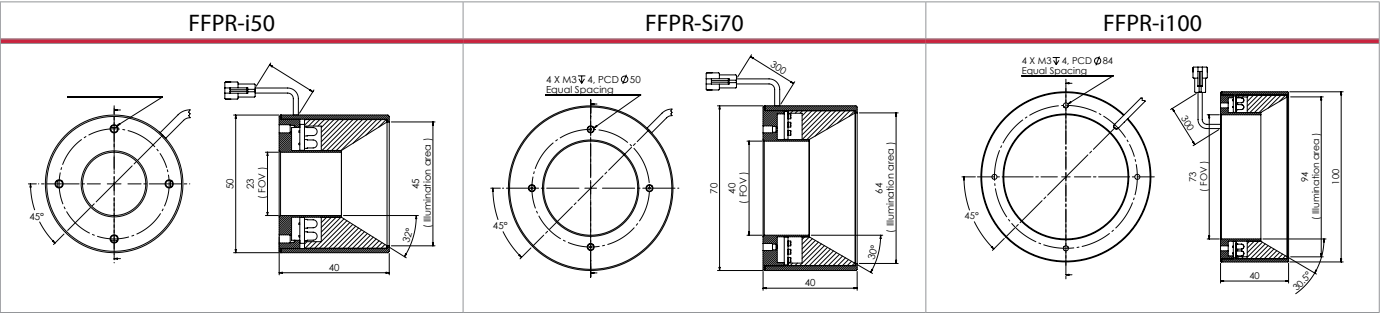
FFPR

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FFPR-i50	■	24	2,88	T1 3 mm	Ø 50	Ø 45	Ø 40
	IR		1,80				
	■ ■ □		2,88				
FFPR-Si70	■	24	6,72	SMD	Ø 70	Ø 64	Ø 50
	■ ■ □		4,80				
	■ ■ □		4,80				
FFPR-i100	■	24	7,20	T1 3 mm	Ø 100	Ø 94	Ø 84
	IR		4,80				
	■ ■ □		8,16				
FFPR-Si100	RGB	24	R=1,92 G=2,88 B=2,88	SMD	Ø 100	Ø 94,6	Ø 73
	■		8,64			Ø 94	
	■ ■ □		6,24			Ø 94	
FFPR-Si136	RGB	24	R=3,36 G=3,84 B=3,84	SMD	Ø 136	Ø 122	Ø 105
	■		7,68				
	■ ■ □		5,76				
FFPR-Si136-4	■	24	7,68	SMD	Ø 136	Ø 122	Ø 105
	■ ■ □		5,76				
	■ ■ □		5,76				
FFPR-Si170	■ ■ □	24	-	SMD	Ø 170	Ø 156	Ø 135

FHPR High-Power

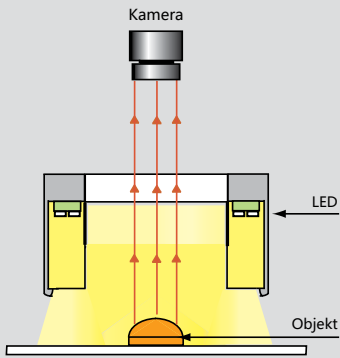
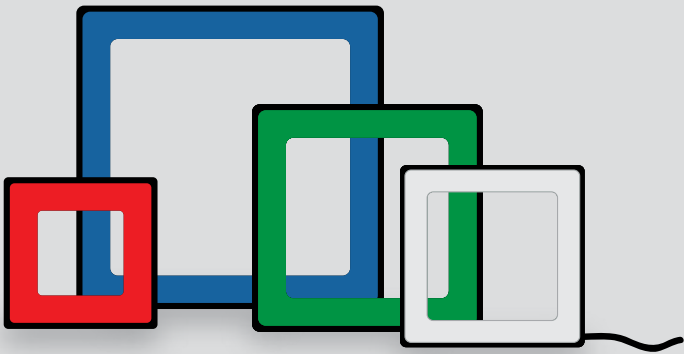
FHPR-Si50	□	24	8,40	SMD	Ø 60	Ø 50	Ø 23
FHPR-Si100-IP67	■	24	24,00	SMD	Ø 115	Ø 93	Ø 56
	■ ■ □						

Other sizes available on request.



FFPQ

Low-angle Square lights



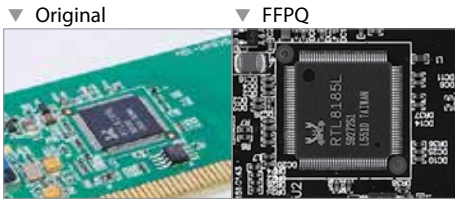
- 0-50 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- Diffuser
- Housing: Al (optional stainless steel)
- LED angle: 0°

Properties
The FFPQ series generates highly-diffuse and homogeneous light with a low angle. This allows shiny, flat, and also rectangular surfaces to be inspected for defects and also to be ideally illuminated. The FFPQ series is used as dark field light at low working distances.

Application examples
Inspection of circuit board conductors, solder joints, or components on circuit boards

- Options**
- Colors: Red, green , blue,white, RGB, IR (850 nm)
 - Without series resistor or with series resistor
 - Custom solutions: Segment lights
 - Protection class: IP 30 as standard, IP 67 available

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors



FFPQ

FFPQ

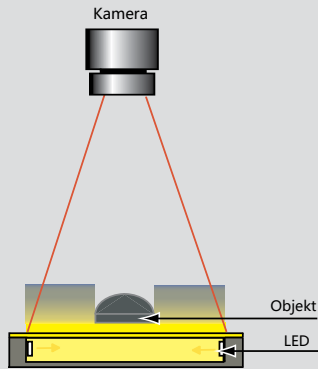
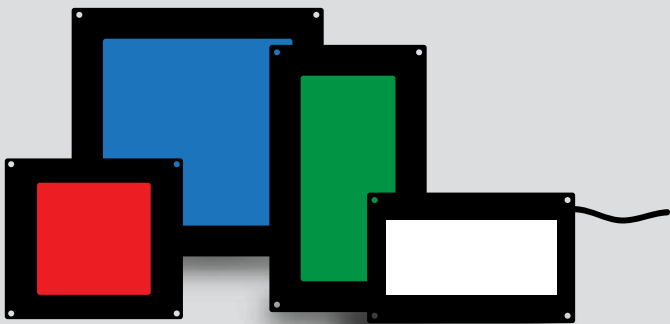
Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Inner diameter
FFPQ-Si31x35		24	1,92	SMD	35 x 31 x 14,5	29 x 29	17 x 17
			0,96				
FFPQ-Si32		24	1,92	SMD	32 x 32 x 30	28 x 28	10 x 10
			0,60				
FFPQ-Si50		24	3,84	SMD	50 x 50 x 30	46 x 46	28 x 28
			1,20				
FFPQ-Si75		24	5,76	SMD	75 x 75 x 30	71 x 71	53 x 53
			2,40				
FFPQ-Si100		24	7,68	SMD	100 x 100 x 30	96 x 96	78 x 78
			3,60				
FFPQ-Si120		24	9,60	SMD	120 x 120 x 30	116 x 116	98 x 98
			7,68				
FFPQ-Si120-4 4-segments		24	9,60	SMD	120 x 120 x 30	116 x 116	98 x 98
			7,68				
FFPQ-Si130		24	7,68	SMD	130 x 130 x 30	126 x 126	108 x 108
			7,68				
FFPQ-Si150		24	11,52	SMD	150 x 150 x 30	146 x 146	128 x 128
			9,60				

Other sizes available on request.

FFPQ-Si31x35	FFPQ-Si32	FFPQ-Si50
FFPQ-Si75	FFPQ-Si100	FFPQ-Si120

FLFL

Diffuse, flat back light, transmitted, and surface light



- 0-30 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- Diffuser
- Housing: Al (optional stainless steel)
- LED angle: 90°

Properties
The FLFL series is a typical back light or surface light. Extremely homogeneous illumination with very diffuse light is generated by the 90° alignment of the SMD LEDs and with the special foils installed in the area of the light output. Due to their low installed height, the lights also fit into a wide range of equipment. Use of a light control film is recommended for outline inspections.

Application examples
Outline inspections, fill level metering

- Options**
- Colors: Red, green , blue,white, RGB, IR (850 nm)
 - Without series resistor or with series resistor
 - Protection class: IP 30 as standard, IP 67 available
 - Material: Aluminum (standard), stainless steel (on request)

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Light control film



FLFL

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Height
FLFL-Si25	IR	12	0,30	SMD	44 x 26	25 x 25	6
	■ ■ □	24	0,48				
FLFL-Si60	■	24	7,68	SMD	94 x 94	60 x 60	10
	IR		2,40				
	■ ■ □		5,76				
FLFL-Si70x40N	■	24	3,84	SMD	90 x 70	70 x 40	10
	IR		1,20				
	■ ■ □		4,32				
FLFL-Si90x40N	■	24	3,84	SMD	110 x 70	90 x 40	10
	IR		2,40				
	■ ■ □		4,32				
FLFL-Si100	■	24	11,52	SMD	133 x 133	100 x 100	10
	IR		4,80				
	■ ■ □		11,52				
FLFL-Si100x80	■	24	9,60	SMD	133 x 113	100 x 80	10
	IR		4,20				
	■ ■ □		10,08				
FLFL-Si110x50	■	24	5,76	SMD	143 x 83	110 x 50	10
	IR 24		3,60				
	■ ■ □		8,64				
FLFL-Si120x100	■	24	12,48	SMD	153 x 133	120x100	10
	IR		5,40				
	■ ■ □		12,96				
FLFL-Si132x60-3S*	IR	24	4,20	SMD	150 x 90	132 x 60	10
	■ ■ □		7,20				
FLFL-Si140	■	24	15,36	SMD	173 x 173	140 x 140	9
	IR		7,20				
	■ ■ □		17,28				
FLFL-Si150x70	■	24	11,52	SMD	174 x 100	150 x 70	10
	IR	12	5,40				
FLFL-Si160x40	■	24	9,60	SMD	193 x 77	160 x 40	10
	IR		4,80				
	■ ■ □		11,52				
FLFL-Si200	■	24	23,04	SMD	233 x 233	200 x 200	10
	IR		9,60				
	■ ■ □		23,04				
FLFL-Si200-C100	■	24	15,36	SMD	225 x 225	200 x 200	6
FLFL-Si200-RGB	RGB	24	-	-	-	-	-
FLFL-Si250	■	24	26,88	SMD	283 x 283	250 x 250	10
	IR		12,00				
	■ ■ □		28,80				
FLFL-Si250x100	■	24	19,20	SMD	283 x 133	250 x 100	10
	IR		8,40				
	■ ■ □		20,16				

*FLFL-Si132x60-3S = thin frame on 1 side

FLFL

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Height
FLFL-Si320x90		24	-	SMD	353 x 123	320 x 90	10
FLFL-Si320x120		24	23,04	SMD	353 x 153	320 x 120	10
FLFL-Si360x240		24	32,64	SMD	393 x 273	360 x 240	10
	IR		14,40				
			36,00				

Other sizes available on request.

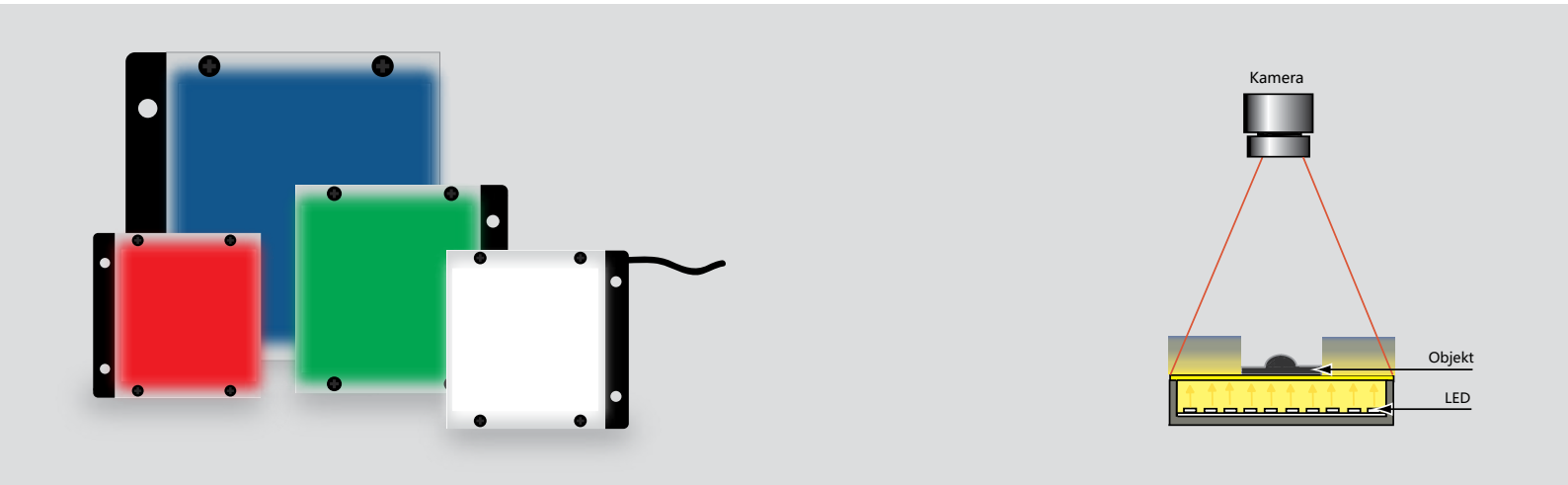
FLFL-Si60	FLFL-Si70x40N	FLFL-Si90x40N
FLFL-Si100	FLFL-Si100x80	FLFL-Si110x50
FLFL-Si120x100	FLFL-Si132x60-3S	FLFL-Si140

FLFL

FLFL-Si150x70	FLFL-Si160x40	FLFL-Si200
FLFL-Si200-C100	FLFL-Si250	FLFL-Si250x100
FLFL-Si320x120	FLFL-Si360x240	

FLDL-TP

High-intensity back light, transmitted-, and surface light



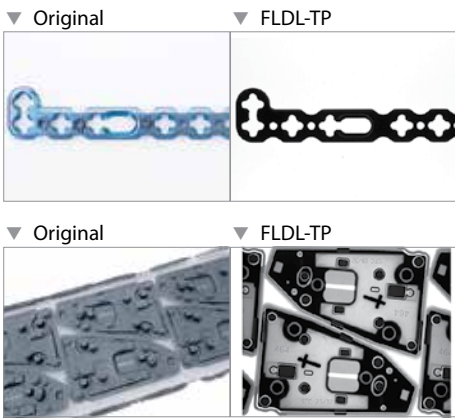
- 0-100 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- Diffuser
- Housing: Al (optional stainless steel)
- LED angle: 0°

Properties
The FLDL-TP series is a very high-performance, yet flat transmitted light that is also frequently used as incident light due to its light output. The installed SMD LEDs and the standard diffuser configuration supply homogeneous and diffuse illumination.

Application examples
Outline inspections, fill level metering
homogeneous illumination of large surfaces

- Options**
- Colors: red, green, blue, white, RGB, IR (850 nm), UV (375/ 400 nm)
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor
 - Protection class: IP 30 as standard, IP 67 available

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Light control film
 - Polarization filter



FLDL-TP

FLDL-TP

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Height
FLDL-TP-Si27		24	1,92	SMD	37 x 37	25 x 25	13
	IR	24	1,20				
	  	24	1,44				
	UV		1,44				
FLDL-TP-Si36		24	3,84	SMD	47 x 47	36 x 36	15
	IR		1,80				
	  		2,88				
			7,68				
FLDL-TP-Si51		24	3,60	SMD	62 x 62	50 x 50	15
	IR		7,20				28
	  						
	RGB						
FLDL-TP-Si85x77		24	13,44	SMD	95 x 95	85 x 77	15
	IR		7,92				
	  		11,52				
FLDL-TP-Si85x80-RGB	RGB	24	R:4,32 G:6,24 B:6,24SMD		104 x 99	85 x 80	28
FLDL-TP-Si100		24	23,04	SMD	124 x 112	100 x 100	24
	IR		9,00				
	  		15,36				
FLDL-TP-Si100x80		24	17,28	SMD	110 x 106	100 x 80	20
	IR	12	7,20				
	  	24	11,52				
FLDL-TP-Si110x90	RGB	24	R:6,72, G:9,60, B:9,60SMD			110 x 90	28
FLDL-TP-Si160	  	24	31,68	SMD	170 x 170	160 x 160	25
	IR		19,20				
FLDL-TP-Si200		24	80,64	SMD	216 x 226	202 x 202	25
	IR		32,40				
	  		57,60				
	RGB						
FLDL-TP-Si200x100		24	33,60	SMD	228 x 116	202 x 102	23,5
	IR		15,60				
	  		26,88				
FLDL-TP-Si250		24	120,96	SMD	270 x 272	260 x 252	25
	IR		36,00				
	  		81,60				
FLDL-TP-Si250x88	  	24	28,80	SMD	262 x 110	250 x 88	25
FLDL-TP-Si255x35	  	24	12,00	SMD	280 x 45	265 x 35	25
FLDL-TP-Si250x50		24	23,04	SMD	277 x 48	250 x 44	24
	  		18,24				
FLDL-TP-Si250x210		24	94,08	SMD	272x238x25	260 x 216	25
FLDL-TP-Si300x100		24	-	SMD	320 x 120	310 x 102	25
	IR		29,40				
	  		53,76				
FLDL-TP-Si320x100	IR	24	28,40	SMD	334 x 122	322 x 100	25

FLDL-TP

FLDL-TP

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Height
FLDL-TP-Si320x180	IR	24	50,40	SMD	334 x 202	322 x 180	25
FLDL-TP-Si400x300	IR		82,80	SMD	412 x 332	400 x 300	25
FLDL-TP-Si400x300-C30	IR		82,80	SMD	412 x 322	400 x 300	25
FLDL-TP-Si400x300-C50	IR	24	81,60	SMD	412x322x25	400 x 300	25
	RGB		233,48				
FLDL-TP-Si1000x400	■	24	384,00	SMD	-	-	-
	■ ■ □				-	-	-

FHDL-TP High-Power

Model	Color	Volt	Wattage	LED type	Dimensions in mm		
					Outside dimensions	Illuminated area	Height
FHDL-TP-Si50ST Stainless steel	□	24	14,00	SMD	78 x 66	50 x 50	30
FHDL-TP-Si50	■ ■ □	24	14,00	SMD	73 x 63	50 x 50	30
FHDL-TP-Si200x100	■	24	48,00	SMD	228 x 116	202 x 102	40

FLDL-TP Half models, round

FLDL-TP-Si230-HC180	■ 24	24	27,84	SMD	242 x 171	230	24
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Other sizes available on request.

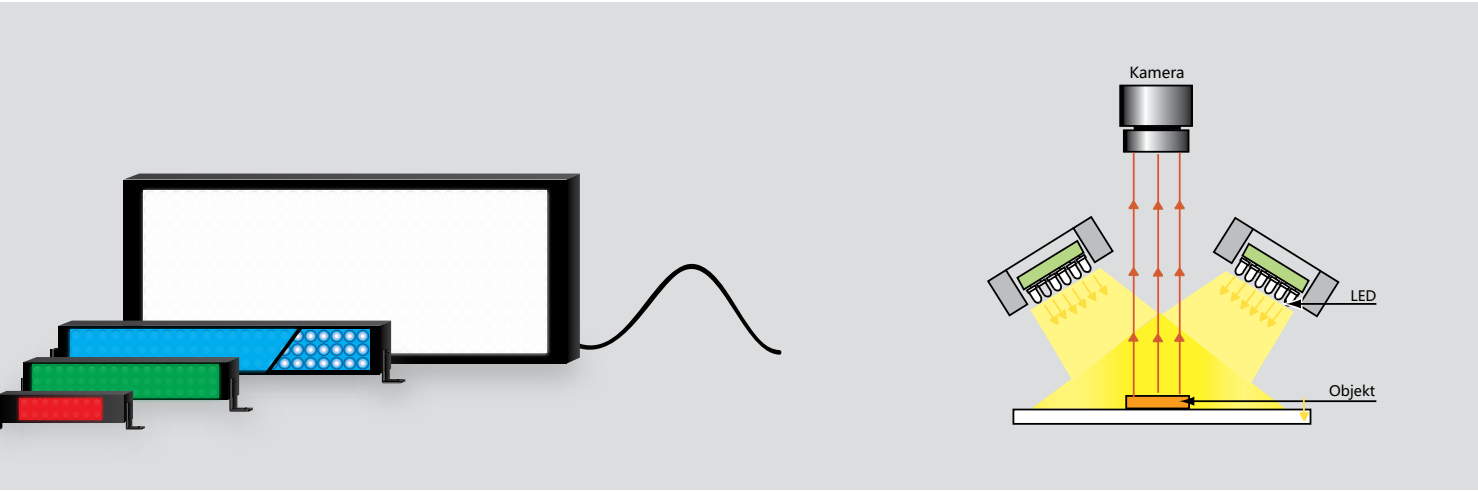
FLDL-Si27 	FLDL-TP-Si36 	FLDL-TP-Si51
FLDL-TP-Si85x77 	FLDL-TP-Si85x80-RGB 	FLDL-TP-Si100

FLDL-TP

FLDL-TP-Si100x80 	FLDL-TP-Si200x100 	FLDL-TP-Si250
FLDL-TP-Si250x50 	FLDL-TP-Si250x88 	FLDL-TP-Si255x35
FLDL-TP-Si300x100 	FLDL-TP-Si320x100 	FLDL-TP-Si320x180
FLDL-TP-Si400X300 	FLDL-TP-Si230-HC180 	FLDL-TP-Si400X300-C50

FLDL

Bar lights



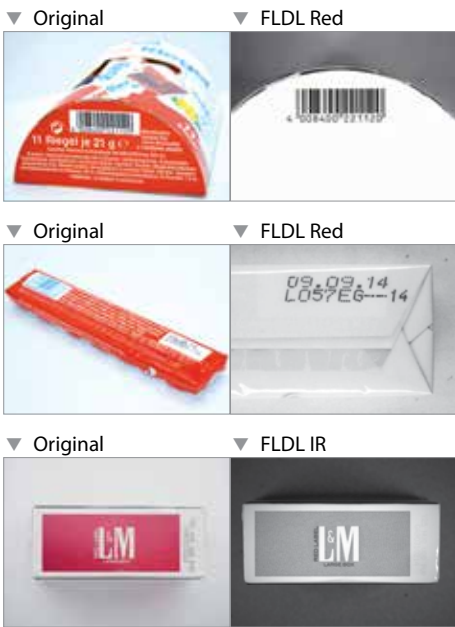
	0-500 mm working distance
	Continuous and flash mode
	Connector: JST (optional M8, M12)
	Diffuser 421
	Housing: Al (optional stainless steel)
	LED angle: 0°

Properties
The FLDL series describes high-performance, highly-flexible bar lights. Bar lights are by default equipped with a diffuser (excluding UV) and are frequently used in pairs to illuminate surfaces from various angles or to excite fluorescent materials.

Application examples
UV applications
reflecting objects
illuminating surfaces

- Options**
- Colors: red, green, blue, white, RGB, IR (850 nm), UV (365/ 375/ 400 nm)
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor
 - Protection class: IP 30 as standard, IP 67 available
 - Falcon Easy

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Mounting brackets
 - Diffuser
 - Polarization filter
 - Light control film



FLDL

Model	Color	Volt	Wattage	Dimensions in mm		
				Housing	Illuminated area	Height
FLDL-i30x10	SR	24	0,48	46 x 10	30 x 8	15
	IR		0,60			
			0,96			
FLDL-i24x15	SR	24	0,72	34 x 17,5	24 x 15	20
	IR		0,60			
			0,96			
	UV		0,48			
FLDL-i44x15	SR	24	2,16	52 x 17,5	44 x 15	20
	IR		1,20			
			2,40			
	UV		0,96			
FLDL-i55x50	IR	24	3,60	69 x 60	55 x 50	20
			6,24			
FLDL-i56x15	SR	24	2,88	65,5 x 17,5	56 x 15	20
	IR		1,20			
			2,88			
	UV		1,44			
FLDL-i74x27	SR	24	6,48	83 x 30	74 x 27	20
	IR		3,60			
			5,76			
	UV		2,88			
FLDL-i86x15	SR	24	3,60	94,5 x 17,5	84 x 15	20
	IR		2,40			
			4,32			
	UV		1,92			
FLDL-i120x15	SR	24	5,04	128 x 17,5	120 x 15	20
	IR		3,60			
			5,76			
	UV		2,88			
FLDL-i120x40	SR	24	11,52	132 x 50	120 x 40	20
	IR		12,00			
			14,40			
	UV		8,64			
FLDL-i130x15	SR	24	3,36	140 x 17,5	130 x 15	20
	IR	12	3,60			
		24	5,76			
	UV		2,88			
FLDL-i130x50	SR	24	13,44	144 x 60	131 x 53	22
	IR		10,80			
			19,20			
	UV		-			
FLDL-i150x15	SR	24	6,48	158 x 17,5	150 x 15	20
	IR		3,60			
			6,24			
	UV		3,36			

FLDL

Model	Color	Volt	Wattage	Dimensions in mm		
				Housing	Illuminated area	Height
FLDL-i150x27	SR	24	12,96	150 x 37	141 x 27	20
	IR		7,20			
	Green Blue White		11,52			
FLDL-i180x15	SR	24	8,64	191 x 17,5	180 x 15	20,5
	IR		4,20			
	Green Blue White		7,20			
	UV		4,32			
FLDL-i180x40	SR	24	13,44	188 x 50	178 x 42	20
	Green Blue White		19,20			
FLDL-i200x15	SR	24	8,64	212 x 25	200 x 15	20
	IR		4,80			
	Green Blue White		8,64			
FLDL-i200x27	SR	24	13,68	200 x 34	192 x 27	20
	IR		7,80			
	Green Blue White		17,28			
FLDL-i220x25	SR	24	15,84	240 x 35	223 x 25	20
	IR		9,00			
	Green Blue White		16,80			
FLDL-i240x35	SR	24	21,60	255 x 45	240 x 35	20
	IR	12	14,40			
	Green Blue White	24	23,04			
FLDL-i300x15	SR	24	12,96	320 x 27	300 x 15	20
	Green Blue White		12,96			
	UV		7,20			
	Green Blue White		7,20			
FLDL-i300x20	SR	24	9,60	320 x 30	300 x 20	20
	Green Blue White		17,28			
FLDL-i300x24	SR	24	21,60	320 x 34	300 x 24	20
	IR	12	15,00			
	Green Blue White	24	24,00			
FLDL-i300x30	SR	24	25,92	320 x 40	300 x 30	20
	IR		15,00			
	Green Blue White		25,92			
FLDL-i300x35	SR	24	30,24	320 x 45	310 x 35	20
	Green Blue White		13,44			
	UV		13,44			
	Green Blue White		13,44			
FLDL-i400x15	Green Blue White	24	15,84	420 x 27	400 x 15	20
FLDL-i400x30	SR	24	34,56	420 x 40	400 x 30	30
	Green Blue White		31,68			
	UV		17,28			
FLDL-i600x50	IR	24	16,32	610 x 58	600 x 50	30
	Green Blue White		53,76			
	UV		53,76			

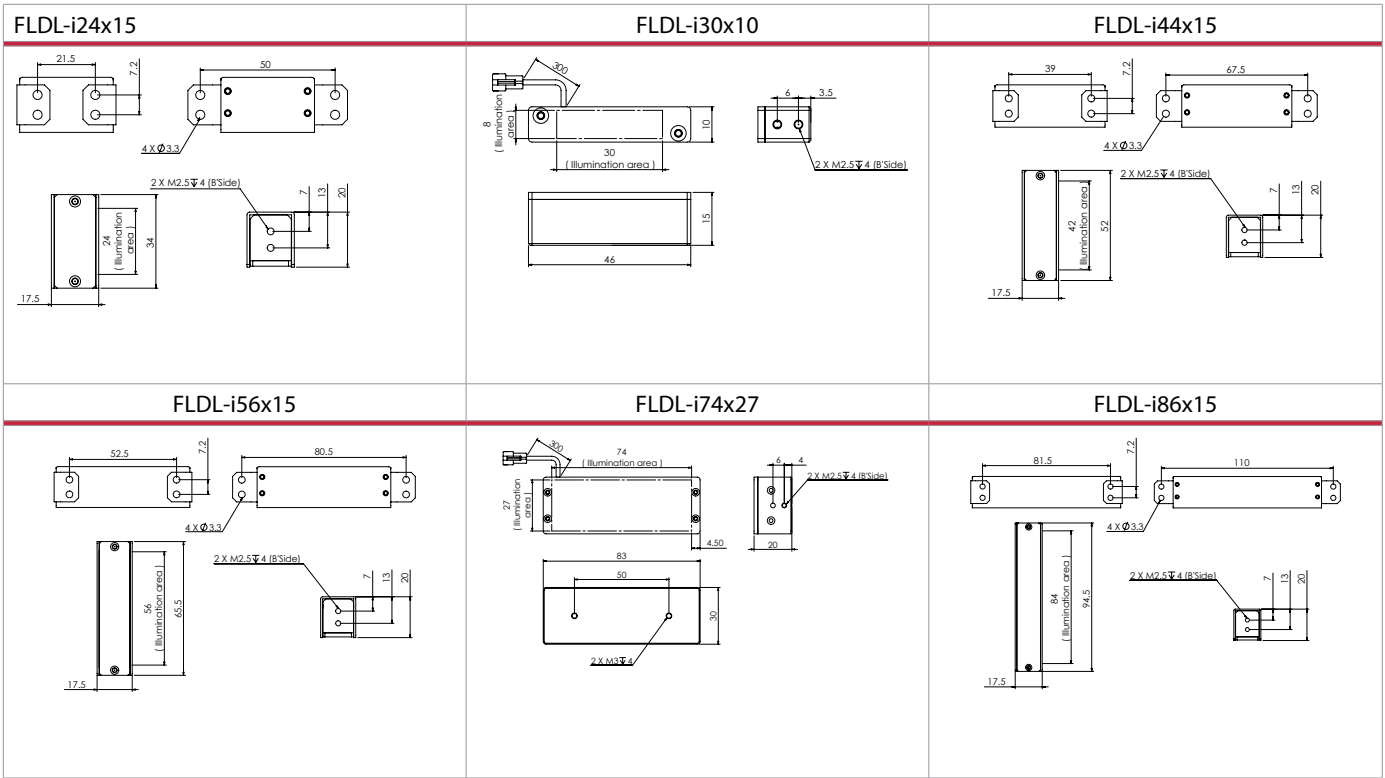
Other sizes available on request.

FLDL

FHDL

Model	Color	Volt	Wattage	Dimensions in mm		
				Housing	Illuminated area	Height
FHDL-Si24x15	Red	24	3,60	33,5 x 17,8	26 x 15	20
	White Blue		3,60			
FHDL-Si24x15N	IR	24	8,40	46 x 25	24 x 15	30
	UV	12	6,00			
FHDL-Si56x15N	Green Blue White	24	4,56	61 x 17	50 x 15	20
FHDL-Si86x25	Red	24	25,20	100 x 27	86 x 25	20
FHDL-i120x15 Strobe	White	24	6,24	128 x 17,5	120 x 15	20
FHDL-Si150x27	Red	22	8,40	150 x 37	141 x 27	20
FHDL-Si150x45	Red	24	25,20	166 x 70	146 x 50	34
FHDL-Si200x35	IR	24	-	-	-	-

Diffusers included in price - UV lights excluded.
Mounting brackets and frames for light bars can be found under accessories.



FLDL

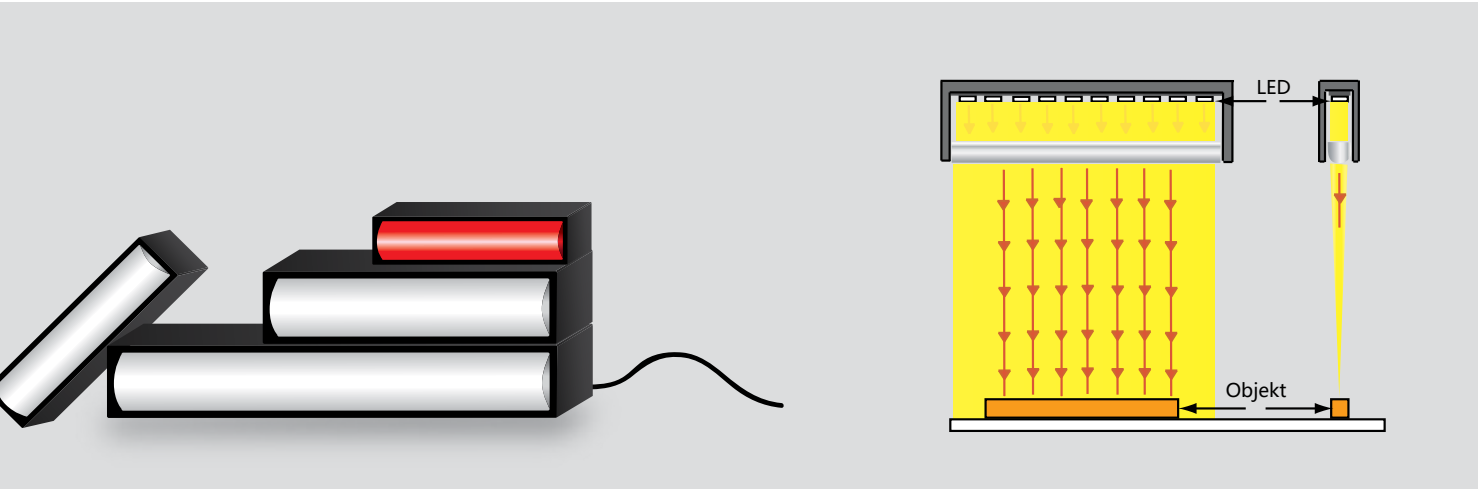
FLDL-i120x15	FLDL-i120x28-RGB	FLDL-i120x40
FLDL-i130x15	FLDL-i130x50	FLDL-i150x15
FLDL-i150x27	FLDL-i180x15	FLDL-i180x40
FLDL-i200x15	FLDL-i200x27	

FLDL

FLDL-i220x25	FLDL-i240x35	FLDL-i260x50
FLDL-i300x15	FLDL-i300x20	FLDL-i300x24
FLDL-i300x30	FLDL-i300x35	FLDL-i400x15
FLDL-i400x30	FLDL-i600x50	

FLLN, FHLN, FHLN-S

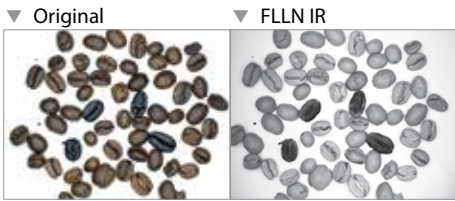
Line lights



- 0-100 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- Lens
- Housing: Al (optional stainless steel)
- LED angle: 0°

Properties
Line lights were developed specifically for use with line scan cameras. It supplies extremely high light intensities that is additionally focused by a lens. The spacing of the lens to the LEDs is variable. The focus can then be arranged at various working distances. Strobe mode is required for extremely high-performance lights from the FHLN series. These are generally marked with an "S" in the type identifier. Certain models also have an active cooling port for compressed air.

Application examples
Line scan camera applications
Dark field at large distances or at required light output



- Options**
- Colors: red, green, blue, white, RGB, IR (850 nm), UV (365/ 375/ 400 nm)
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor
 - Protection class: IP 30 as standard, IP 67 available

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Mounting adapter
 - Polarization filter

FLLN, FHLN

FLLN

Model	Color	Volt	Wattage	Dimensions in mm	
				Outside dimen-sions	Illuminated sur-face
FLLN-i50	■ ■ ■ ■	24	1,20	80 x 20 x 40	50 x 15
			1,20		
FLLN-i100	■	24	1,20	130 x 20 x 40	100 x 15
	■		4,80		
FLLN-i150	■	24	1,44	180 x 20 x 40	150 x 16
	■		2,40		
FLLN-i180	■	24	7,20	210 x 20 x 40	180 x 16
	■		2,40		
FLLN-i300	■	24	3,60	330 x 20 x 40	300 x 16
	■		4,80		
FLLN-Si300	■	24	6,00	330 x 20 x 40	300 x 15
	■		3,84		
FLLN-i400	■	24	7,20	430 x 20 x 40	420 x 15
	■		14,40		
	■		8,40		
	■		6,72		
FLLN-i500	■	24	7,20	530 x 25 x 50	520 x 20
	■		24,00		
FLLN-i600	■	24	8,40	630 x 25 x 50	600 x 20
	■		12,00		
FLLN-i800	■ ■	24	12,00	830 x 25 x 50	800 x 20
FLLN-i1000	■	24	14,40	1030 x 25 x 50	1000 x 20
	■		19,20		
FLLN-i1300	■	24	25,20	1330 x 25 x 50	1300 x 20

FHLN High-Power

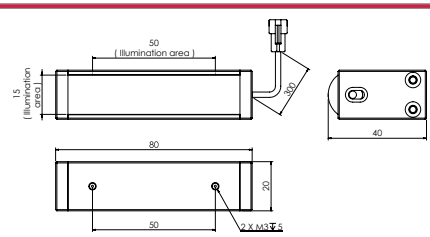
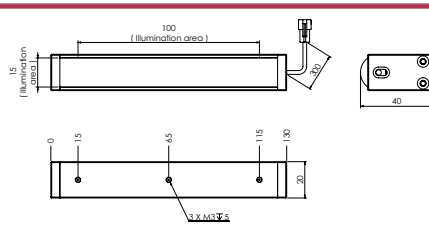
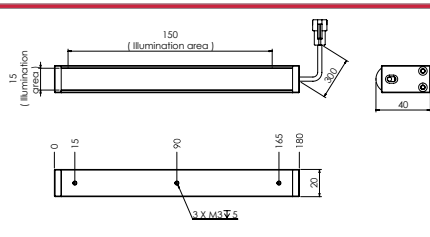
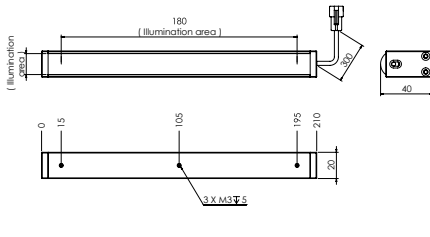
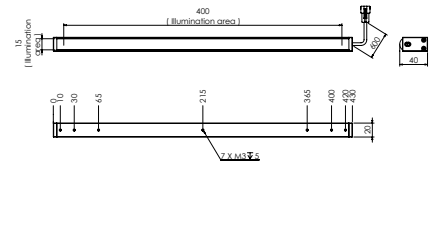
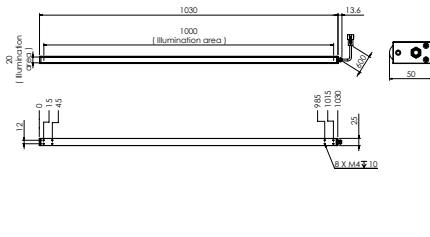
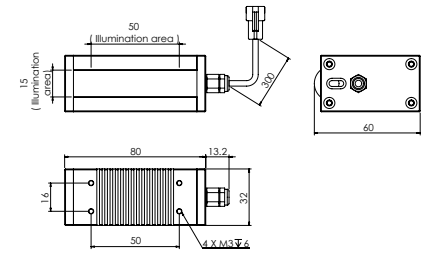
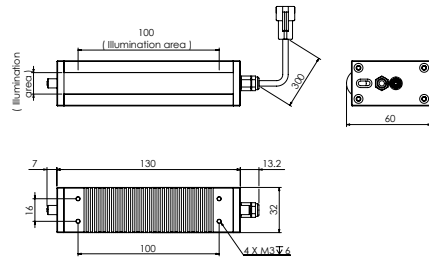
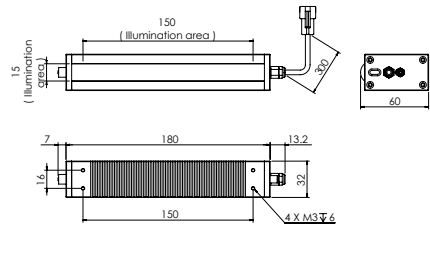
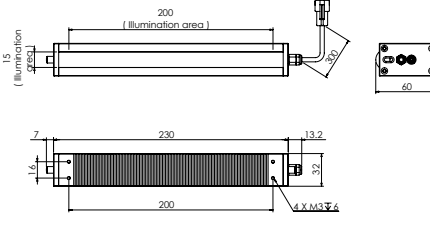
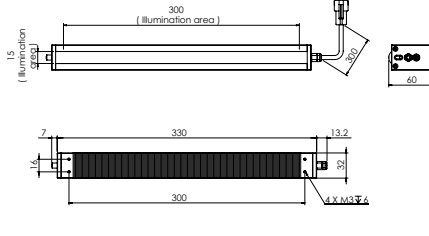
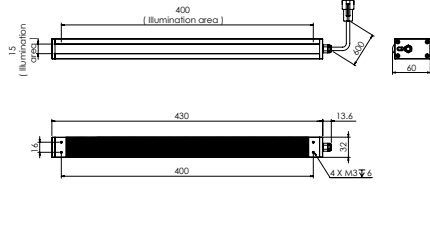
FHLN-Si50	■	24	8,40	80 x 32 x 60	50 x 15
FHLN-Si100	■	24	16,80	130 x 32 x 60	100 x 15
	■		16,80		
FHLN-Si150	■	24	25,20	180 x 32 x 60	170 x 15
FHLN-Si200	■	24	33,60	230 x 32 x 60	220 x 15
FHLN-Si300	■	24	50,40	330 x 32 x 60	300 x 15
FHLN-Si400	■	24	67,20	430 x 32 x 60	400 x 15
FHLN-Si800	■	24	134,40	830 x 32 x 60	800 x 20
	■		72,00		
FHLN-Si1000	■	24	168,00	1030 x 32 x 60	1000 x 20

FHLN-S Strobe High-Power

FHLN-Si50S	■	22	15,40	80 x 32 x 60	50 x 15
FHLN-Si100S	■	24	on request	130 x 32 x 60	100 x 15
FHLN-Si150S	■	24	33,60	180 x 32 x 60	150 x 15
FHLN-Si300S	■	24	72,00	330 x 32 x 60	300 x 15
FHLN-Si400S	■	24	67,20	435 x 32 x 80	400 x 15

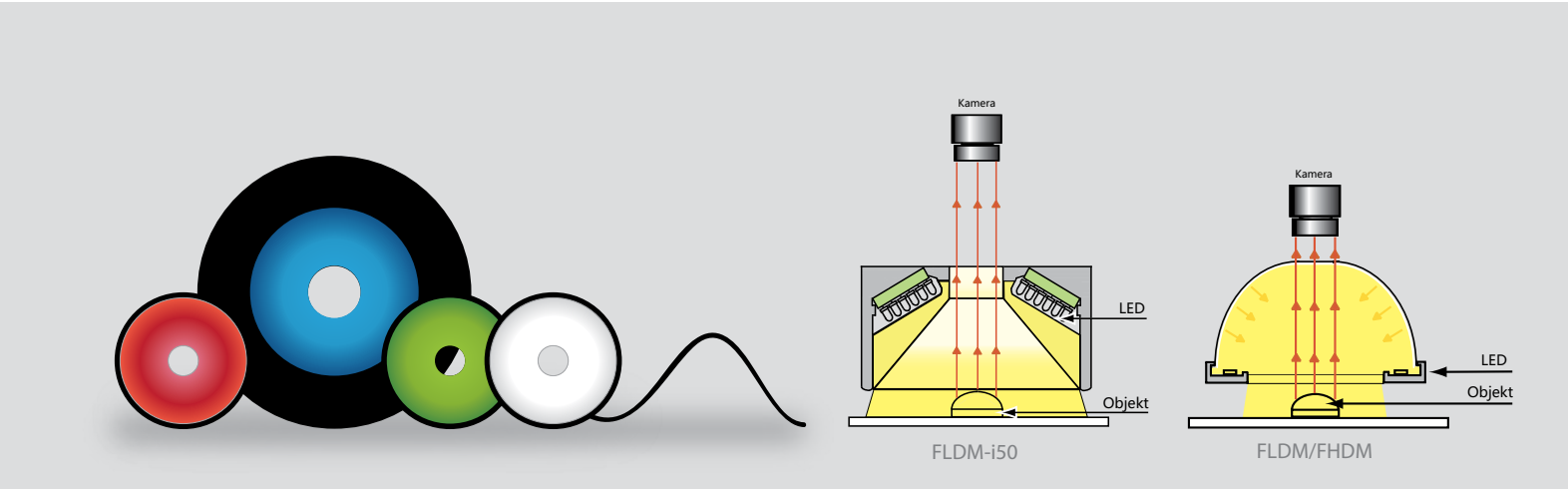
Other sizes available on request.

FLLN, FHLN

FLLN-i50 	FLLN-i100 	FLLN-i150 
FLLN-i180 	FLLN-i400 	FLLN-i1000 
FHLN-Si50 	FHLN-Si100/S 	FHLN-Si150/S 
FHLN-Si200 	FHLN-Si300/S 	FHLN-Si400/S 

FLDM, FHDM, FFDQ

DOME lights



- 0-30 mm working distance
- Continuous and flash mode
- Connectors: JST, M8, M12
- Housing: Al (optional stainless steel)

Properties
Dome lights radiate the light into a cupola that reflects very homogeneous and diffuse light. This allows uneven or crowned inspection objects to be illuminated without shadows. Dome lights are generally used with short working distances to the inspected object. High-power versions are available for extremely high light requirements. For rectangular inspected objects, the FFDQ series is available with the same properties.

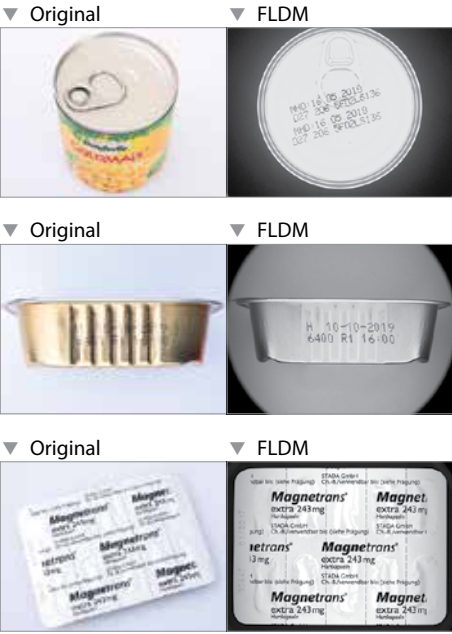
Application examples
Mirror surfaces
Uneven surfaces

- Options**
- Colors: red, green, blue, white, RGB, IR (850 nm), UV (365 nm)
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor
 - Custom solutions: Segment lights

Accessories, from page 83

- Industrial-strength M8 & M12 connectors
- Mounting adapter

Miscellaneous
The camera aperture required by the design in the image centerpoint results in low intensity, which can however be compensated by using an additional coaxial light.



FLDM, FHDM

FLDM

Model	Color	Volt	Wattage	LED type	Dimensions in mm	
					Outside dimensions	Illuminated area
FLDM-i50	SR	24	5,04	T1 3 mm	Ø 50 x H 40	Ø 46
	IR	12	3,00			
		24	4,80			
FLDM-i100		24	3,60	P4	Ø 130 x H 64	Ø 80
	IR		5,40	T1 3 mm		
			G = 2,88 B/W = 4,80			
FLDM-Si100	RGB	24	R = 1,92 G = 2,88 B = 2,88	SMD	Ø 130 x H 70	Ø 80
FLDM-i150		24	4,80	P4	Ø 180 x H 87	Ø 110
	IR		7,20	T1 3 mm		
			4,32	P4		
	 		7,20			
FLDM-i150	RGB		R = 3,36 G = 5,76 B = 6,24	T1 3 mm	Ø 180 x H 88	Ø 110
FLDM-i200		24	7,20	P4	Ø 230 x H 107	Ø 160
			19,20			
FLDM-i250		24	8,40	P4	Ø 280 x H 146	Ø 212
	IR		-			
			7,20			
	 		12,00			
FLDM-i380		24	32,40	P4	Ø 380 x H 185	Ø 295
		24	32,40			

Sizes 150, 250 and 380 are available as segment lights with 4/8 segments – see custom solutions

FHDM High-Power

FHDM-Si100	White	24	33,60	SMD	Ø 130 x H 62	Ø 80
	UV		48,00			
	UV White		UV = 48,00 W = 25,20	XPG	Ø 160 x H 72	Ø 70
FHDM-Si150	White	24	42,00	SMD	Ø 180 x H 87	Ø 110
FHDM-Si200	White	24	67,20	SMD	Ø 230 x H 120	Ø 160
	UV		44,00			
FHDM-Si250	White	24	67,20	SMD	Ø 280 x H 138	Ø 212

Sizes 150 and 250 are also available as segment lights with 4/8 segments – see custom solutions

FFDQ

FFDQ-i52	Green Blue White	24	7,68	T1 3 mm	100 x 100	52 x 52
FFDQ-i150	White	24	23,04	T1 3 mm	198 x 198	150 x 150
FFDQ-i200	White	24	28,80	T1 3 mm	258 x 24 x 42	200 x 200

FFDQ/FHDQ Segment

FFDQ-i150-4	SR	24	-	-	-	-
	White		23,04			
FHDQ-i150-4	White	24	-	-	-	-

FLDM, FHDM

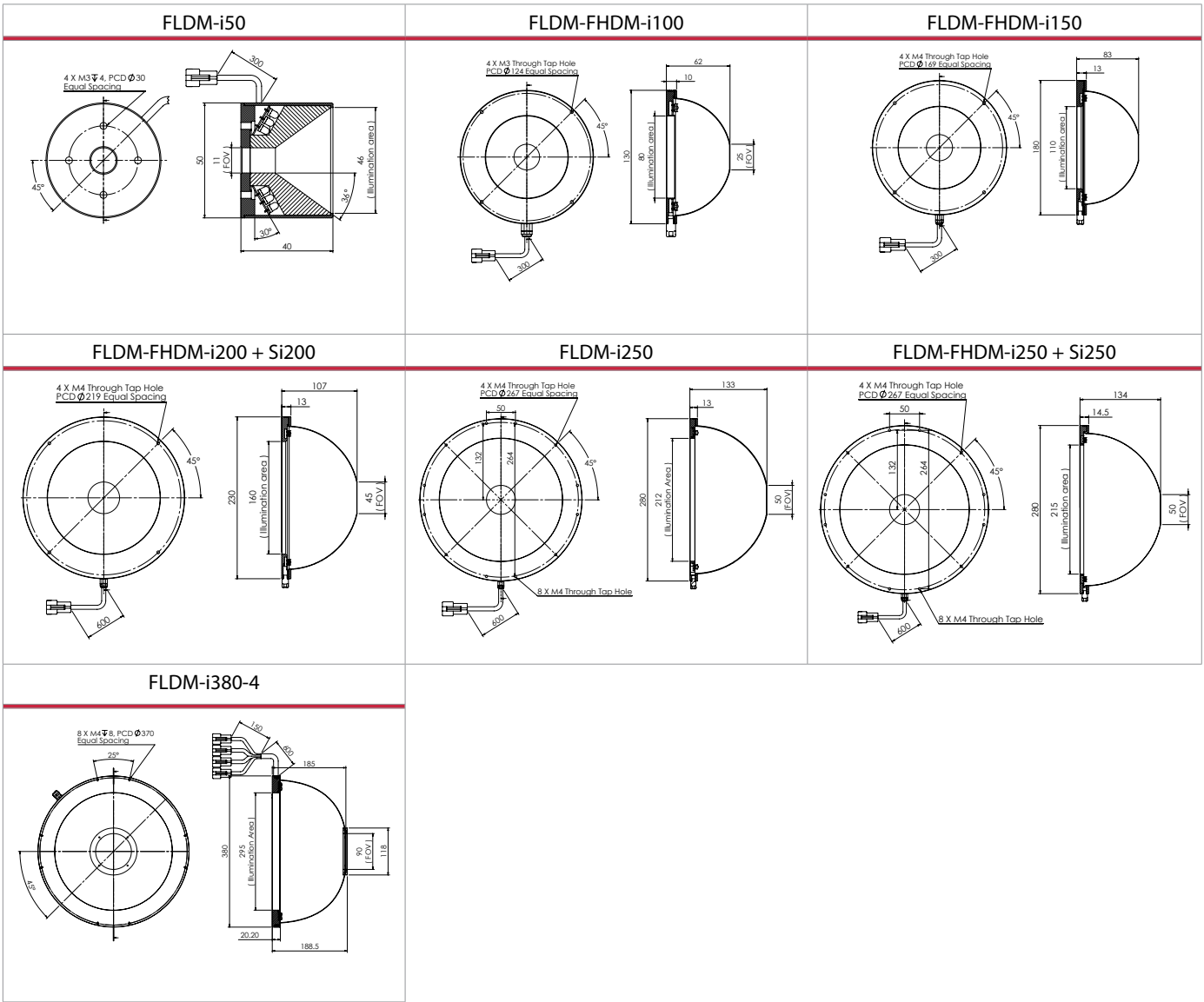
FLDM Half models

Model	Color	Volt	Wattage	LED type	Dimensions in mm	
					Outside dimensions	Illuminated area
FLDM-i50-HC180	Red	24	2,40	T1 3 mm	Ø 50 x H 40	Ø 42 x 180°

FLDM Segment

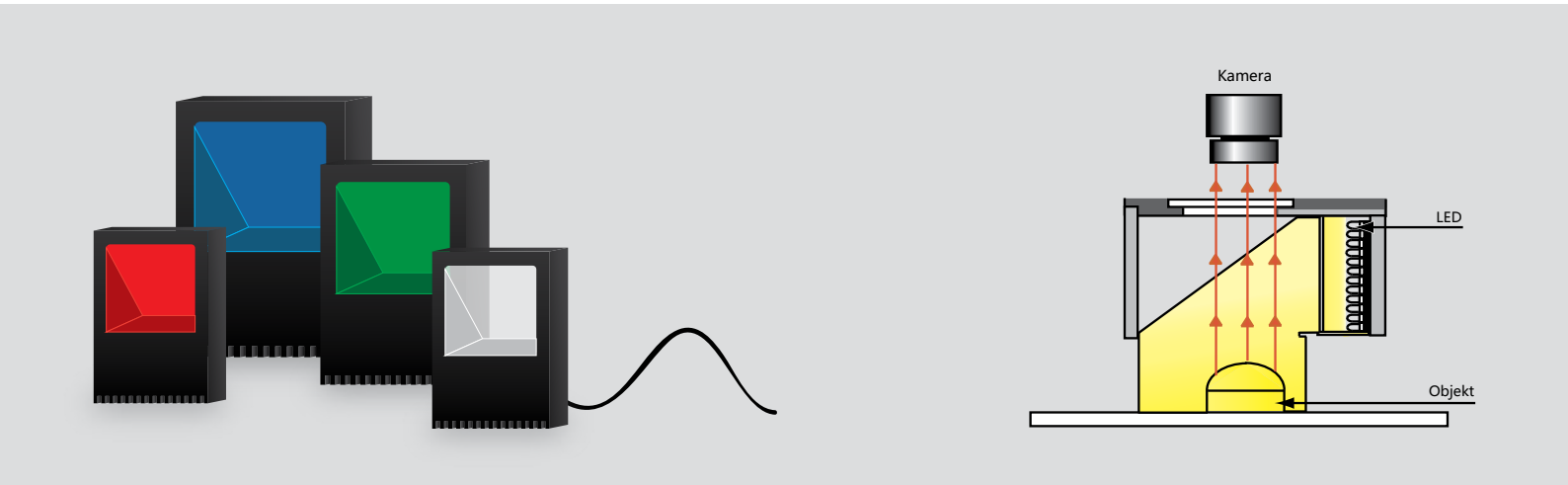
FLDM-i150-4	Green	24	2,88	P4	Ø 180 x H 88	Ø 110
	Blue White		4,80			
FLDM-i250-4	Red	24		P4	Ø 280 x H 138	Ø 212
	Green Blue White		9,60			
FLDM-i380-4	Green Blue White	24	33,60	P4	Ø 380 x H 185	Ø 295

Other sizes available on request.



FLFV, FHFV, FCAX

Coaxial lights: Brightfield



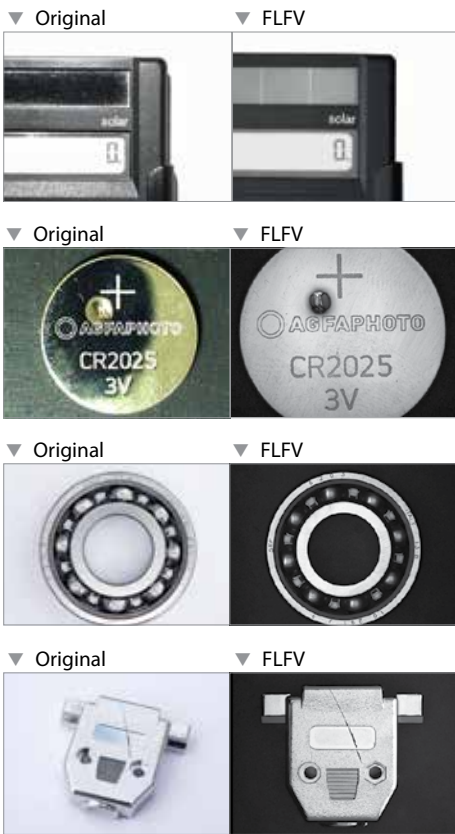
- 0-30 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- Diffuser
- Housing: Al (optional stainless steel)
- LED angle: 90°

Properties
The internally installed half-mirror gives coaxial lights the ability to illuminate surfaces with extremely homogeneous light without a blind spot in the center. The LEDs (oriented at a 90° angle to the horizontal) radiate on the mirror (oriented at 45°), resulting in a reflection on the object. Series FHFV is available for applications with high light requirements. The new FCAX series also provides additional benefits. These include the high tolerance against mechanical loads, an even more homogeneous light, and even higher light output.

Application examples
homogeneous illumination of reflective and smooth surfaces in combination with dome lights

- Options**
- Colors: red, green, blue, white, RGB, IR (850 nm), UV (365/ 375 nm)
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor
 - Protection class: IP 30 as standard, available up to IP 65

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Mounting adapter



FLFV, FHFV, FCAX

FLFV

Model	Color	Volt	Wattage	LED type	Dimensions in mm	
					Housing	Illuminated area
FLFV-Si18	IR	12	1,44	SMD	56 x 30	18 x 18
			0,60			
FLFV-Si25N		24	1,44	SMD	55 x 35	25 x 25
			1,92			
FLFV-Si35N	IR	24	3,84	SMD	70 x 45	35 x 35
			1,80			
FLFV-Si50N		24	8,64	SMD	86 x 60	50 x 50
			6,48			
FLFV-Si70N	IR	24	9,60	SMD	118 x 84	70 x 70
			5,10			
FLFV-Si100	UV	24	10,20	SMD	151 x 118	100 x 100
			9,60			
FLFV-i140x100	RGB	24	23,04	SMD	157 x 118	134 x 93
			19,20			
FLFV-i200	UV	24	31,20	P4	177 x 134	200 x 200
			15,60			
FLFV-Si200x150	UV	24	21,60	SMD	177 x 150	134 x 93
			55,20			
FLFV-Si200x150	RGB	24	33,12	SMD	291 x 230	200 x 200
			55,20			
FLFV-Si200x150	RGB	24	15,84	SMD	230x141x167	200 x 150
			G=23,04 B=23,04			

FHFV High High-Power

FHFV-Si18	IR	24	8,40	HighPower SMD	56 x 30	18 x 18
			16,80			
FHFV-Si25N	IR	24	8,40	HighPower SMD	55 x 35	25 x 25
			16,80			
FHFV-Si25N-IP65-W	UV	24	16,80	HighPower SMD	122 x 90	70 x 70
			10,20			
FHFV-Si35N		24	25,20	HighPower SMD	70 x 45	35 x 35
			33,60			
FHFV-Si50	IR	24	42,00	HighPower SMD	86,6 x 59	46 x 46
			58,80			
FHFV-Si50N	UV	24	42,00	HighPower SMD	85 x 60	50 x 50
			42,00			
FHFV-Si70N	UV	24	92,40	HighPower SMD	118 x 84	70 x 70
			92,40			

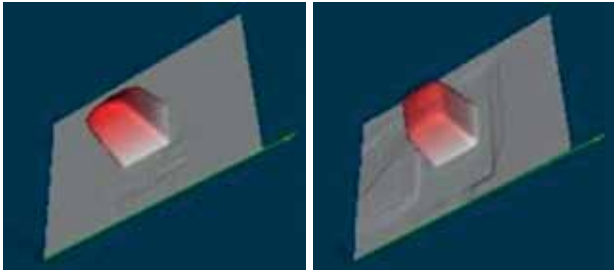
Other sizes available on request.

FLFV, FHFV, FCAX

FCAX

The new FCAX series from FALCON improves coaxial lights in a number of ways. The FCAX series is now no longer susceptible to dirt ingress, does not have fragile mirrors installed, and is better than previous coaxial lights in terms of its light output and illumination uniformity.

The two images below were generated in a uniformity tester. They show that the light output in the right image is distributed much more uniformly over the entire surface than on the left image. Expressed as a figure, the FCAX series illuminates about 20% more evenly compared to the FLFV series.



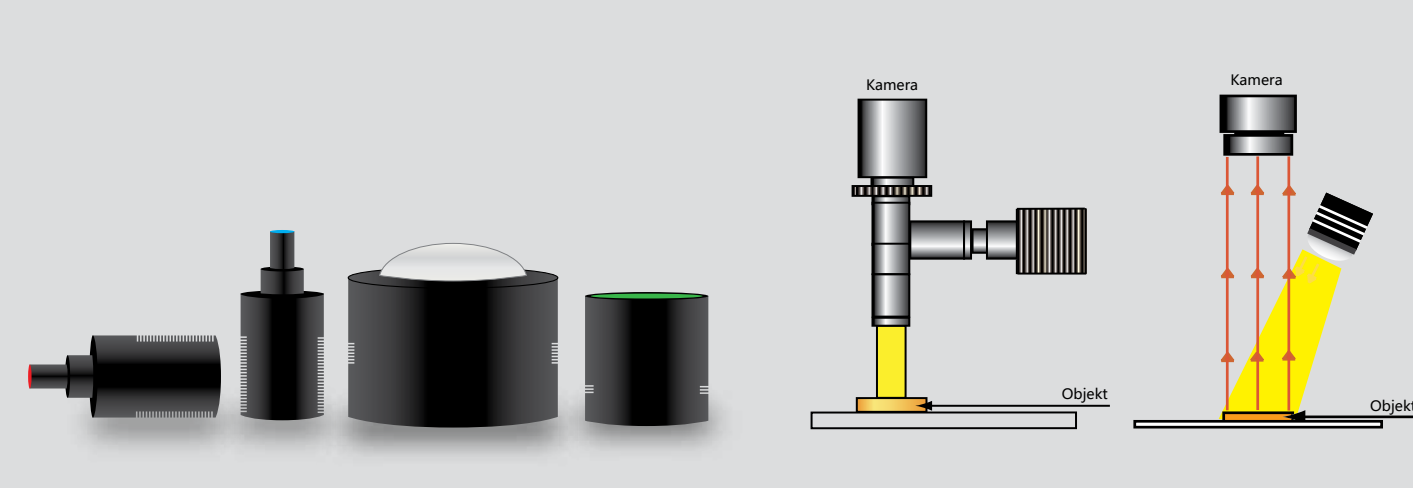
The next two images show histograms of the brightness distribution. The images again show the conventional FLFV, and the FCAX to the right. It is evident that the frequency distribution of the gray values has a narrower and sharper range for the FCAX series. Attributes are more readily detected as a result.



FLFV-Si18	FLFV-Si25N	FLFV-Si50N
FLFV-Si70N	FLFV-Si100	FLFV-i200

FLSP | FHLV | FHSP

Spot light with high-power illumination



- 10-3000 mm working distance
- Continuous and flash mode
- Connector: JST (optional M8, M12)
- Diffuser
- Housing: Al (optional stainless steel)

Properties

Various designs are consolidated under the spot lights.

The **FHSP** is ideally suited for installation in machinery and equipment with M12 thread. It supplies strong diffused light that is lightly bundled.

The **FLSP** series represents spot lights with diffuser disk and internally installed 5mm LEDs. This allows evenly illuminating a circular surface from distances up to approx. 1m.

The **FHSP-Si60N** series is similar to the FLSP series, but with much higher output and lens. The targeted light diffused by the large working distance is suited for working distances of up to approx. 3m.

The spot lights of the FHLV series are specifically suited for use in lenses with coaxial light input coupling. Diffused and bundled light creates a homogeneous and evenly bright illumination.



Application examples

- Condenser lens and rod lens
- Installation in equipment with M12 thread
- Illumination from large distances
- Illuminating with pinpoint accuracy

- Options**
- Colors: red, green, blue, white, RGB, IR (850 nm), UV (365/ 405 nm)
 - Protection class: IP 30 as standard ,available up to IP 67
 - Material: Aluminum (standard), stainless steel (on request)
 - Without series resistor or with series resistor

- Accessories, from page 83**
- Industrial-strength M8 & M12 connectors
 - Mounting adapter
 - Polarization filter

FLSP | FHLV | FHSP

FHLV Spot-light

Model	Color	Volt	Wattage	Dimensions in mm	
				Housing	Illuminated area
FHLV-Si27N2	■	24	0,77	Ø 27 x 60	Ø 6,3
	■ IR	12	1,05		
	■ ■ ■		1,05		
	■ UV	12	6,00		

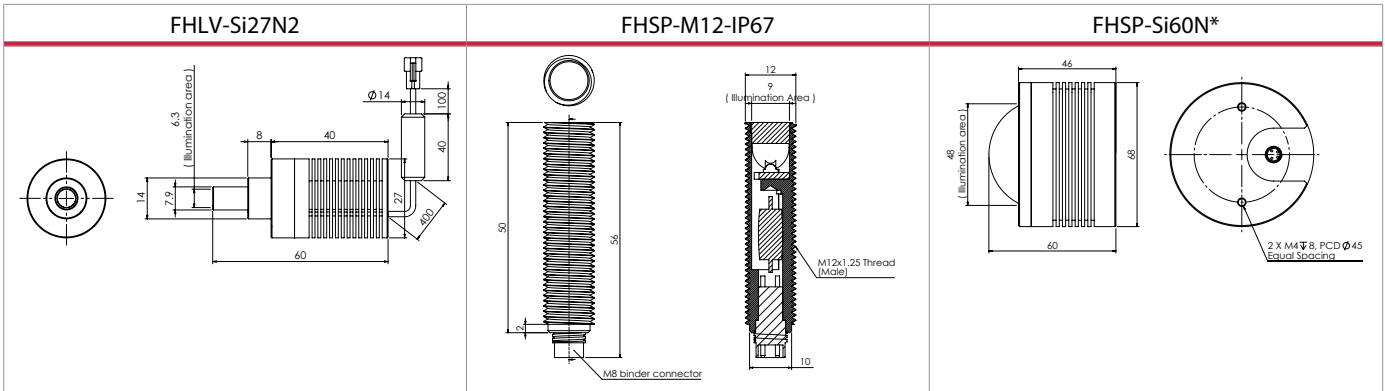
FLSP Spot

FLSP-i41	■	24	1,44	Ø 41 x 40	Ø 33
	■ ■ ■		2,16		

FHSP High-Power Spot

FHSP-M12-IP67	■	12	1,05	Ø 56 x 12	Ø 9
	■ ■ ■		1,05		
FHSP-Si60N*	■	24	8,40	Ø 68 x 43	Ø 38
	■ IR		8,40		
	■		8,40		

* Strobe mode recommended

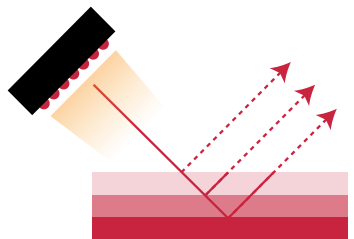


IR lights (infrared)

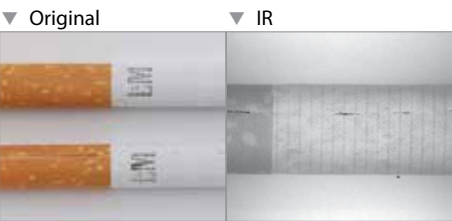
Continuous and flash mode
Protection class IP30
Connector: JST (optional M8, M12)
Diffuser
Housing: Al (optional stainless steel)
LED type: SMD

Properties
Long-wave IR radiation generates little reflection on boundary layers and penetrates deeply into materials. IR radiation is also used to reduce color differences for images with monochromatic cameras. Deeper lying structures can then be examined, or materials can be viewed without color attributes.

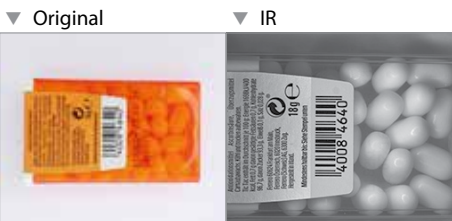
- Options**
- 3 & 5 mm LEDs (-i): 875 nm
 - SMD-LEDs (-Si): 850 nm
- Other wave lengths on request



- Application examples:**
- Minimum shelf life on aluminum lid
 - Inspecting fill levels in packaging
 - Reducing surface reflections on metal surfaces
 - Inspections on printed or soiled surfaces, printed colors are rendered invisible, black remains visible.



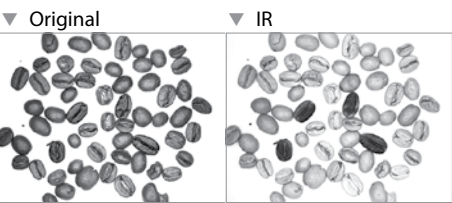
- Defect detection: Tear in paper: The best result is achieved with infrared lights since the print is rendered completely invisible and the defect also becomes visible within the print. If only the print or the filter need to be checked, blue light would be better since it supplies the best contrast (filter and print become darker).



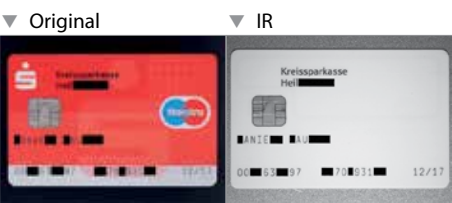
- The use of blue light on red objects lets the red can and red print appear darker due to the blue complementary color. Only the barcode is visible as a result. UV light creates the ability to inspect the surface of plastic packaging. IR light makes the printed text of the expiration date disappear and lets the plastic packaging appear transparent. The plastic box can then be seen more readily.



- IR light reduces the scatter on metal surfaces. The long wave length of infrared supports a deeper penetration into the plastic (transmission). Scratches or other defects on the object surfaces can then be easily concealed.



- The roasting level of coffee beans can be examined when illuminated with IR light. One can see that burned beans completely absorb the IR light, thus eliminating all reflection. All properly roasted coffee beans reflect the IR light and therefore appear bright.



- IR light with a wave length of 850 nm used in an application on a credit card has the effect that the red background and the blue print disappear. The white content is reflected and is visible in white, whereas the black text absorbs the IR radiation, resulting in no reflection.

IR lights (infrared)

Back lights – FLFL

850 nm/875 nm

Model	Color	Volt	Wattage	Dimensions in mm		
				Outside dimensions	Illuminated area	Height
FLFL-Si60	IR	24	2,40	94 x 94	60 x 60	10
FLFL-Si70x40N	IR	24	1,20	90 x 70	70 x 40	10
FLFL-Si90x40N	IR	24	2,40	110 x 70	90 x 40	10
FLFL-Si100	IR	24	4,80	133 x 133	100 x 100	10
FLFL-Si110x50	IR	24	3,60	143 x 83	110 x 50	10
FLFL-Si120x100	IR	24	5,40	153 x 133	120 x 100	10
FLFL-Si132x60-3S	IR	24	4,20	150 x 90	132 x 60	10
FLFL-Si140	IR	24	7,20	173 x 173	140 x 140	9
FLFL-Si150x70	IR	12	5,40	174 x 100	150 x 70	10
FLFL-Si200	IR	24	9,60	233 x 233	200 x 200	10
FLFL-Si250	IR	24	12,00	283 x 283	250 x 250	10
FLFL-Si250x100	IR	24	8,40	283 x 133	250 x 100	10
FLFL-Si360x240	IR	24	14,40	393 x 273	360 x 240	10

Bar lights – FLDL/FHDL

FHDL-Si24x15N	IR	24	3,60	46 x 25	24 x 15	30
FLDL-i24x15	IR	24	0,60	34 x 17,5	24 x 15	20
FLDL-i30x10	IR	24	0,60	46 x 10	30 x 8	15
FLDL-i44x15	IR	24	1,20	52 x 17,5	44 x 15	20
FLDL-i56x15	IR	24	1,20	65,5 x 17,5	56 x 15	20
FLDL-i74x27	IR	24	3,60	83 x 30	74 x 27	20
FLDL-i86x15	IR	24	2,40	94,5 x 17,5	86 x 15	20
FLDL-i120x15	IR	24	3,60	128 x 17,5	120 x 15	20
FLDL-i120x40	IR	24	12,00	132 x 50,0	120 x 40	20
FLDL-i130x15	IR	24	3,60	140 x 17,5	130 x 15	20
FLDL-i130x50	IR	24	10,80	144 x 60	131 x 53	22
FLDL-i150x15	IR	24	3,60	158 x 17,5	150 x 15	20
FLDL-i180x15	IR	24	4,20	191 x 17,5	180 x 15	20,5
FLDL-i200x15	IR	24	4,80	212 x 25	200 x 15	20
FLDL-i200x27	IR	24	7,80	200 x 34	192 x 27	20
FLDL-i220x25	IR	24	9,00	240 x 35	223 x 25	20
FLDL-i240x35	IR	12	14,40	255 x 45	240 x 35	20
FLDL-i300x24	IR	12	15,00	320 x 34	300 x 24	20
FLDL-i300x30	IR	24	15,00	320 x 40	300 x 30	20
FLDL-i600x50	IR	24	16,32	610 x 58	600 x 50	30

Dark field lights – FLDR-LA1

FLDR-Si49-LA1	IR	24	1,20	Ø 49	Ø 26	7
FLDR-Si75-LA1	IR	24	2,40	Ø 75	Ø 50	10
FLDR-Si100-LA1	IR	12	3,00	Ø 102	Ø 65	12
FLDR-Si130-LA1	IR	24	4,20	Ø 130	Ø 94	12
FLDR-Si180-LA1	IR	24	5,40	Ø 180	Ø 150	12
FLDR-Si220-LA1	IR	12	7,20	Ø 220	Ø 185	12

IR lights (infrared)

Dark field lights – FLDR-LA3

850 nm/875 nm

Model	Color	Volt	Wattage	Dimensions in mm		
				Outside dimensions	Illuminated area	Height
FLDR-i49-LA3	IR	24	1,80	Ø 49	Ø 40	19
FLDR-i74-LA3	IR	24	3,60	Ø 74	Ø 65	19
FLDR-Si74-LA3	IR	24	2,40	Ø 74	Ø 65	19
FLDR-i100-LA3	IR	24	8,40	Ø 115	Ø 97	22
FLDR-i132-LA3	IR	24	10,80	Ø 132	Ø 113	22
FLDR-i170-LA3	IR	24	13,80	Ø 172	Ø 163	23
FLDR-i220-LA3	IR	24	16,80	Ø 220	Ø 205	23
FLDR-i250-LA3	IR	24	21,60	Ø 250	Ø 230	23
FLDR-i280-LA3	IR	24	-	Ø 280	-	-

Ring lights – FLDR A / B

FLDR-Si32A	IR	24	0,60	Ø 37	Ø 32	20
FLDR-Si32B	IR	24	0,60	Ø 32	Ø 28	16
FLDR-i38B	IR	24	1,20	Ø 38	Ø 32	16,6
FLDR-i50A	IR	24	1,80	Ø 49	Ø 43	21
FLDR-i50B	IR	24	2,40	Ø 49	Ø 47	17,2
FLDR-i56A	IR	24	3,00	Ø 56	Ø 52	23,5
FLDR-i70A	IR	24	4,80	Ø 70	Ø 65	22,5
FLDR-i70B	IR	24	3,60	Ø 70	Ø 65	22,5
FLDR-i90A	IR	24	6,00	Ø 102	Ø 90	23
FLDR-i90B	IR	24	7,20	Ø 93,5	Ø 87	24,6
FLDR-i120B	IR	24	20,40	Ø 128	Ø 112	29
FLDR-i230B	IR	24	31,20	Ø 235	Ø 220	40

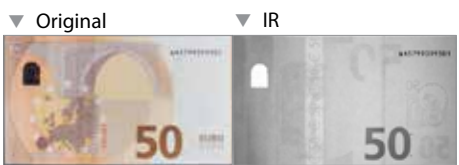
High-powered flat back lights – FLDL-TP

FLDL-TP-Si27	IR	24	1,20	37 x 37	25 x 25	13
FLDL-TP-Si36	IR	24	1,80	47 x 47	36 x 36	15
FLDL-TP-Si51	IR	24	3,60	62 x 62	50 x 50	15
FLDL-TP-Si85x77	IR	24	6,60	95 x 95	85 x 77	15
FLDL-TP-Si100	IR	24	9,00	124 x 112	100 x 100	24
FLDL-TP-Si160	IR	24	19,20	170 x 170	160 x 160	25
FLDL-TP-Si200	IR	24	32,40	226 x 216	202 x 202	25
FLDL-TP-Si200x100	IR	24	15,60	228 x 116	202 x 102	23,5
FLDL-TP-Si250	IR	24	36,00	272 x 270	260 x 252	25
FLDL-TP-Si300x100	IR	24	29,40	320 x 120	310 x 102	25
FLDL-TP-Si320x180	IR	24	50,40	334 x 202	322 x 180	25
FLDL-TP-Si400x300-C30	IR	24	82,80	412 x 322	400 x 300	25

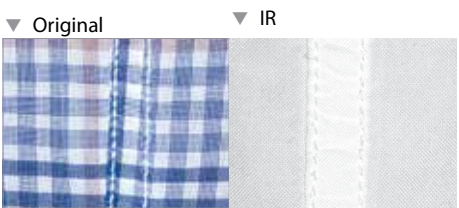
Line lights - FLLN

FLLN-i400	IR	24	14,40	430 x 20 x 40	400 x 15	40
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IR lights (infrared)



► When a EUR 50 bill is illuminated with IR light, codes printed in black are rendered visible and the surface can be inspected for attributes. The yellowish print disappears, security attributes are highlighted, and even the print on the reverse side bleeds through.



► IR light has enormous potential in the textile sector. The long wave illumination suppresses the checkered pattern, and the texture of the fabric and the seam become visible.

Spot lights – FHLV/FHSP 850 nm/875 nm

Model	Color	Volt	Wattage	Dimensions in mm		
				Outside dimensions	Illuminated area	Height
FHLV-Si27N	IR	12	1,05	Ø 27 x 60	Ø 6,3	-
FHSP-Si60N	IR	24	8,40	Ø 68	Ø 38	-
FHSP-Si110	IR	24	69,00	Ø 110	Ø 90	-

Diffused incident light- FLFR/FLKR

FLFR-Si70	IR	24	2,40	Ø 80	Ø 60	16
FLFR-Si100	IR	24	3,00	Ø 110	Ø 90	16
FLFR-Si200	IR	24	7,20	Ø 220	Ø 195	16
FLKR-Si70	IR	24	2,40	Ø 74	Ø 69	18

DOME lights - FLDM

FLDM-i50	IR	12	3,00	Ø 50	Ø 46	40
FLDM-i150	IR	24	7,20	Ø 180	Ø 110	87
FLDM-i250	IR	24	n. A.	Ø 280	Ø 212	146

Dark field lights - FFPQ/FFPR

FFPQ-Si32	IR	24	0,60	32 x 32 x 30	28 x 28	10 x 10
FFPQ-Si50	IR	24	1,20	50 x 50	46 x 46	28 x 28
FFPQ-Si75	IR	24	2,40	75 x 75 x 30	71 x 71	53 x 53
FFPQ-Si100	IR	24	3,60	100 x 100 x 30	96 x 96	78 x 78
FFPR-i50	IR	24	1,80	Ø 50	Ø 45	Ø 23
FFPR-i100	IR	24	4,80	Ø 100	Ø 94	Ø 73
FLFQ-Si245x200	IR	24	18,00	270 x 228	245 x 200	Ø 90

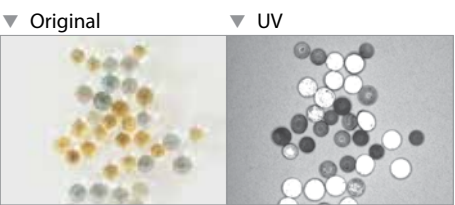
Coaxial lights - FLFV

FLFV-Si18	IR	12	0,60	56 x 30	18 x 18	24
FLFV-Si35N	IR	24	1,80	70 x 45	35 x 35	45

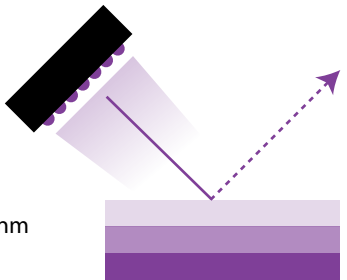
All red lights are available in **infrared**. IR safety goggles available in request!

UV lights (ultraviolet)

	Continuous and flash mode
	Protection class IP30
	Connector: JST (optional M8, M12)
	Diffuser
	Housing: Al (optional stainless steel)
	LED type: SMD, T1 5mm



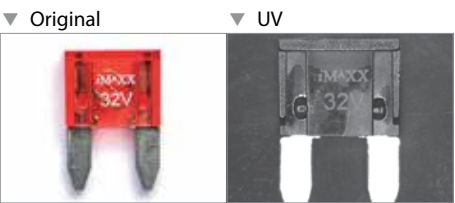
Properties
Short wave UV radiation is primarily used to excite fluorescent substances in adhesives or other materials and to trigger the fluorescent properties. Due to the short wave length, UV radiation also generates strong reflections on certain materials, and is therefore used for detecting surfaces.



- Options**
- 5mm LEDs (-i): 375nm, 400nm
 - Standard SMD-LEDs (-si): 365nm, 375nm
 - High-Power SMD-LEDs (-si): 365nm, 375nm, 405nm

Special features
Other wave lengths are available on request - including other wave lengths in one lighting. UV lights are by default shipped without diffuser, excluding lights from the FLDL-TP series.

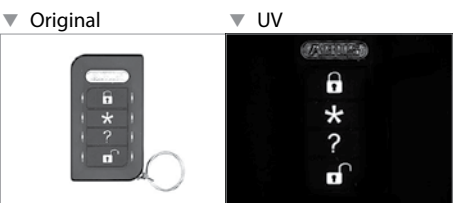
► The contrast differential is greatly enhanced under UV. Moist (dark) and dry (light) silica gels can then be easily distinguished.



► UV renders metal surfaces highly-reflective, whereas plastic is penetrated less so. Surface damage can then be rendered more readily than e.g. under infrared light.



► In addition to direct reflections, one can detect print with a minimum shelf life date on the bottom of the can. Under UV light, one can clearly identify the can outline and a code not visible for end customers. The reason for this is that additional print was applied with fluorescent ink. The can outline is also fluorescent to simplify subsequent position detection.



► On this car key, the use of short-wave UV radiation has the advantage that many reflections highly accentuate the white print.

UV lights (ultraviolet)

Ring lights – FLDR A / B

Model	Color	Volt	Wattage	Dimensions mm	Illuminated area	Height
FLDR-i32B	UV	24	1,92	Ø 32	Ø 28	16
FLDR-i38B	UV	24	0,96	Ø 38	Ø 32	16,6
FLDR-i50B	UV	24	1,44	Ø 49	Ø 47	17,2
FLDR-i56A	UV	24	2,88	Ø 56	Ø 52	23,5
FLDR-i70A	UV	24	3,84	Ø 70	Ø 65	22,5
FLDR-i75B	UV	24	1,92	Ø 75	Ø 69	20
FLDR-i90B	UV	24	5,76	Ø 90	Ø 86	19,5
FLDR-i100B	UV	24	6,24	Ø 103	Ø 99	20
FLDR-i100B-UV-W5	UV □	24	W= 3,36 UV= 2,88	Ø 103	Ø 98	20
FLDR-i120B-UV-W5	UV □	24	n. A.	-	-	-
FLDR-i230B	UV	24	n. A.	Ø 235	Ø 220	40
FHDR-Si75B	UV	24	25,20	Ø 75	Ø 69	20
FHDR-Si90A	UV	24	24,00	Ø 100	Ø 84	23

Ring light horizontal - FLDR-LA1

Model	Color	Volt	Wattage	Dimensions mm	Illuminated area	Height
FLDR-i94-LA1	UV	24	2,88	Ø 94	Ø 72	17
FLDR-i120-LA1	UV	24	4,32	Ø 120	Ø 75	12

Flat angle dark field light - FLDR-LA3

FLDR-Si49-LA3	UV	24	2,40	Ø 49	Ø 40	19
FLDR-i74-LA3	UV	24	4,80	Ø 74	Ø 65	19
FLDR-i100-LA3	UV	24	7,20	Ø 115	Ø 97	22
FLDR-i132-LA3	UV	24	8,16	Ø 132	Ø 113	22
FLDR-i170-LA3	UV	24	12,0	Ø 172	Ø 163	23
FLDR-i250-LA3	UV	24	15,36	Ø 250	Ø 230	23
FHDR-Si45-LA3	UV	24	2,88	Ø 45	Ø 38	18

Back light - FLDL-TP

FLDL-TP-Si250x200	UV	15	75,0	272x204	250 x 200	25
FHDL-Si24x15N	UV	12	6,00	46 x 25	24 x 15	30

Line light - FLLN

FLLN-i100	UV	24	1,44	130 x 20	100 x 15	40
FLLN-Si300	UV	24	3,84	330 x 20	300 x 15	40
FLLN-i400	UV	24	6,72	430 x 20	420 x 16	40
FLLN-i400	UV	24	6,72	430 x 20	420 x 16	40
FHLN-Si800	UV	24	72,00	830 x 32 x 60	800 x 20	60

UV lights (ultraviolet)

Ring lights – FLDR

Model	Color	Volt	Wattage	Dimensions mm	Illuminated area	Height
FLDR-i32B	UV	24	1,92	Ø 32	Ø 28	16
FLDR-i38B	UV	24	0,96	Ø 38	Ø 32	16,6
FLDR-i50B	UV	24	1,44	Ø 49	Ø 47	17,2
FLDR-i56A	UV	24	2,88	Ø 56	Ø 52	23,5
FLDR-i70A	UV	24	3,84	Ø 70	Ø 65	22,5
FLDR-i75B	UV	24	1,92	Ø 75	Ø 69	20
FLDR-i90B	UV	24	5,76	Ø 90	Ø 86	19,5
FLDR-i100B	UV	24	6,24	Ø 103	Ø 99	20
FLDR-i100B-UV-W5	UV □	24	W= 3,36 UV= 2,88	Ø 103	Ø 98	20
FLDR-i120B-UV-W5	UV □	24	n. A.	-	-	-
FLDR-i230B	UV	24	n. A.	Ø 235	Ø 220	40

Bar lights

Model	Color	Volt	Wattage	Dimensions mm	Illuminated area	Height
FLDL-i24x15	UV	24	0,48	34 x 17,5	25 x 15	20
FLDL-i44x15	UV	24	0,96	52 x 17,5	44 x 15	20
FLDL-i56x15	UV	24	1,44	65,5 x 17,5	56 x 15	20
FLDL-i74x27	UV	24	2,88	83 x 30	74 x 27	18
FLDL-i86x15	UV	24	1,92	94,5 x 17,5	86 x 15	20
FLDL-i120x15	UV	24	2,88	128 x 17,5	120 x 15	20
FLDL-i120x40	UV	24	8,64	132 x 50	120 x 40	18
FLDL-i130x15	UV	24	2,88	140 x 17,5	130 x 15	20
FLDL-i130x50	UV	24	-	140 x 60	131 x 50	22
FLDL-i150x15	UV	24	3,36	158 x 17,5	150 x 15	20
FLDL-i180x15	UV	24	4,32	191 x 17,5	180 x 15	20
FLDL-i300x15	UV	24	7,20	320 x 27	300 x 15	18
FLDL-i300x35	UV	24	13,44	320 x 45	310 x 35	18
FLDL-i400x30	UV	24	17,28	420 x 40	404 x 30	20
FLDL-Si74x27	UV	24	3,36	83 x 30	74 x 27	18

Many other **UV** models are also available in other UV wave lengths on request.

UV lights (ultraviolet)

DOME light - FLDM

Model	Color	Volt	Wattage	Dimensions mm	Illuminated area	Height
FHDM-Si100	UV	24	44,00	Ø 130	Ø 80	62

Coaxial light - FLFV

FHFV-Si50N	UV	24	42,00	60 x 85	50 x 50	-
FLFV-Si70N	UV	24	9,60	-	-	-

Incident light, diffuse - FLKR

FLKR-Si100	UV	24	7,68	Ø 125	Ø 98	18
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Spot light - FHLV

FHLV-Si25N	UV	24	16,80	35 x 55	25 x 25	-
FHLV-Si27N2	UV	12	6,00	Ø 27 x 60	6,3	-

Custom solutions: Stainless steel

Dark field lights FFPR

Model	Color	Volt	Wattage	Dimensions mm	Illuminated area	Height
FFPR-Si70ST-IP54	☐	24	4,80	Ø 70	Ø 64	40

Bar lights FLDL

FLDL-i150x15ST-IP67	☐	24	6,24	-	-	-
FLDL-i170x15ST-IP67	☐	24	6,72	195 x 32	170 x 15	28
FLDL-i180x15ST-IP69	☐	24	7,20	-	-	-

Diffuse back light, incident, and surface lights FLDL-TP

FLDL-TP-Si50ST-IP65	☐	24	-	82 x 68	50 x 50	30
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Direct incident lights FLDR-A

FLDR-i70AST-IP69	☐	24	4,80	Ø 86	Ø 70	28
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Back lights FLFL

FLFL-Si120x100ST-IP54	☐	24	12,96	162 x 142	120 x 100	12
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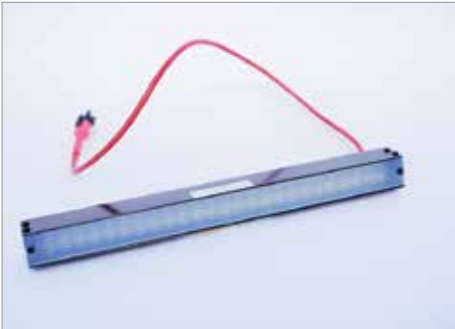
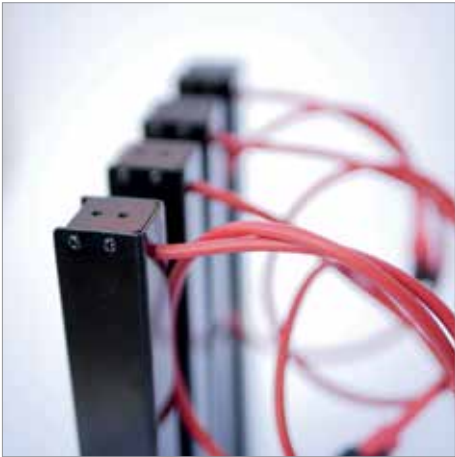
Hygiene safety is a top priority in the food, beverage, and pharmaceutical industries. Stainless steel lights from Falcon Illumination are available in various configurations and light colors in a stainless steel housing (V2A, V4A).



Almost all our lights can be purchased in stainless steel. Do not hesitate to contact us.

Custom solutions: **FALCONeasy** FLDL | FLFR | FLDR

	Continuous and flash mode
	Protection class IP30
	Connectors: JST, M8, M12
	Diffuser
	Housing: Al
	LED type: T1 5mm



For many applications, lights with lower light output are sufficient for obtaining a perfect image. Price sensitivity also plays a role, in particular for higher quantities.

The new »FALCONeasy« product line was created in collaboration with key accounts, in particular for large projects.

The Falcon*easy* line always uses 5 mm LEDs in place of 3 mm LEDs while keeping the quality of the housing design the same. When SMD LEDs are used, these are supplied from another reputable manufacturer for a cost-effective price.

We pass these saving directly on to our customers.

This approach gives us the ability to also offer essentially all Falcon light types as part of the Falcon*easy* line.

How can I tell whether I am holding a Falcon*easy* light in my hand?
By the **red cables**.

Only one condition:
the minimum order quantity is 5 units.

Customer-specific sizes
Standard sizes and types are available in approx. 3-4 weeks.
New product developments require approx. 6 weeks.

Custom solutions: **FALCONeasy** FLDL | FLFR | FLDR

E-FLDL series	Color	Wattage
E-FLDL-i180x15-SR24	SR	3,60
E-FLDL-i200x15-W		5,76
E-FLDL-i200x50-W		21,60
E-FLDL-i200x50-SR24	SR	15,12
E-FLDL-i300x15-IP65-W		10,80
E-FLDL-i300x15-IP65-SR24	SR	6,48
E-FLDL-i300x30-W		17,28
E-FLDL-i300x30-SR24	SR	11,52
E-FLDL-i600x50-W		51,84
E-FLFR series		
E-FLFR-Si100-W		-
E-FLFR-Si100-R24		-
E-FLDR-B series		
FLDR-i100B-W		5,28
E-FLDR-i90B-W		-
E-FLDR-LA3 series		
E-FLDR-i100-LA3-W		-
E-FLDR-i132-LA3-W		-
E-FLDR-i170-LA3-W		-
E-FLDL-TP series		
E-FLDL-TP-Si85x77-W		11,52
E-FLDL-TP-Si250x88-W		28,80



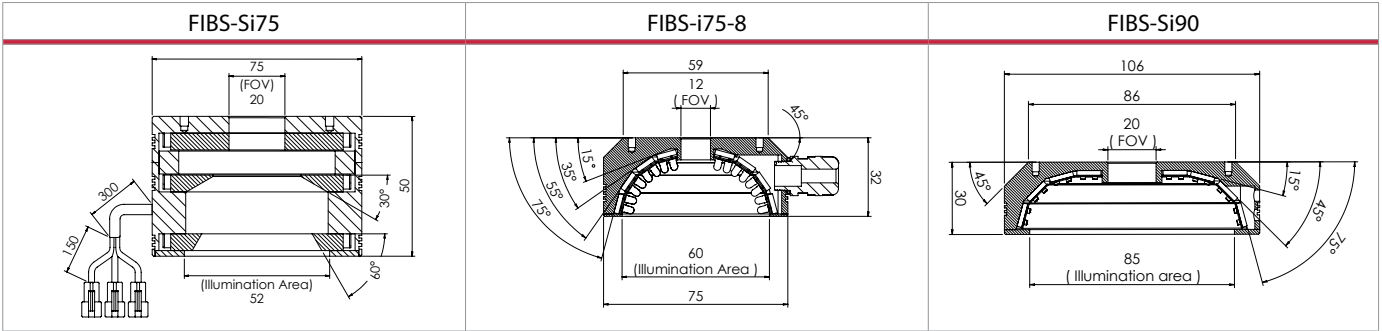
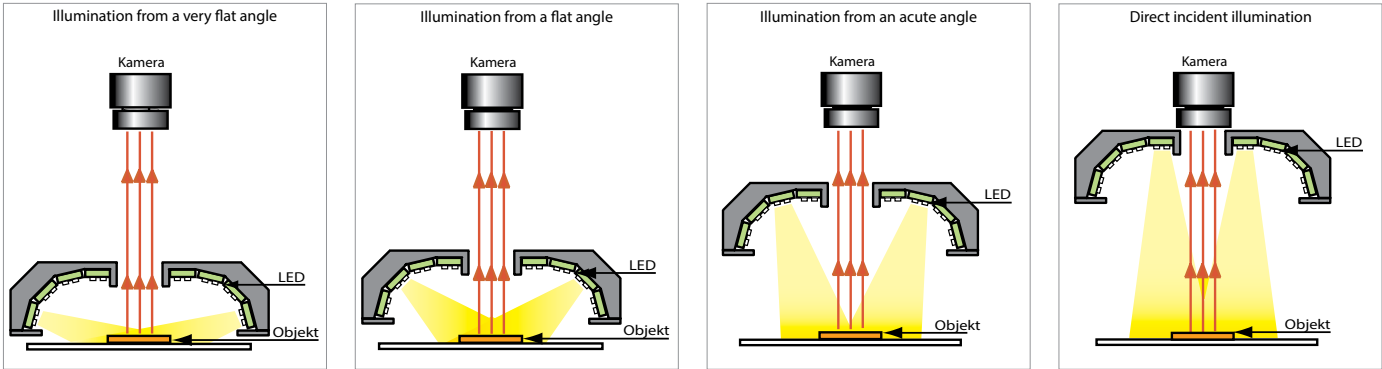
Custom solutions: FIBS, multi-angle light

The multi-angle lights from the FIBS series contain several LED rows grouped in a horizontal orientation. The individual LED rows can be controlled separately and are independent of each other in terms of color selection. A single light can then be used to take care of several inspection tasks, such as dark field and incident light, or to highlight various color attributes of objects by the selective use of light colors.

Lights in various angles and colors

Model	Color	Volt	Wattage				Dimensions – in mm		
							Dimensions	ID	Illuminated area
FIBS-Si75-3-W		24	3,84	3,84	3,84	x	Ø 75	Ø 20	Ø 52
FIBS-i75-8-WGBR		24	-	-	-	-	Ø 75	Ø 12	Ø 60
FIBS-Si90-R24		24	2,40	4,80	5,28	6,24	Ø 106	Ø 20	Ø 85
FIBS-Si90-G		24	2,40	3,36	5,28	6,24	Ø 106	Ø 20	Ø 85
FIBS-Si90-B		24	2,40	3,36	5,28	6,24	Ø 106	Ø 20	Ø 85
FIBS-Si90-W		24	2,40	3,36	5,28	6,24	Ø 106	Ø 20	Ø 85
FIBS-Si90-IR24		24	1,20	2,40	3,00	3,60	Ø 106	Ø 20	Ø 85
FIBS-Si90-UV24		24	2,40	3,36	5,28	6,24	Ø 106	Ø 20	Ø 85
FIBS-Si90-RGBW		24	R = 3,84 G = 3,36 B = 5,28 W = 6,24				Ø 106	Ø 20	Ø 85
FIBS-Si90-GGRB		24	G = 2,40 G = 3,36 R = 6,72 B = 6,24				Ø 106	Ø 20	Ø 85

Other light types can also be fitted with different colors by row.



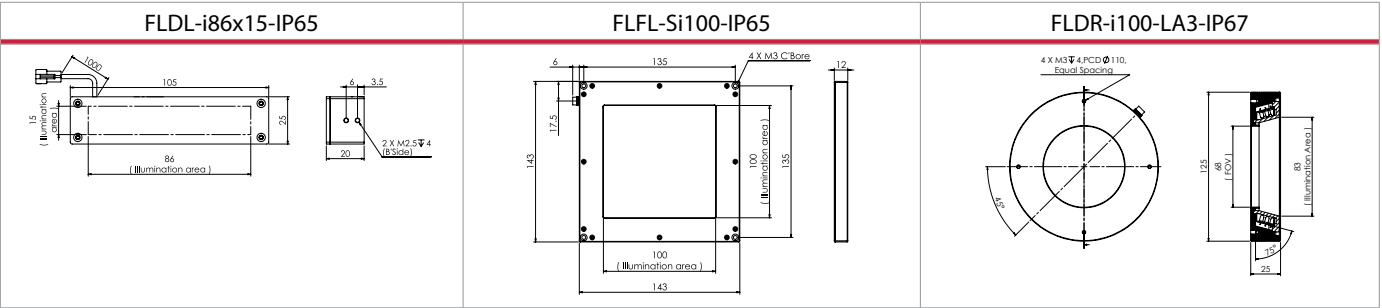
Custom solutions: IP protection

Lights with enhanced IP protection

FFPQ-Serie	Color
FFPQ-Si75-IP67-W	☐
FFPQ-Si100-IP67-R24	☒
FHPR-Serie	
FHPR-Si100-IP67-R24-Strobe	☒
FHSP-Serie	
FHSP-M12-IP67-W12	☐
FHDL-Serie	
FHDL-Si100x20ST-IP67-W with clear Protection	☐
FHDL-Si150x20ST-IP67-W with clear Protection	☐
FLDL-Serie	
FLDL-i44x15-IP67-W	☐
FLDL-i86x15-IP65-B	☒
FLDL-i150x15-IP67-W	☐
FLDL-i300x15-IP65-W	☐
FLDL-i350x35-IP54-W	☐
FLDL-TP-Serie	
FLDL-TP-Si51-IP67-W	☐
FLDL-TP-Si100x80-IP65-W	☐
FLDL-TP-Si200x100-W	☐
FLDL-TP-Si160-IP67-R24	☒
FLDL-TP-Si600x100ST-W-IP54	☐

FLDR-A-Serie	Color
FLDR-Si56A-IP54-W	☐
FLDR-i70A-IP67-W	☐
FLDR-i120A-IP65-IR24	☒
FLDR-B-Serie	
FLDR-Si20B-IP54-W	☐
FLDR-i90B-IP54-SR24	☒
FLDR-LA3-Serie	
FLDR-i74-LA3-IP55-W-N	☐
FLDR-i100-LA3-IP67-W	☐
FLDR-i132-LA3-IP65-W	☐
FLDR-i220-LA3-IP67-W	☐
FLFL-Serie	
FLFL-Si100-IP67-W	☐
FLFV-Serie	
FLFV-Si25N-IP65-W	☐
FLFV-Si70N-IP60-W	☐
FLFV-Si100-IP60-W	☐
FLLN-Serie	
FLLN-i50-IP54-R24	☒
FALCONeasy-Serie	
E-FLDL-i300x15-IP65-R24	☒
E-FLDL-i400x30-IP65-R24	☒

Other models available on request.

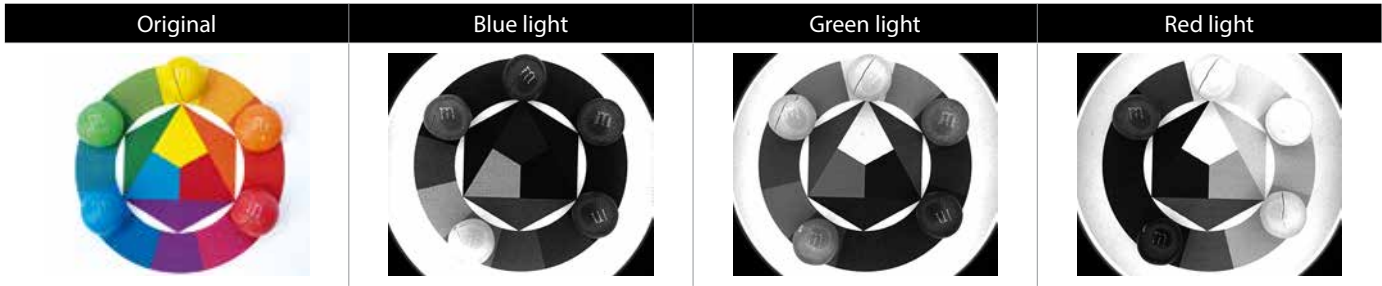


Custom solutions: RGB lights

Lights with RGB features

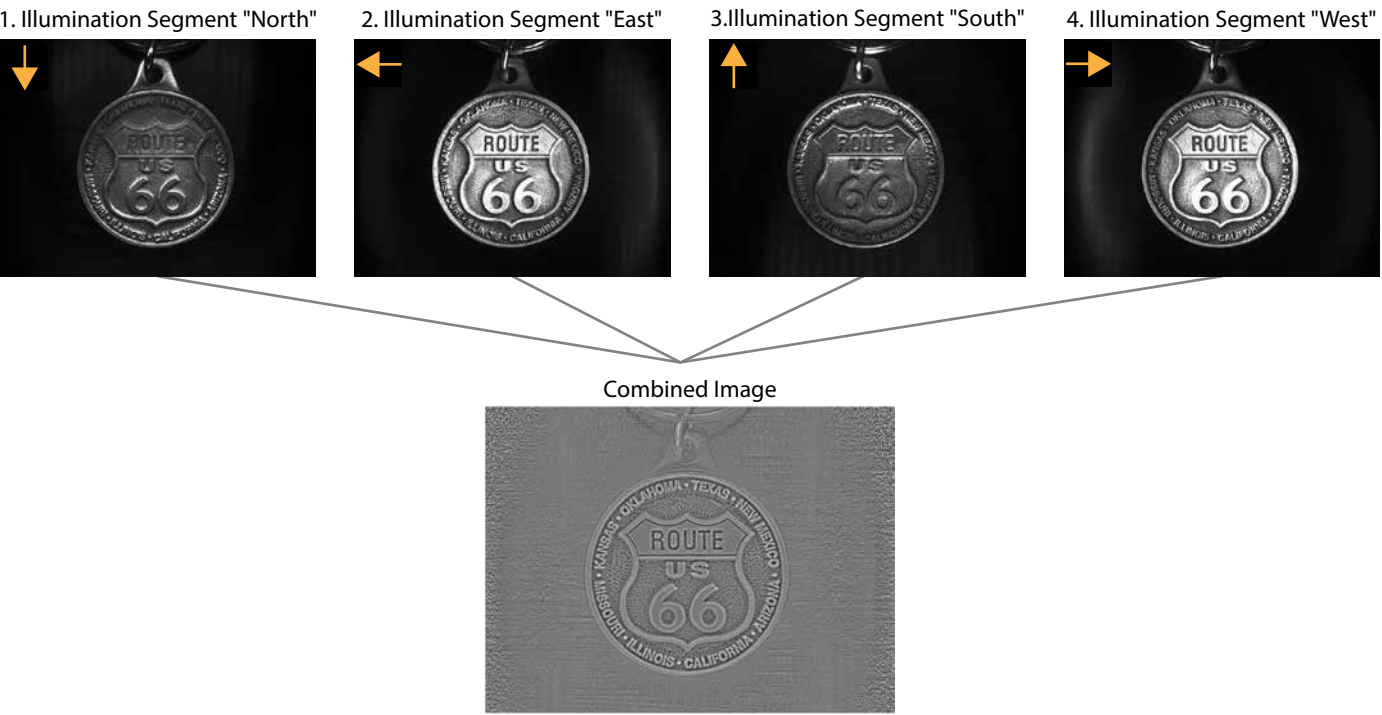
LED lights from FALCON operate based on the additive color system. The three primary colors red, green, and blue are mixed with each other in certain ratios, thus creating the desired composite color from the CIE color space. Each of the three colors has its own supply cable that is used to control the specific color intensity.

Model	Color	Volt	Wattage			Dimensions – in mm		
			Red	Green	Blue	Dimensions	ID	Illuminated area
FLDR-Si90B-RGB	RGB	24	3,60	3,36	3,36	Ø 93,5	Ø 50	Ø 87
FLDR-Si120B-RGB	RGB	24	9,60	6,72	6,72	Ø 122	Ø 63,5	Ø 112
FLDR-i132-LA3-RGB	RGB	24	3,36	5,76	5,76	Ø 132	Ø 98	Ø 113
FLDR-i280-LA3-RGB	RGB	24	12,96	12,48	12,48	Ø 280	Ø 260	Ø 240
FLDR-Si170-LA3-RGB	RGB	24	3,36	5,28	5,28	Ø 172 x 23	Ø 134	Ø 163
FLDL-Si74x27-RGB	RGB	24	1,92	2,88	2,88	83 x 30	-	75 x 27
FLDL-TP-Si51-RGB	RGB	24	-	-	-	62 x 62	-	50 x 50
FLDL-TP-Si85x80-RGB	RGB	24	4,32	6,24	6,24	104 x 99	-	85 x 80
FLDL-TP-Si100-RGB	RGB	24	8,64	12,48	12,48	124 x 112	-	100 x 100
FFPR-Si100-RGB	RGB	24	1,92	2,88	2,88	Ø 100	Ø 73	Ø 94,6
FFPR-Si136-RGB	RGB	24	3,36	3,84	3,84	Ø 136	Ø 105	Ø 122
FLDM-Si100-RGB	RGB	24	1,92	2,88	2,88	Ø 130	25	Ø 80
FLDM-i150-RGB	RGB	24	3,36	5,76	6,24	Ø 180	35	Ø 110
FLFV-Si50N-RGB	RGB	24	1,92	2,88	2,88	90 x 60	-	50 x 50
FLFV-Si100-RGB	RGB	24	8,16	11,52	11,52	116 x 118 x 157	-	100 x 100



Custom solutions: 4 and 8 segment lights

In combination with the LIC-S controller, FALCON relies on its segment lights to implement the basis for "shape from shading" attribute extraction. "Shape from shading" involves recording images with different shading by sequentially controlling individual light partitions. These images are then processed by software. The individual attributes of the images are then processed into a combined image.



Dark field, square

Model	Color	Volt	Wattage	Dimensions mm	Inner diameter	Illuminated surface
FFPQ-Si120-4	■	24	9,60	120 x 120	98 x 98	116 x 116
	■ ■ □		7,68			

DOME

FLDM-i100-4	■	24	2,88	Ø 130	Ø 25	Ø 80
	■ □		4,80			
FLDM-i150-4	■	24	2,88	Ø 180	Ø 35	Ø 110
	■ □		4,80			
FLDM-i250-4	■ ■ □	24	9,60	Ø 280	Ø 50	Ø 212

IR and UV versions also available on request.

Custom solutions: 4 and 8 segment lights

Model	Color	Volt	Wattage	Dimensions mm	Inner diameter	Illuminated surface
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Ring light

FLDR-i230B-4	■	24	28,80	Ø 235	Ø 145	Ø 220
FLDR-i230B-8	■	24	28,80	Ø 235	Ø 145	Ø 220
	■ ■ □		48,00			
FLDR-i300B-4	■	24	33,60	Ø 305	Ø 200	Ø 286
FLDR-i300B-8	■ ■ □	24	48,00	Ø 305	Ø 200	Ø 286
FLDR-i420B-8	■ ■ □	24	76,80	Ø 430	Ø 325	Ø 408
FLDR-i60B-4	SR	24	2,88	Ø 60	Ø 47	Ø 25

Dark field light

FLDR-i74-LA3-4	■	24	-	Ø 80	Ø 48	Ø 65
	■ ■ □		5,76			
FLDR-i100-LA3-4	SR	24	14,40	Ø 115	Ø 76	Ø 97
	■ ■ □		13,44			
FLDR-i100-LA3-8	■ ■ □	24	11,52	Ø 115 x 22	Ø 76	Ø 97
FLDR-i132-LA3-4	■ ■ □	24	17,28	Ø 132	Ø 98	Ø 113
FLDR-i170-LA3-4	■ ■ □	24	23,04	Ø 172	Ø 134	Ø 163
FLDR-i170-LA3-8	■ ■ □	24	23,04	Ø 172	Ø 134	Ø 163
FLDR-i220-LA3-4	■ ■ □	24	28,80	Ø 220	Ø 180	Ø 205
FLDR-i250-LA3-4	■	24	31,68	Ø 250	Ø 210	Ø 230
	■ ■ □		34,56			
FLDR-i280-LA3-4	■ ■ □	24	34,56	Ø 280	Ø 240	Ø 260
FLDR-i280-LA3-8	■ ■ □	24	-	Ø 280	-	-

Diffused incident light

FLFR-Si200-4	■	24	15,36	Ø 220	Ø 70	Ø 195
	■ ■ □		11,52			
FLKR-Si87-4	■	24	3,84	Ø 87	Ø 20	Ø 57
FLKR-Si100-4	■	24	7,68	Ø 130	Ø 60	Ø 98
	■ ■ □		5,76			

IR and UV versions also available on request.

Custom solutions: One-off designs

Over the course of the last 10 years, FALCON has developed several lights that the majority of customers will not be aware of. In order to show customers and new customers these capabilities, this page shows several examples of lights manufactured outside of regular series production. FALCON is dedicated to continue promoting one-off production applications and to facilitate the development of custom lights.

FAKR-Si80 DOME + Coaxial light



The FAKR series is a combination of FLKR and FLFV. The FLKR series uses RGB LEDs to transmit diffused and slightly angled light in various colors, whereas the coaxial light ensures that the camera aperture does not result in uneven illumination.

FLTU-Si120 Tunnel light



The customer's task it to inspect shiny and round metal for defect attributes. A short test phase in the FALCON lab showed that the inspection task can be solved with a tunnel light equipped with diffuse and homogeneous light. The highlight on this light is the machined camera aperture.

FCSP-Si10-W12 Focused Spotlight



THE FCSP is equipped with a lens. It projects a highly focused light beam over large distances. Developed as a prototype with the ability to focus a spot from various distances.

FLDL-TP-Si230-HC180 Back light



The objective was to build an incident light with high light output. There is also the somewhat unusual shape. The result is a derivative version of the standard FLDL-TP series. The output of the FLDL-TP-Si230-HC180 is rated at approx. 30 W; its light is ideally suited for illuminating shiny components.

Custom solutions: One-off designs

FLCR-Si170-W Cylinder light



The customer specified a cylinder light with extremely diffuse light and homogeneous illumination. The task involved inspecting a component to be recorded by the lights in flight. The inspection task was solved by installing SMD LEDs with a wide radiation angle and a glass diffuser sandblasted on both sides, having an output rating of 48 W.

FHLNX-Si150 Coaxial line light



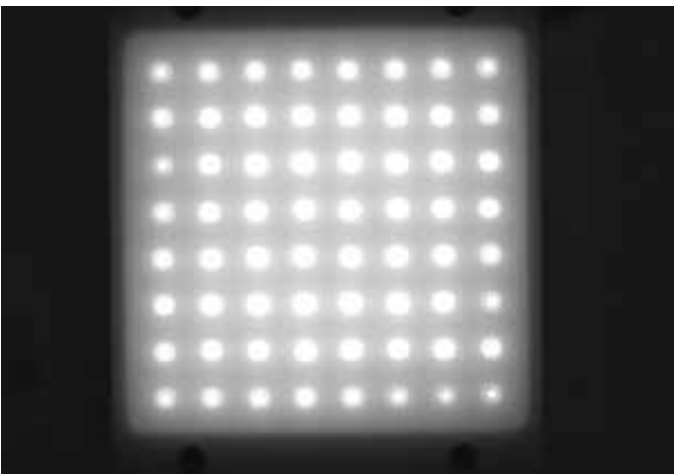
The FHLNX is a coaxial line light. A camera aperture integrated on both sides of the light, in combination with a one-way mirror installed at a 45° angle results in a light featuring the shade-free illumination of a coaxial light, while also having the enormous light output of a line light. The necessary light output is supplied by high-power LEDs and an installed lens.

PCB-FHDL-TP-Si105x77-23 LED-PCB



A custom high-power design with 161 LEDs in 23 groups that are connected individually. 193 watts in strobe mode! This light was made for deep-sea research.

FLDL-TP-Si51-IR24-1450 SWIR



After expanding the range of products in UV-spectrum, this year FALCON took tests in IR-spectrum. On the base of FLDL-TP a light with wavelength 1450 nm was build and tested. The intention was to find differences to standard wavelength 850 nm. Further to get experience with SWIR-cameras and find new possibilities of detecting characteristics.

Power supply

With analog control input

The power supplies for the PSA series are the simplest version for controlling FALCON lights. The PSA is connected to the 230 V grid with a Schuko connector on the rear. Depending on the version, the front side has up to 4 outputs with adjustable intensity, equipped with the standard FALCON JST connector. The control is implemented as a 120 kHz pulse width modulation, which guarantees flicker-free camera images.

Model	Output voltage [V]	Total output power [W]	Quantity Output channels
1 output			
PSA-1-12/25W	12	25	1
PSA-1-24/25W	24	25	1
PSA-1-48/60W	42	60	1
2 / 4 outputs (also in 12/24V combination)			
PSA-2-12/24/25W	12/24	25	2
PSA-2-12/24/60W	12/24	60	2
PSA-2-24/25W	24	25	2
PSA-2-24/60W	24	60	2
PSA-2-24/100W	24	100	2
PSA-4-24/ 100W	24	100	4



With digital and analog control input

The power supply for the PSD series is an upgrade of the PSA series. In addition to intensity control with 120 kHz pulse width modulation, the PSD series also has the ability to communicate with other devices through an RS-232 interface to implement software-based controls. PSD series can also process trigger signals to synchronize lights with a camera, or can even be overdriven as a strobe unit light synchronous with the camera. Ideal for use in test labs.

Model	Output voltage [V]	Total output power [W]	Quantity Output channels
Standard			
PSD-1256-12V/25W	12	25	1
PSD-1256-24V / 25W	24	25	1
PSD-1256-24V / 60W	24	60	1
PSD-2016-12V / 25W	12	25	2
PSD-2016-24/25W	24	25	2
PSD-2016-24V/60W	24	60	2
PSD-4256N-24V/25W	24	25	4
STROBE-UNIT			
PSD-2016S-48V/60W	48	60	2
PSD-1256S-48V/60W	48	60	1



Light intensity control (LIC)

Light Intensity Control (LIC)

Falcon supplies various light controls on the basis of LIC. Control in this case means that trigger signals can be processed and lights can either be operated in continuous mode, in trigger mode, or in strobe mode. 120 kHz pulse width modulations allows all controllers to ensure flicker-free and therefore reliable image processing.

The LIC series is split into three areas:

- Starting with LIC-A, which meets basic requirements and can be easily integrated into applications.
- The mid-range of the series - as measured by the technical specification - is represented by the models LIC-2256, LIC-4256, as well as LIC-8 and LIC-16.
- As a new addition to the line, LIC-S is specifically intended for „shape from shading“ applications.

LIC-A

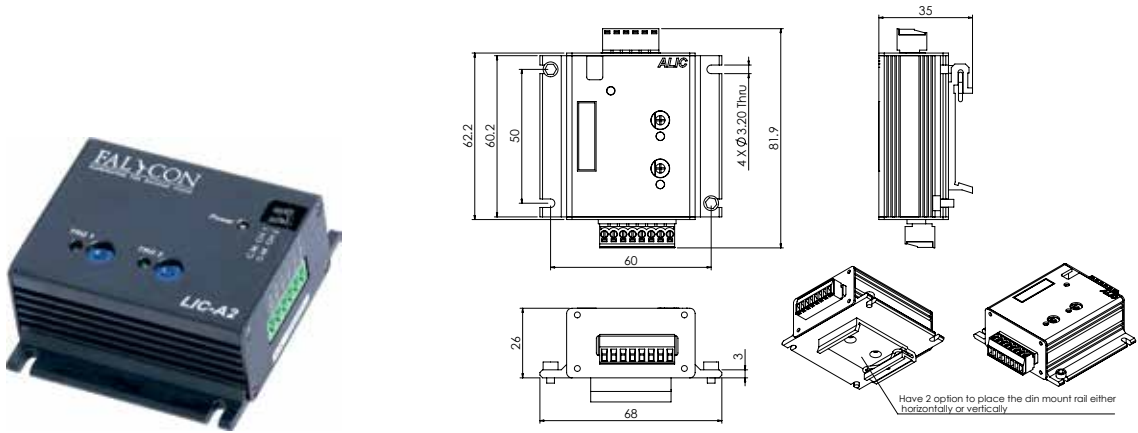
FALCON expanded the product line by developing a controller that is easy to operate and cost-effective, while also equipped with proven technology. The result will be available as the LIC-A starting in 2019.

The LIC-A is available in two versions:

- LIC-A1 processes a trigger signal.
- LIC-A2 processes 2 trigger signals and switches these to the same number of outputs.

The trigger signals can have 5V or 24V levels. The LIC-A has switchover times between 2µs and 5µs. In spite of its short switchover times, the LIC-A is able to control up to 48V and 10 ampere per output in strobe mode. The associated output voltage depends on the available input voltage. In strobe mode, the maximum switch-on time is hardware-limited to 100µs to protect the light against overheating. The switch between individual operating modes is implemented with jumpers. A simple potentiometer is arranged as an intensity control for each channel. Like the entire LIC series, the LIC-A also features 120 kHz pulse width modulation to prevent brightness fluctuations in the image recording.

Model	Input/output voltage [V]	Output rating per channel [W]	Quantity Output channels
LIC-A1	12 - 48	240W (24V)	1
LIC-A2	12 - 48	240W (24V)	2



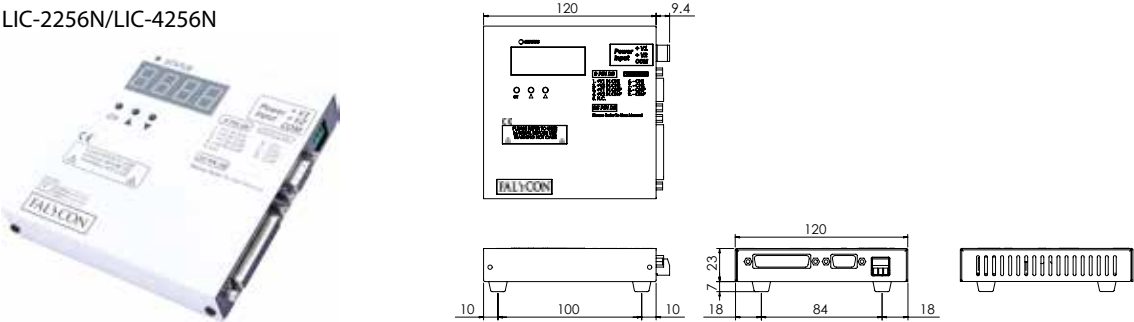
Light intensity control (LIC)

LIC-X256N, LIC-8, LIC-16

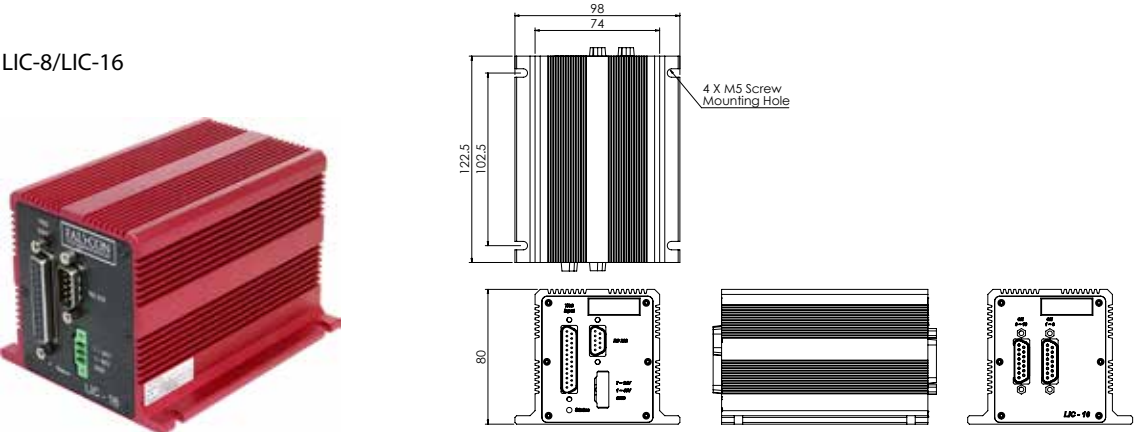
In contrast to the LIC-A the light intensity controllers LIC-X256N, LIC-8 and LIC-16 offer the possibility of communication. Via RS232-interface individual output-channels can be controlled. Intensities can be set and activated by software or manually. In addition, a display allows to adjust the brightness accurately. Like the LIC-A, this series is also equipped with jumpers, which switch between the Continuous/Trigger-Mode (12/24 Volt) and the Strobe-Mode (48 Volt). In Strobe-Mode, the Switch-ON-Time is limited to 7.5ms by the hardware side. A special feature of the LIC-X256N is that different voltages can be connected. Thus it is possible to operate a controller with 12 volt and 24 volt lights.

Model	Input/output voltage [V]	Output rating per channel [W]	Quantity Output channels
2 & 4 output channels			
LIC-2256N	12-48	40	2
LIC-2256N-4A	12-48	120	2
LIC-4256N	12-48	40	4
LIC-4256N-4A	12-48	120	4
8 & 16 output channels			
LIC-8	12-48	40	8
LIC-16	12-48	40	16
Optional accessories			
Mounting rail Adapter for LIC-X256N			

LIC-2256N/LIC-4256N



LIC-8/LIC-16



Light intensity control (LIC)

LIC-S

The LIC-S is a controller with the ability to cost-effectively implement „shape from shading“ systems. Starting with the trigger signal from a camera or PLC, it continuously switches its outputs. Segment lights can then be used to obtain images with various illumination angles. The achieved results differ with the illumination angle. Software can then be used to process the results into a composite image with a meaningful result.

- The first result shows smallest scratches or bumps on the flat surface.
- The second result shows normal OCV/OCR applications which can be detected by synchronized switching of all segments.

This makes it possible to detect several characteristics in one application. Several LIC-S's can also be synchronized by software.

The hardware of LIC-S is similar to the hardware of LIC-X256N. The technology with 120 kHz pulse width modulation, the BCD display and the buttons on the frontpanel have proven themselves and are a decisive factor for Customers.

Model	Input/output voltage [V]	Output rating per channel [W]	Quantity Output channels
LIC-S-4256	12-48	40	4
LIC-S-4256-4A	12-48	120	4
Optional accessories			
Tophat rail adapter, matches LIC-S			

A „Shape-from-Shading system“ with the LIC-S additionally requires a simple monochrome camera, a segment lighting and a software for the evaluation of the captured images. The user is free to determine which camera and software to use.



Segment lights
(FALCON)



LIC-S
(FALCON)



Monochrom Camera
(Provided by customer)



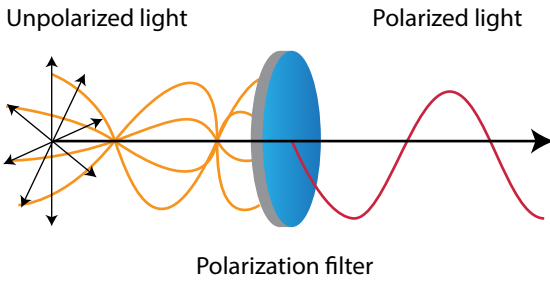
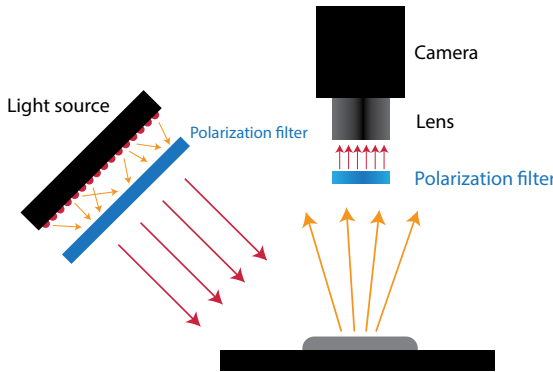
Software
(Provided by customer)

The LIC-S offers the possibility to set individual sequences by the buttons attached on the frontpanel. Additionally the sequences can be set by a free available software. So no difficult programming skills are necessary.

Accessories Polarization filter

Polarization filter

Polarization filters can be a straight-forward solution for improving attribute extraction when a measurement task is inhibited by reflections. The first polarization filter positioned on the light polarizes the light beam linearly. This means that the transverse light waves are filtered out down to a minimal amount. A reflection occurs when contact is made with the object - the boundary surface to be exact. Depending on various refraction angles, this reflection then again generates transverse stray light. The stray light (the reflection) generated by the reflection can be absorbed by the second filter. Only a small part of the previously linearly polarized light remains.



The example images show that even strong reflections can be suppressed by using polarization filters. Polarization filters also provide the option to render material stresses visible in irradiated materials, when transmitted light is used.



Model
FLDL
FLDL-i24x15-PL-Set
FLDL-i44x15-PL-Set
FLDL-i56x15-PL-Set
FLDL-i74x27-PL-Set
FLDL-i86x15-PL-Set
FLDL-i120x15-PL-Set
FLDL-i150x27-PL-Set
FLDL-i180x15-PL-Set
FLDL-TP
FLDL-TP-Si51-PL
FLDL-TP-Si100-PL
FLDR-LA3
FLDR-i132-LA3-PL-Set
FLDR-i170-LA3-PL-Set

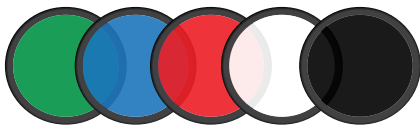
Model
FLDR-A
FLDR-i50A-PL-Set
FLDR-Si32A-PL-Set
FLDR-i70A-PL-Set
FLDR-i120A-PL-Set
FLDR-B
FLDR-i70B-PL-Set
FHLN
FHLN-Si50-PL-Set
FHLN-Si150S-PL-Set
Polarization filter for lenses
Polfilter 30.5 mm
Polfilter 27 mm



Accessories Filters (camera accessories)

Filters (camera accessories)

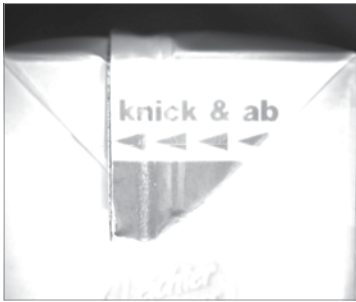
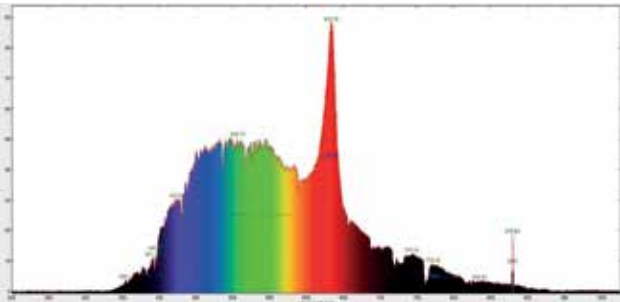
Bandpass filters are used to allow defined spectral ranges to “pass” and to filter out others. As a result, undesirable influences due to daylight can for instance be minimized by only allowing the color of the light to pass. In combination with monochromatic cameras, color filters create the ability to distinguish colors reflected with equal brightness.



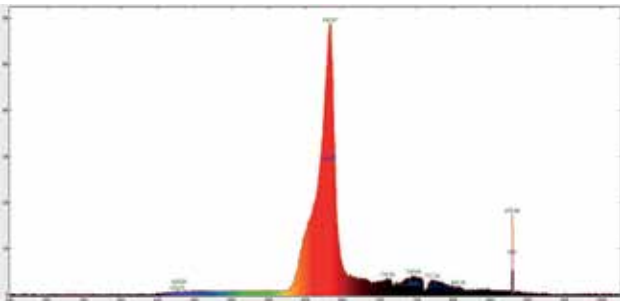
Model	Thread	Peak
Bandpass filter UV	30,5	375
Bandpass filter blue	30,5	470
Bandpass filter green	30,5	525
Bandpass filter red	30,5	630
Bandpass filter infrared	30,5	850
Bandpass filter kit, incl. polarizer	30,5	470, 525, 635, 850

Other filter sizes available on request.

It is possible to minimize unwanted effects of daylight. Furthermore, the influence of ambient light can be reduced. As a result, process reliability can be increased enormously. Below are two images which explain the influence of the individual wavelengths and the function of a pass filter.



The image shows the spectrum of the light, which is captured by a camera. The red part of the spectrum shows the reflection of the LED from object. All other reflections have their origin in other light sources. As a result facilities detect many faulty parts.



By using a pass filter for the wavelength red, the spectrum of the daylight is blocked. So the best possible contrast between the error characteristics to the rest of the component can be increased. Safe detection, independent of daylight is guaranteed.

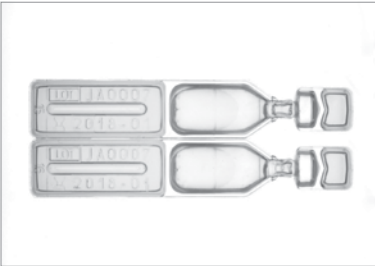
Accessories Light control film

Light control film

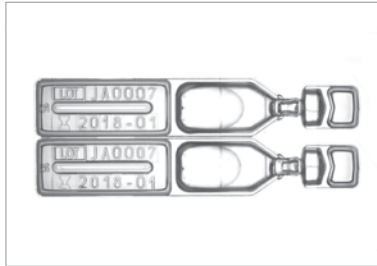
Light control film is film that gives light beams a parallel beam path. A parallel beam path has significant advantages, primarily for inspection tasks with transmitted light. The light control film filters out diffuse portions of light and therefore the half-shade on the inspected object. This results in an image with clearly defined and comparatively easily detected edges. Light control films are primarily used on inspected objects with rounded edges that need to be metrologically detected.

Light control film
Series FLDL-TP
LCF-FLDL-TP-Si100
LCF-FLDL-TP-Si160
LCF-FLDL-TP-Si27
LCF-FLDL-TP-Si36
LCF-FLDL-TP-Si51
Series FLFL
LCF-FLFL-Si100
LCF-FLFL-Si140
LCF-FLFL-Si200
LCF-FLFL-Si60
other LCFs
LCF-FHDL-Si24x15
LCF-FHDL-TP-Si50

Backlight without LC-film



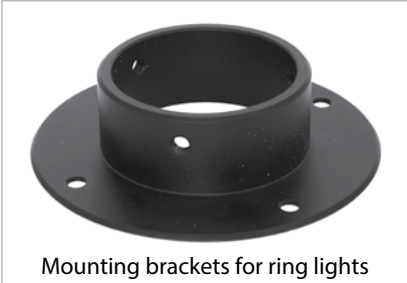
Backlight with LC-film



Accessories Mounting adapter

Mounting brackets for ring lights

Mounting Adapter	Inner diameter
P.C.D. 20-28mm (FLDR-i32B, FLDR-i38B)	30 mm
P.C.D. 40mm (FLDR-i50A, FLDR-i50B, FLDR-i56)	31 mm
P.C.D. 50mm (FLDR-i70)	31 mm
P.C.D. 60mm (FLDR-i74-LA3)	48 mm
P.C.D. 65mm (FLDR-i75B)	45 mm
P.C.D. 70mm (FLDR-i90, FLFR-Si100, FLDR-i100B)	31 mm
P.C.D. 80mm (FLDR-i100-LA1, FLDR-i100B)	66,5 mm
P.C.D. 100-115mm (FLDR-Si130-LA1, FLKR-Si100)	30,5 mm



Mounting brackets for ring lights

Mounting brackets for bar lights

Mounting Bracket	Illuminated width
M1-FLDL (FLDL-i44x15, FLDL-i130x15,...)	10-27mm
M2-FLDL (FLDL-i180X40,FLDL-i240x35,...)	30-50mm
M3-FLDL (FLDL-i400X30, FLDL-i600X50)	30-50mm



Angle bracket for FLDL series

Mounting frame for bar lights

Mounting Frame Holder
FLDQ-i86
FLDQ-i120
FLDQ-i130
FLDQ-i300



Mounting frame for 4 lights from the FLDL series

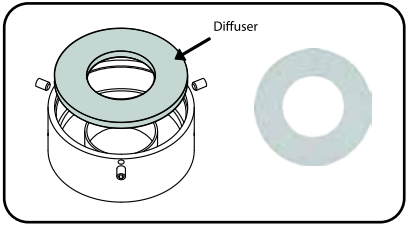
Accessories Diffusers

Diffusers

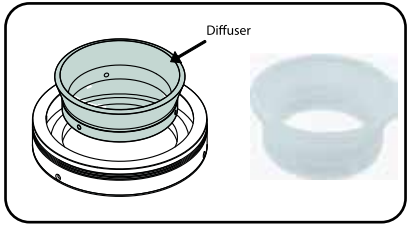
Diffusers are available as additional accessories for the series FLDR-A, FLDR-B, FLDR-LA3 and FLDL. The diffusers for the series FLDR-A, FLDR-LA3 and FLDL are fastened with screws by default; depending on housing shape, one adapter is needed for the FLDR-B series. Diffusers with adapters are referred to as a set. There are different levels with regard to diffuser properties: The levels are called 000 (clear), 421 (diffuse) and 433 (very diffuse). Diffusers for the FLDR-LA3 series range from diffuse to very diffuse.

Model
FLDL-Series
FLDL-i24x15-DP Diffusor 421
FLDL-i24x15-PP Protection Plate 000
FLDL-i74x27-DP Diffusor 421
FLDL-i74x27-DP Diffusor 433
FLDL-i74x27-PP Protection Plate 000
FLDL-i120x15 PP Protection Plate 000
FLDL-i120x15-DP Diffusor 421
FLDL-i300x20-DP Diffusor 421
FLDL-i300x20-DP Diffusor 433
FLDR-LA3-Series
FLDR-i74-LA3-PP Protection Plate 000
FLDR-i74-LA3-DP Diffusor
FLDR-i100-LA3-DP Diffusor
FLDR-i100-LA3-PP- Protection Plate 000
FLDR-i170-LA3-DP Diffusor

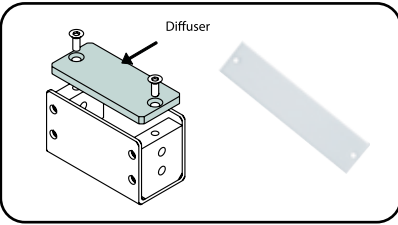
Model
FLDR-A-Series
FLDR-i50A-DP Diffusor 421
FLDR-i50A-DP Diffusor 433
FLDR-56A-Protection Plate 000
FLDR-i56A-DP Diffusor 421
FLDR-i70A-PP Protection Plate 000
FLDR-i70A-DP Diffusor 421
FLDR-i90A-PP-Protection Plate 000
FLDR-i90A-DP Diffusor 421
FLDR-i90A-DP Diffusor 433
FLDR-i120A-DP Diffusor 421
FLDR-B-Series
FLDR-i32B-DP Diffusor 421 Set
FLDR-Si32B-DP Diffusor 421
FLDR-i38B-DP Diffusor 421
FLDR-i50B-PP Protection Plate 000 Set
FLDR-i50B-DP Diffusor 421 Set
FLDR-i70B-PP Protection Plate 000
FLDR-i70B-DP Diffusor 421
FLDR-i90B-DP Diffusor 421
FLDR-i100B-DP Diffusor 421 Set
FLDR-i120B-DP Diffusor 421



FLDR-A/FLDR-B



FLDR-LA3



FLDL

Accessories

Connectors | Cables

Connectors M8/M12

FALCON- lights are shipped by default equipped with a JST-SMR connector. Depending in the voltage, the connector either has 2 or 3 pins. Other connectors are available for a surcharge. Do not hesitate to contact us if your requested model is not available.

M8 Connectors
M8 connector, 3 pins, mounted on light or cable
M8 socket, 3 pins, mounted on light or cable
M8 connector, 4 pins, mounted on light or cable
M8 socket, 4 pins, mounted on light or cable
M12 Connectors
M12 connector, 5 pins, mounted on light or cable
M12 socket, 5 pins, mounted on light or cable
M12 connector, 4 pins, mounted on light or cable
Other connectors available on request - do not hesitate to contact us.



Extension and Y cables

FALCON cables are available in various lengths and with a different number of branches. Cable are by default shipped with JST connectors. The standard cable cross-section is 0.25mm². We will also gladly configure custom solutions for longer cable lengths in combination with high-power lights. Custom solutions also include drag chain-compatible or oil-resistant cables.

Model	12 V	Length
WB-1		1 m
WB-2		2 m
WB-3		3 m
WB-4		4 m
WB-5		5 m
WB-W-1		1 m
WB-W-2		2 m
WB-W-3		3 m
WB-W-4		4 m
WB-W-5		5 m
WB-T-1		1 m
WB-T-2		2 m
WB-T-3		3 m
WB-T-4		4 m
WB-T-5		5 m
WB-F-1		1 m
WB-F-2		2 m
WB-F-3		3 m
WB-F-4		4 m
WB-F-5		5 m

Model	24 V	Length
FWB-1		1 m
FWB-2		2 m
FWB-3		3 m
FWB-4		4 m
FWB-5		5 m
FWB-W-1		1 m
FWB-W-2		2 m
FWB-W-3		3 m
FWB-W-4		4 m
FWB-W-5		5 m
FWB-T-1		1 m
FWB-T-2		2 m
FWB-T-3		3 m
FWB-T-4		4 m
FWB-T-5		5 m
FWB-F-1		1 m
FWB-F-2		2 m
FWB-F-3		3 m
FWB-F-4		4 m
FWB-F-5		5 m

Detector cards

Model	Description
DC-IR	Infrared Detector Card 700 - 1400 nm
DC-UV	Ultraviolet Detector Card 250 - 540 nm

Stands



Vertical stand/ repro stand

A flexible holding system for the camera and lightings are essential for operating in a lab or for test setups.

The vertical stand consists of a reflex-free, matte-black base plate and a guide tube. The modular design allows the repro stand to be upgraded to your specific needs.

The camera is secured to the mounting bracket with two opposing screw clamps. Cameras with widths from 15 to 75 mm can be used. An integrated rotating wheel is used for precision adjustments. (accuracy: 0.01 mm)

Base plate (WxHxT): approx. 300 x 22 x 500 mm
Height of guide rod: 620 mm / diameter: 24 mm

Vertical stand kit, consisting of:

- 1x stand (base plate & guide rod)
- 1x camera mounting bracket
- 1x locating bar
- 2x locating arms
- 2 x articulated arms with clamps (all 3 axis are centrally secured with a clamping screw)



Gooseneck stand

We expanded our line of accessories with a gooseneck stand to work together with our ring lights.

The figure shows a stand for a ring light with a pitch circle diameter (P.C.D.) of 60 mm, e.g. FLDR-i74-LA3*

Article identifier: FLDR-i74-LA3-STATIV*
Gooseneck length: 290 mm; thread: 3/8"-16 UNC.
Other sizes available on request



About FALCON Company, Team and Values

What Falcon has to offer

- Comprehensive, fast, competent technical advice in all matters related to LED lights for industrial image processing.
- Prompt delivery of ordered lights.
- High-quality housings and installed LEDs.
- Friendly, honest, and reliable business practices. From customer order to invoicing. The focus is always on the customer.

Performance and objective

- The ultimate goal of the highly-motivated team is unconditional customer satisfaction. The team will only be happy when the customer is happy with his business relationship to Falcon.
- Falcon makes every effort to create a fair win/win situation for the customer and for Falcon.

Key accounts

- Falcon offer quality lights at affordable prices. We only use LEDs made by highly-reputable international manufacturers.
- Only high-quality products will enable Falcon customers to achieve the best results long-term. And it is the only way customers become key accounts.
- Falcon unconditionally supports its key accounts.

Standard type or prototype

- Falcon's thinking and acting is first and foremost directed to the customer. Consulting is primarily focused on the best available lights solution.
- If this cannot be achieved with standard products, we can develop a customized solution in collaboration with the customer. Depending on effort and type development, this is accomplished with a quick turnaround at a reasonable price.
- Falcon generally fabricates custom sizes and new developments within 6 weeks. Typically, this does not result in significant additional costs - as is often assumed. Falcon makes custom LED lights to fit your budget.

Infrared and ultraviolet

- Ultraviolet and infrared LED lights are yet another specialty area for Falcon. Customers can also purchase any light supplied in the light color red with an infrared configuration.
- For large spacing or strong reflections, we are increasingly relying on lights from our line of high-power UV LEDs. At the best value for money.

Solutions

- The requirements of the automation sector are constantly increasing. It is then good to have a lights specialist at your side who exclusively deals with LED lights for industrial image processing. This greatly simplifies your job. The team at Falcon Illumination MV GmbH & Co. KG is fully committed to supporting you.
- We will support you whenever possible. With advice and loaners. With lights solution beyond the conventional. With lights made in our factory exclusively for your needs.
- Your full satisfaction is our top priority. If there is ever anything that you are not satisfied with, we are committed to a fast, courteous, and unbureaucratic solution. Do not hesitate to contact management directly.



Three key reasons that speak for Falcon LED lights:

- ✓ The materials: We only use the best of the best, both for LEDs and for housings. We have an uncompromising quality awareness.
- ✓ The price: The pricing is based on a win/win situation; our customers can buy at a fair price that the market will bear.
- ✓ But the most important reason is our staff: Falcon has a super team that is fully committed to our customers together with management.

About FALCON Lights, Product Benefits, and Standards

LED lights made by FALCON

- ... always correspond to the **state of the art**
- ... are always fitted with premium **quality LEDs**
- ... are tested with **in-house software**
- ... where possible, pass a **homogeneity test** for quality control
- ... are developed to optimally evacuate heat to the housing and to keep the **operating temperature** as low as possible
- ... supply outstanding **brightness** with uniform illumination
- ... can be controlled and overdriven in **intensity**
- ... cannot be cross-wired for lights with **series resistor**
- ... have a 2 year **guarantee/warranty**
- ... are produced with **European know-how**
- ... have **CE, Eye Safety** and **ROHS certificates**
- ... for bar lights are shipped including **diffusers** (excluding UV lights)
- ... are worth their price and do not shy away from **aprice comparison**
- ... are available as **loaners** for in-house testing
- ... can be customized with **accessories** to your specific needs
- ... have a high-quality, sandblasted **aluminum housing**
- ... are shipped in a **stainless steel housing** if needed
- ... can be manufactured up to protection class **IP67**
- ... are available in many **wave lengths**
- ... are shipped the same day if in **stock**
- ... newly developed lights are shipped within 4-6 weeks for **initial production**. The **standard leadtime** is approximately 14 business days
- ... arrive at the customer properly **packaged, fast** and **on-time**
- ... depending on quantity, can be relabeled to **your company name**
- ... are shipped with a 30 cm long **cable** - longer if requested
- ... are shipped with a **standard connector**
- ... can be configured with any **connector of your choice**
- ... can be shipped **without series resistor** on request
- ... can be seamlessly **integrated into any system**
- ... offer **high accuracy** and optimized **equipment flexibility**
- ... can be shipped for pre-selection in customer in-house **lab tests**
- ... are available as custom-fabricated lights **even for lot-sizes of 1**
- ... can also be supplied in the **FALCONeasy version** - the product line costed with a sharp pen for large orders.

Manufacturer's notices - the fine print

All products, data sheets, data, and information are subject to change without notice with respect to quality, reliability, function, design, or other attributes. Falcon Illumination (M) Sdn. Bhd. (hereinafter called Falcon), its subsidiaries, sales representatives, distributors, employees, and all persons acting on behalf of, or on the account thereof (Falcon collectively) reject any liability whatsoever for errors, inaccuracies, or omissions for products, in data sheets, or in other publications. Falcon assumes no guarantees, assurances, or warranties for fitness of the product for a specific use or to continue production of a product. Falcon furthermore rejects any liability, guarantee, or warranty whatsoever based on the application or use of a product. This applies including, and without restriction, for indirect and direct damages and consequential damages. Any implied guarantees, including guarantees for fitness for a specific purpose, non-infringement, and fitness for use are deemed to be not granted. Information and statements about the suitability of products for certain types of applications are based on knowledge about typical requirements. Such statements and information are not binding in nature. It is the customer's responsibility to verify and/or to confirm that a certain product is suited for use in a specific application based on the characteristics described in the product data sheets. The parameters in product data sheets and/or specifications can differ in various applications and the performance can vary over time. All operating parameters, including typical parameters must be verified and/or validated by the customer's engineering for every customer application. Unless expressly confirmed in writing, product from Falcon are not suited for use in medical, life-saving or life-supporting applications or for any other use where a product failure can cause injury or death. Customers who use our products for the aforementioned applications without our written consent do so at their own risk and declare their agreement to hold Falcon and its distributors harmless from all claims, liabilities, expenses, damages, consequential damages, including legal fees. This is also the case when claims are asserted for instance due to negligent manufacturing of a part. Please contact us so that we may recommend products that meet the needs for the named applications. Designed and assembled by Falcon Illumination (M) Sdn. Bhd., Penang, Malaysia. Distributed by Falcon Illumination MV GmbH & Co. KG., Germany.

FALCON



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Useful information

Eye safety

The ability to market a light with CE mark throughout Europe requires an RoHS and EMC measurement, but also a classification iaw. **DIN EN 62471** "Photobiological Safety of Lights and Light Systems". This classification allows lights to be classified into so-called risk groups (RG). Each risk group has limit values for the radiation duration of the eye at a corresponding intensity and wave length.

Hazard potential by risk groups	
Risk-free group	No hazard even on extended view contact
RG 1	Light free of hazards for normal light use
RG 2	Lights with minor hazard based on the natural protection response of the eye.
RG 3	Lights represent a hazard even for short-duration exposure.

Lights in the visible wave length spectrum are normally classified as RG0 up to RG2 since the natural protection response of the eye (turning away, closing) protects from damage. This natural protection response does not work for lights in the invisible wave length spectrum. High-power UV lights are therefore classified as RG3. A corresponding mark is applied on each of our lights.



There are several options for using lights assigned to the higher risk groups. A simple option is to use safety goggles. The two other options require an evaluation of the overall system by a laser protection representative. They either require an enclosure for the overall system or a reduction of exposure time by using a controller (LIC).

UV safety goggles 190-398 nm	
EC2-35	UV safety goggles with EC2 filter for the specified range. Min. optical density: 7 (OD7+). Glass color: clear. Particularly light-weight model with athletic design, adjustable temples, plastic frame
EC2-38	UV safety goggles with EC2 filter for the specified range. Min. optical density: 7 (OD7+). Glass color: suitable for spectacle wearers Over-goggles with side vision window and adjustable temples, comfortable feel, plastic frame.

IP classification

EN 60529 specifies that protection against foreign particle and moisture ingress is marked based on a specified code. This code is formatted as the letters IP followed by 2 figures. The first figure indicates the protection level against dust, the second figures the protection level against water. Most of our lights are by default classified as protection class IP 30. Higher protection classes up to IP 67 are available on request.

Protection against foreign bodies (First digit)	Protection against water (Second digit)
0 No protection against solid foreign bodies	0 No protection against water
1 Protected against solid objects over 50mm Ø	1 Protected against vertically falling drops of water
2 Protected against solid objects over 12.5 mm Ø	2 Protection against diagonal water drips (up to a 15° angle)
3 Protected against solid objects over 2.5 mm Ø	3 Protection against diagonal water drips (up to a 60° angle)
4 Protected against solid objects over 1.0 mm Ø	4 Protected against splash water from any direction.
5 Limited protection against dust ingress	5 Protected against low pressure water jets from any direction. Limited ingress permitted.
6 Totally protected against dust ingress	6 Protected against high pressure water jets from any direction. Limited ingress permitted.
	7 Protected against short periods of immersion in water.
	8 Protected against long, durable periods of immersion in water.
	9 Protected against close-range high pressure, high temperature spray downs.

„IMAGE PROCESSING SOLUTIONS
ALWAYS START WITH THE
CORRECT CHOICE OF LIGHT.“



Notes



Notes

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RING LIGHTS

DARK FIELD LIGHTS

DOME LIGHTS

COAXIAL LIGHTS

INCIDENT LIGHTS

BAR LIGHTS

BACK LIGHTS

SPOT LIGHTS

CUSTOM DEVELOPMENTS

STROBE CONTROLS



**CUSTOM
SOLUTIONS**



**EXTENSIVE
CONSULTING**



**TOP-RATED
QUALITY**



**SHORT
LEADTIMES**



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