



Installation and Operating Instructions

R-CLR-69x41-R645-SL

Coaxial LED ring light, vicolux® smart light

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Validity

These operating instructions are valid for the following devices

Device	Order no.
R-CLR-69x41-R645-SL	1-33-005

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1 ABOUT THESE INSTRUCTIONS

These instructions contain important information required to operate the device safely, appropriately and economically. These instructions must be read completely and carefully in order to avoid hazards and the need for repairs, and to reduce downtimes and lengthen the service life of the device.

The instructions must always be present at the operation site.

The installation and operating instructions are part of the device, and must be followed. Furthermore, the local work protection, accident prevention, environmental protection and general safety regulations apply at the at the operation site of the device.

2 SAFETY

2.1 Representation of Warning Notices

Warning instructions appear at the relevant places in the document to warn of impending hazards. Each warning instruction is introduced by a key word and colour highlighted. The key word indicates the degree of danger.

WARNING

Indicates a potentially dangerous situation. If this situation is not avoided, fatality or very serious injuries may be caused.

CAUTION

Indicates a potentially dangerous situation. If this situation is not avoided, minor or moderate injuries may be caused.

NOTICE

Refers to a situation that may cause property damage or damage to the environment.

2.2 Safety Instructions

Safety instructions warn of general hazards. Knowledge of the basic safety instructions is the basic prerequisite for the safe handling and fault-free operation of the device.

- It is forbidden to modify the device in any way without prior consultation with and the agreement of the manufacturer.
- Accessible parts may be electrically live as a result of a defect or incorrect installation.

Work on the electrical system may only be performed by qualified electricians or under the instruction and supervision of qualified electricians. Never work on the device when it is powered up!

Before starting work on the device, disconnect it from the operating voltage.

- Never remove stickers or labels from the product! All labels must be kept in clearly legible condition at all times!
- Only operate the device for its intended purpose, and when it is in a fully-functional, undamaged condition.
- When operating the device together with other devices, systems or other accessories, their operating instructions must also be observed!

2.3 Qualified Personnel

On account of their training and experience, qualified personnel are capable of recognizing the risks involved with handling the this device, and avoiding possible hazards.

Only those persons may work on or with this device who are qualified for their particular task, and who have read and understood the safety and warning instructions in this document.

3 PRODUCT DESCRIPTION

vicolux[®] smart light

vicolux[®] smart light is a new type of lighting technology, with which Vision & Control GmbH has revolutionized industrial image processing.

vicolux[®] smart light technology does much more than the traditional approach, in which a lighting controller only adjusts the brightness of a lighting unit.

By continuously recording and evaluating sensor data from the lighting unit, the vicolux[®] smart light lighting controller optimally adjusts the lighting to the conditions, and provides a constant light.

3.1 Intended Use

The device is intended for use solely as an internal lighting element for machine vision in the field of automation technology. The device may only be used in enclosed areas.

Safe, trouble-free operation of this device is conditional upon its proper transport and storage, mounting, installation, commissioning, operation and maintenance. The permissible environmental conditions must be maintained.

Limitation of liability

The manufacturer shall not be held liable for any damage that occurs as a result of:

- Use for any purpose, other than intended
- Non-compliance with this guide
- Opening the device and unauthorised modifications to the device
- Use of unskilled/untrained personnel
- Operating the device if it is not in its original, standard, technical condition
- Using unauthorised and incompatible accessory components

3.2 Foreseeable Misuse

Dangers may arise from the device if it is used improperly or for other than its intended purpose.

The device is not designed for use in potentially explosive atmospheres. They include the EU directives 1999/92/EC (ATEX 137) and 2014/34/EU (ATEX 95), but are not limited to them.

3.3 Labelling of the Device

Product Name

Designation	Description
R	Ring light
CLR	Transparent cover of LEDs
69x41	Dimension of luminous field: Ø 69 mm Dimension of through view: Ø 41 mm
R645	Red, peak wavelength: 645 nm
SL	vicolux® smart light

Rating plate

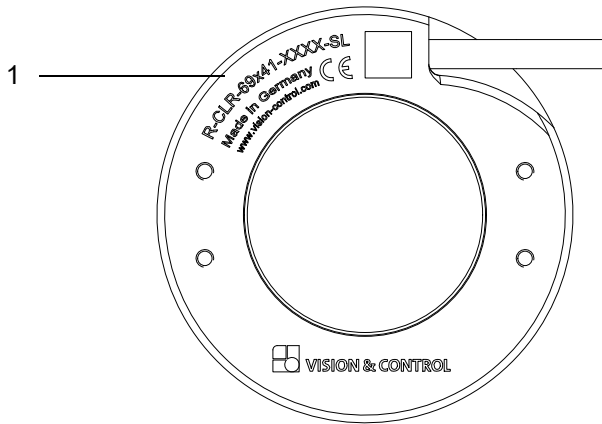


Figure 1: Rating plate

- 1 Rating plate with product name, serial number and CE mark

3.4 Display and Operating Elements

The device does not have any display or operating elements.

3.5 Structure of the Device

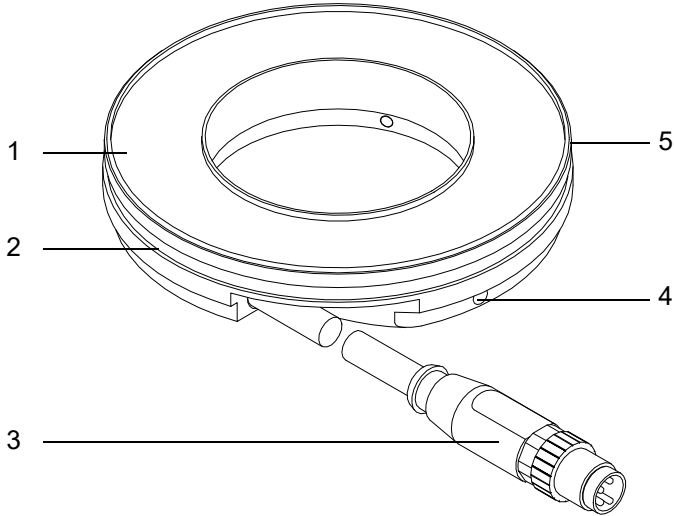


Figure 2: Structure of the device

- 1 Luminous field
- 2 Housing
- 3 4-pin M8 plug
- 4 3 x M2.5 threaded pins
- 5 External thread for mounting the accessories

3.6 Dimensional Drawing

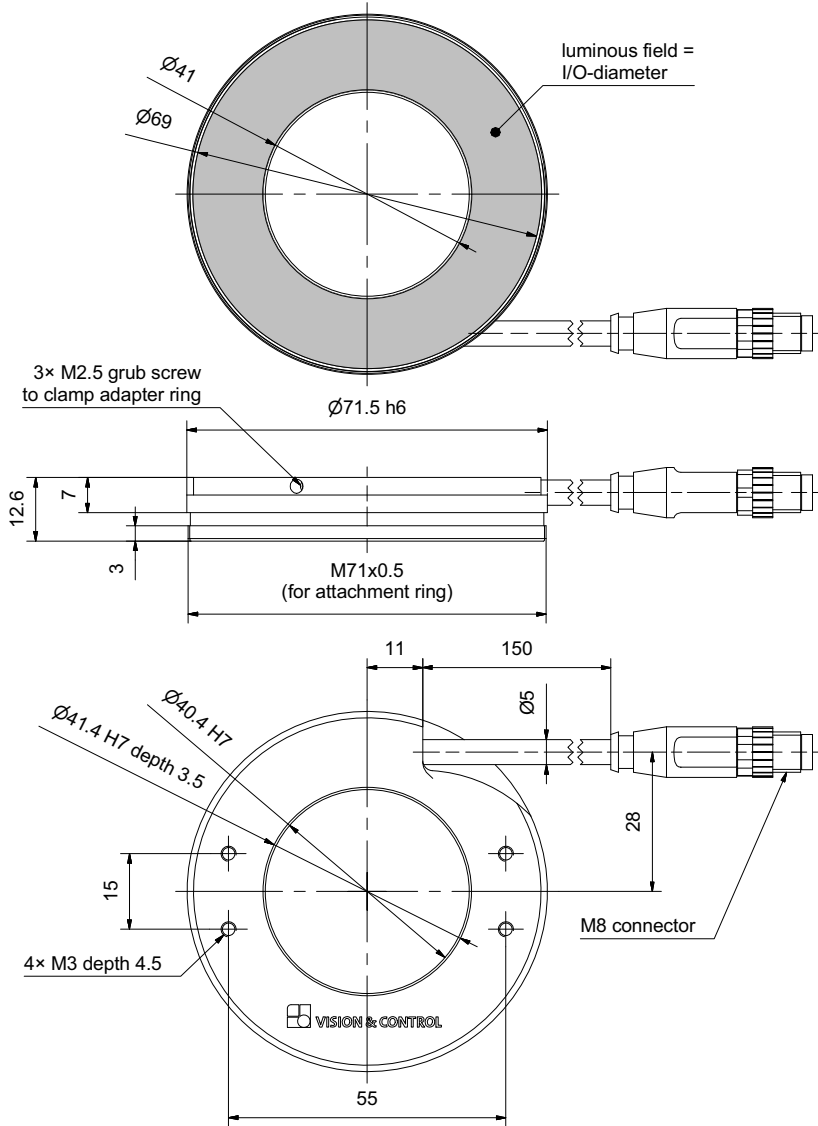


Figure 3: Dimensional drawing (all dimensions in mm)

4 PACKAGING AND TRANSPORTATION

NOTICE

The ambient conditions specified in the data sheet must be observed during storage and transport (see chapter 8.4 “Ambient Conditions” on page 23).

- Do not expose the device to strong variations in temperature.
 - After storage and transport, allow the device to adjust slowly to the ambient temperature at the place of use.
-

The device is suitably packed for the expected transport conditions. Only environmentally friendly materials are used for the packaging.

The fixing packaging is intended to protect the device against transport and other damage until it is installed. Therefore do not destroy the packaging, and do not unpack the device until shortly before it is installed.

The special folding mechanism ensures that the stretch film securely fixes the product onto the corrugated board format. This ensures that slipping can be avoided.

The device may only be transported in its original packaging or in other suitable packaging. Adapters and mounted parts must be dismantled before the device is transported.

The packaging materials must be disposed of in a way that does not harm the environment, and in compliance with the currently valid legal stipulations and the local regulations.

5 INSTALLATION AND MOUNTING

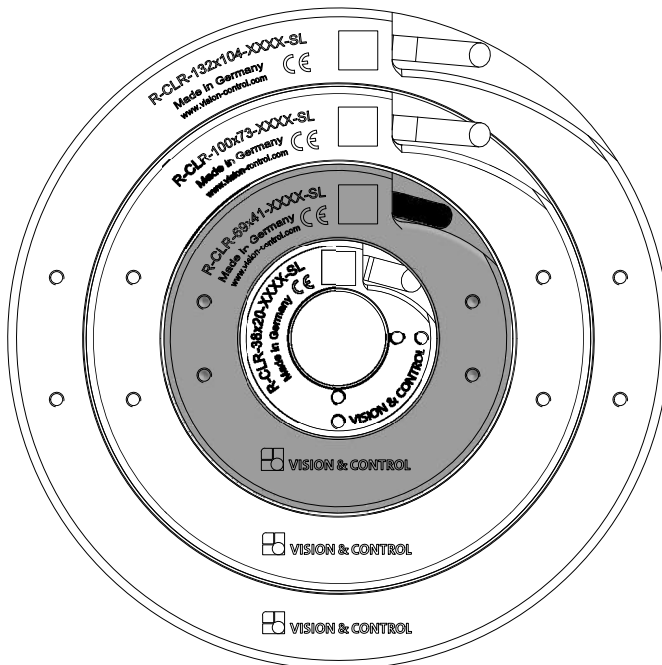
NOTICE

Electronic components and modules are sensitive to electrostatic discharges.

- Appropriate ESD protection measures must be taken before the device is mounted.
- The device may only be connected when it is electrically dead.

NOTE

Variously coloured R-CLR-xxx-SL series ring lights can be combined to form a round floodlight with a camera aperture.



5.1 Mounting the Device

To mount the device four M3 tapped holes (2) are located on the rear of the device.

There are also three threaded pins (1) attached to the side for mounting accessories.

A 1.5 mm-allen key is needed to mount the accessories (not part of the scope of delivery).

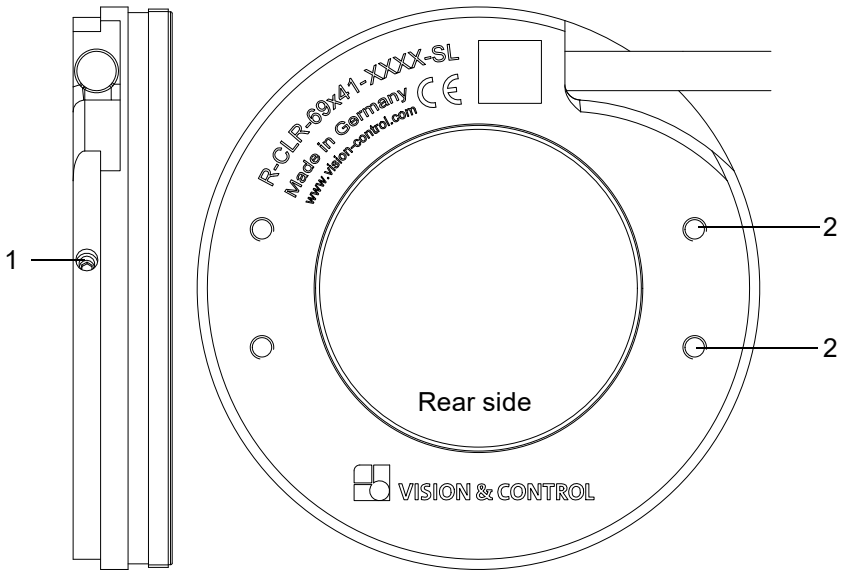


Figure 4: Position of the mounting holes and threaded pins

- 1 3 x M2.5 threaded pins
to mount the adapter rings
- 2 4 x M3 threaded holes (on rear side)
Maximum screw-in depth: 4.5 mm
(exact position: [see "Dimensional Drawing" on page 11](#))

5.2 Mounting the Accessories

5.2.1 Lens Adapter

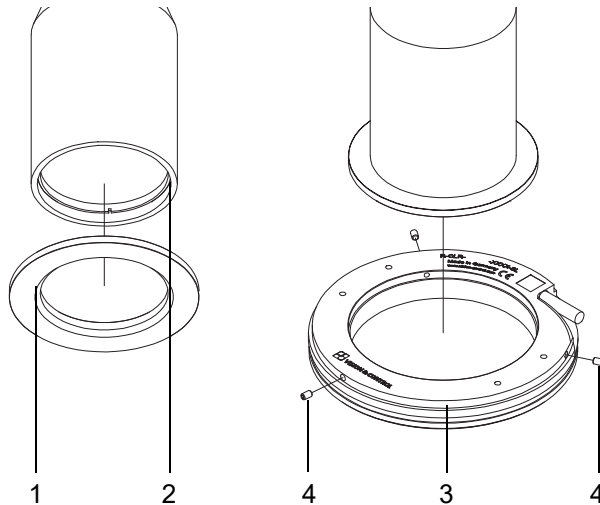


Figure 5: *Installation by means of an adapter ring (general display)*

- 1 Adapter ring
- 2 Lens barrel
- 3 Lighting
- 4 M2.5 threaded pin (3 x, lateral)

1. According to whether the objective is endocentric or telecentric, screw an appropriate adapter ring (1) ([see chapter 8.5 "Accessories" on page 25](#)) into the filter thread of the lens barrel (2), or place it on the lens barrel (2) and fixate it with threaded pins.
2. Mount the lighting unit (3) on the adapter ring (1).
3. Hand-tighten the three threaded pins (4) alternately a little at a time.

5.2.2 Optical head

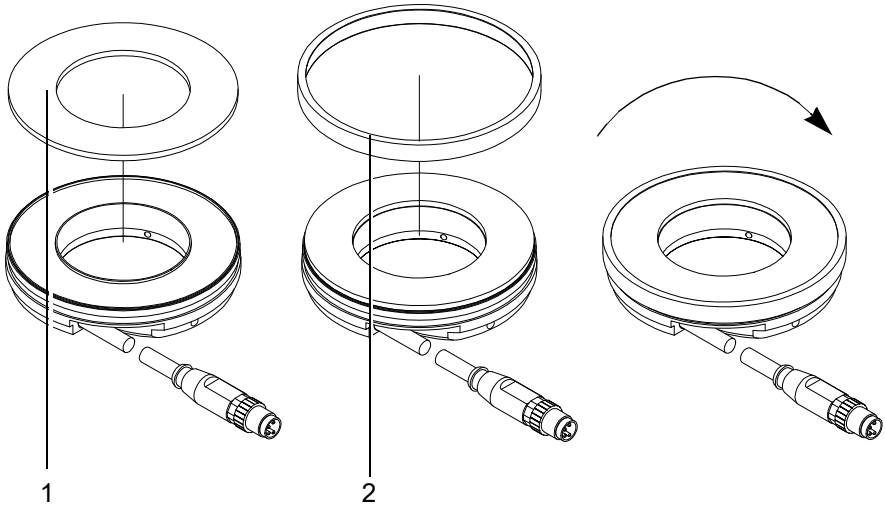


Figure 6: Mounting the optical accessories

- 1 Optical head
- 2 Attachment ring

1. Place the optical head (1) on the lamp surface.
2. Mount the attachment ring (2) directly on the lighting unit.
3. Tighten the attachment ring hand tight.

6 OPERATION

6.1 Connecting the Device

Connect the device according to the pin assignment.

NOTICE

- Operate the device only using suitable power sources (LED or flash controllers).
Observe the admissible parameters
(see chapter 8 "Technical Data" on page 21).
- The device is protected against polarity inversion and overheating (protection against overheating is only guaranteed in combination with a vicolux[®] smart light lighting controller).
- Comply with the safety regulations for the operation of electrical installations and devices.

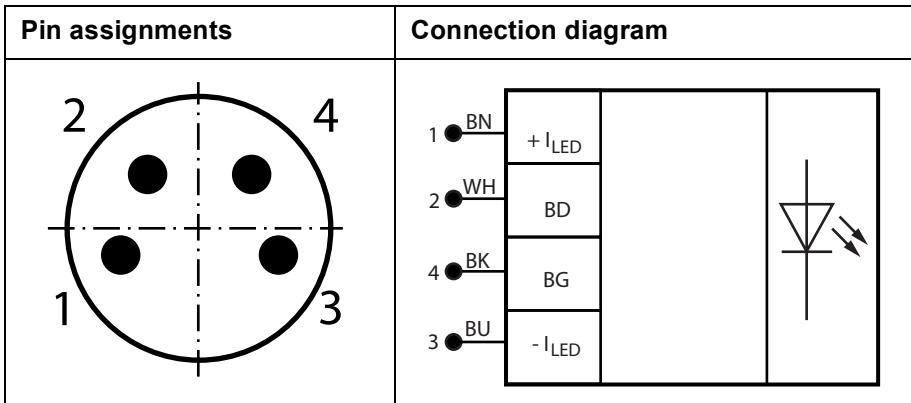


Figure 7: Pin assignments/Connection diagram

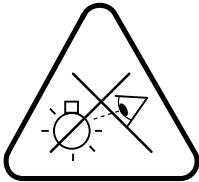
Pin	Wire colour	Signal	Description
1	BN	+ I _{LED}	LED anode, positive current input
2	WH	BD	Data-Channel for vicolux [®] smart light lighting ¹⁾
3	BU	- I _{LED}	LED cathode, negative current input
4	BK	BG	Data-Channel for vicolux [®] smart light lighting ¹⁾

1) Only use with vicolux[®] smart light lighting controllers.

6.2 Commissioning

Personal injuries caused by flicker, dazzle or radiation

CAUTION



Flicker, dazzling and stroboscopic effects can cause psychological disturbances, such as headache, a feeling of unease or tiredness.

Dazzle hazard

- The strong dazzling effect can cause temporarily impaired vision, that can lead to irritation, impairment of vision or accidents. Wear protective goggles!

Danger of burns due to hot surface

CAUTION



The housing of the device can reach temperatures exceeding 55 °C during operation.

- Do not touch the device during operation.
- Allow the device to cool before touching it.

6.3 Operating Modes

Continuous mode

The device will be continuously operated using LED current permissible in continuous mode. Do not exceed the maximum permissible value of continuous current (see [chapter 8.2 “Electrical Parameters” on page 22](#)).

Flash mode

The device will be operated using current pulses permissible in flash mode. Do not exceed the maximum permissible parameters in the flash mode (see [chapter 8.2 “Electrical Parameters” on page 22](#)).

7 MAINTENANCE AND TECHNICAL SUPPORT

7.1 Maintenance

The device is maintenance-free. Depending on the operating environment, soiling may have to be cleaned off the device in order to generate the maximum intensity of illumination and homogeneity. The device may only be cleaned when it is electrically dead.

Cleaning the outer face

- Clean the outer surface with a damp cloth.
- Remove heavy contamination with a cleanser approved for anodised aluminium. In doing so, follow the instructions for using the cleanser.
- Cleansers must not be applied directly to the housing, the housing must not be immersed in the cleanser.

Cleaning the luminous field

- Clean the luminous field only with clean compressed air.
Do not use cleaning agents which contain solvents.

7.2 Technical Support

Please contact your local sales partner or our Technical Support if you have any questions concerning the device and the matching accessories.

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8 TECHNICAL DATA

8.1 General Parameters

Parameters	Properties
Casing material	Aluminium, anodised
Optical material	LED, potted
Casing dimensions	Ø outside: 71.5 mm Ø inside: 40.4 mm Height: 12.6 mm
Dimension of luminous field	Ø outside: 69.0 mm Ø inside: 41.0 mm Ring width: 14.0 mm
Dimension of through view	Ø 40.4 mm
Plug connector	M8, 4 pole
Length of the connecting cable	150 mm
Cable type	Li9Y11Y, 4 x 0.5 mm ² , TPU, UL20549
Cable diameter (outside)	5.0 mm
Bending radius, fixed cable	min. 5 x cable diameter
Weight	75 g
Degree of protection	IP 67
Protection class	III, for the operation of separated extra-low voltage
Risk group (DIN EN 62471)	Exempt
Overheat protection T _{MAX}	65 °C
Protection against overheating is only guaranteed in combination with a vicolux® smart light lighting controllers.	

8.2 Electrical Parameters

Parameters	Min	Nom	Max
Continuous mode			
LED current I_{LED}	0 A ¹⁾		0.9 A ²⁾
Forward voltage U_{LED}	7.5 V		10.0 V
Power consumption P_{total}			8.5 W ²⁾
Flash mode / Pulse operation			
LED current I_{LED}	0 A ¹⁾		2.4 A ²⁾
Forward voltage U_{LED}	8.5 V		11.0 V
Power consumption P_{total}			8.5 W ²⁾
Control factor $t_{ON} : t_{OFF}$			1 : 4
(see diagram "Pulse load" on page 24)			

- 1) The wavelengths stated in chapter 8.3 "Radiation Parameters" are maintained as from an LED current of 0.12 A.
- 2) The maximum values refer to an ambient temperature of +25 °C if convection is unobstructed.

8.3 Radiation Parameters

Parameters	Min	Nom	Max
Beam angle		30°	
Peak wavelength		645 nm	
Centroid wavelength		642 nm	
Continuous mode			
Irradiance		260 W/m ²	
Working distance = 100 mm, measured in the optical axis at maximum parameters			
Flash mode / Pulse operation			
Irradiance		670 W/m ²	
Working distance = 100 mm, measured in the optical axis at maximum parameters			

8.4 Ambient Conditions

Parameters	Operation	Storage/transport
Temperature	- 10 °C to 55 °C	- 20 °C to 85 °C
Air humidity	20 % to 80 %	20 % to 95 %
Condensed water	not permitted	not permitted

Pulse load

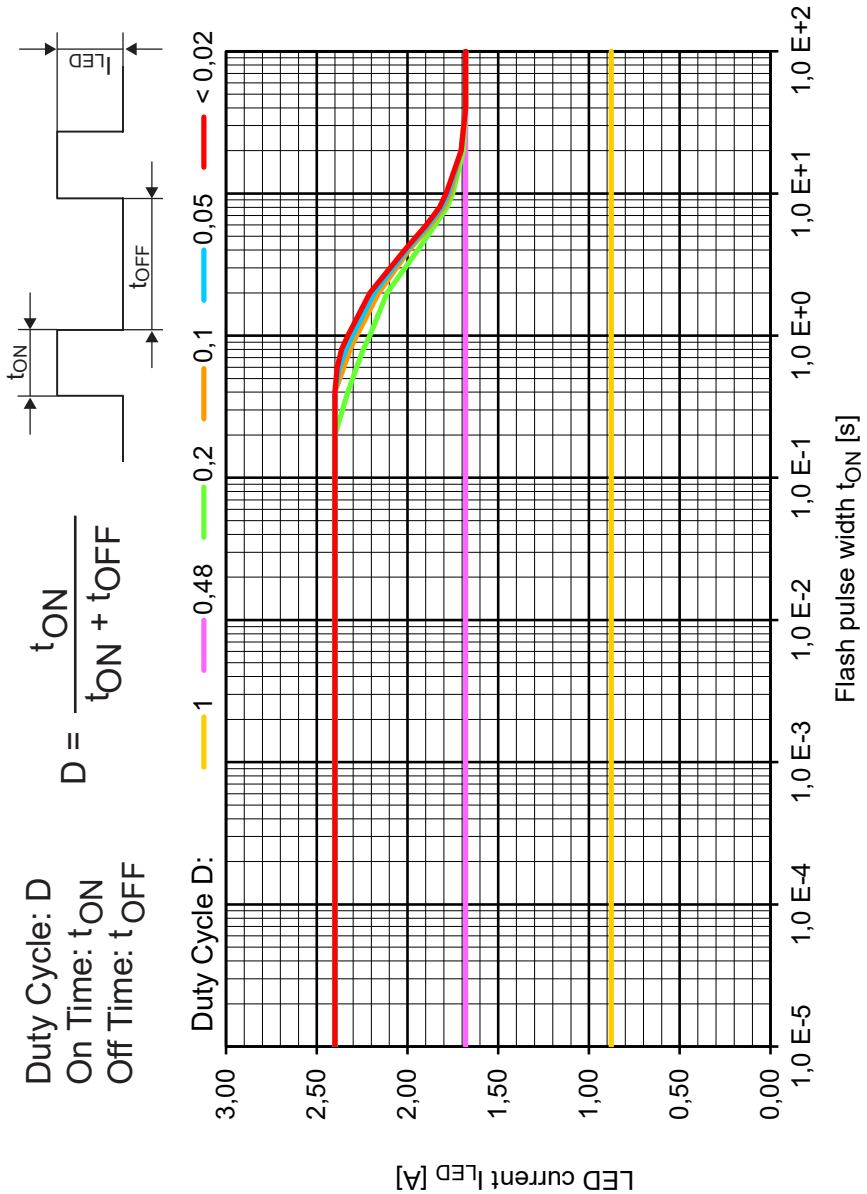


Figure 8: Pulse load at ambient temperature = 25 °C

Spectral emission

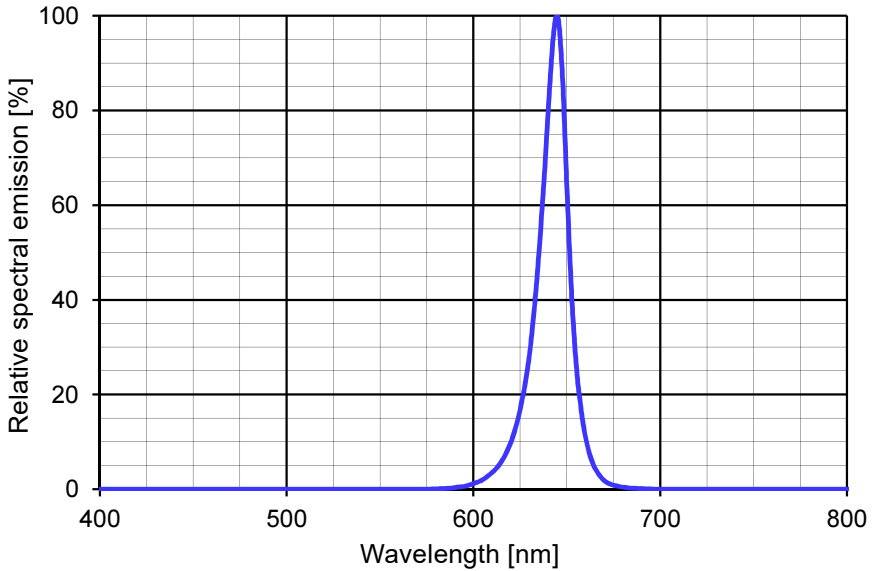


Figure 9: *Spectral emission*

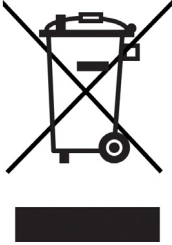
8.5 Accessories

A wide range of accessories are available for the R-CLR-69x41-R645-SL lighting unit, for example optical heads, diffusers and adapter rings.

You will find more detailed technical information about the accessories in the product catalogue under www.vision-control.com.

9 DISPOSAL

The device is RoHS-compliant.



Packaging and ancillary packaging material can and should be recycled. The product itself must not be disposed of in the household waste.

Instructions for the proper disposal of old devices can be obtained from the manufacturer, local sales partner or relevant national authority. Alternatively, the device can be returned to the manufacturer for proper disposal.

10 DECLARATION OF CONFORMITY

EU Declaration of Conformity

In accordance with Directive 2014/30/EU (electromagnetic compatibility)
dated 26 February 2014

We herewith declare that the device described below, by virtue of its design and construction and moreover in the type brought onto the market by us, conforms to the relevant safety and health requirements of the EC Directive 2014/30/EU. This declaration shall lose its validity if a modification is made to the device that we have not authorised.

Manufacturer: Vision & Control GmbH
Mittelbergstraße 16
D-98527 Suhl, Germany

Description of the device:

Designation: Coaxial LED ring light,
vicolux® smart light
Type: R-CLR-69x41-R645-SL
Order no.: 1-33-005

Compliance with other EC Directives applicable to the product has been declared:

Directive 2006/25/EC – Artificial optical radiation
Directive 2006/95/EC – Low Voltage Directive
Directive 2011/65/EU – Restriction of Hazardous Substances

Applied harmonized standards:

DIN EN 61000-6-2:2006-03	DIN EN 61000-6-4:2011-09
DIN EN 61000-4-2:2009-12	
DIN EN 62471:2009-03 / EN 62471:2008	DIN EN 62471 supplement 1:2010-06

Date of declaration: 15.06.2016
Name of the signatory: Dr. Ulrich Pahl, Head of development

11 LIST OF CHANGES

Version	Date	Contents	Chapter

12 NOTES

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