

Table of contents

1.	For your safety	23
1.1	Designated use	23
1.2	Safety instructions.....	23
1.3	Warning levels.....	24
2.	Model overview	25
3.	Mounting.....	27
3.1	Dimensions	27
3.2	Mounting the luminaire	28
3.3	Aligning the luminaire.....	29
4.	Connection.....	30
4.1	Connecting the luminaire to the supply voltage.....	30
4.2	Through-wiring	31
5.	Control.....	32
5.1	Digital switching signals.....	32
5.2	Powerless switching	32
5.3	Adjusting the dimming levels	32
5.4	Adjusting the RGB.....	33
5.5	Operating mode "Combined operation WHITE+RGB"	33
6.	What to do if?.....	36
7.	Maintenance	37
7.1	Checking the filtering effect.....	37
8.	Cleaning	37
9.	Repair	37
10.	Replacing the luminaire	38
11.	Disposal.....	38
12.	Technical data	39
12.1	Electrical values.....	39
12.2	Classifications	39
12.3	Symbols	39

1. For your safety

The luminaire has been designed in accordance with state-of-the-art standards, manufactured with utmost care using high-quality materials, and tested.

Nevertheless, its use may constitute a risk to persons or cause material damage.



- ▶ Read all enclosed instructions and information.
- ▶ Please observe the warnings included in the documentation and attached to the unit.
- ▶ The device must only be used in technically perfect condition, and only by persons being aware of the risks and dangers involved in operating the device.
- ▶ Keep this document available near the device.

1.1 Designated use

This luminaire is a machine light for illuminating objects on and in machines.

The luminaire model LEA .../YEL has been developed especially to illuminate photochemically sensible processes. The yellow cover of this model blocks wave lengths below 500 nm.

1.2 Safety instructions

Explosion hazard

Operating the luminaire in rooms subject to explosion hazards can trigger an explosion and result in serious injuries or death.

- ▶ **Do not** operate the luminaire in rooms subject to explosion hazards.

Danger due to electric shock

Improper use and faulty work on the luminaire may result in injuries and material damage.

- ▶ Connection by a skilled electrician only.
- ▶ Operate the luminaire at safety extra low voltage (SELV) only.
- ▶ Have maintenance and repair work performed by the manufacturer, by a service technician authorised by the manufacturer or by a person with comparable qualification.
- ▶ Before performing work on the light, disconnect the light from the power supply.

Safe mounting

A luminaire falling down can result in personal injuries and material damage.

- ▶ Use only the delivered fastening elements or other suitable fastening elements available from the manufacturer.
- ▶ Mount fastening elements correctly.

Risk of blinding caused by bright light source

Looking directly into the light source may cause temporary visual impairment and afterimages. This may result in irritations, inconveniences, impairments or even accidents.

- ▶ **Do not** look into the light source.
- ▶ Position the luminaire in such a way that looking directly into the light source is avoided.

Risk of burns

Hot surfaces can result in burns to the skin.

- ▶ Do **not** touch the light during operation.
- ▶ Do not touch the light until it has cooled down.

Hazard caused by unsuitable spare parts

Unsuitable spare parts can result in injuries and material damage.

- ▶ Use only spare parts approved by the manufacturer.

Danger due to incident laser beam

Direct or indirect incidence of a laser beam may result in the destruction of the LED.

- ▶ Use the luminaire only outside the range of action of high-performance lasers such as a cutting laser.

Danger from aggressive media

Aggressive media, such as cooling lubricants, disinfectants and aggressive cleaning agents can damage the plastic parts of the luminaire.

- ▶ Use the luminaire only outside the range of action of aggressive media.

Danger due to high ambient temperature

Exceeding the allowed ambient temperature will shorten the useful life of the electronic components.

- ▶ Do not exceed the maximum allowed ambient temperature.
- ▶ Avoid direct exposure to sunlight.

1.3 Warning levels

DANGER

Warning against hazards that result **directly in serious injuries or death** in case of non-observance.

WARNING

Warning against hazards that may result in **serious injuries or death** in case of non-observance.

CAUTION

Warning against hazards that may result in **injuries** in case of non-observance.

NOTICE

Warning against hazards that may result in **material damage** in case of non-observance.

2. Model overview

For optimum installation and use of the luminaire, you have to identify the luminaire model. To do so, you will require the model number of the luminaire.

NOTE: The model number can be found on the rating plate of the luminaire.

- ▶ Check which model number the luminaire has.
- ▶ Determine the luminaire model by referring to the following table, see Tab. 1.

Example: The model number **LEA 1200/850/ST** stands for the following luminaire model:

LE	A	1200	850	ST
LINURA.edge machine luminaire	Adaptation type A: surface-mounted	Luminous flux class: 1200 lm	Colour code: Ra > 80, 5000 K	ST version Functions: <ul style="list-style-type: none"> ▪ Safety Extra Low Voltage (SELV) ▪ Through-wiring

Type	Adaptation type	Luminous flux class	Colour code	Version
LE LINURA.edge machine luminaire	A surface-mounted	300 lm 600 lm 900 lm 1200 lm 1500 lm 1800 lm 2100 lm 2400 lm 2700 lm 3000 lm	850 Colour rendering index Ra > 80, colour temperature 5000 K	S Safety Extra Low Voltage (SELV) ST Safety Extra Low Voltage (SELV) Through-wiring

Type	Adaptation type	Luminous flux class	Colour code	Version
LE LINURA.edge machine luminaire	A Structure	300 lm	850 Colour rendering index Ra > 80, colour temperature 5000 K	MS Switchable to several levels (dimming levels) Safety Extra Low Voltage (SELV)
		600 lm		
		900 lm		
1200 lm				
1500 lm				
1800 lm				
2100 lm				
2400 lm				
2700 lm				
3000 lm				
		100 lm	RGB 7 adjustable light colours	S Safety Extra Low Voltage (SELV)
		200 lm		
		300 lm		
		400 lm		
		500 lm		
		600 lm		
		700 lm		
		800 lm		
		900 lm		
		1000 lm		
		100 lm	YEL Yellow light	S Safety Extra Low Voltage (SELV)
		200 lm		
		300 lm		
		400 lm		
		500 lm		
		600 lm		
		700 lm		
		800 lm		
		900 lm		
		1000 lm		
				ST Safety Extra Low Voltage (SELV) Through-wiring

Tab. 1: Model overview.

3. Mounting

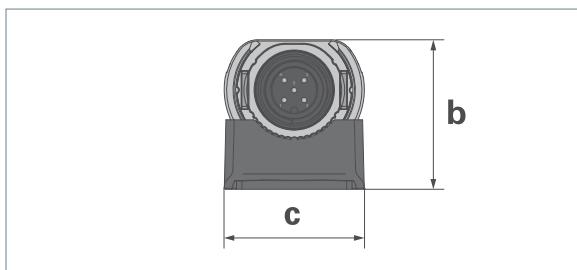
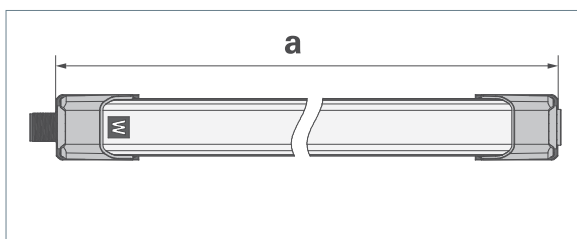
⚠ CAUTION

Risk of injury caused by a falling luminaire.

Personal injury and material damage.

- ▶ Use only suitable fastening elements available from the manufacturer.
- ▶ Mount fastening elements correctly.

3.1 Dimensions



No.	Luminaire	Dimensions
	LEA 300/850 LEA 100/RGB LEA 100/YEL	195 mm
	LEA 600/850 LEA 200/RGB LEA 200/YEL	335 mm
a	LEA 900/850 LEA 300/RGB LEA 300/YEL	475 mm
	LEA 1200/850 LEA 400/RGB LEA 400/YEL	615 mm
	LEA 1500/850 LEA 500/RGB LEA 500/YEL	755 mm

No.	Luminaire	Dimensions
	LEA 1800/850 LEA 600/RGB LEA 600/YEL	895 mm
	LEA 2100/850 LEA 700/RGB LEA 700/YEL	1035 mm
a	LEA 2400/850 LEA 800/RGB LEA 800/YEL	1175 mm
	LEA 2700/850 LEA 900/RGB LEA 900/YEL	1315 mm
	LEA 3000/850 LEA 1000/RGB LEA 1000/YEL	1455 mm
b	all	26.5 mm
c	all	25 mm

Tab. 2: Dimensions.

3.2 Mounting the luminaire

Mounting the fastening elements

NOTES:

- The two outer fastening elements must be mounted to the mounting surface at a distance of **a minus 30 mm**, see Tab. 2.
- For the following luminaire versions, you also have to mount a third fastening element and an intermediate holder.
 - LEA 2700/850
 - LEA 900/RBG
 - LEA 900/YEL
 - LEA 3000/850
 - LEA 1000/RBG
 - LEA 1000/YEL
- The fastening element for the intermediate holder must be mounted in the middle section between the two outer fastening elements.
- The tolerance range of the holders and of the intermediate holder, relative to the fastening elements, is in each case $\pm 15\text{ mm}$.
- For mounting the fastening elements, flat-headed screws must be used that are suitable for the respective mounting surface. These screws may have a maximum shaft diameter of 4 mm, a maximum head diameter of 8 mm and a maximum head height of 3.5 mm.
- For mounting the fastening elements to metal sheets, suitable self-tapping screws can be found in the scope of delivery of the luminaire.

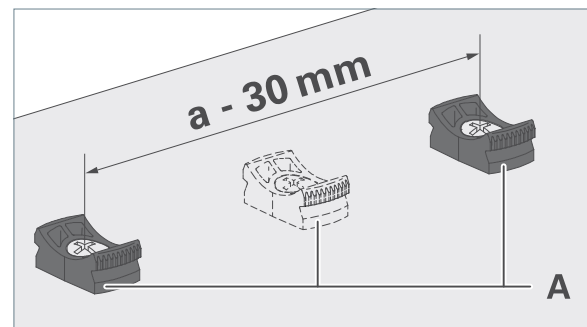


Fig. 1: Mounting the fastening elements

- ▶ Mount the fastening elements **A** to the mounting surface in parallel to each other using suitable screws, see Fig. 1.

Mounting the holder

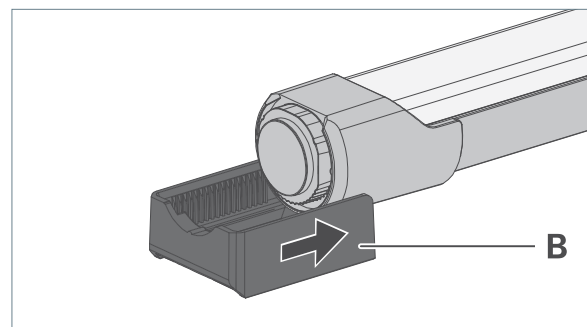


Fig. 2: Mounting the holder

- ▶ Place the holder **B** on the side part such that the detent lug is located in the groove of the side part and the holder locks into place in the side part, see Fig. 2.
- ▶ Mount the second holder to the opposite side part of the luminaire such that the two holders are aligned in parallel to the mounting surface.

If desired: Mounting the intermediate holder

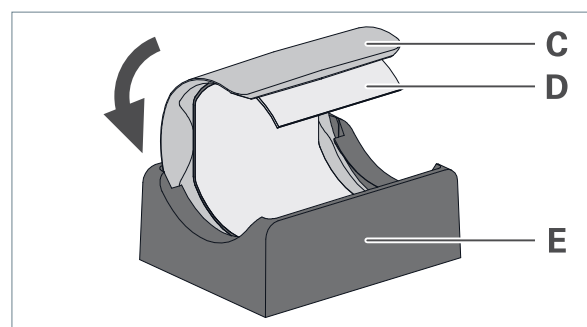


Fig. 3: Mounting the insert in the intermediate holder.

- ▶ Slide the insert **C** in the groove of the intermediate holder **E** until the open side of the insert points upwards, see Fig. 3.
- ▶ Pull of the tab **D** from the adhesive film in the insert.

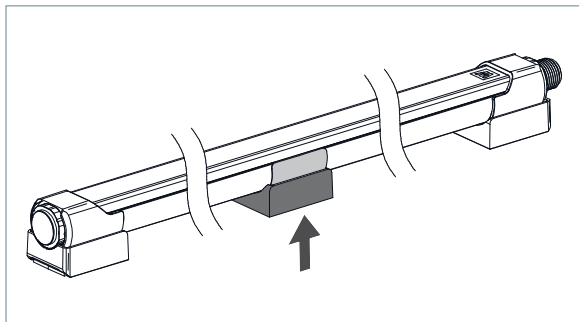


Fig. 4: If desired: Mounting the intermediate holder

- ▶ Mount the intermediate holder to the aluminium housing of the luminaire in the area where the middle fastening element is located on the mounting surface, such that the insert does not protrude into the cover.

Mounting the luminaire to the fastening elements

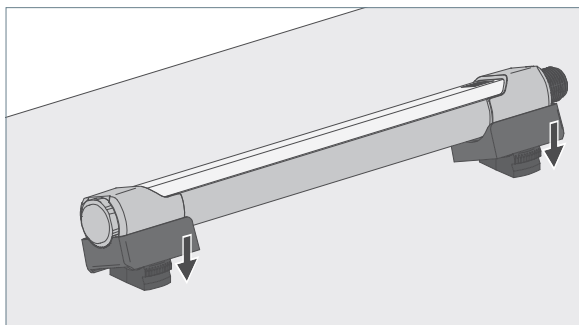


Fig. 5: Mounting the luminaire to the fastening elements

- ▶ Place the luminaire together with the mounted holders onto the fastening elements and press the luminaire downward until the holders snap into the fastening elements, see Fig. 5.

3.3 Aligning the luminaire

After mounting, you can align the luminaire. The holders are provided with detent lugs that engage with teeth on the side parts of the luminaire.

The angle of the luminaire can be adjusted in small steps over a range of 120°. There are additional detent points at -90° and +90°, to align the luminaire in exactly these angles.

NOTE: The luminaire is only securely fastened if the detent lugs of the holders are located in the area of the teeth on the side parts.

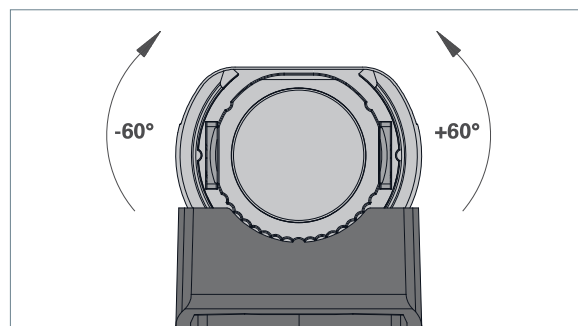


Fig. 6: Aligning the luminaire between -60° and +60°.

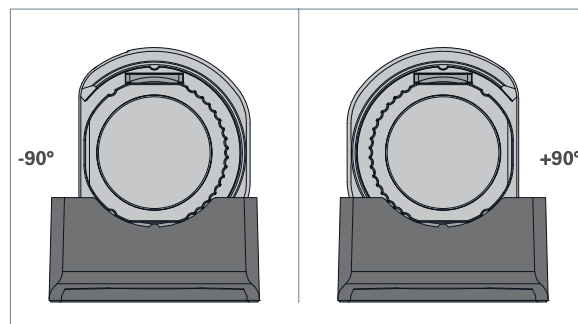


Fig. 7: Aligning the luminaire at -90° or +90°.

- ▶ Turn the luminaire at an angle between -60° and +60° until the work area is optimally lighted, see Fig. 6.

or

- ▶ Turn the luminaire to an angle of exactly -90° or +90°, see Fig. 7.

4. Connection

4.1 Connecting the luminaire to the supply voltage

To connect the luminaires, we recommend using connecting cables found in the Waldmann range of accessories.

NOTICE

Material damage caused by wrong mains voltage.

Damage or destruction of the luminaire.

- ▶ Connection by a skilled electrician only.
- ▶ Operate the luminaire at safety extra low voltage (SELV) only.
- ▶ Observe the pin assignment and the socket assignment.
- ▶ Use connecting cable with strands which have a conductor cross-section of at least 0.5 mm². For luminaires with through-wiring, use a connecting cable with a cross-section of 1.0 mm².
- ▶ Make sure that the maximum allowed short-circuit current of the voltage source is not exceeded: $I_k < 4A$
- ▶ **USA and Canada:** This device must be connected to a power supply unit of class 2.

NOTICE

Material damage caused by ingress of moisture.

Damage or destruction of the luminaire.

- ▶ Use a plug-in connection that guarantees at least the same ingress protection as the luminaire.
- ▶ If a luminaire with through-wiring is operated as a single luminaire or end luminaire: The enclosed sealing cap must be screwed onto the unused socket.

NOTICE

Material damage due to improper installation.

Damage or destruction of the luminaire.

- ▶ Do **not** twist plug and socket against each other.
- ▶ Tighten the union nut of the plug-in connection to a defined torque: 0.6 Nm

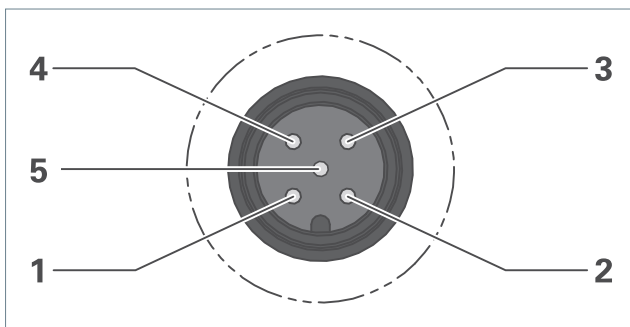
There are different pin assignments available for the luminaire:

- Type D
- Type E

To be able to connect the luminaire, you must know the pin assignment of the luminaire.

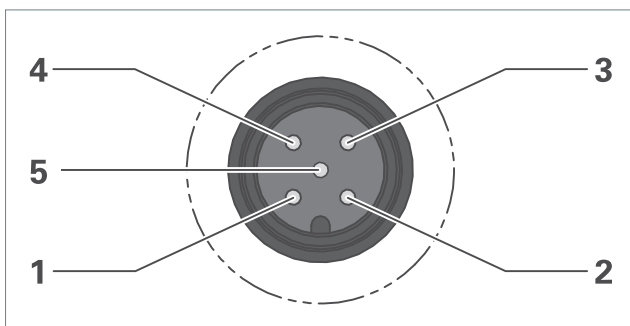
NOTE: The pin assignment designation can be found on the rating plate of the luminaire.

- ▶ Check which designation is on the rating plate.
- ▶ Make sure that the supply voltage and digital switching signals have the same reference potential.
- ▶ For the pin assignment, please refer to the following table.



No.	Designation
1	DC +
2	Not assigned
3	DC -
4	Powerless switching
5	Not assigned

Tab. 3: Plug M12-A-5, pin assignment Type D.



No.	Designation
1	DC +
2	Bit 0
3	DC -
4	Bit 1
5	Bit 2

Tab. 4: Plug M12-A-5, pin assignment Type E.

- ▶ Connect a suitable socket to the A-coded plug.
- ▶ Tighten the union nut of the plug-in connection without twisting the plug and socket against each other. Torque: 0.6 Nm

4.2 Through-wiring

Luminaires with through-wiring can be linked to one another via the pre-mounted plug-in connection. These luminaires are identified by the letter **T** in the model number, for example LEA 300/850/**ST**.

To link the luminaires, connecting cables are recommended which are found in the Waldmann range of accessories.

For more information on the accessories of this luminaire, please visit the Waldmann home page at: www.waldmann.com

NOTE: In luminaires with through-wiring connected in series, the total current consumption must not exceed **3 A**. The data given on the rating plate of the luminaire apply.

- ▶ Link the luminaires with a suitable connecting cable.
- ▶ Tighten the union nut of the plug-in connection without twisting the plug and socket against each other. Torque: 0.6 Nm

5. Control

5.1 Digital switching signals

0 signal

Input voltage range: -3.0 V ... 5.0 V

- ▶ To generate a 0 signal, apply an input voltage between -3 V and 5 V to the digital inputs pin no. **2**, pin no. **4** or pin no. **5**, see Tab. 3 or see Tab. 4.

1 signal

Input voltage range: 15.0 V ... 30.0 V

- ▶ To generate a 1 signal, apply an input voltage between 15.0 V and 30.0 V to the digital inputs pin no. **2**, pin no. **4** or pin no. **5**, see Tab. 3 or see Tab. 4.

5.2 Powerless switching

Precondition: The luminaire is equipped with a plug with the pin assignment Type D.

NOTE: Switching cycles may not be smaller than 0.5 seconds.

Switching on

- ▶ Apply a 0 signal to pin no. **4**, see Tab. 3.
or
- ▶ Do not apply any voltage to pin no. **4**.

Switching off

- ▶ Apply a 1 signal to pin no. **4**, see Tab. 3.

5.3 Adjusting the dimming levels

Luminaires which can be switched to several levels can adopt different dimming levels depending on the digital switching signal on the pins no. **2**, no. **4** and no. **5**, see Tab. 5.

These luminaires are identified by the letter **M** in the model number, for example LEA 300/850/**MS**.

Dimming level	Signal		
	Bit: 2	1	0
	Pin: 5	4	2
0%	0	1	0
40%	0	1	1
50%	1	1	1
60%	1	1	0
70%	0	0	1
80%	1	0	1
90%	1	0	0
100%	0	0	0

Tab. 5: Adjustable dimming levels.

- ▶ To adjust the desired dimming level, apply the corresponding signal to the respective pins, see Tab. 5.

5.4 Adjusting the RGB

Luminaires provided with the RGB function can adopt different light colours depending on the digital switching signal on the pins no. **2**, no. **4** and no. **5**, see Tab. 6.

These luminaires are identified by the letter combination **RGB** in the model number, for example LEA 300/**RGB**/S.

CAUTION

Risk of injury caused by strobe effect.

Applies **only** to LEA .../**RGB**/S with **white** light colour: Risk of injury caused by moving objects that are perceived as slowed down or standing due to pulse width modulation.

- ▶ Before touching illuminated objects, ensure that the illuminated objects are stationary.

Light colour	Signal		
	Bit: 2	1	0
	Pin: 5	4	2
Off	0	0	0
Red	0	0	1
Yellow	0	1	0
Green	0	1	1
Blue	1	0	0
Violet	1	0	1
Turquoise	1	1	0
White	1	1	1

Tab. 6: Adjustable light colours.

- ▶ To adjust the desired light colour, apply the corresponding signal to the respective pins, see Tab. 6.

5.5 Operating mode "Combined operation WHITE+RGB"

In the operating mode "Combined operation WHITE+RGB", one or several appropriate white luminaires and a final luminaire with adjustable light colour can be operated and controlled with one single connection cable. The white luminaires can be operated in different dimming levels and the RGB luminaire with different light colours at the same time.

Appropriate luminaires for the operating mode "Combined operation WHITE+RGB" are identified by the letter combination **MST** (for luminaires with white light colour) and **RGB** (for luminaires which can adopt different light colours) in the model number.

NOTES:

- For this combined operation, all luminaires must be connected to one connection cable in the operating mode "Combined operation WHITE+RGB".
- In luminaires with through-wiring connected in series, the total current consumption must not exceed **3 A**. The data given on the rating plate of the luminaire apply.

Possible dimming levels and light colours in the operating mode "Combined operation WHITE+RGB"

Dimming level	Signal			
	Bit:	2	1	0
	Pin:	5	4	2
0 %		0	1	0
40%		0	1	1
70%		0	0	1
100%		0	0	0

Tab. 7: Adjustable dimming levels for the operating mode "Combined operation WHITE+RGB" for the luminaire variants MST.

Light colour	Signal			
	Bit:	2	1	0
	Pin:	5	4	2
Off		1	0	0
Red		1	0	1
Yellow		1	1	0
Green		1	1	1

Tab. 8: Adjustable light colours in the operating mode "Combined operation WHITE+RGB" for the luminaire variants RGB.

Activating the "Combined operation WHITE+RGB"

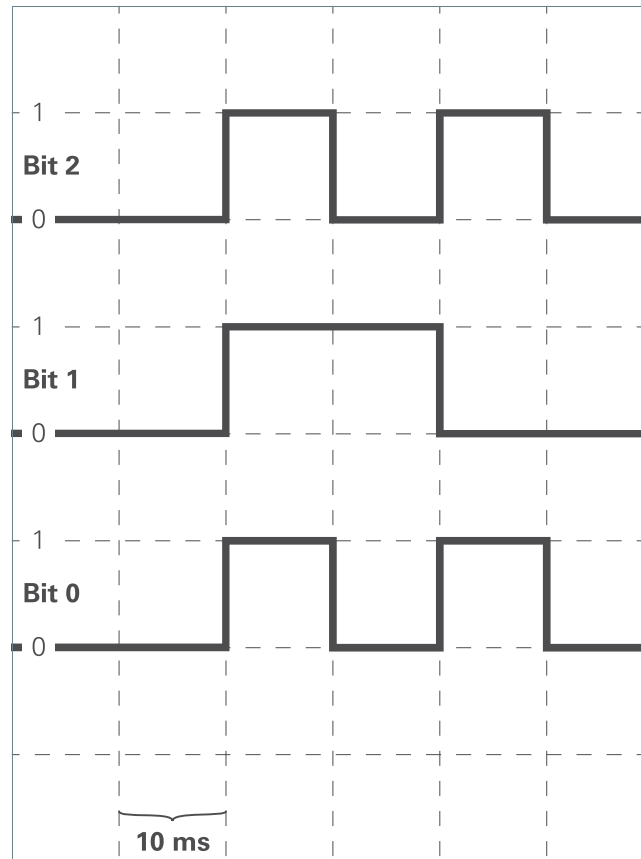


Fig. 8: Bit sequence to activate the operating mode "Combined operation WHITE+RGB".

NOTE: The bit sequence consists of three bits. The corresponding bit length must be in a range between 8 ms and 12 ms.

- Send the bit sequence for activation to the connection cable with the white luminaires and the RGB luminaire, see Fig. 8.

The operating mode will be changed. The white luminaires will light up shortly. For a short time, the RGB luminaire will light up in red, then in green and will go off afterwards.

The operating mode "Combined operation WHITE+RGB" is now activated for all luminaires which are connected to the connection cable.

Adjusting the dimming level and the light colour

- ▶ To adjust the desired dimming level, apply the corresponding signal to the respective pins, see Tab. 7.

All white luminaires connected to the connection cable switch to the adjusted dimming level, the RGB luminaire remains unchanged.

- ▶ To set the desired light colour, apply the corresponding signal to the respective pins, see Tab. 8.

The RGB luminaire switches to the set light colour, the white luminaires remain unchanged.

Deactivating the operating mode "Combined operation WHITE+RGB"

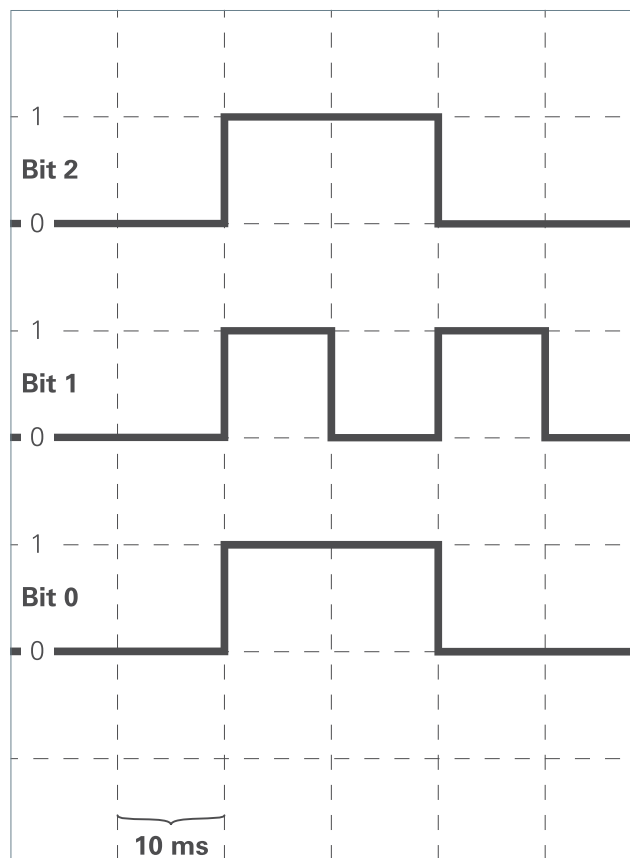


Fig. 9: Bit sequence to deactivate the operating mode "Combined operation WHITE+RGB".

NOTE: The bit sequence consists of three bits. The corresponding bit length must be in a range between 8 ms and 12 ms.

- ▶ Send the bit sequence for deactivation to the connection cable with the white luminaires and the RGB luminaire, see Fig. 9.

The operating mode will be changed. The white luminaires will light up shortly. For a short time, the RGB luminaire will light up in red, then in green and will go off afterwards.

The operating mode "Combined operation WHITE+RGB" is now deactivated for all luminaires which are connected to the connection cable.

The luminaires are in normal mode.

6. What to do if?

Problem	Possible causes	Corrective action
Luminaire is not lit.	Luminaire has not been connected.	▶ Connect the luminaire, see chapter 4 "Connection", page 30.
	Improper connection of the luminaire.	▶ Check the signals applied to the socket.
	Luminaire is defective.	▶ Contact our service team.
Luminaire does not indicate the desired light colour or dimming level.	Improper connection of the luminaire.	▶ Check the signals applied to the socket.
Luminaire does not indicate the desired light colour.	Luminaire is in the operating mode "Combined operation WHITE+RGB".	▶ Deactivate the combined operation, see section "Deactivating the operating mode "Combined operation WHITE+RGB""; page 35.
	Luminaire is not in the operating mode "Combined operation WHITE+RGB".	▶ Activate the combined operation, see section "Activating the "Combined operation WHITE+RGB""; page 34.
The brightness set on the luminaire is automatically reduced.	Temperature in the luminaire is too high.	▶ Operate the luminaire at a temperature below the maximum ambient temperature.
		▶ As soon as the temperature in the luminaire has dropped down, the luminaire is switched again to the set dimming level.

If you would like to use our service, please contact our Service team:

Service Hotline: +49 7720 601 170

Service E-Mail: service@waldmann.com

Tab. 9: What to do if?

7. Maintenance

7.1 Checking the filtering effect

NOTICE: The filter in the cover of the luminaire model LEA .../YEL degrades over time. The filtering effect of the cover gradually decreases. The luminaire must be checked on site at regular intervals. For this, use a suitable measuring device, such as a spectrometer.

Interval	Description
6 months	<p>Prerequisite: The effect of external light at the place of use is reduced to a minimum since this can affect the measuring result.</p> <ul style="list-style-type: none"> ▶ Measure the wave length of the emitted light. ▶ If wave lengths shorter than 500 nm are measured: replace the luminaire.

Tab. 10: Regular checks.

8. Cleaning

NOTICE

Material damage caused by using wrong cleaning agents.

Damage to the luminaire.

- ▶ Make sure the cleaning agents are compatible with the surface.

- ▶ Clean the luminaire with a cloth and a mild detergent.

9. Repair

NOTICE

Material damage caused by improper repair.

Damage or destruction of the luminaire.

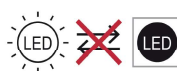
- ▶ Always have repairs performed by the manufacturer, by a service technician authorised by the manufacturer or by a person with comparable qualification only.
- ▶ Use only spare parts approved by the manufacturer.

NOTICE

Loss of tightness by opening the luminaire.

The tightness cannot be restored.

- ▶ Do not open the luminaire.



The light source is **not** replaceable. When the light source has reached the end of its useful life, the entire luminaire must be replaced.

NOTE: Should a defect occur on the luminaire, you can contact our Service team as follows:

Service hotline: +49 7720 601 170

Service e-mail: service@waldmann.com

10. Replacing the luminaire

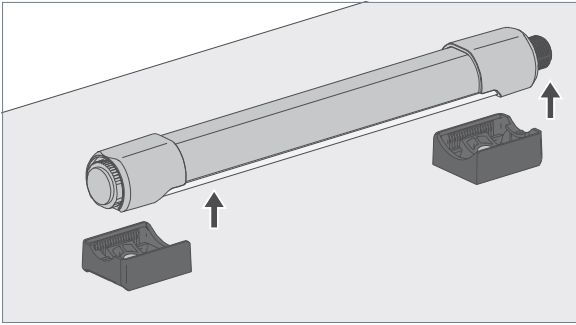


Fig. 10: Removing the luminaire.

- ▶ Turn the protective cover of the luminaire to the mounting surface and remove the luminaire from the holders, see Fig. 10.

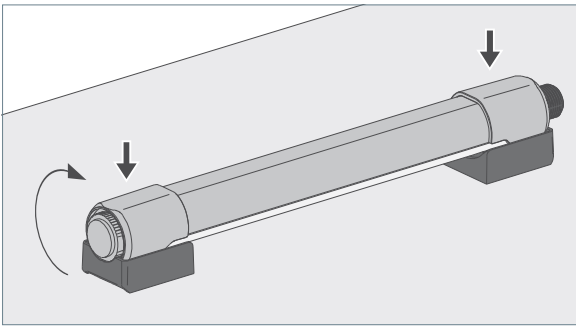



Fig. 11: Mounting the luminaire.

- ▶ Place the new luminaire on the holders and make sure that the protective cover points to the mounting surface. Make sure that the side parts are flush with the holders.
- ▶ Turn the luminaire along the holders by at least 90° , so that the detent lugs of the holders snap into the grooves of the side parts of the luminaire, see Fig. 11.
- ▶ Connect the new luminaire, see chapter 4 "Connection", page 30.

11. Disposal

 The luminaire is subject to the European WEEE Directive.

- ▶ Dispose of the luminaire separately from domestic waste using the agencies responsible for disposal and designated by the authorities.

Proper disposal avoids adverse effects on man and the environment.

12. Technical data

NOTE: The data given on the rating plate attached to the rear side of the luminaire is applicable.

12.1 Electrical values

Designation	Value
Voltage range SELV version	22–26 V DC
Power consumption	The power consumption is specified on the rating plate of the luminaire.






Tab. 11: Electrical values.

12.2 Classifications

Designation	Value
Protection class SELV version	III
Degree of protection	IP54
Operating mode	Continuous operation
Maximum allowed ambient temperature	The maximum allowed ambient temperature is specified on the rating plate of the luminaire.
This product contains a light source of energy efficiency class	B (LEA .../ MS ...) or E (LEA .../ S ...)

Tab. 12: Classifications.

12.3 Symbols

Symbol	Designation
	Protection class III Operation with safety extra low voltage (SELV)
	CE conformity mark
	Luminaire with limited surface temperature for production facilities subject to fire hazards
	ETL approval
	Disposal in accordance with the European WEEE Directive

Tab. 13: Symbols.