

LEDengine Mini PREMIUM

An innovative LED Downlight System that allows you to combine state-of-the-art LED light sources with a number of well-designed housings to fit most common architectural lighting applications in a professional or domestic environment.



Highlights

- State-of-the-art recessed LED Downlight system
- Available in fixed or tunable white versions:
 - Fixed warm white color 2700 K with Ultra-high CRI>97
 - Tunable white version with DIM2WARM technology that becomes warmer (2700→1800K) when dimmed but still maintains a high CRI>90 - as close to incandescent light you can get with LED
- Market leading color stability MacAdam 3-step
- Click-to-fit housings for the most common lighting applications
- Pre-mounted 2-meter connection cable with built-in strain relief
- Long Life time and low failure rate: L90F10 = 50.000h Ⓢ
- 5-year warranty ☺

Applications

- General Lighting - ideal for hospitality, wellness and high-end domestic environments where an incandescent-like light quality is needed
- Also suitable for food lighting of fresh goods, e.g. salads, pastry, bread etc.

Technical Properties

- Three different light output versions;
 - Small 600 lm
 - Medium 800 lm
 - Large 1000 lm
 - X-Large 1500 lm
- Constant Current Operation;
 - Small 175 mA
 - Medium 250 mA
 - Large 350 mA
 - X-Large 500 mA
- Connect up to 4 engines (parallel connection) to the same driver
- Optimized for high resolution dimming 1-100 % using Tridonic drivers
- System efficiency of > 90 lm / W Ⓢ
- A professional and true alternative to dichroic 12V halogen reflector lamps – choose from luminous intensity equivalent to 35 W | 50 W | 75 W | 100 W IRC

Standards

→ page 4

Accessories/Options

- Wide variety of light distributions 10° / 20° / 38° / 55° / 60° to fit most common lighting applications
- Adjustable housing with 30° swivel
- Deep housing with low glare cut off UGR ≤ 19
- IP44 housings for Bathrooms, Showers, Spa-areas and outdoor Eaves & Cornices

→ page 2

Mounting Instructions

→ page 6

Driver Selection Guide

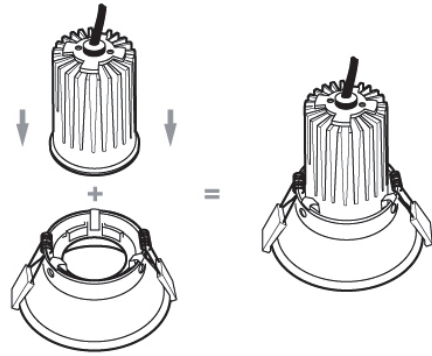
- Complete range of Amplitude Modulation Drivers with extremely low ripple to ensure flicker-free operation
- Large selection of dimmable drivers to fit every need and application - phase cutting dimmers, 1-10 V, switchDIM, DSI, or DALI.

→ page 7














How to select your system

The system is easy to configure and use:

1. Choose a suitable housing listed in table (A).
2. Selected a LED Light Source that fits your illumination requirements from the table (B) below.
3. Connect to a driver according to Driver Selection Guide on the last page.



Housings

TABLE A		Article Code	Color	Weight (g)	Ceiling Cut-out (mm)	Ceiling Thickness (mm)	Dimensions Ø x D (mm)	Total recessed depth including Light Source Type S (mm)	Total recessed depth including Light Source Type M (mm)	Total recessed depth including Light Source Type L (mm)	Total recessed depth including Light Source Type XL (mm)
Adjustable		W8210	White	65	70	3 - 25	90 x 33	60	83	94	112
Adjustable Large		W8206	White	135	90	3 - 25	105 x 36	69	95	108	126
Adjustable Deep		W8211	White	155	80	3 - 25	90 x 60	95	121	128	146
Deep		W8205	White	100	90	3 - 25	102 x 47	78	103	117	135
Deep IP44		W8205-IP44	White	110	90	3-25	102 x 47	78	103	117	135
Deep Gold		W8205-WG	White/Gold	100	90	3 - 25	102 x 47	78	103	117	135
Deep Black Gold		W8205-BG	Black/Gold	100	90	3 - 25	102 x 47	78	103	117	135
Deep Adjustable		W8205-W-A	White	100	90	3 - 25	102 x 47	78	103	117	135
IP44		W8204	White	85	70	3 - 25	90 x 22	57	78	89	107
Square		W8212	White	120	90	3 - 25	100 x 100 x 47	85	110	128	146
Square Adjustable		W8214	White/Black	240	90x90	3 - 25	115 x 115 x 39	73	95	113	131
Square Adjustable Dual		W8214-2	White/Black	400	175x90	3 - 25	115 x 185 x 39	73	95	113	131
Square Adjustable Triple		W8214-3	White/Black	600	260x90	3 - 25	115 x 270 x 39	73	95	113	131

Light Sources



TABLE B

	Article Code	Max Driving Current (mA) ①	Color (K)	Photometric Code ②	Typ. Data @Max Current ③				Connection Cable	Weight (g)	Ø x Depth (mm)	Operating temp (°C)	EEL Energy Class
					Luminous flux (lm)	Efficacy (lm/W)	Forward Voltage (VDC)	Power (W)					
LE Mini S 927 20°	W8201-927-20-G6	175	2 700	927 / 349	600	100	35	6	2 m	100	50 x 48	-30 °C +40 °C	A+
LE Mini S 927 38°	W8201-927-38-G6	175	2 700	927 / 349	600	100	35	6	2 m	100	50 x 48	-30 °C +40 °C	A+
LE Mini S 927 55°	W8201-927-55-G6	175	2 700	927 / 349	600	100	35	6	2 m	100	50 x 48	-30 °C +40 °C	A+
LE Mini M 927 20°	W8201-927	250	2 700	927 / 349	800	84	36	9	2 m	130	50 x 78	-30 °C +40 °C	A+
LE Mini M 927 38°	W8202-927-38-G6	250	2 700	927 / 349	800	100	34	8	2 m	130	50 x 78	-30 °C +40 °C	A+
LE Mini M 927 55°	W8202-927-55-G5	250	2 700	927 / 349	800	100	34	8	2 m	130	50 x 78	-30 °C +40 °C	A+
LE Mini L DIM2WARM 20°	W8203-918-927-20	350	1 800 - 2 700	918-927 / 349	1 000	77	37	13	2 m	150	50 x 86	-30 °C +40 °C	A+
LE Mini L DIM2WARM 38°	W8203-918-927-38-G3	350	1 800 - 2 700	918-927 / 349	1 000	77	37	13	2 m	150	50 x 86	-30 °C +40 °C	A+
LE Mini L DIM2WARM 60°	W8203-918-927-60	350	1 800 - 2 700	918-927 / 349	1 000	77	37	13	2 m	150	50 x 86	-30 °C +40 °C	A+
LE Mini XL 927 10°	W8204-927-10-G5	500	2 700	927 / 349	1 500	84	37	18	2 m	190	50 x 102	-30 °C +40 °C	A+
LE Mini XL 927 38°	W8204-927-38-G5	500	2 700	927 / 349	1 500	84	37	18	2 m	190	50 x 102	-30 °C +40 °C	A+
LE Mini XL 927 55°	W8204-927-55-G5	500	2 700	927 / 349	1 500	84	37	18	2 m	190	50 x 102	-30 °C +40 °C	A+

① Running at 175 mA and $t_a = 25\text{ °C}$ max. Assumed efficiency for the LED driver is 0.95.

② Only when used in combination with Tridonic LED Drivers

③ Exceeding the maximum operating current leads to an overload of the LED. This may result in a significant reduction in lifetime or even destruction of the LED. Max. permissible surge current: 3 A, duration max. 10 μs . 5 Max. permissible repetitive peak current 960 mA.

④ According to IEC 62717

⑤ Tolerance range for electrical and optical data $\pm 10\%$

Standards

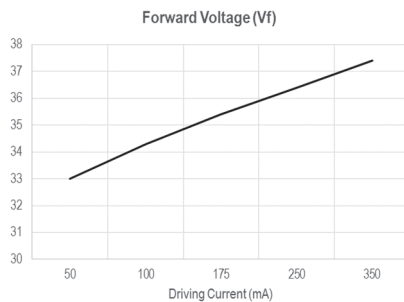
- EN 55015
- EN 62031
- EN 61547
- EN 62471
- IEC 62717

Thermal behavior

Storage Temperature	-30/+60 °C
Operating Temperature	-30/+40 °C
Tc Optimal Performance	65 °C
Tc Max	85 °C

Driving Current vs. Forward Voltage behavior

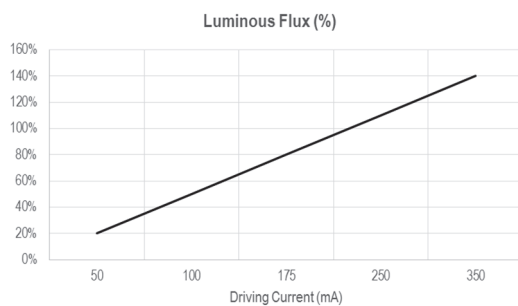
Ta = 25 °C



Type	Driving Current (mA)	Max Forward Voltage (Vf)
Small	175	35.4
Medium	250	36.2
Large	350	37.0
X-Large	500	37.2

Driving Current vs. Luminous Flux and Efficiency

Ta = 25 °C



Type	Driving Current (mA)	Typ. Luminous Flux (lm)	Typ. Efficiency (lm/W)
Small	175	600	100
Medium	250	800	100
Large	350	1 000	77
X-Large	500	1 500	84

Life time, lumen maintenance and failure fraction

The light output of the LEDengine decreases over the life-time, this is characterized with the L value. L70 means that the LEDengine will give 70 % of its initial luminous flux. This value is always related to the number of operation hours and therefore defines the lifetime of an LED-module.

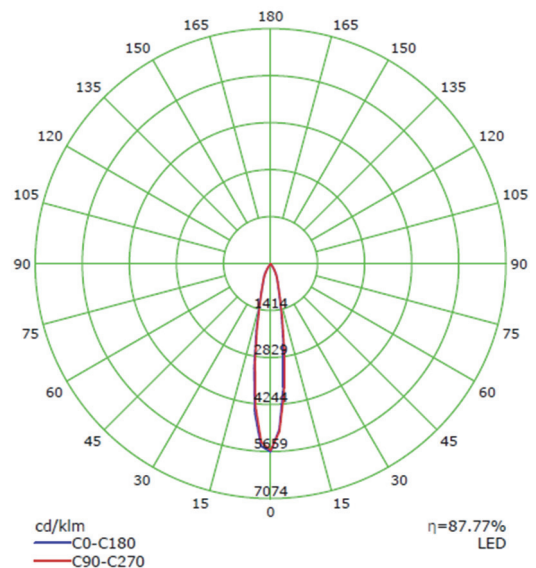
The L value is a statistical value and the lumen maintenance may vary over the delivered LEDengines. The B value defines the amount of LEDengines which are below the specific L value, e.g. L70B10 means 10 % of the LEDengines are below 70 % of the initial luminous flux, respectively 90 % will be above 70 % of the initial value.

In addition the percentage of failed LEDengines (fatal failure) is characterized by the C value. The F value is the combination of the B and C value. That means for F degradation and complete failures are considered, e.g. L70F10 means 10 % of the LEDengines may fail or be below 70 % of the initial luminous flux.

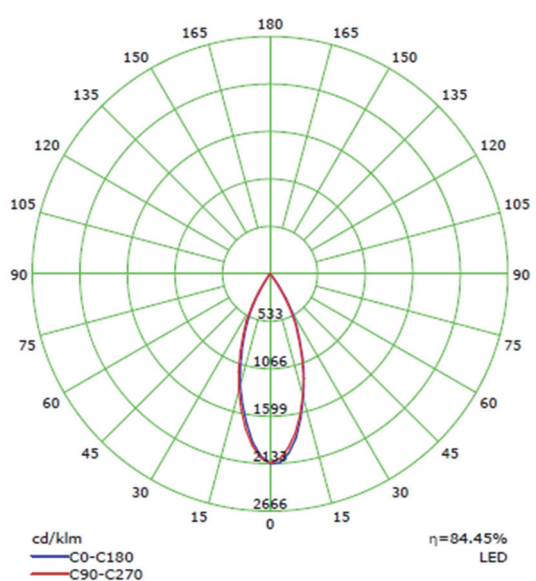
Type	Driving Current (mA)	Ambient Temperature (Ta)	L90F10	L70F10
Small	175mA	25°C	>50 000 h	>50 000 h
		40°C	31 000 h	>50 000 h
Medium	250mA	25°C	32 000 h	>50 000 h
		40°C	26 000 h	46 000 h
Large	350mA	25°C	24 000 h	50 000 h
		40°C	16 000 h	36 000 h
X-Large	500mA	25°C	24 000 h	50 000 h
		40°C	16 000 h	36 000 h

Luminous Intensity Distribution (cd/klm)

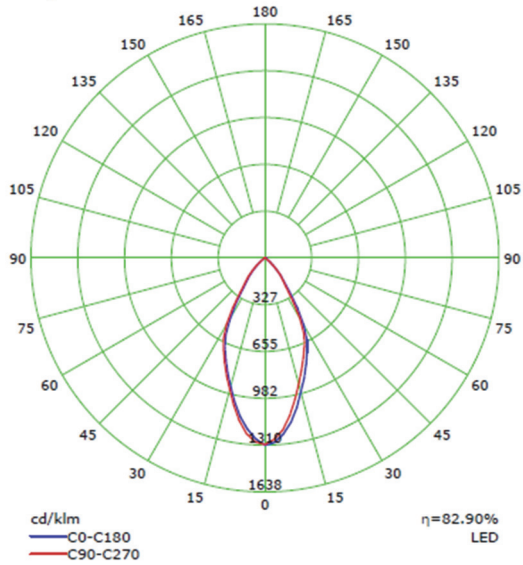
Beam Angle = 20°



Beam Angle = 38°



Beam Angle = 55°



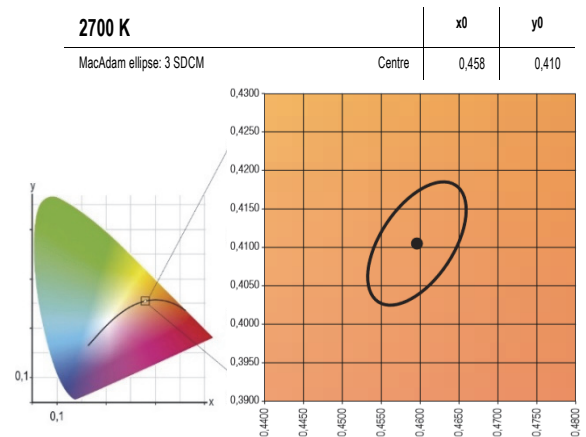
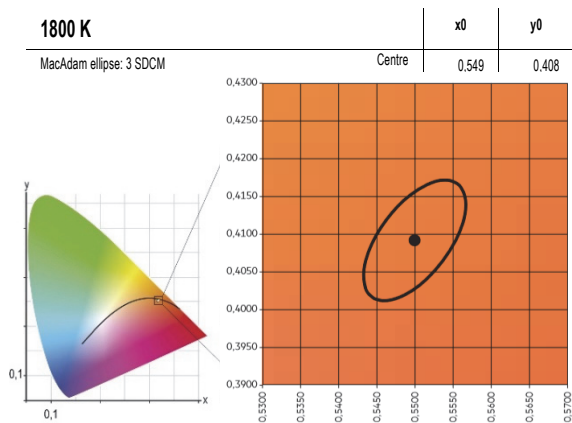
Photometric Code (according to EN 62717)

1st digit		2nd + 3rd digit		4th digit	5th digit	6th digit	
Code	CRI	Color temperature in Kelvin x 100		Initial MacAdam ellipse SDCM	Maintained MacAdam ellipse SDCM after 25% of the lifetime (6000 h)	Lumen maintenance after 25% of the lifetime (6000 h)	
7	67 - 76					Code	Light Output
8	77 - 86					7	≥ 70 %
9	87 - ≥90					8	≥ 80 %
						9	≥ 90 %

Chromaticity coordinates and tolerances (according to CIE 1931)

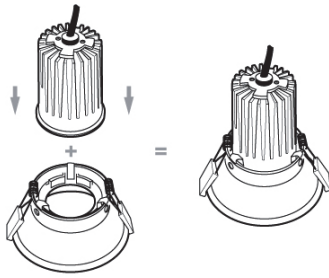
White Tone	CCT	Photometric Code
Warm (incandescent)	2700 K	927 / 349
DIM2WARM (tunable)	1800 - 2700 K	918 - 927 / 349

The specified color coordinates are measured by a current impulse with nominal values of module after a settling time of 100 msec. The ambient temperature of the measurement is $t_a = 25\text{ °C}$. The measurement tolerance of the color coordinates is ± 0.01 .



Mounting Instructions

Assembly



Fasten the light source to a housing by pressing the two together as seen in the picture until the locking mechanism has clicked in place and they are firmly connected.

Once fixed to the housing, the LED light source can rotate freely allowing you point the cable in the direction of the LED driver (if needed).

Ceiling Cutout

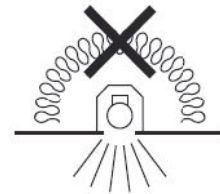


Use a circular (or jig) saw to cut out the installation hole in the ceiling. Make sure to use the correct size depending on housing type:



Single 90x90 | Dual 90x170 | Triple 90x260 mm

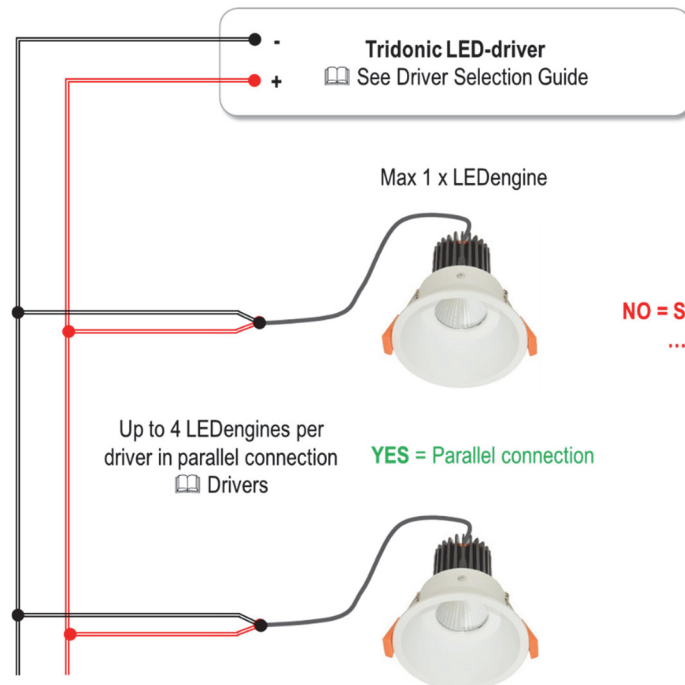
Do not cover!



Once installed in the ceiling, do not cover the LED engine and driver with insulating material. Always leave space for free air convection around the LED engine and driver.

Wiring

Each LED engine is delivered with a 2-meter color coded connection cable 2 x 0,5 mm². The connection cable can be cut to desired length, but do not extend the length between the LED engine and the driver beyond 2 meters as this may result in voltage drop and EMC interference.



Do not connect LED engine Mini in series!



Cable Color Coding:

Color	Red	Black
Polarity	+	-

In order to drive welight LED engine safely, it is absolutely necessary to operate them with an electronically stabilized power supply protecting against short circuits, overload and overheating. Always use our approved drivers and controls to power the LED engine. If the wrong type of driver is used the product warranty is void. Electronic control gear for LED should carry the CE mark and ENEC certified. In Europe the declarations of conformity must include the following standards: CE: EC 61347-2-13, EN 55015, IEC 61547 and IEC 61000-3-2 - ENEC: 61347-2-13 and IEC/EN 62384. Also check for the mark of an independent authorized certification institute. Tridonic electronic control gear complies with all relevant standards and guarantees safe operation.

Driver Selection Guide



Always check the maximum driving current (mA) of the light source as indicated on datasheet and product label. Driving the light source at a higher current than permissible may result in a significant reduction in lifetime or even destruction of the LED and product warranty will be void.

S – Small – 175mA		
Dimming Signal →		
No of light sources per driver ↓	Digital Dimmable one4all ①	Phase Cut Dimmable ②
1	Tridonic LCA 10W 150-400mA one4all SC PRE 28000673 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574	Tridonic LCA 15W 180mA flexC PH-C SR ADV 87500627
2	Tridonic LCA 17W 250-700mA one4all SC PRE 28000674 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 350MA BL 28001110	Tridonic LCA 15W 350mA flexC PH-C SR ADV 87500627
3	Tridonic LCA 25W 350-1050mA one4all SC PRE 28000675 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 550MA BL 28001115	Not available
4	Tridonic LCA 25W 350-1050mA one4all SC PRE 28000675 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 700MA BL 28001118	Tridonic LCBI 25W 700mA BASIC phase-cut SR 89800307
M – Medium – 250mA		
Dimming Signal →		
No of light sources per driver ↓	Digital Dimmable one4all ①	Phase Cut Dimmable ②
1	Tridonic LCA 17W 250-700mA one4all SC PRE 28000674 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574	Tridonic LCA 15W 250mA flexC PH-C SR ADV 87500627
2	Tridonic LCA 25W 350-1050mA one4all SC PRE 28000675 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 500MA BL 28001114	Tridonic LCA 21W 500mA flexC PH-C SR ADV 87500603
3	Tridonic LCA 45W 500-1400mA one4all SC PRE 28000676 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 750MA BL 28001119	Not available
4	Tridonic LCA 45W 500-1400mA one4all SC PRE 28000676 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 1000MA BL 28001124	Not available
L – Large – 350mA		
Dimming Signal →		
No of light sources per driver ↓	Digital Dimmable one4all ①	Phase Cut Dimmable ②
1	Tridonic LCA 17W 250-700mA one4all SC PRE 28000674 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 350MA BL 28001110	Tridonic LCA 15W 350mA flexC PH-C SR ADV 87500627
2	Tridonic LCA 45W 500-1400mA one4all SC PRE 28000676 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 700MA BL 28001118	Tridonic LCBI 25W 700mA BASIC phase-cut SR 89800307
3	Tridonic LCA 45W 500-1400mA one4all SC PRE 28000676 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 1050MA BL 28001125	Not available
XL – Extra Large – 500mA		
Dimming Signal →		
No of light sources per driver ↓	Digital Dimmable one4all ①	Phase Cut Dimmable ②
1	Tridonic LCA 25W 350-1050mA one4all SC PRE 28000675 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 500MA BL 28001114	Tridonic LCA 21W 500mA flexC PH-C SR ADV 87500603
2	Tridonic LCA 45W 500-1400mA one4all SC PRE 28000676 + ACU SC 15x43x30mm CLIP-ON SR PA 28001574 + I-SELECT 2 PLUG 1000MA BL 28001124	Not available



Always connect the exact number of light sources to the specified driver. Otherwise the LED might be damaged.

- ① one4all supports ready2mains, corridorFUNCTION, switchDIM (dimming via phase impulse), DSI and DALI in the same dimmer.
- ② For compatible phase cutting dimmers please refer to Tridonic Technical Note - LED control gear with different phase-cut dimmers.

SAFETY INSTRUCTIONS

- EN** Read these instructions carefully before starting the installation and save for future reference. All connections to the device must be made by a qualified electrician or person with the necessary expertise in electrical installation in accordance with relevant rules and standards. Make sure that the mains voltage is disconnected before installation or maintenance.
- SE** Läs dessa instruktioner innan installationen påbörjas och lämna dem vidare till brukaren av anläggningen. All anslutning till enheten får endast utföras av behörig elektriker eller person med kännedom om elektrisk installation i enlighet med gällande regler och standard. Se till att spänningen är frånslagen före installation eller underhåll.
- FI** Lue nämä ohjeet ennen asentamista ja luovuta ohjeet valaisimen seuraavalle käyttäjälle. Kytkenät ohjaimen saa tehdä ainoastaan pätevä sähköasentaja tai sähköasennukset hallitseva henkilö voimassa olevien määräysten ja standardien mukaisesti. Varmista, että jännite on kytketty päältä ennen asennusta ja huoltoa.
- NO** Les disse instruksjonene før du starter installeringen, og gi den deretter videre til anleggets bruker. All tilkobling til enheten skal utføres av godkjent elektriker eller person med nødvendig kunnskap om elektrisk installasjon i henhold til gjeldende forskrifter og standard. Sørg for at strømmen er koblet fra før installering og ved vedlikehold.
- DK** Læs disse anvisninger før du starter installationen og aflever vejledningen til anlæggets bruger. Alle tilslutninger på enheden skal udføres af en autoriseret elinstallatør i overensstemmelse med gældende regler og standarder. Afbryd spænding før installation og vedligeholdelse.