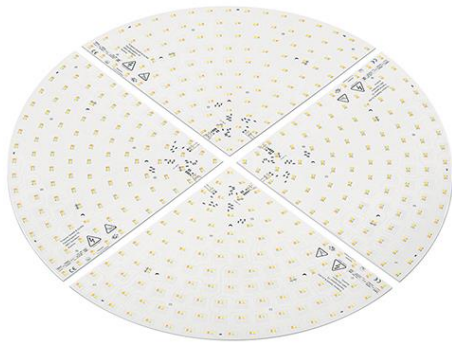
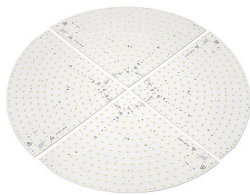


Module CLE PRE2

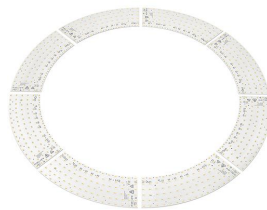
Modules CLE premium



CLE 261mm 4600lm 927-965 4T PRE2



CLE 401mm 2450lm 927-965 4T PRE2



CLE 541mm 900lm 927-965 4T PRE2

Product description

- _ Ideal for round shaped ceiling and pendant luminaires
- _ Optimal solution for Tunable White applications together with LCA PRE DT8 or 2 channel low profile LED drivers
- _ This article contains 4 slices of CLE 261 / 401 or 8 slices CLE 541 to equip one luminaire of 360 degrees
- _ Long lifetime up to 50,000 hours
- _ 5 years guarantee (Conditions at <https://www.tridonic.com/en/int/services/manufacturer-guarantee-conditions>)

Optical properties

- _ Circular Tunable White LED module with 2,700 and 6,500 K SMT packages
- _ Efficacy of the LED module up to 198 lm/W at 6,500 K, Irated and $t_p = 45^\circ\text{C}$
- _ High colour rendering index CRI > 90
- _ Small colour tolerance (MacAdam 3) ^①
- _ Low tolerances for luminous flux

^① Integral measurement over the complete module.

Website

<http://www.tridonic.com/28004931>



Linear



High bay



Decorative



Downlights



Spotlights



Free-standing



Area



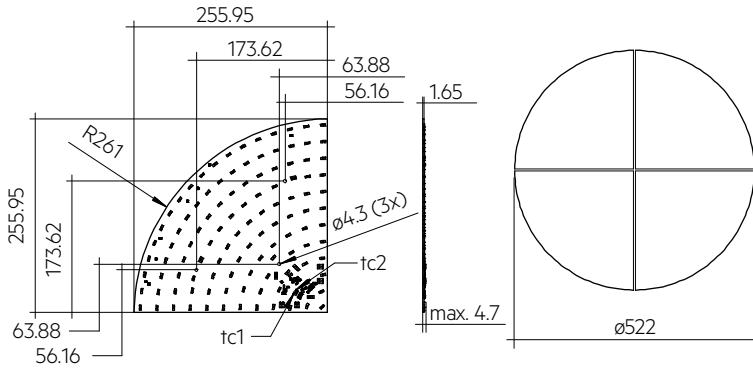
Floor | Wall



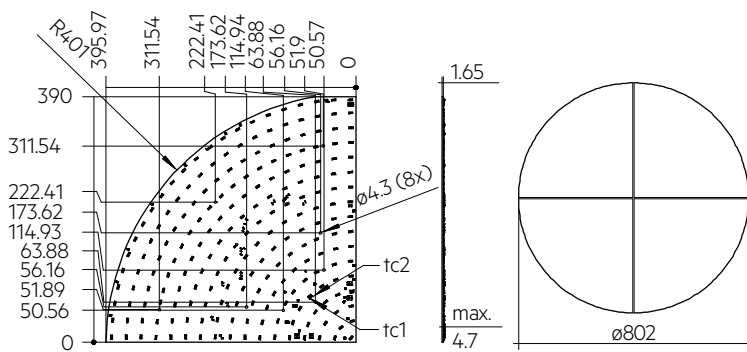
Street

Module CLE PRE2

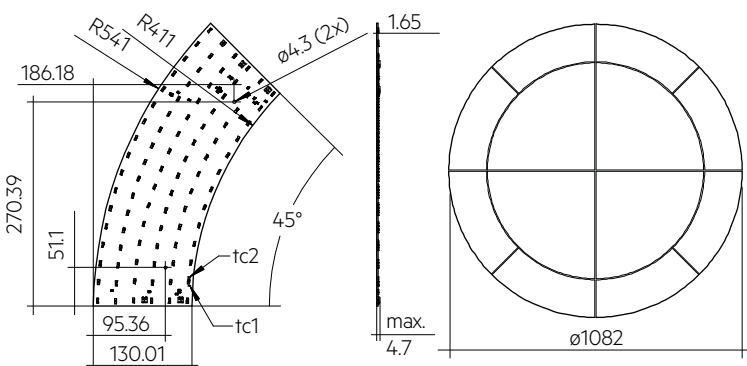
Modules CLE premium



CLE 261mm 1150lm 927-965 4T PRE2 QTY4



CLE 401mm 2450lm 927-965 4T PRE2 QTY4



CLE 541mm 900lm 927-965 4T PRE2 QTY8

Ordering data

Type	Article number	Packaging	Weight per pc.
CLE 261mm 1150lm 927-965 4T PRE2 QTY4	28004931	1 pc(s).	0.632 kg
CLE 401mm 2450lm 927-965 4T PRE2 QTY4	28004932	1 pc(s).	1.412 kg
CLE 541mm 900lm 927-965 4T PRE2 QTY8	28004933	1 pc(s).	1.176 kg

Technical data

Beam characteristic	120°
Ambient temperature ta	-25 ... +55 °C
tp rated	45 °C
tc	95 °C
Irated for TW CLE 261mm	150 mA
Irated for TW CLE 401mm	350 mA
Irated for TW CLE 541mm	150 mA
Imax for TW CLE 261mm	220 mA
Imax for TW CLE 401mm	550 mA
Imax for TW CLE 541mm	220 mA
Max. permissible LF current ripple for TW CLE 261mm	245 mA
Max. permissible LF current ripple for TW CLE 401mm	605 mA
Max. permissible LF current ripple for TW CLE 541mm	245 mA
Max. permissible peak current for TW CLE 261mm	500 mA / max. 10 ms
Max. permissible peak current for TW CLE 401mm	1,000 mA / max. 10 ms
Max. permissible peak current for TW CLE 541mm	500 mA / max. 10 ms
Max. working voltage for insulation SELV	60 V
Insulation test voltage	0.5 kV
ESD classification	Severity level 1
Risk group (IEC 62471)	RG0 (IEC 62471), RG2 (Ethr = 200 lx, dthr = 395 mm, IEC 62778)
Classification acc. to IEC 62031	Built-in
Type of protection	IPO0
Lumen maintenance L70B50	50,000 h
Guarantee (conditions at www.tridonic.com)	5 Year(s)

Approval marks



Standards

EN 61000-4-2, EN 61547, EN 62031, EN 62471, EN 62778

Specific technical data

Type	Article number	Colour temperature	Photometric code ^②	Useful luminous flux at tp = 25 °C ^③	Expected luminous flux at tp rated ^④	Typ. forward current	Min. forward voltage at tp rated	Max. forward voltage at tp = 25 °C	Power consumption Pon at tp = 25 °C ^⑤	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
CLE 261mm 1150lm 927-965 4T PRE2 QTY4	28004931	2,700 K	927/349	1,090 lm	1,080 lm	150 mA	39.9 V	43.5 V	6.3 W	173 lm/W	174 lm/W	>90
CLE 261mm 1150lm 927-965 4T PRE2 QTY4	28004931	6,500 K	965/349	-	1,230 lm	150 mA	39.9 V	43.5 V	-	-	198 lm/W	>90
CLE 401mm 2450lm 927-965 4T PRE2 QTY4	28004932	2,700 K	927/349	2,385 lm	2,345 lm	350 mA	37.6 V	41.1 V	13.8 W	173 lm/W	171 lm/W	>90
CLE 401mm 2450lm 927-965 4T PRE2 QTY4	28004932	6,500 K	965/349	-	2,670 lm	350 mA	37.6 V	41.1 V	-	-	195 lm/W	>90
CLE 541mm 900lm 927-965 4T PRE2 QTY8	28004933	2,700 K	927/349	885 lm	880 lm	150 mA	32.4 V	35.4 V	5.1 W	174 lm/W	173 lm/W	>90
CLE 541mm 900lm 927-965 4T PRE2 QTY8	28004933	6,500 K	965/349	-	1,000 lm	150 mA	32.4 V	35.4 V	-	-	196 lm/W	>90

② The detailed explanation, see data sheet section 1.1.

③ Tolerance of useful light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %.

④ Tolerance of expected light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %. Based on calculation.

⑤ Tolerance of power consumption Pon ± 10 %. Measurement uncertainty ± 5 %.

1. Standards

EN 61000-4-2
EN 61547
EN 62031
EN 62471
EN 62778

1.1 Photometric code

Key for photometric code, e. g. 930 / 349

1 st digit	2 nd + 3 rd digit	4 th digit	5 th digit	6 th digit		
Code	Colour temperature in Kelvin x 100	MacAdam initial	MacAdam after 25% of the lifetime (max.6000h)	Luminous flux after 25% of the lifetime (max.6000h)		
				Code	Luminous flux	
7				70 – 79	7	≥ 70 %
8				80 – 89	8	≥ 80 %
9	≥90			9	≥ 90 %	

1.2 Risk group

Forward current	Risk group (IEC 62471)	Risk group (IEC 62778)
I _{max}	RGO	RG2 (E _{thr} = 200 lx, d _{thr} = 395 mm)

1.3 Energy classification

Type	Colour temperature	Forward current	Energy classification	Energy consumption
CLE 261mm 1150lm 927-965 4T PRE2 QTY4	2,700 – 6,500 K	150 mA	C	7 kWh / 1,000 h
CLE 401mm 2450lm 927-965 4T PRE2 QTY4	2,700 – 6,500 K	350 mA	C	14 kWh / 1,000 h
CLE 541mm 900lm 927-965 4T PRE2 QTY8	2,700 – 6,500 K	150 mA	C	6 kWh / 1,000 h

Energy label and further information at www.tridonic.com in the certificates tab of the corresponding product page and at the EPREL data base <https://eprel.ec.europa.eu/>

2. Thermal details

2.1 tc point, ambient temperature and lifetime

The temperature at tp reference point is crucial for the light output and lifetime of a LED product.

For CLE a tp temperature of 45 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and lifetime.

Compliance with the maximum permissible reference temperature at the tc point must be checked under operating conditions in a thermally stable state. The maximum value must be determined under worst-case conditions for the relevant application.

The tc and tp temperature of LED modules from Tridonic are measured at the same reference point.

2.2 Storage and humidity

Storage temperature	-30 ... +80 °C
---------------------	----------------

Operation only in non condensing environment.
Humidity during processing of the module should be between 30 to 70 %.

2.3 Thermal design and heat sink

The rated life of LED products depends to a large extent on the temperature. If the permissible temperature limits are exceeded, the life of the CLE will be strongly reduced or even destroyed.

Tridonic's excellent thermal design for the LED products provides the lowest thermal resistance and therefore allowing new compact designs without sacrificing quality, safety and lifetime.

3. Installation / wiring

3.1 Electrical supply/choice of LED driver

CLE modules from Tridonic are not protected against overvoltages, overcurrents, overloads or short-circuit currents. Safe and reliable operation can only be guaranteed in conjunction with a LED driver which complies with the relevant standards. The use of LED driver from Tridonic in combination with CLE modules guarantees the necessary protection for safe and reliable operation.

If a LED driver other than Tridonic is used, it must provide the following protection:

- Short-circuit protection
- Overload protection
- Overtemperature protection



CLE modules must be supplied by a constant current LED driver. Operation with a constant voltage LED driver will lead to an irreversible damage of the module.

Wrong polarity can damage the CLE.

With parallel wiring tolerance-related differences in output are possible (thermal stress of the module) and can cause differences in brightness.

If a wire breaks or a complete module fails then the current passing through the other module increases. This may reduce its life considerably.

Permissible number of LED modules per LED driver:

Type	max. number of sets	corresponds to number of modules
CLE 261	2	8
CLE 401	1	4
CLE 541	1	8

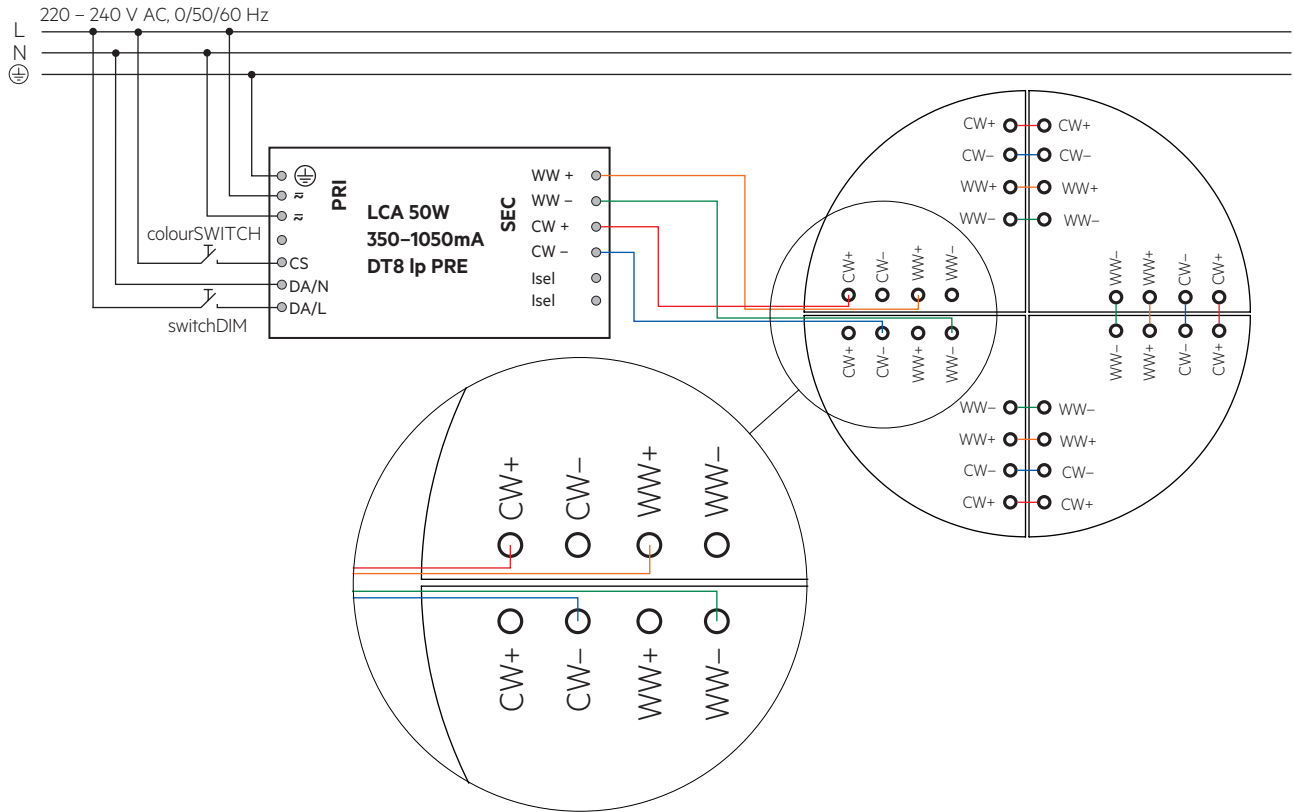
CLE have to be operated with SELV LED drivers.



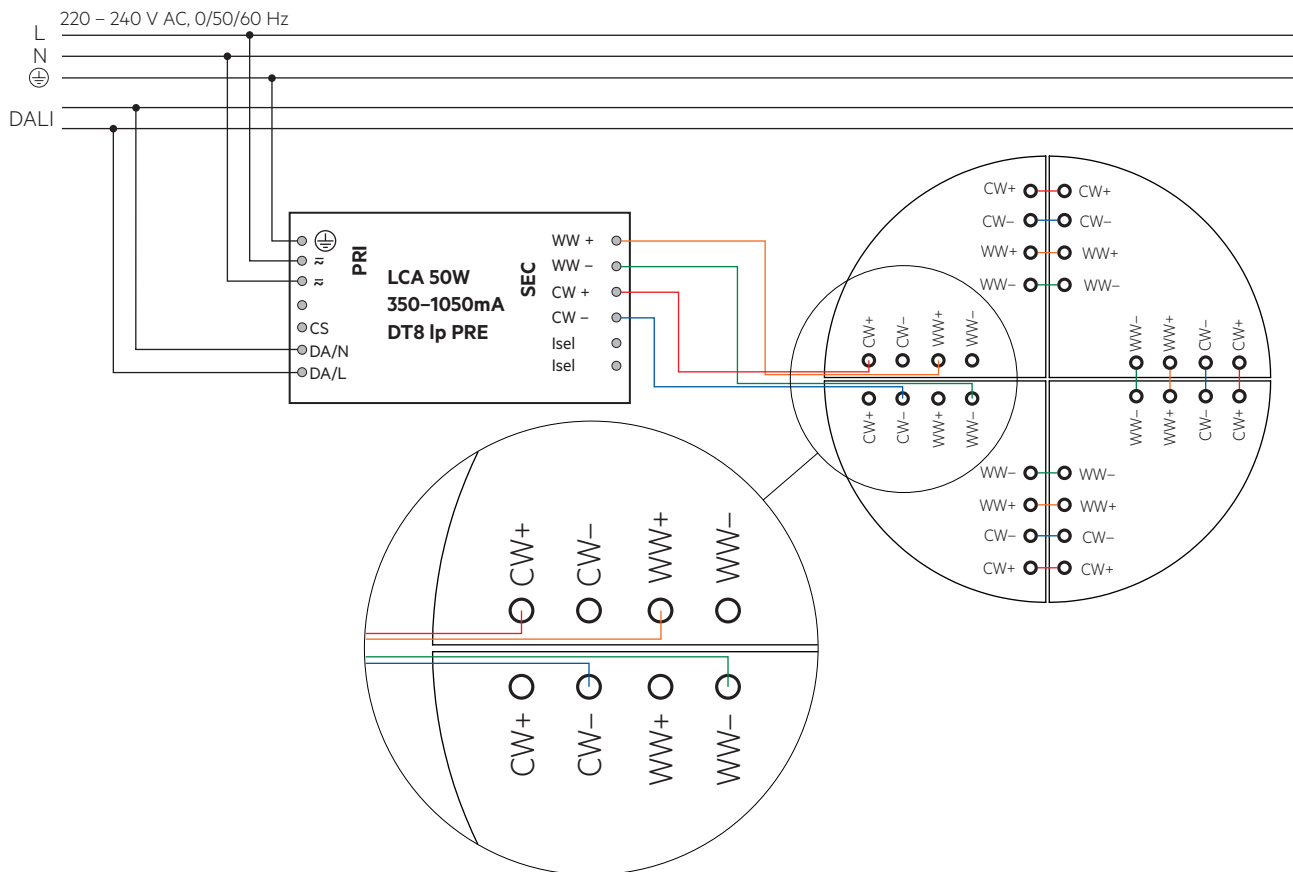
CLE are basic insulated up to 60 V SELV (if mounted with M4 screws with head diameter 8 mm) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED driver (also against earth) is above 60 V SELV, an additional insulation between LED module and heat sink is required (for example by insulated thermal pads) or by a suitable luminaire construction.

3.2 Wiring

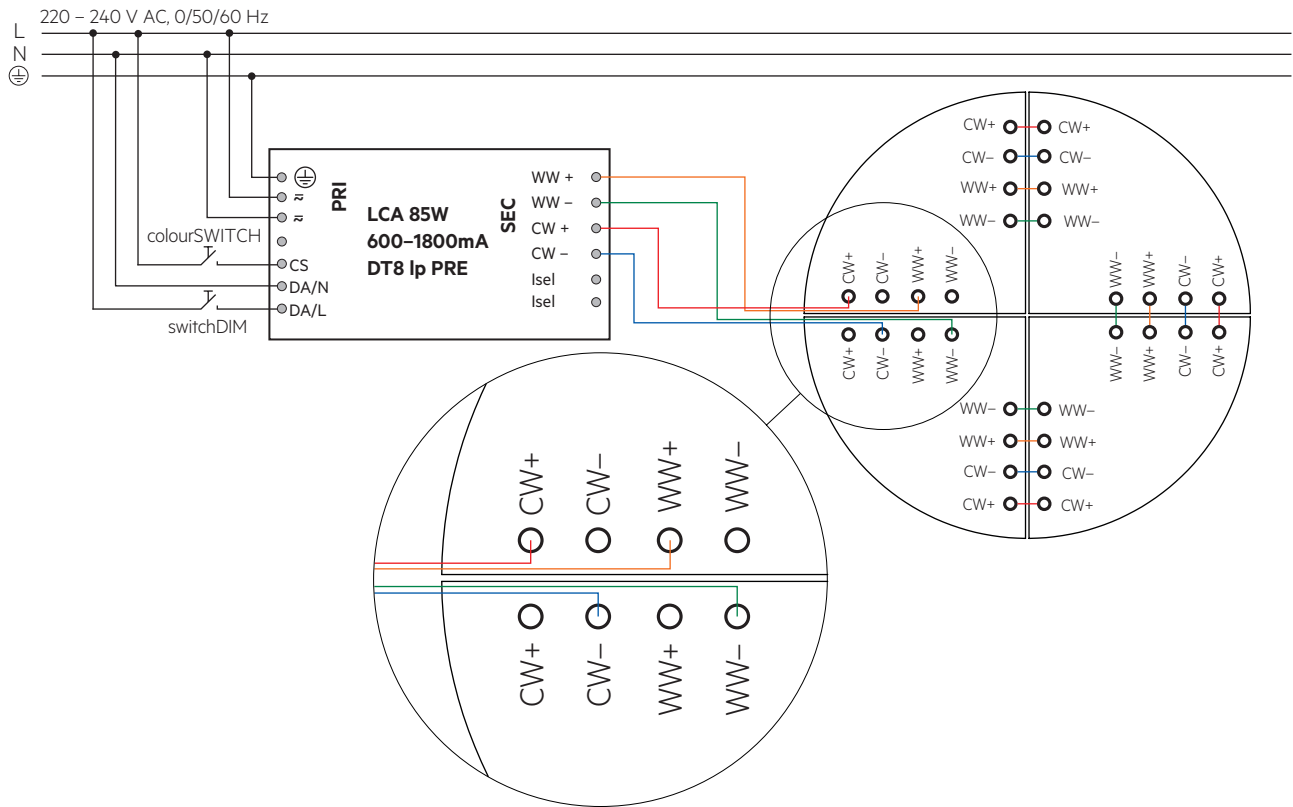
Wiring diagram for switchDIM and colourSWITCH for CLE 261 PRE2



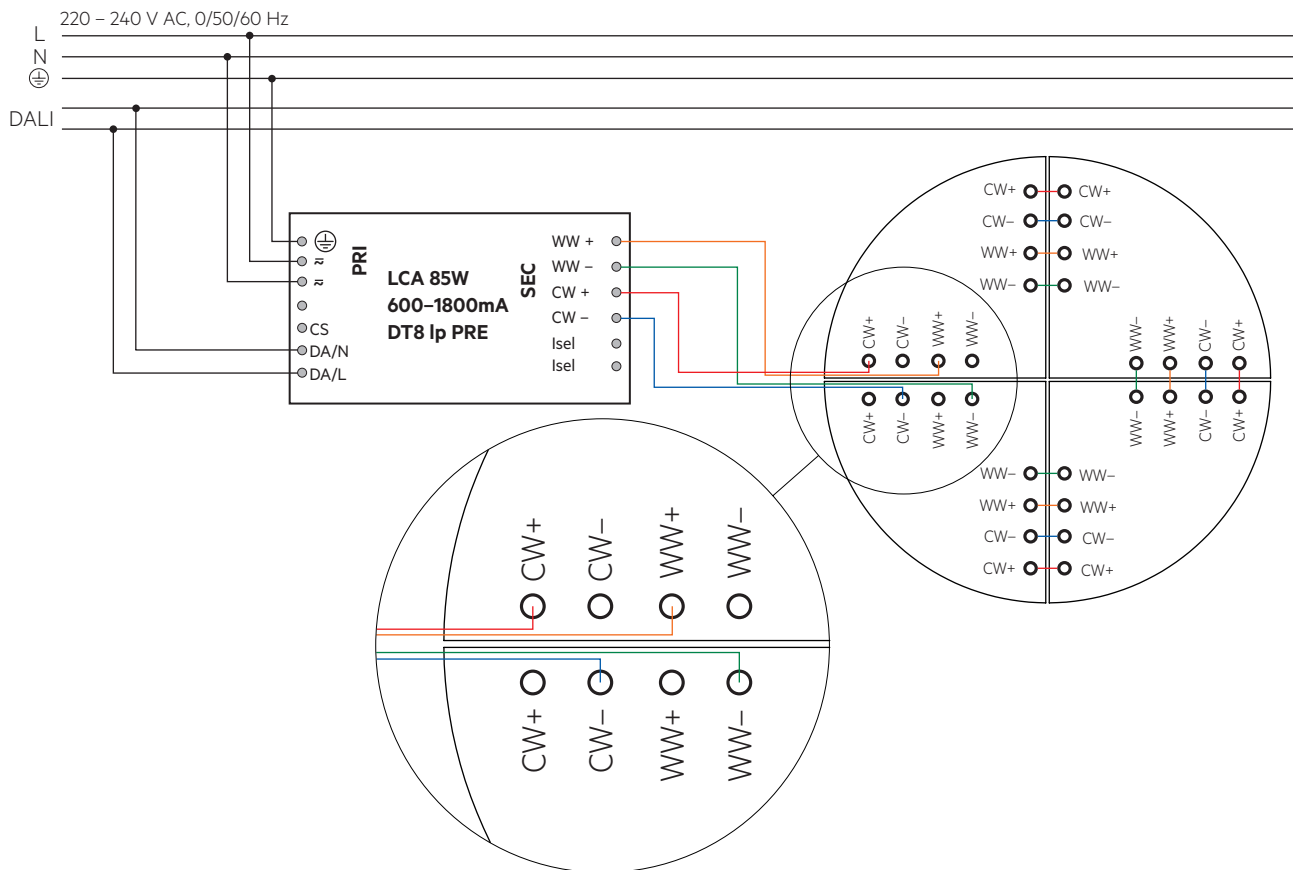
Wiring diagram for DALI for CLE 261 PRE2



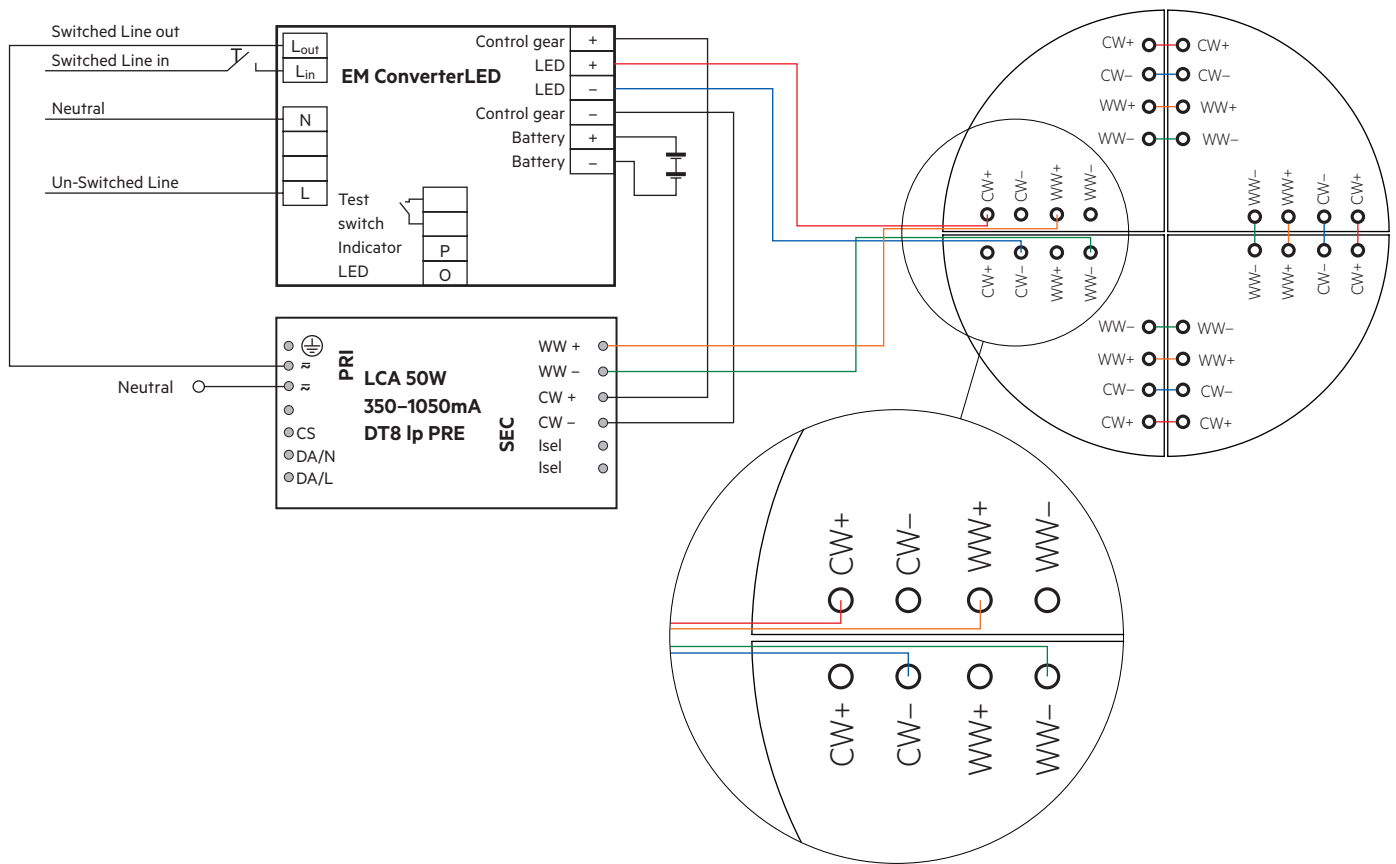
Wiring diagram for switchDIM and colourSWITCH for CLE 401 PRE2



Wiring diagram for DALI for CLE 401 PRE2



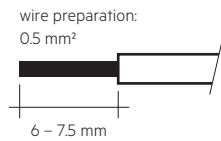
Wiring diagram for emergency



3.3 Wiring type and cross section

For wiring use solid wire of 0.5 mm².

For the push-wire connection you have to strip the insulation (6–7.5 mm).



To remove the wires use a suitable tool (e.g. Microcon release pin) or through twist and pull.

3.4 Mounting instruction



None of the components of the CLE (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

Max. torque for fixing: 0.5 Nm.

The LED modules are mounted onto a heat sink with min. 3 screws per module or ACL CLIP 4.3mm.



Chemical substance may harm the LED module. Chemical reactions could lead to colour shift, reduced luminous flux or a total failure of the module caused by corrosion of electrical connections.

Materials which are used in LED applications (e.g. sealings, adhesives) must not produce dissolver gas. They must not be condensation curing based, acetate curing based or contain sulfur, chlorine or phthalate.

Avoid corrosive atmosphere during usage and storage.

3.5 EOS/ESD safety guidelines



The device / module contains components that are sensitive to electrostatic discharge and may only be installed in the factory and on site if appropriate EOS/ESD protection measures have been taken. No special measures need be taken for devices/modules with enclosed casings (contact with the pc board not possible), just normal installation practice. Please note the requirements set out in the document EOS / ESD guidelines (Guideline_EOS_ESD.pdf) at: <http://www.tridonic.com/esd-protection>

4. Lifetime

4.1 Lifetime, lumen maintenance and failure rate

The light output of an LED module decreases over the lifetime, this is characterized with the L value.

L70 means that the LED module will have 70 % of its initial luminous flux after the stated operating time. This value is always related to the number of operation hours and therefore defines the lifetime of an LED module.

As the L value is a statistical value the lumen maintenance may vary over the delivered LED modules.

The B value defines the amount of modules which are below the specific L value, e.g. L70B10 means 10 % of the LED modules are below 70 % of the initial luminous flux, respectively 90 % will be above 70 % of the initial value. In addition the percentage of failed modules (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 LED modules may fail or be below 70 % of the initial luminous flux.

4.2 Lumen maintenance for CLE premium

Lifetime declarations are informative and represent no warranty claim.

tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
45 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
50 °C	49,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
55 °C	43,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
60 °C	38,000 h	46,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
65 °C	34,000 h	42,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
70 °C	30,000 h	37,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
75 °C	26,000 h	33,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h

Lumen maintenance values are based on LM80 data.

Values may be updated when more recent results are available.

5. Photometric characteristics

5.1 Coordinates and tolerances according to CIE 1931

The specified colour coordinates are integral measured by a current impulse of 100 ms.

The ambient temperature of the measurement is $t_a = 25^\circ\text{C}$.

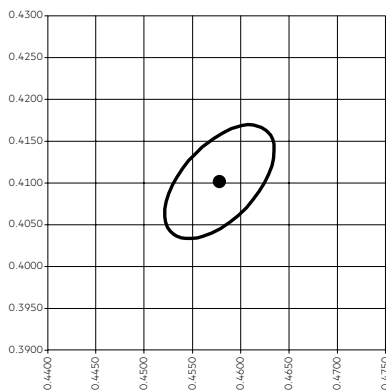
The measurement tolerance of the colour coordinates are ± 0.01 .

Module type	Current impulse
CLE 261mm 4600lm PRE2	455 mA
CLE 401mm 2450lm PRE2	910 mA
CLE 541mm 900lm PRE2	455 mA

2,700 K

	x0	y0
Centre	0.4578	0.4101

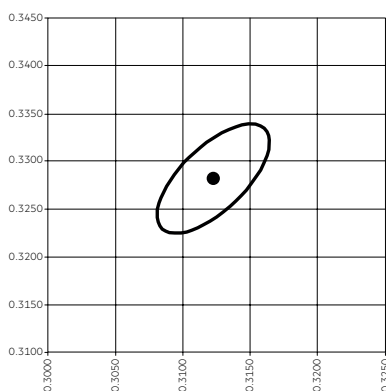
MacAdam ellipse: 3SDCM



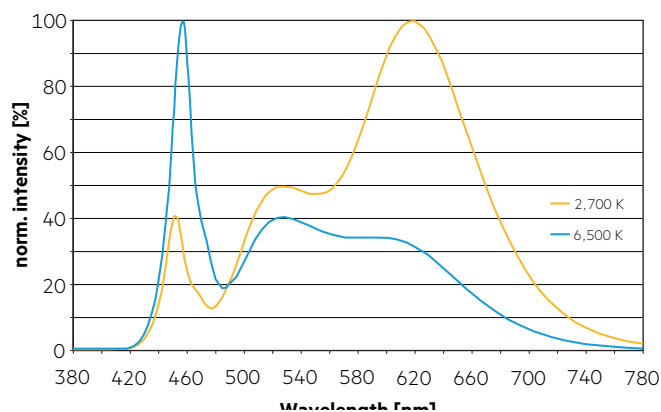
6,500 K

	x0	y0
Centre	0.3123	0.3281

MacAdam ellipse: 3SDCM



Colour spectrum at different colour temperatures



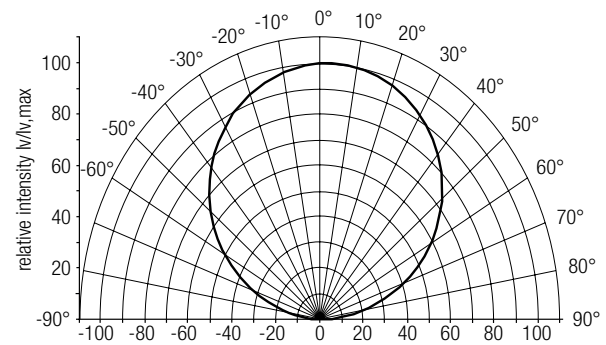
5.2 Light distribution

The optical design of the CLE product line ensures optimum homogeneity for the light distribution.



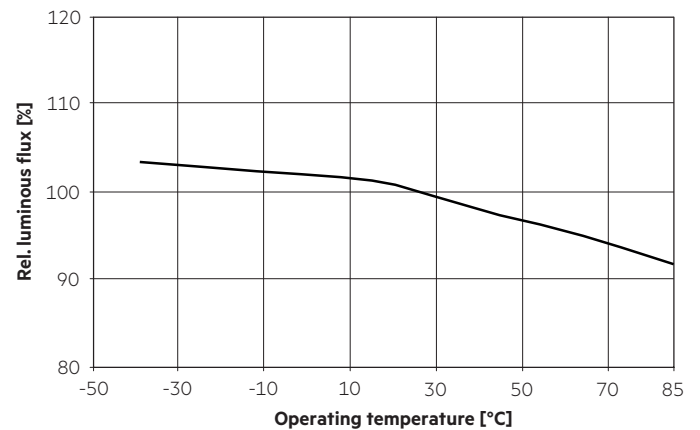
The colour temperature is measured integral over the complete module.

To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 6 cm) should be used.



The diagrams are based on statistic values.

5.3 Relative luminous flux vs. operating temperature



7. Miscellaneous

7.1 Additional information

Additional technical information Design-in Guide, 3D data, photometric data and Guarantee conditions at www.tridonic.com

Guarantee conditions at www.tridonic.com → Services

Lifetime declarations are informative and represent no warranty claim.