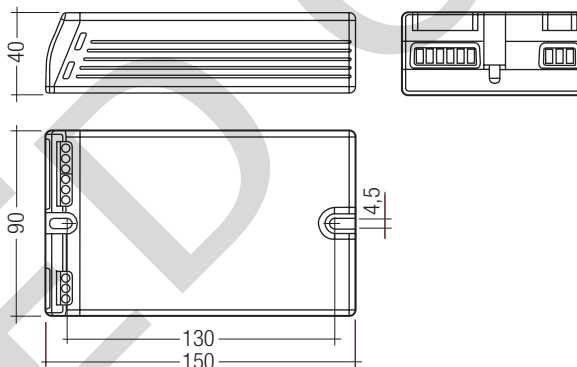


PCIS, PCI, PCS outdoor DIM B011

PCI outdoor

Product description

- Pulse packets for increased ignition energy (pulseCONTROL technology)
- Flicker-free light
- Colour stability thanks to constant power
- No acoustic resonance
- Safety shutdown if a lamp is faulty or missing
- Greatly reduced reignition time
- Hardly any EMC interference in the ignition phase
- Screw terminals: $\leq 1.5 \text{ mm}^2$ for stranded wire, $\leq 2.5 \text{ mm}^2$ for solid wire
- Dimming via digital interface
- Noise-free precise control via DALI, DSI or stepDIM
- Fault reporting in DALI mode
- Unit fully encased to protect against dust, moisture and vibration
- Enhanced protection against mains transients
- Enhanced insulation
- Casing: polycarbonate, black



Technical data

Mains voltage range	220 – 240 V
AC voltage range	198 – 254 V
Mains frequency	50 / 60 Hz
λ at 50 Hz 230 V	0.97
Max. ignition voltage PCI, PCIS	5 kVp
Max. ignition voltage PCS	2.5 kVp
Operating frequency	145 Hz
Type of protection	IP20
Dimensions L x W x H	150 x 90 x 40 mm

Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pc.
For luminaires with 1 lamp				
PCI 45 outdoor DIM B011	86459332	16 pc(s).	480 pc(s).	0.700 kg
PCI 50 outdoor DIM B011	86459336	16 pc(s).	480 pc(s).	0.700 kg
PCS 50 outdoor DIM B011	86459335	16 pc(s).	480 pc(s).	0.700 kg
PCI 60 outdoor DIM B011	86459159	16 pc(s).	480 pc(s).	0.697 kg
PCI 70 outdoor DIM B011	86459337	16 pc(s).	480 pc(s).	0.700 kg
PCS 70 outdoor DIM B011	86458595	16 pc(s).	480 pc(s).	0.720 kg
PCI 90 outdoor DIM B011	86459160	16 pc(s).	480 pc(s).	0.749 kg
PCIS 100 outdoor DIM B011	86458596	16 pc(s).	480 pc(s).	0.760 kg
PCI 140 outdoor DIM B011	86459161	16 pc(s).	480 pc(s).	0.727 kg
PCIS 150 outdoor DIM B011	86458597	16 pc(s).	480 pc(s).	0.747 kg

Standards, page 2

Wiring diagrams and installation examples, page 2

Specific technical data

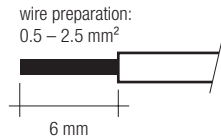
Lamp wattage	Lamp type	Type	Article number	Lamp power	Circuit power ^①	EEl	Efficiency	Current at 50 Hz 230 V	Max. cable length to lamp	tc point max.	Ambient temperature ta	tc/ta for $\geq 60,000 \text{ h}$
For luminaires with 1 lamp												
1 x 45 W	HI	PCI 45 outdoor DIM B011	86459332	45 W	52 W	A2	> 88 %	0.23 A	5 m / 400 pF	70 °C	-25 ... +60 °C	70/60 °C
1 x 50 W	HI	PCI 50 outdoor DIM B011	86459336	50 W	57 W	A2	> 88 %	0.25 A	5 m / 400 pF	70 °C	-25 ... +60 °C	70/60 °C
1 x 50 W	HS	PCS 50 outdoor DIM B011	86459335	50 W	57 W	A2	> 88 %	0.25 A	5 m / 400 pF	70 °C	-25 ... +60 °C	70/60 °C
1 x 60 W	HI	PCI 60 outdoor DIM B011	86459159	60 W	68 W	A2	> 88 %	0.30 A	5 m / 400 pF	70 °C	-25 ... +60 °C	70/60 °C
1 x 70 W	HI	PCI 70 outdoor DIM B011	86459337	70 W	81 W	A2	> 88 %	0.35 A	5 m / 400 pF	70 °C	-25 ... +55 °C	70/55 °C
1 x 70 W	HS	PCS 70 outdoor DIM B011	86458595	73 W	81 W	A2	> 88 %	0.35 A	5 m / 400 pF	70 °C	-25 ... +55 °C	70/55 °C
1 x 90 W	HI	PCI 90 outdoor DIM B011	86459160	90 W	99 W	A2	> 91 %	0.45 A	5 m / 400 pF	70 °C	-25 ... +55 °C	70/55 °C
1 x 100 W	HI & HS	PCIS 100 outdoor DIM B011	86458596	100 W	109 W	A2	> 91 %	0.50 A	5 m / 400 pF	70 °C	-25 ... +55 °C	70/55 °C
1 x 140 W	HI	PCI 140 outdoor DIM B011	86459161	140 W	155 W	A2	> 91 %	0.65 A	5 m / 400 pF	75 °C	-25 ... +55 °C	75/55 °C
1 x 150 W	HI & HS	PCIS 150 outdoor DIM B011	86458597	147 W	161 W	A2	> 91 %	0.70 A	5 m / 400 pF	75 °C	-25 ... +55 °C	75/55 °C

① At ta = 25 °C.

Installation instructions

Wiring type and cross section

Stranded wire with end ferrule with a cross section of 1.5 mm² or solid wire up to 2.5 mm² may be used for wiring. Strip 6 mm of insulation from the cables to ensure perfect operation of the screw terminals.



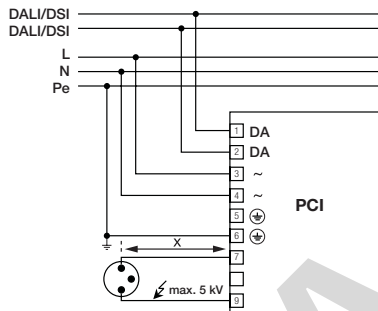
Note on wiring

The length of the lamp wires is limited by the value of cable capacitance. The maximum of 400 pF would enable connection of approximately 5 metres of lamp wire.

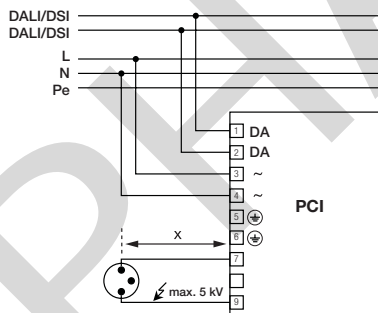
To avoid the damage of the control gear, the wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.).

In class 1 luminaires it is necessary to earth the ballast and the luminaire via the earth terminal.

Protection class 2 luminaires do not need an earth connection. Insulation must be provided by the luminaire design.



Circuit diagram PCIS class 1 application



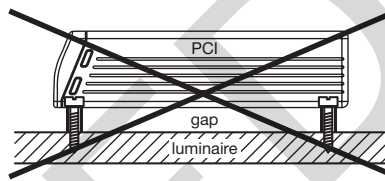
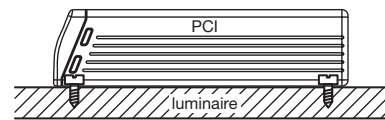
Circuit diagram PCIS class 2 application

Radio interference

- Do not cross mains and lamp cables.
- Do not lay mains cables together with lamp cables (ideally they should be 5–10 cm apart).
- Do not lead mains cables too closely along the electronic ballast.
- Twist lamp cables.
- Increase the distance between lamp cables and earthed metal surfaces.
- Keep the mains cable in the luminaire short.
- Parallel runs (x) of mains and lamp cables must be kept as short as possible.

Mounting recommendation

To ensure optimum heat removal the ECG should be mounted on a metal plate (luminaire body). No insulators between the ECG and the cooling surface (air, adhesive tape, etc.). Finally, the temperature measurement remains important.



If several ballasts are installed in masts, boxes, etc., measures must be taken to avoid overheating of individual components.

Harmonic distortion in the mains supply

Type	THD
PCI 45 outdoor DIM B011	< 10 %
PCI 50 outdoor DIM B011	< 10 %
PCS 50 outdoor DIM B011	< 10 %
PCI 60 outdoor DIM B011	< 10 %
PCI 70 outdoor DIM B011	< 10 %
PCS 70 outdoor DIM B011	< 10 %
PCI 90 outdoor DIM B011	< 10 %
PCIS 100 outdoor DIM B011	< 10 %
PCI 140 outdoor DIM B011	< 10 %
PCIS 150 outdoor DIM B011	< 10 %

Ballast lumen factor EN 60929 8.1

Type	AC/DC-BLF at U = 198–254 V, 25 °C
PCI 45 outdoor DIM B011	1.00
PCI 50 outdoor DIM B011	1.00
PCS 50 outdoor DIM B011	1.00
PCI 60 outdoor DIM B011	1.00
PCI 70 outdoor DIM B011	1.00
PCS 70 outdoor DIM B011	1.00
PCI 90 outdoor DIM B011	1.00
PCIS 100 outdoor DIM B011	1.00
PCI 140 outdoor DIM B011	1.00
PCIS 150 outdoor DIM B011	1.00

Safety switch off

End of life of the lamps

At the end of their useful life, lamps often cycle on/off. The PCIS ballast recognises this condition and switches off the lamp, after three complete on/off cycles and whilst the supply has been unswitched. Complete lamp switch-off enables easy identification of a defective lamp in the application. After a change of the faulty lamp and an interruption of the mains supply (mains reset) or send a ON-OFF sequence the ballast will strike the lamp. When there is no lamp in circuit or a defective lamp is connected to the ballast, the ballast will switch off after apr. 25 minutes.

Overtemperature shutdown

The ballasts are equipped with a thermal shutdown to protect against destruction. After shutdown they can be restored with an OFF-ON sequence via DALI/DSI or with a mains reset.

Overload strength

320 V AC / 1 h

Important advise

When a lamp is changed (at the end of its life), if a lamp is missing, or after overtemperature shutdown the mains voltage of the ECG must be disconnected. Alternatively an OFF ON sequence can be sent.

Warning – starting voltage up to max. 5 kV!

Not suitable for use with lamps with integral ignitors. A list of released lamps for the safe operation with PCIS can be found on www.tridonic.com → Techn. Data → Lamp matrix → Lamp Matrix for HID

Standards

EN 55015 (radio interference)
EN 61000-3-2 (mains harmonics)
EN 61347-2-12
EN 61547 (interference immunity)
IEC 62368-203 (DALI standard)
CE mark
ENEC mark

Transient protection

Type	L/N-PE	L-N
PCI 45 outdoor DIM B011	4 kV	6 kV
PCI 50 outdoor DIM B011	4 kV	6 kV
PCS 50 outdoor DIM B011	4 kV	6 kV
PCI 60 outdoor DIM B011	4 kV	6 kV
PCI 70 outdoor DIM B011	4 kV	6 kV
PCS 70 outdoor DIM B011	4 kV	6 kV
PCI 90 outdoor DIM B011	4 kV	6 kV
PCIS 100 outdoor DIM B011	4 kV	6 kV
PCI 140 outdoor DIM B011	4 kV	6 kV
PCIS 150 outdoor DIM B011	4 kV	6 kV

according to EN 61000-4-5. Protected against a single 10 kV pulse.

Loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20
Installation Ø	1.5 mm ²	1.5 mm ²	1.5 mm ²	2.5 mm ²	1.5 mm ²	1.5 mm ²	1.5 mm ²	2.5 mm ²
PCI 45 outdoor DIM B011	14	25	36	42	8	14	25	30
PCI 50 outdoor DIM B011	14	25	36	42	8	14	25	30
PCS 50 outdoor DIM B011	14	25	36	42	8	14	25	30
PCI 60 outdoor DIM B011	14	25	36	42	8	14	25	30
PCI 70 outdoor DIM B011	14	25	36	42	8	14	25	30
PCS 70 outdoor DIM B011	14	25	36	42	8	14	25	30
PCI 90 outdoor DIM B011	10	18	26	30	6	10	13	13
PCIS 100 outdoor DIM B011	10	18	26	30	6	10	13	13
PCI 140 outdoor DIM B011	7	14	20	20	4	6	7	7
PCIS 150 outdoor DIM B011	7	14	20	20	4	6	7	7

Dimming of HID lamps

Using PCIS ballasts HID lamps can be dimmed down to 40 % light output.

In principle all sodium lamps can be dimmed down to 40 %. Due to the lamp characteristics of metal halide lamps only selected lamps are released for dimming. The minimum dim level of PCI 45/60/90/140 outdoor DIM B011 is set according to the lamp specification.

If lamps are operated below their specified minimum dim level, performance and life-time can be declined.

After starting up the PCIS stepDIM the connected lamp needs to be burned in for the first 19 min in operation. A power reduction within these 19 min is not possible.

When leaving the interface open the ballasts stay on 100 % light output.

At a dimming level of 40 % the light output can vary due to the lamp characteristics between 20 and 45 %.

A list of released lamps for the save operation with PCIS can be found on www.tridonic.com → Techn.

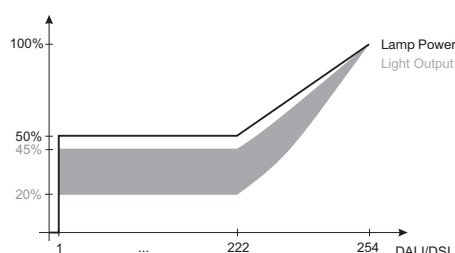
Data → Lamp matrix → Lamp Matrix for HID

Factory settings minimum dimming value

Type	DALI	DALI %
PCI 45 outdoor DIM B011	247	82 %
PCI 50 outdoor DIM B011	235	60 %
PCS 50 outdoor DIM B011	222	40 %
PCI 60 outdoor DIM B011	239	66 %
PCI 70 outdoor DIM B011	235	60 %
PCS 70 outdoor DIM B011	222	40 %
PCI 90 outdoor DIM B011	226	47 %
PCIS 100 outdoor DIM B011	222	40 %
PCI 140 outdoor DIM B011	224	44 %
PCIS 150 outdoor DIM B011	222	40 %

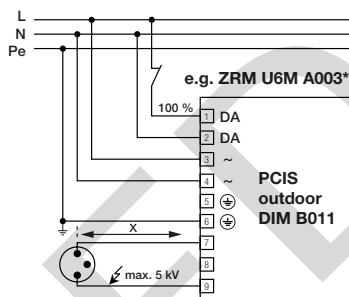
Dimming via DALI/DSI

Via DALI/DSI the lamp can be dimmed between the preadjusted minimum and DALI 254/DSI 255 (100 %). Using DALI/DSI levels between 1 and the preadjusted minimum dimm level the light output is the minimum dimm level.

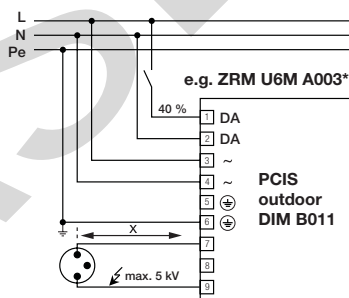


Dimming via stepDIM

Via stepDIM it is possible to select 2 dim levels via mains. The two levels are programmable using DALI/DSI. When connecting mains (e.g. via ZRM U6M A003*) to the interface the ballast regulates to 100 %. After switching off the interface the ballast regulates to 40 % within 90 s.



PCIS outdoor DIM B011 100 % operating SK1 Lamp



PCIS outdoor DIM B011 40 % operating SK1 Lamp

Control via DALI/DSI

Control input (DA)

Digital DALI/DSI signal can be wired on the terminals DA.

Digital signal DALI/DSI

The control input is non-polar and protected against accidental connection with a mains voltage up to 264 V. The control signal is not SELV. Control cable should be installed in accordance with the requirements of low voltage installations.

Different functions depending on each module.

Standards (DALI)

HID EVG → device type 2

DALI 0 = 0 % light

DALI 1 ... 222 = 40 % light

Programmable parameters

- Groups 1–16
- Scenes 1–16 (values 0 % / 40 % ...100 % / MASK)
- Power On Level (values 0 % / 40 % ...100 %)
- System Failure Level (values 0 % / 40 % ...100 %)

Queries

via DALI standard:

- Lamp wattage (value yes/no)
- Lamp error (value yes/no)

via Tridonic masterCONFIGURATOR:

- Lamp type
- Device type
- Article number
- Production date
- Serial number
- Software version
- Commissioning

OEM Memory Bank

The customer can store additional luminaire information in the ECG (Memory Bank 1), such as luminaire type and article number. Data is written to Memory Bank 1 in accordance with DALI standard IEC 62368.

Commissioning of PCIS outdoor DIM ballasts

Because of the special characteristics of HID light sources, PCIS outdoor DIM ballasts (Device Type 2) cannot be addressed in the same way as conventional DALI ballasts for fluorescent or halogen lamps for example. For visualisation during the grouping phase the HID lamps must remain switched off before and during the addressing phase as they can only be properly ignited in the cold state. Dimmed operation of these lamps is not recommended, which also calls for different handling during commissioning.

Tridonic recommends masterCONFIGURATOR ≥ V2.0.0 software for commissioning PCIS outdoor DIM ballasts (download from www.tridonic.com → Services → Software).

IMPORTANT: Other DALI controllers can only be used for commissioning if they handle DALI Device Type 2 units appropriately (see Requirements of control products).

Requirements of control products

Initialization/addressing phase:

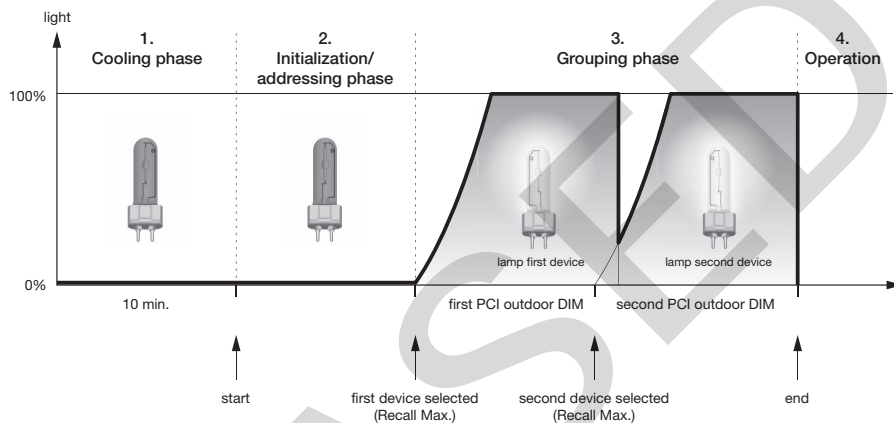
INITIALIZE	(This command must be sent first)
...	When the INITIALIZE command is sent, PCIS outdoor DIM devices change the
...	RECALL MIN value to 0% → devices switch off/remain switched off
...	(Last command in the initialization phase)
RECALL MIN LEVEL	
...	
...	
...	
TERMINATE	When the TERMINATE command is sent, PCIS outdoor DIM changes the RECALL MIN value back to 40% (100% light)

The high ignition voltage of high pressure lamps can lead to interferences. During the ignition time the communication can be disturbed. Therefore the ballast might not react during the ignition phase. This has to be considered especially when using gateways.

Realisation with Tridonic controls

	Commissioning	Operation
DALI GC		✓
x-touchPANEL	✓	✓
x-touchBOX	✓	✓
DALI TOUCHPANEL		✓
Software masterCONFIGURATOR	✓	✓

Overview – commissioning cycle with masterCONFIGURATOR ≥ V2.0.0



Step-by-step commissioning with masterCONFIGURATOR ≥ V2.0.0

1. Cooling phase

HID EVG → Device Type 2
The lighting must have been switched off before start-up for at least 10 min. (visualization/grouping is not possible with hot lamps)

2. Initialisation and addressing phase

- Launch DALI masterCONFIGURATOR
- Click on “Addressing wizzard” and follow the on-screen instructions.

PCIS outdoor DIM devices remain dark during the entire addressing phase. In contrast, DALI devices for fluorescent lamps, LEDs and incandescent lamps fade down to their minimum value and go to 100 % during the addressing phase. At the end of the addressing phase they fade back to their minimum value.

3. Visualisation in the grouping phase

- Activate the “Enable optical selection feedback” by ticking the checkbox.
- If a PCIS outdoor DIM device (Device Type 2, special symbol) is selected in masterCONFIGURATOR the appropriate device switches on. It remains on until a different DALI device is selected in the system. → PCIS outdoor DIM then switches off after a maximum delay of 10 seconds.

4. Operation

- PCIS outdoor DIM devices can be switched powerless with a broadcast signal (DALI or DSI, without addressing of the devices)
- PCIS outdoor DIM devices can be addressed and operated individually or in groups with a DALI signal. For examples with Tridonic controls please see matrix above.

Commissioning comparison table

	DALI HID ballast PCIS outdoor DIM	Standard DALI ballast e.g. PCA Excel one4all
Before commissioning the installation	Devices must have been switched off for at least 10 minutes!	—
Initialisation and addressing phase	Devices remain switched off	<ul style="list-style-type: none"> • Devices fade to minimum value • On successful addressing the devices fade up to 100 % • At the end of the addressing phase the devices fade down to the minimum value
Visualisation in the grouping phase	<ul style="list-style-type: none"> • Selected device starts the lamp at 100 % • If a different device is selected the previously selected device switches off with a maximum delay of 10 s <p>Visualisation/grouping is not possible with hot HID lamps!</p>	<ul style="list-style-type: none"> • Selected device fades from minimum value to 100 % • If a different device is selected the previously selected device fades to the minimum value
Operation	Devices can be controlled/operated with other DALI/DSI control products	Devices can be controlled/operated with other DALI/DSI control products

Temperature range

The t_a temperature value is the basis for specifying the rated life.

The relationship between the t_c temperature and the t_a temperature depends on the design of the luminaire.

PCIS outdoor B011 is designed for an average life of 60,000 hours under rated conditions, with a failure probability of less than 10 %. This corresponds to an average failure rate of 0.2 % per 1,000 hours of operation.

The specified t_c temperature is the maximum permitted value (rated temperature according to EN 61347 -1). Above this safety-related value the thermal cutout protects the device against damage.

The expected life-time values are shown in the following table. The t_c values are the relevant values here.

Expected life-time

Type	Lamp type	Lamp power	t_a	40 °C	50 °C	55 °C	60 °C
				t_c	50 °C	60 °C	65 °C
PCI 45 outdoor DIM B011	HI	1x45 W	t_c	50 °C	60 °C	65 °C	70 °C
			Life-time	> 100,000 h	> 100,000 h	80,000 h	60,000 h
PCI 50 outdoor DIM B011	HI	1x50 W	t_c	50 °C	60 °C	65 °C	70 °C
			Life-time	> 100,000 h	> 100,000 h	80,000 h	60,000 h
PCS 50 outdoor DIM B011	HS	1x50 W	t_c	50 °C	60 °C	65 °C	70 °C
			Life-time	> 100,000 h	> 100,000 h	80,000 h	60,000 h
PCI 60 outdoor DIM B011	HI	1x60 W	t_c	50 °C	60 °C	65 °C	70 °C
			Life-time	> 100,000 h	> 100,000 h	80,000 h	60,000 h
PCI 70 outdoor DIM B011	HI	1x70 W	t_c	55 °C	65 °C	70 °C	x
			Life-time	> 100,000 h	80,000 h	60,000 h	x
PCS 70 outdoor DIM B011	HS	1x70 W	t_c	55 °C	65 °C	70 °C	x
			Life-time	> 100,000 h	80,000 h	60,000 h	x
PCI 90 outdoor DIM B011	HI	1x90 W	t_c	55 °C	65 °C	70 °C	x
			Life-time	> 100,000 h	80,000 h	60,000 h	x
PCIS 100 outdoor DIM B011	HI/HS	1x100 W	t_c	55 °C	65 °C	70 °C	x
			Life-time	> 100,000 h	80,000 h	60,000 h	x
PCI 140 outdoor DIM B011	HI	1x140 W	t_c	60 °C	70 °C	75 °C	x
			Life-time	> 100,000 h	80,000 h	60,000 h	x
PCIS 150 outdoor DIM B011	HI/HS	1x150 W	t_c	60 °C	70 °C	75 °C	x
			Life-time	> 100,000 h	80,000 h	60,000 h	x

Storage conditions

Humidity: 5 % up to max. 85 %, not condensed (max. 56 days/year at 85 %)

Storage temperature: -40 °C up to max. +80 °C

The devices have to be within the specified temperature range (t_a) before they can be operated.

Isolation and electric strength testing of luminaires

Electronic devices can be damaged by high voltage. This has to be considered during the routine testing of the luminaires in production.

According to IEC 60598-1 Annex Q (informative only!) or ENEC 303-Annex A, each luminaire should be submitted to an isolation test with 500 V_{DC} for 1 second. This test voltage should be connected between the interconnected phase and neutral terminals and the earth terminal.

The isolation resistance must be at least 2 MΩ.

As an alternative, IEC 60598-1 Annex Q describes a test of the electrical strength with 1500 V_{AC} (or 1.414 x 1500 V_{DC}). To avoid damage to the electronic devices this test must not be conducted.

Additional information

Additional technical information at www.tridonic.com → Technical Data

Guarantee conditions at www.tridonic.com → Services

No warranty if device was opened.