

## Assembly instructions for mounting and installing of electronic control-gear for LEDs

### Regulations

DIN VDE 0100	Regulations for erection of power installations with nominal voltages up to 1000 V
EN 60598	Luminaries – part 1: general requirements and tests
EN 61347-1	Devices for lamps – part 1: general and safety requirements
EN 61347-2-13	Lamp control gear - Part 2-13: Particular requirements for DC or AC supplied electronic control gear for LED modules
EN 62384	DC or AC supplied electronic control gear for LED modules – Performance requirements
EN 61000-3-2	Electromagnetic Compatibility (EMC) – part 3: maximum values – main section part 2: maximum values for mains harmonics (device input current up to and including 16 A per conductor)
EN 55015	Maximum values and methods of measurement for RFI suppression in electrical lighting installations and similar electrical appliances
EN 61547	Installations for general lighting purposes – EMC immunity requirements

### Mechanical mounting of LED-control gears

Mounting	any position is allowed
Clearance	min.0.1 m from walls, ceilings, insulation materials
Surface	Solid and smooth surface area for good heat conduction necessary.
Mounting in indoor luminaries	Install according to EN 60598; keep away from heating sources and water. The cable relief, included in the housing cap, must be used, when the driver is operating as independent device. When used as built-in-version without the housing cap, the luminaire manufacturer must ensure the implementation of the safety standards.
Mounting in outdoor luminaries	Protection grade of the luminaries against water = 4 necessary (e. g. IP54)
Fastening	Using screws, 4 mm dia.
Heat transfer	The installation in a luminaire, must ensure sufficient heat transfer between the control gear and the luminaire casing. The control gear should have the maximum possible clearance to heat sources. During operation, the tc point must not exceed the specified value (see temperature stated on the label)



## Additional mounting instructions for LED control gear

### Safety functions

**Overheating** The control gear has three overheating protection steps:

1<sup>st</sup> step – software protection:

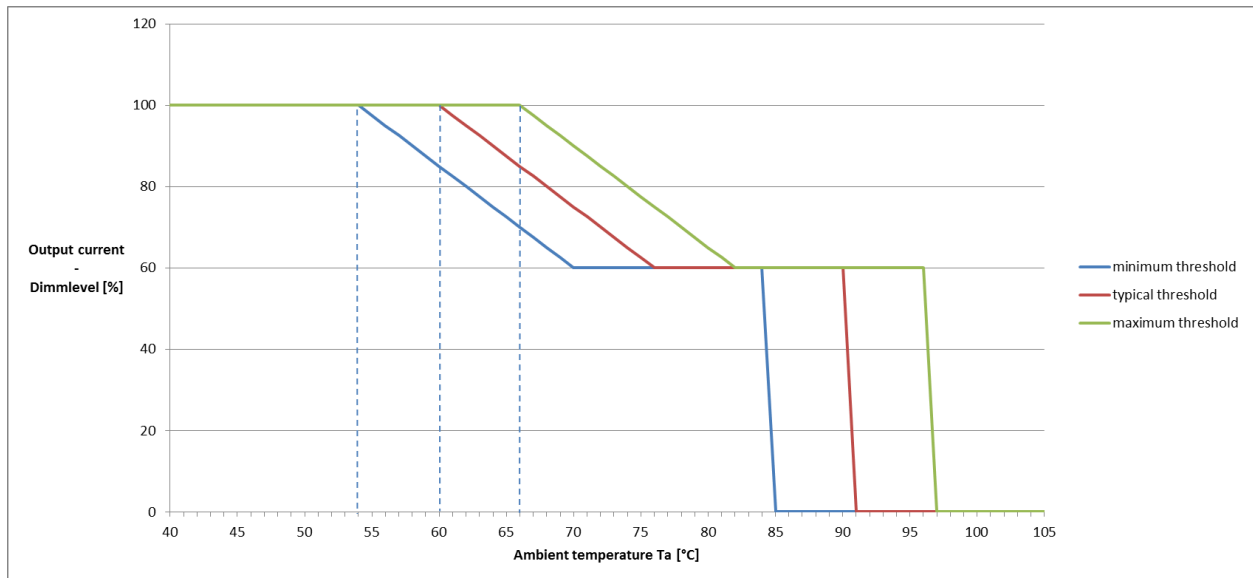
At an ambient temperature of  $60^{\circ}\text{C} \pm 10\%$ , the output current duty cycle starts to decrease from 100% to 60%.

2<sup>nd</sup> step – hardware protection:

At an ambient temperature of  $90^{\circ}\text{C} \pm 6^{\circ}\text{C}$ , an over-temperature circuit turns off the device. When the temperature afterwards drops below a defined threshold, the device restarts automatically at a current level of 100%.

3<sup>rd</sup> step – internal over-temperature protection of output stage

At ambient temperatures higher than approximately  $110^{\circ}\text{C}$ , an internal protection of the output stage turns off the output current. When the temperature afterwards drops below a defined threshold, the device restarts automatically at a current level of 100%.



The ambient temperatures and the according thresholds in the diagram above are only valid for full power operation with cord-grip-cap mounted.

**No Load operation** The control gear is protected against no load operation (open load)

**Short circuit protection** The control gear is protected against permanent short circuit before start up the device. Short circuit during normal operation (disconnect load and make short circuit) will damage the device.

If any of the above-mentioned safety functions will be triggered, disconnect the control gear from the power supply then find and eliminate the cause of the problem.

Any kind of load change during operation not admissible.

**Protection against**

**Transient mains peaks** Surges between L&N up to 1kV  
Burst, Dips & Interrupts according to EN61547



**Dimming function (for dimmable devices)**

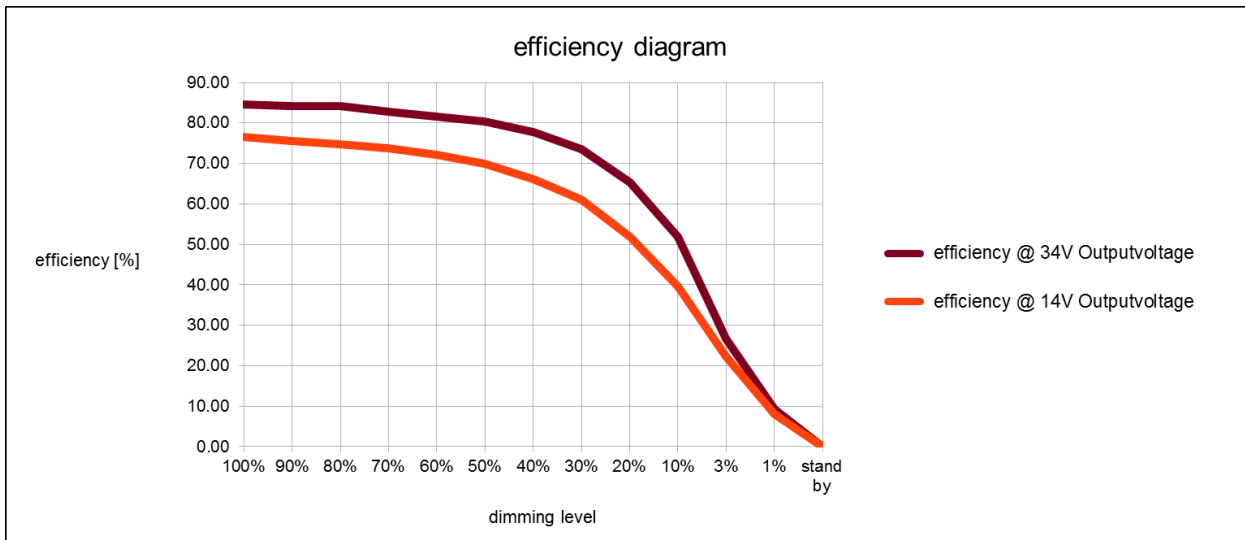
- Phase cut dimming     Dimming from mains side by phase cutting dimmers is impermissible.
- Dimming frequency     976 Hz
- Dimming level             from 1 % (min.) to 100% (max.)
- Push                         dimmable with usual push key
- DALI                         Complete implementation of the DALI - standard according to EN 62386-102 (control gear), EN 62386-207 (LED modules), addressable, memory store for scenes and groups, bidirectional communication.

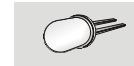
**Initial operation**

- Start-Up                     The driver features an intelligent regulation, that adapts and calibrates itself to the used LED-voltage at first start-up. During this procedure, the LED-load can show flicker-effects. This procedure is also started, when the operating mode is changed from PUSH-operation to DALI operation and vice versa.  
When the LED module is changed, the driver will re-adjust itself after 20s of operation.

**Efficiency diagram**

efficiency                     The following diagram shows the driver’s efficiency at an output current of 700 mA.





**Selection of automatic cut-outs for VS converters**

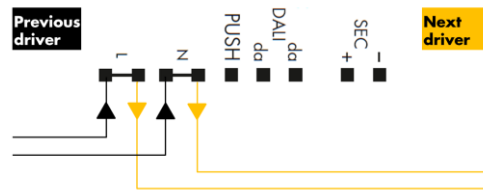
**Release reaction characteristics. The system.** Release reaction of automatic cut-outs in accordance with VDE 0641, part 11 for B-, C- following values are guidelines and may vary depending on the respective circuit breaker

**No. of converters** The maximum number of VS converters applies to cases where the devices are switched on simultaneously. Specifications apply to single-poled fuses. The number of permissible ballasts must be reduced by 20 % for multi-pole fuses. The considered circuit impedance equals 400 mΩ (approx. 20 m [1.5 mm<sup>2</sup>] of conductor from the power supply to the distributor and a further 15 m to the luminary).

Possible number of control gear				
Current source	Type of automatic cut-outs			
	B 10 A	B 16 A	C 10 A	C 16 A
ECXd 700.166	35	56	58	93

**Through wiring** Pins for L, N are doubled and internally connected about the wiring diagram to allow through wiring.

In case of through wiring, maximum allowed current per wire is 1.6A. No. of drivers in such installation is 10.



**Electrical installation**

**Conductors** Primary and secondary conductor cross section: min. 0.2 mm<sup>2</sup> and max. 1.5 mm<sup>2</sup>

model	Cross section	Max. lead length of secondary conductor
ECXd 700.166 – 186465	0,2 mm <sup>2</sup>	0.8 m
	0,5 mm <sup>2</sup>	0.8 m
	0,75 mm <sup>2</sup>	0.8 m
	1,0 mm <sup>2</sup>	0.8 m
	1,5 mm <sup>2</sup>	0.8 m

**Connections** Push in terminals with release button

**Wiring** Primary wires must be as short as possible, and shouldn't cross the secondary wires.

**Secondary load** The RFI requirements according EN 55015 for in series connected LED-Modules are fulfilled then the sum of forward voltages of LED-loads isn't below or above the values showed in Electrical information under USEC.

**Parallel connection** Secondary side parallel connection not admissible

**Cord grip** When used as an independent driver, it must be operated using the following cable-combinations:



No.	Combination	cabLe
1	Power supply cable without through-wiring and without dimming Secondary side cable	1 x H03VV-F 4x0.75mm <sup>2</sup>  1 x H03VV-F 3x0.75mm <sup>2</sup>
2	Power supply cable with through-wiring Secondary side cable	2 x H03VV-F 3x0.75mm <sup>2</sup> 1 x H03VV-F 3x0.75mm <sup>2</sup>
3	Power supply cable Interface cable Secondary side cable	1 x H03VV-F 3x0.75mm <sup>2</sup> 1 x H03VV-F 3x0.75mm <sup>2</sup> 1 x H03VV-F 3x0.75mm <sup>2</sup>

The screws of the cord grip must be alternately and evenly tightened.  
When combination 1 is used, the power supply cable should not be fixed at the middle but at the outer position of the cord grip.

Switching on and off On the secondary side admissible

Lead preparation	
a	8,5-10 mm

### Electrical information

Electronic control gear for LEDs												
Type	Ref. no.	UPRI 0 Hz 50/60 Hz V	Nominal Input current (IPRI) mA	USEC (with load) V	USEC (max) V	PSEC max. W	Nominal output current (ISEC) mA	Max. tc temp. tc (°C)	Min/Max. Ambient temperature ta (°C)	Protec tion class	Degree of protectio n	Weigh t g
ECXd 700.166	186465	198/26 4 220/24 0	160 – 100 130 – 120	14 – 34	45	24	700 ±5% 350 ±5%	75	- 25...+50°C	II	IP20	145

Additional information DC voltage operation: 198...264V (DC voltage can be reduced to 176V for 2 hours.)