



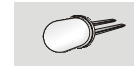
## Assembly instructions for mounting and installing of electronic control-gear for LEDs

### Regulations

DIN VDE 0100	Regulations for erection of low voltage installations with nominal voltages up to 1000 V
EN 60598-1	Luminaires – part 1: General requirements and tests
EN 61347-1	Lamp control gear – 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 gears 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	Built in application: - Any position inside a luminaire is allowed Independent application: - Drivers are not allowed to use for independent applications
Clearance	Min. of 0.1 m from walls, ceiling's, insulation materials
Surface	Solid and smooth surface area for good heat dissipation required
Mounting In indoor Luminaires	Install according to EN 60598; keep away from heating sources and water.
Mounting In outdoor Luminaires	Degree of protection for the luminaires against water = 4 necessary (e. g. IP54)
Fastening	Using M4 screws for fastening in the designated holes
Heat transfer	Installation in a luminaire must ensure sufficient heat transfer between the control gear and the lamp housing. The control gear should have the maximum possible clearance to heat sources. During operation, the temperature measured at the tc point of the driver must not exceed the specified value (see temperature stated on the label or Electrical information at page 4)



## Additional mounting instructions for LED control gear

### Safety functions

**Overheating** The control gear has overheating protection. In case of overheating the control gear will dimm down, and is able to switch off the LEDs. After cooling down it will dimm up and restart automatically.

**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 with automatic restart function. Normal operation if the short circuit is fixed.

**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.**

**Overload protection** The control gear only works in range of rated output power and voltage. Short overload does not damage the LED driver.  
Please check before switch on main power supply that the selected LED load is suitable (see Electrical information's at page 3)

**Protection against transient mains peaks** Values are in compliance with EN61547 (interference immunity)  
Surges between L/N up to 1kV  
Surges between L/N/PE up to 2kV

### Delivery conditions

**Output current** Drivers will be delivered with smallest output current (350mA) to avoid any kind of risk of damage the LED module or any other safety risk like overheating the LED load during normal operation. No resistor is mounted.

### Additional features

**Output current Selection** The output current can be adapted within the rated output current range between 350mA ... 700mA. To change the output current it is necessary to use the correct resistor. Values for different currents are figured out in the technical catalogue.  
Short Circuit on control interface: Max. Current  
Open Circuit on control interface: Min. Current

Please refer to the electrical values and the operating window to see which combinations are possible.

Output current / needed resistor can be calculated as follows:

$$I_{out} = \frac{5V}{R_{set}} \times 1000$$

$$R_{set} = \frac{5V}{I_{out}} \times 1000$$



## Electrical installations

### Selection of automatic Cut-outs

**Release reaction** Release reaction of automatic cut-outs comply with VDE 0641, part 11 for B-, C-characteristics. The number of control gear in below table is recommended values as guidelines and can be varied depending on the respective circuit breaker system.

**No. of control gears** Maximum number of VS control gears apply in such 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 luminaire).

Inrush current		
LED Driver	Inrush current [A]	Time 50% I <sub>peak</sub> [µs]
ECXd 700.213	32	240
ECXd 700.214	26	200
ECXe 700.227	32	240
ECXe 700.228	26	200

Possible number of control gear						
LED Driver	Type of automatic cutoff					
	B 10 A	B 13 A	B 16 A	C10	C 13 A	C 16 A
ECXd 700.213	9	12	15	15	20	24
ECXd 700.214	12	16	20	21	28	34
ECXe 700.227	9	12	15	15	20	24
ECXe 700.228	12	16	20	21	28	34

**Through wiring** Through wiring is not allowed / not possible

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

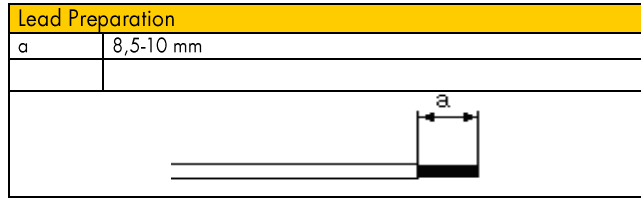
Type	Cross section	Max. lead length of secondary conductor
ECXd700.213 ECXd700.214 ECXe700.227 ECXe700.228	0,2 mm <sup>2</sup>	0.8 m
	0,5 mm <sup>2</sup>	0.8 m
	0,75 mm <sup>2</sup>	0.8 m
	1,0 mm <sup>2</sup>	0.8 m
	1,5 mm <sup>2</sup>	0.8 m

**Connections** Push in terminals with release button

**Wiring** Primary wires must be as short as possible, and need to be separated between primary and secondary wiring. Keep capacity of output wires to PE as low as possible to avoid glowing of LEDs in standby mode.

**Secondary load** The sum of forward voltages of LED-loads are within the tolerance which is highlighted in Electrical information under USEC.

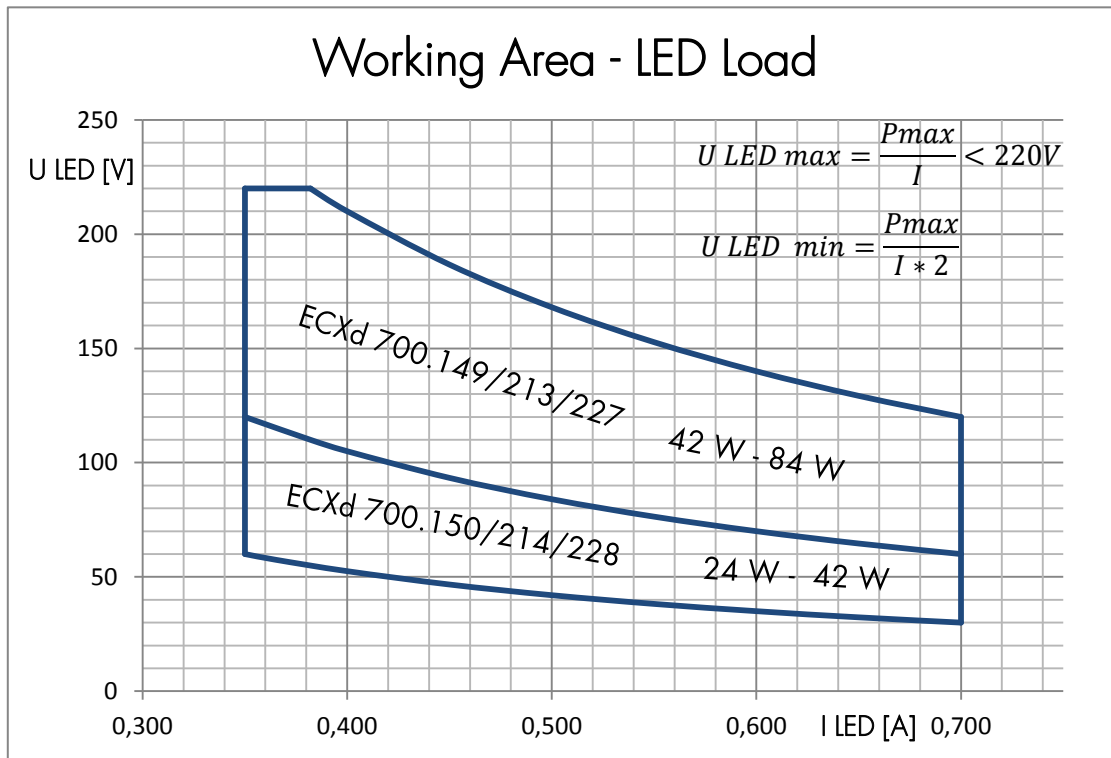
**Switching on and off** Switching on/off at secondary side is not allowed



**Electrical information**

Electronic control gear for LED's												
Type	Ref. no.	U <sub>PR1</sub>	Nominal Input current (I <sub>PR1</sub> , depends on selected current)	U <sub>LED</sub> (with load, depends on selected current)	U-OUT	P <sub>rated</sub> (depends on selected output current)	I <sub>rated</sub> Nominal output current	t <sub>c</sub> max. (depends on selected output current)	t <sub>a</sub> Min/Max-Ambient temperature	Protection class	Degree of protection	Weight
		[V]	[mA]	[V]	[V]	[W]	[mA]	[°C]	[°C]			[g]
ECXd 700.213	186564	220 – 240	410 – 380	60 – 220	<250	84	350 – 700 ±5%	70	-25...+50°C	I	IP20	265
ECXd 700.214	186565	220 – 240	215 – 200	34 – 120	<250	42	350 – 700 ±5%	60	-25...+50°C	I	IP20	235
ECXe 700.227	186589	220 – 240	410 – 380	60 – 220	<250	84	350 – 700 ±5%	70	-25...+50°C	I	IP20	265
ECXe 700.228	186590	220 – 240	215 – 200	34 – 120	<250	42	350 – 700 ±5%	60	-25...+50°C	I	IP20	235

**Operating Window LED Driver**





## Table Output current / Resistor value

All values are rounded to two decimal places

ECXd700.213 / ECXe700.227					
Irated [mA]	R [kOHM]	ULED min. [V]	ULED max. [V]	Prated min. [W]	Prated max. [W]
350	14,29	120	220	42,00	77,00
375	13,33	112	220	42,00	82,50
400	12,50	105	210	42,00	84,00
425	11,76	98	197	41,65	83,73
450	11,11	93	186	41,85	83,70
475	10,53	88	176	41,80	83,60
500	10,00	84	168	42,00	84,00
525	9,52	80	160	42,00	84,00
550	9,09	76	152	41,80	83,60
575	8,70	73	146	41,98	83,95
600	8,33	70	140	42,00	84,00
625	8,00	67	134	41,88	83,75
650	7,69	64	129	41,60	83,85
675	7,41	62	124	41,85	83,70
700	7,14	60	120	42,00	84,00

ECXd700.214 / ECXe700.228					
Irated [mA]	R [kOHM]	ULED min. [V]	ULED max. [V]	Prated min. [W]	Prated max. [W]
350	14,29	68	120	23,80	42,00
375	13,33	64	112	24,00	42,00
400	12,50	60	105	24,00	42,00
425	11,76	56	98	23,80	41,65
450	11,11	53	93	23,85	41,85
475	10,53	50	88	23,75	41,80
500	10,00	48	84	24,00	42,00
525	9,52	45	80	23,63	42,00
550	9,09	43	76	23,65	41,80
575	8,70	41	73	23,58	41,98
600	8,33	40	70	24,00	42,00
625	8,00	38	67	23,75	41,88
650	7,69	36	64	23,40	41,60
675	7,41	35	62	23,63	41,85
700	7,14	34	60	23,80	42,00