



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	Luminaries – 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

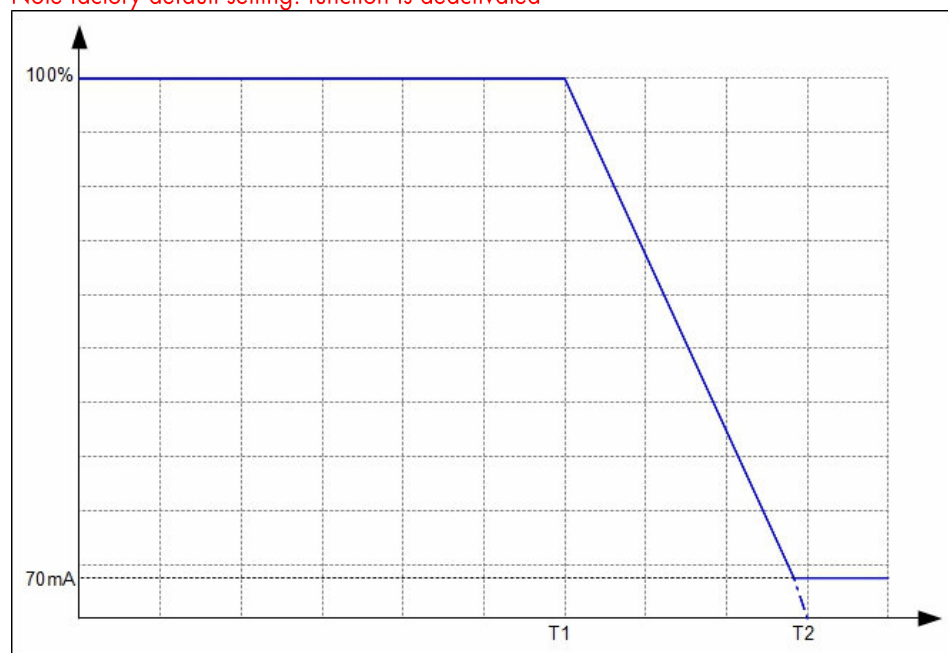
Mounting	Built in application: - Any position inside a luminaire is allowed Independent application: - Drivers are not allowed to use for independent applications
Clearance	Min. of 0.1 m from walls, ceiling's, insulation materials
Surface	Solid and smooth surface area for good heat dissipation required
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	<p>The control gear has overheating protection. It will start to reduce the output current down to minimum output current while increasing of ambient over temperature of LED driver.</p> <p>The control gear has automatic recovery function. After ambient over temperature decrease the driver will increase the output current to rated value and restart with normal operation.</p>
No Load operation	The control gear is protected against no load operation (open load) In case of no - load voltage the main voltage power supply shall be restarted for normal operating mode.
Short circuit protection	<p>The control gear is protected against permanent short circuit during switch on of main voltage power supply.</p> <p>In case of short circuit during switch on, the main voltage power supply shall be restarted for normal operating mode. Short circuit during normal operation can damage the LED Driver.</p> <p>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.</p>
Overvoltage protection	The control gear has overvoltage protection. In case of overvoltage at secondary side, the control gear start with follow operating condition on secondary side: 4 x blinking pulse 1 x break (continuously)
Overload protection	<p>The control gear has overload protection. In case of overvoltage (at secondary side) the control gear start with follow operating condition as described in overvoltage protection (see above) Notice: The LED Driver has an operating window. Please consider the max ratings for U (with load) as mentioned in operating window at page 7</p>
NTC protection	<p>The control gears have a programmable NTC protection to protect the LED load. NTC Type: VISHAY NTCS0805E3 153 FMT. To parametrization please use the VS equipment I Programmer in combination with VS Software</p> <p>Note factory default setting: function is deactivated</p>



Settable values: T1 60 ... 99 T1 < T2
T2 60 ... 99 T2 > T1

start of power reduction
steepness of power reduction

**Note factory default setting: T1: 70
T2: 90**



Additional mounting instructions for LED control gear

Safety functions

Protections against transient mains peaks	Values are in compliance with EN61547 (interference immunity)
	Surges between L/N/LST up to 6kV
	Surges between L/N/PE up to 6kV (in luminaire)

Additional Information for LED control gear

Factory default settings / delivery conditions

Output current	350 mA
NTC function	deactivated
NTC T1	70
NTC T2	90
Dimming	IMCU activated
MFF function	deactivated
Power on	Level 100%, Delay 0, Fade 0
LST	on, H - Active, Level 70%, Delay 0, Fade 0
ISD	deactivated
ISD-Offset	0
Auto DST	off
Remote	off



Additional Information for LED control gear

Input functions

Control phase The LST Input shall only be connected from control gears with same family. Mixed combinations with different combinations are not recommended and forbidden.

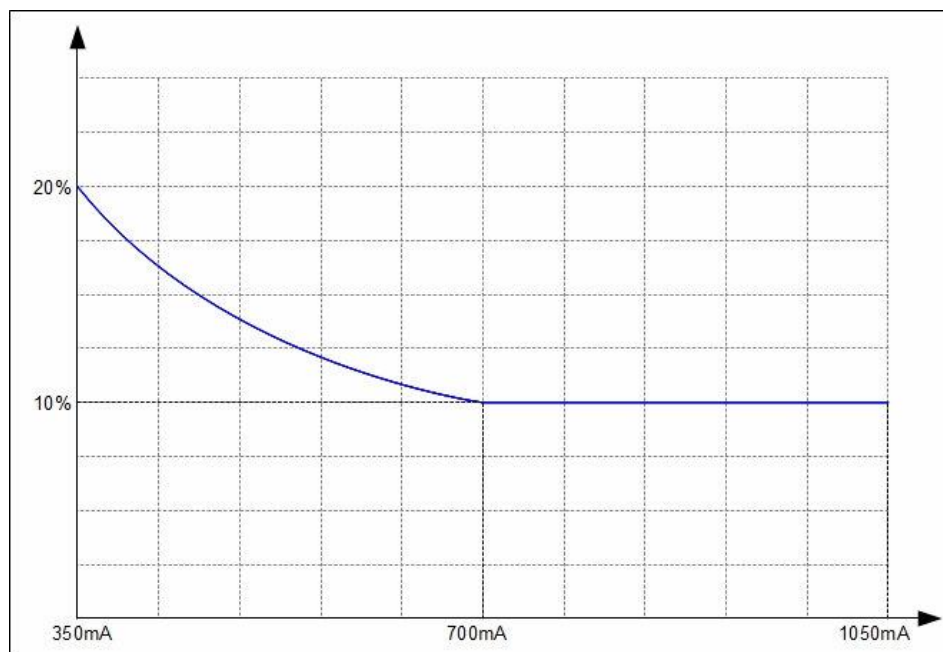
Dimming

1-10V

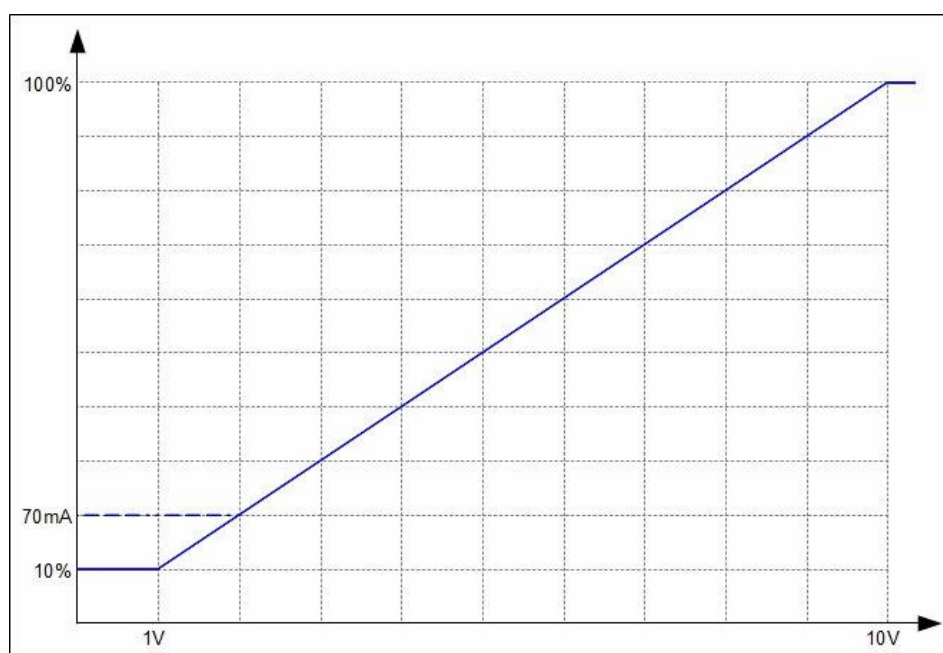
Analogue dimmable function within 10%* (min. dim level) to 100% (max. dim level)

*Note: Min Dim level depends on selected output current. For further details please refer to the attached file.

**Note: At rated current <700mA and low Dim level positions the output current will be fixed to minimal output current (70mA)



*Selected output current: Min dim level



** 1-10V Interface progress



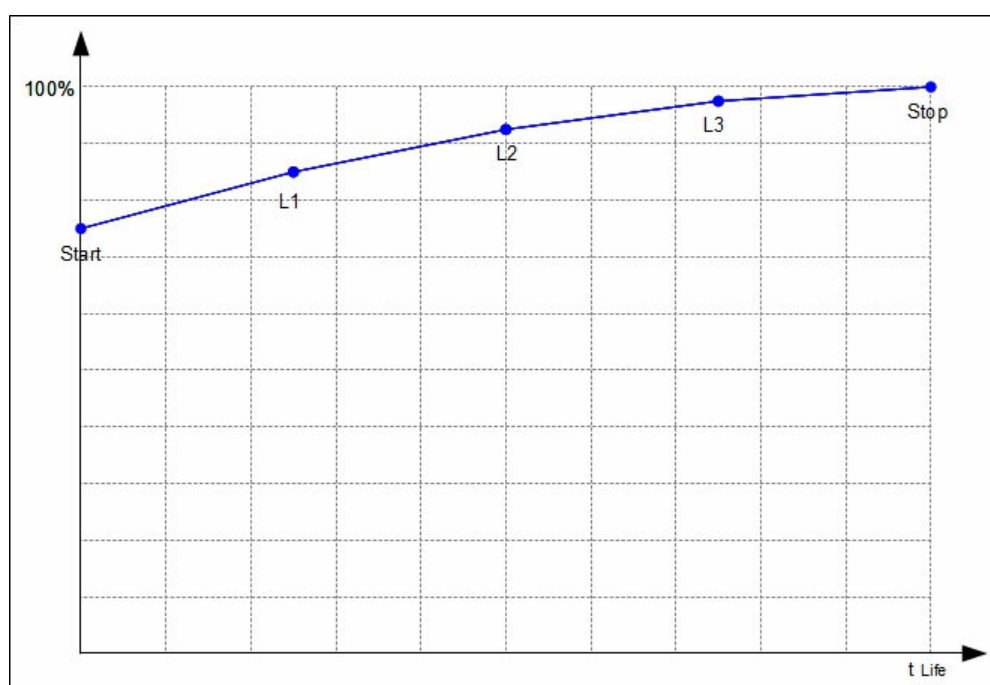
Additional Information for LED control gear

Dimming

IMCU function	dimming interface can be selected between IMCU functions or 1-10V Dimming.
Programmable	DALI Interface for Programming of 3C parameters and change of factory default settings. For further details please have a look on configuration tool from VS (I Programmer)

Software functions

Control phase	The LST Input shall only be connected from control gears with same family. Mixed combinations with different combinations are not recommended and forbidden.
MFF (Maintenance Factor function)	<p>Changes on MFF – parameters will be active after reset of main voltage power supply. Output current values > 100% are not possible. If dimming is active, MFF value will be considered as light level value (100%Dimming) = MFF value 50% Dimming = 50% of MFF value not rated current</p> <p>Note factory default setting: function is deactivated</p>



Maintenance Factor Function graphic

Power on function	<p>Power on Time (including fade time) can be adjusted and programmed as needed.</p> <p>Note factory default setting: function is deactivated</p>
ISD function	<p>ISD = Intelligent Switching Time Dimming. Intelligent, timer-controlled periods of dimmed light</p> <p>A season-specific reference value is derived from the period of time the lighting cable is switched on. Based on the reference value, the controller can control the lighting system with up to 10 dimming levels and dimming sequences. Accidental (erroneous) configurations that can arise, for instance, during maintenance work, are successfully suppressed by the controller as it ignores short lighting periods of less than 6 hours and long periods of more than 18 hours</p> <p>Note factory default setting: function is deactivated</p>



LSt function Using this external 230Vac input it is possible to control the output with up to 10 dimming levels and dimming sequences. Additionally it is possible to change the input polarity and set a hold time.

Remote function Turning on/off the power according to this one way communication protocol it is possible to remotely reprogram the power- on level and the dimming engine settings.

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 mm²] 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 _{peak} [μs]
ECXd1050G.146	8,5	40

Possible number of control gear @ full load						
LED Driver	Type of automatic cut-off					
	B 10 A	B 13 A	B 16 A	C 10	C 13 A	C 16 A
ECXd1050G.146	10	13	16	10	13	16

Through wiring Through wiring is not allowed / not possible

Conductor Primary and secondary wire cross section: 0.75 mm²

Type	Cross section	Colour	Description
ECXd1050G.146	0,75 mm ²	Blue / Orange	Programming DA
		Blue / Orange	Programming DA
		Purple	Dim +
		White	Dim -
		Brown	L
		Blue	N
		Grey	LST
		Pink	NTC
		Pink	NTC
		Red	LED +
		Black	LED -

Wiring Primary wires must be as short as possible, and need to be separated between primary and secondary wiring.

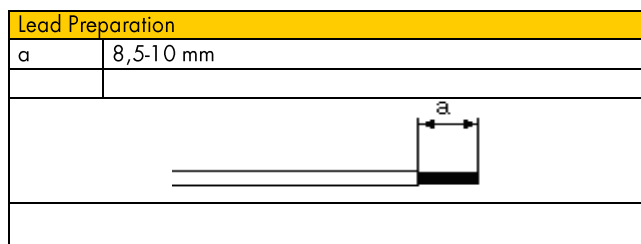
Notice: Non used wires must be isolated according to the protection class of the luminaire

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



Parallel connection Connecting LED's in parallel at secondary side is not allowed

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 _{PR1}	Nominal Input current (I _{PR1} , depends on selected current)	U (with load, depends on selected current)	U _{out} without load	Prated (depends on selected output current, see operating window below)	I rated Nominal output current	T _c max. (depends on selected output current)	t _a Min/Max-Ambient temperature	Protection class	Degree of protection	Weight
		(V)	(mA)	(V)	(V)	(W)	(mA)	(°C)	(°C)			(g)
ECXd 1050G.146	186442	220 – 240	740 – 680	85 – 260	<300	29,7 – 91	350 ±5%	85	-40...+55°C	II	IP65	1100
						42,5 – 130,0	500 ±5%					
						59,5 – 119,0	700 ±5%					
						89,2 – 150,0	1050 ±5%					

Operating Window LED Driver

