OPTOTRONIC®

OT 150/220-240/700 3DIMLT+ E

Programmable 700mA Constant Current LED Power Supply with LEDset and 3DIM

Technical Information

Edition: July 2013

3DIM DALI StepDIM AstroDIM

Technical Data

LED⊳set

Reference:	**OT 150/220-240/700 3DIMLT+ E**
For LED modules:	350 – 700 mA LED
Nominal Voltage:	220 – 240 V_{AC}
Line Current, nominal:	720 mA @ 230V
Mains Frequency:	50/60 Hz
Output Current: *(Remark)*	75 – 700 mA_{DC} *+/- 5% (350-700mA), see load diagram*
Output voltage: *(Remark)*	95 – 335 V_{DC} *maximum 350V_{DC}*
Output Power: *(Remark)*	150 W *Partial Load 34W .. 150W (not dimmed)*
Rated Power factor:	> 0,95 (full load) @ 230V > 0,90 (half load) @ 230V
Power Loss:	15 W max.
ECG efficiency: *(Remark)*	≥ 90,5% *full load at 230V*
Power Loss in standby mode *(Remark):*	< 1,7 W *typical by DALI, typical by LEDset <2,0 W*
Input Voltage: *(Remark)*	195 – 264 VAC *Permitted voltage range*
DC Voltage:	No
Suitable for luminaire protection class:	I/II

Dimmable:	3DIM (AstroDIM/StepDIM/DALI)
Internal Control:	LEDset
NTC Input:	Yes
Constant Lumen Module:	Yes
Programmable Nominal Current:	Yes
No-load proof:	Yes
Hot plug functionality:	No
Short circuit protection:	Automatic, reversible
Overload protection:	Automatic, reversible
Overtemperature protection:	Automatic, reversible

Ambient temperature range, t_a:	-30 °C to +55 °C
Max. case temperature at t_c point:	+85 °C
ECG Lifetime: *(Remark)*	85.000h *at t_{case}= +75°C at t_c point and 10% failure rate*
Maximum casing temperature in case of fault:	120°C

Inrush current:	58 A			
(Remark)	t_{width} = *360 µs (measured at 50% Ipeak)*			
Max. no. of ECG @ circuit breakers 10A (B type):	4			
Max. no. of ECG @ circuit breakers 16A (B type):	9			
Max. no. of ECG @ circuit breakers 25A (B type):	20			
Max. no. of ECG @ circuit breakers 16A (B type): in combination with EBN-OS	20			
Terminal:	Mains (*grey*) DALI (red) StepDIM (white) Equipotential Pole (*pink*) NTCset *(orange)* LEDset (grey [GNDset], purple [Vset], blue [+12Vset]) LEDModule ([+] *red/* [-] *black*)			
Cable cross section input side:	0,5 mm² – 2,5 mm²			
(Remark)	*Solid and flexible,* *Equipotential pole only* 0,2 mm² – 1,5 mm²			
Wire preparation length Input side:	10,0 – 11,0 mm			
(Remark)	*Equipotential pole 8,5 – 9,5 mm*			
Cable cross section output side:	0,2 mm² – 1,5 mm²			
(Remark)	*Solid and flexible, LEDset only 0,2mm² – 0,5mm²*			
Wire preparation length output side:	*8,5 – 9,5 mm*			
Max. cable length - system:	2 m			
Geometry (l x b x h):	170 x 100 x 40 mm³			
Weight:	1100 g			
IP Code:	IP20			
(Remark)	*IP Fixture rating ≥ IP54*			
Safety:	EN 61347-1, EN 61347-2-13			
Performance:	EN 62384			
Radio interference:	EN 55015:2006+A1:2007+A2:2009			
Harmonic content:	EN 61000-3-2			
Immunity:	EN 61547			
Vibration tested:	5 -150 Hz sine sweep, 2g acceration			
Surge capability:	L-N:	6kV	SD – L/N:	4kV
	L/N– Equi:	6kV	SD – Equi:	4kV
Galvanic isolation primary/secondary : *(Remark)*	3,75 kVrms			
Approvals:	CE EAC 10 DVE			

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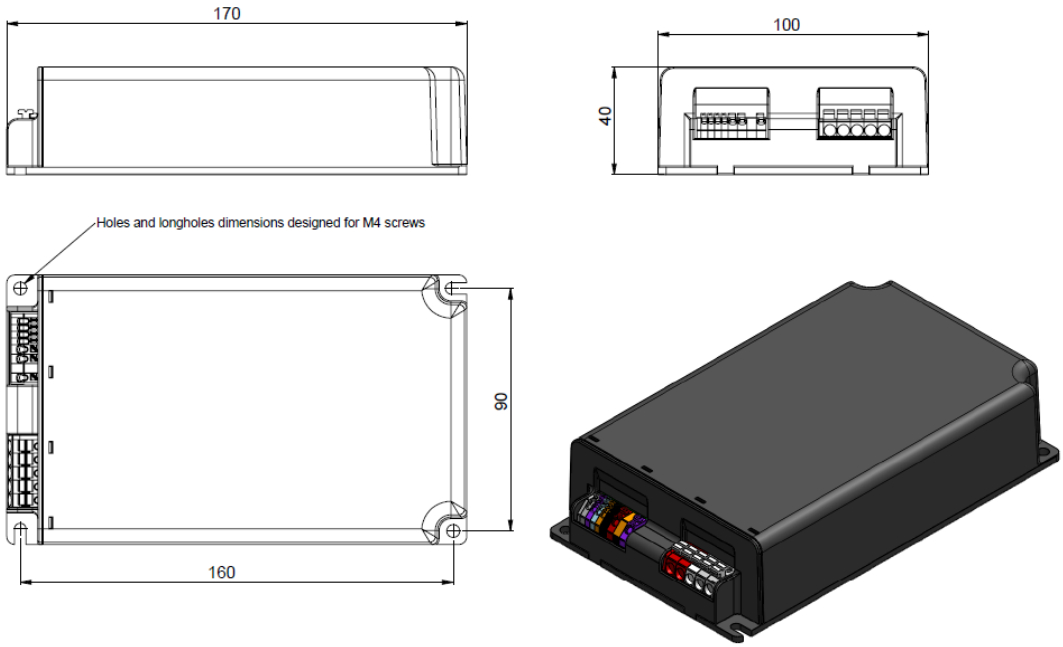
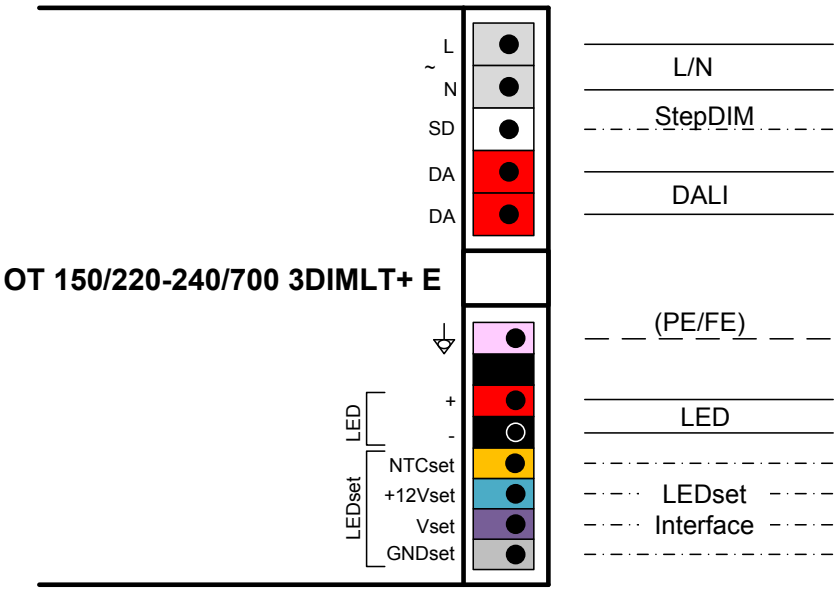
Geometry



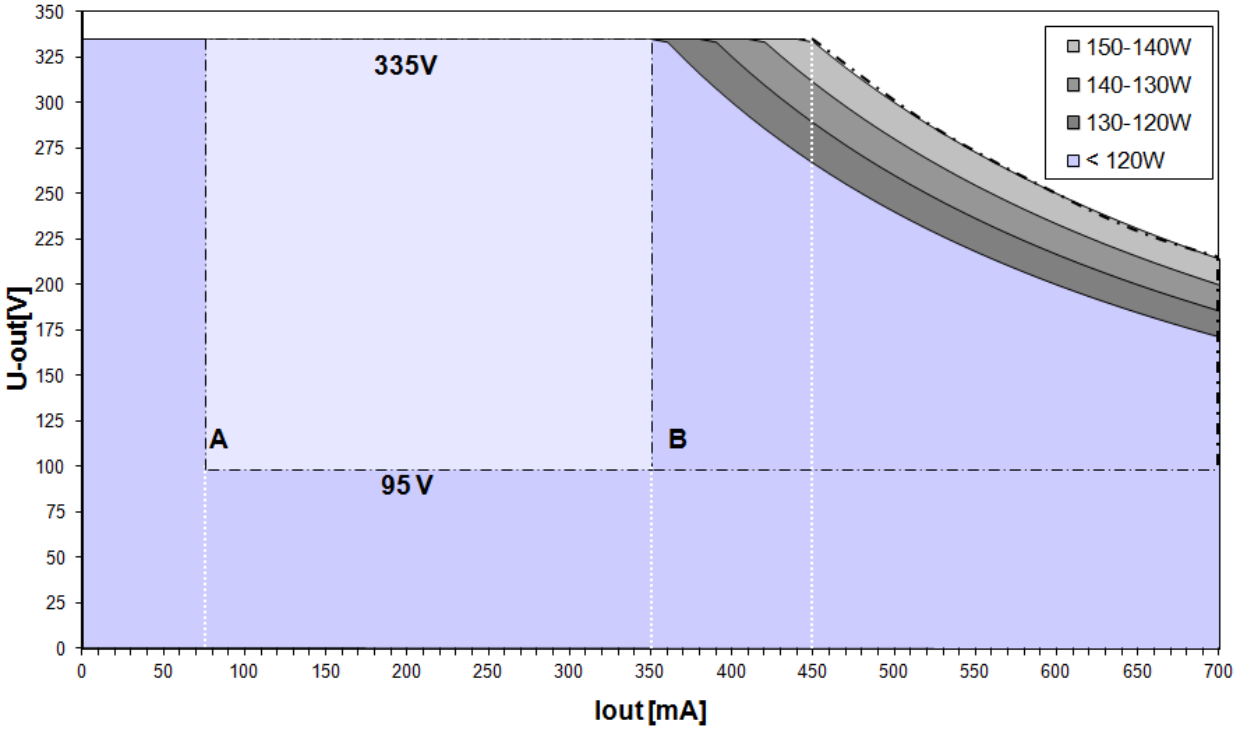
Ordering/Version information

	Version	EAN 10 (1 pc)	EAN 40 (10 pcs)
OT 150/220-240/700 3DIMLT+ E	AA33559	4008321978202	4008321978219

Wiring diagram

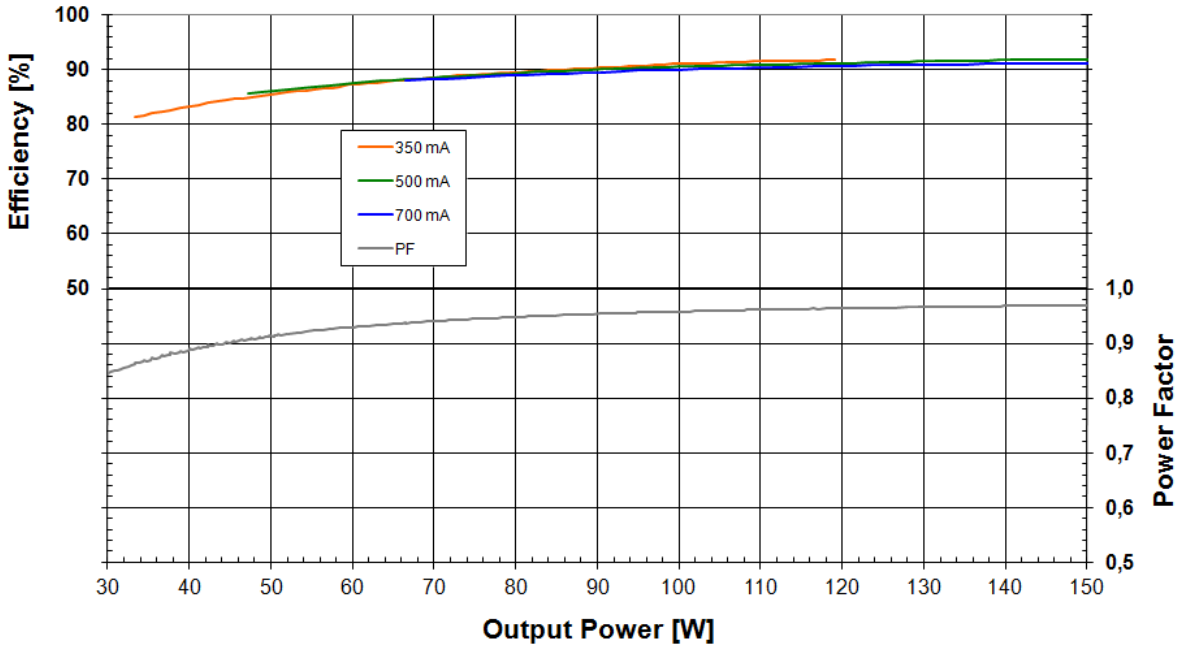


Output Characteristics

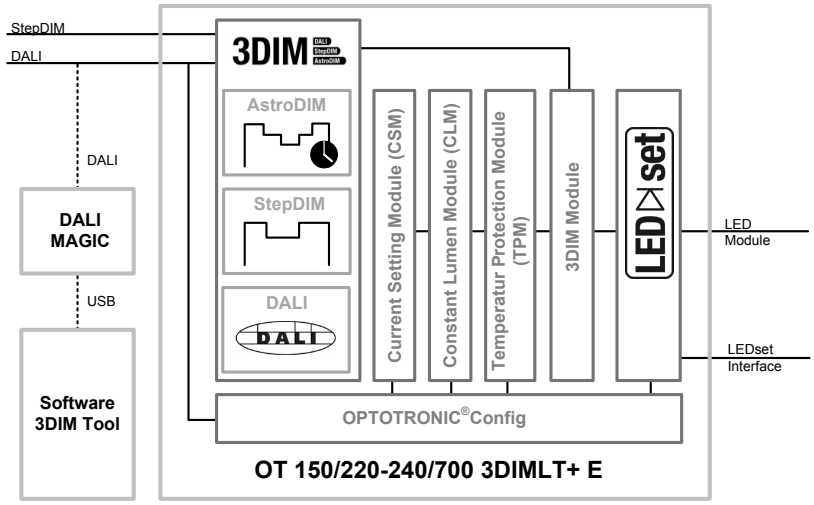


[B] Nominal/Rated Operating Range, [A] + [B] Output Current Range

Typical Efficiency and Power Factor versus Load



3DIM / LEDset interface



This control gear is fully programmable. The different configuration modules [Current Setting Module (CSM), Constant Lumen Module (CLM), Temperature Protection Module (TPM) and 3DIM] could be set via the 3DIM Tool (software) in combination with the DALI Magic (interface USB/DALI)**.** The maximum operating current of the control gear should be set within the rated current range (*CSM Module*). The 3DIM, Constant Lumen (*CLM)*, Temperature Protection Module (TPM) and LEDset module varies the output current relative to the set maximum operating current I_{max}. The default value of I_{max} is 700mA.

Iout[mA]= I_{max}(*CSM Module* [mA]) x *CLM Module*[1)][%] x TPM Module[1)][%] x LEDset [%] x 3DIM Module[1)][%]

3DIM Interface

One of the 3DIM operation modes (DALI, StepDim (Bi-Power) and AstroDIM) could be set either by external wiring or by software configuration. Parameters, which define the dimming behaviour, could be configured by the 3DIM Tool (software). The control line to activate the StepDIM should only be connected to the SD port of the 3DIM ECGs. In all other cases, it is recommended to use a relay in between. Further information regarding functionality, wiring and operation could be found in the 3DIM application guide under www.osram.com/3DIM.

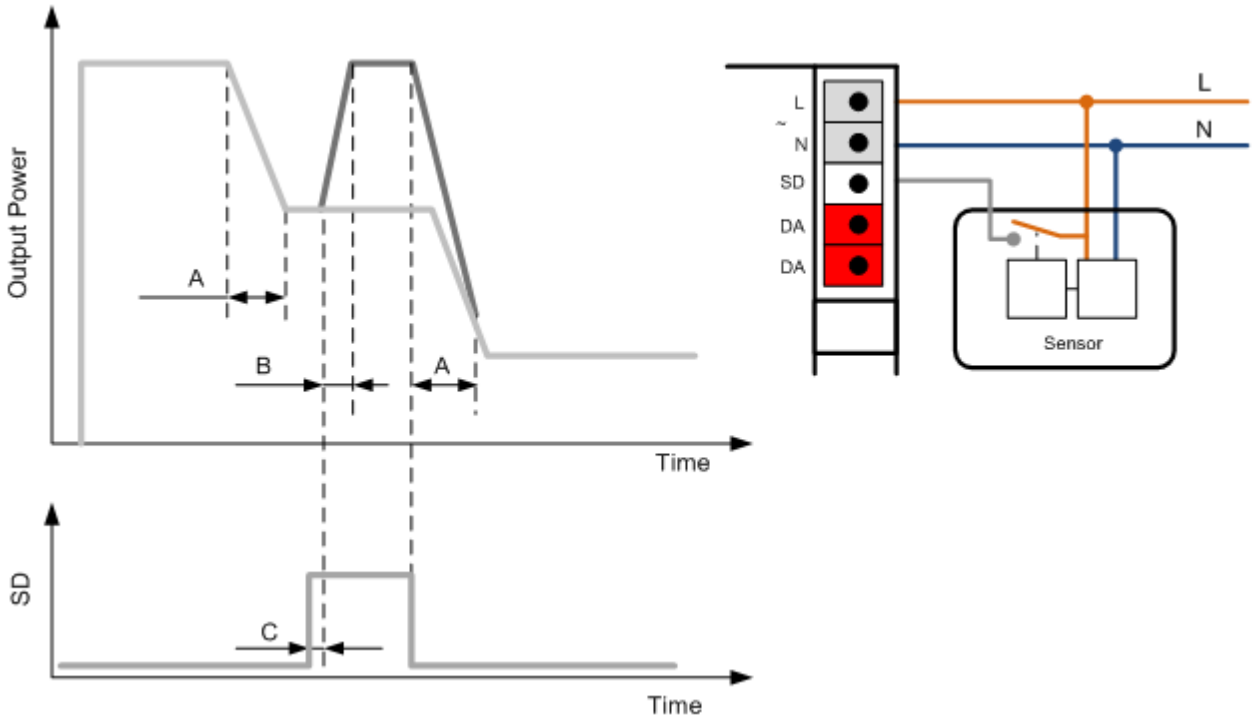
Following default factory settings are stored in the device:

Parameter	StepDIM	AstroDIM
Fading-Time	180 sec	180 sec
Dim Duration 1	Dependent on StepDIM Pin	6 h
Dim Timeshift 1	Not necessary	1 h
Nominal Level	100%	100%
Dim Level 1	50%	50%

Example AstroDIM: In case the ECG is switched on at 18 o'clock and off at 6 o'clock, the dim period would start at 22 o'clock and ends at 4 o'clock.

Diasble AstroDIM / Presence Detection

Only in this operating mode (AstroDIM/DALI) a high level (active phase) on the SD-Pin switches the 3DIM output level to the “POWER ON LEVEL” in case the signal is applied longer than 750ms [C]. The fade up time [B] is defined by the set “DALI FADE TIME” [0..90sec, default=0sec] and the fade down time [A] by set ”DIM FADE TIME” [0..720 sec, default= 180,8 sec]. This functionality could be used to deactivate dimming in AstroDIM mode or in combination with a presence detection system.



LEDset interface

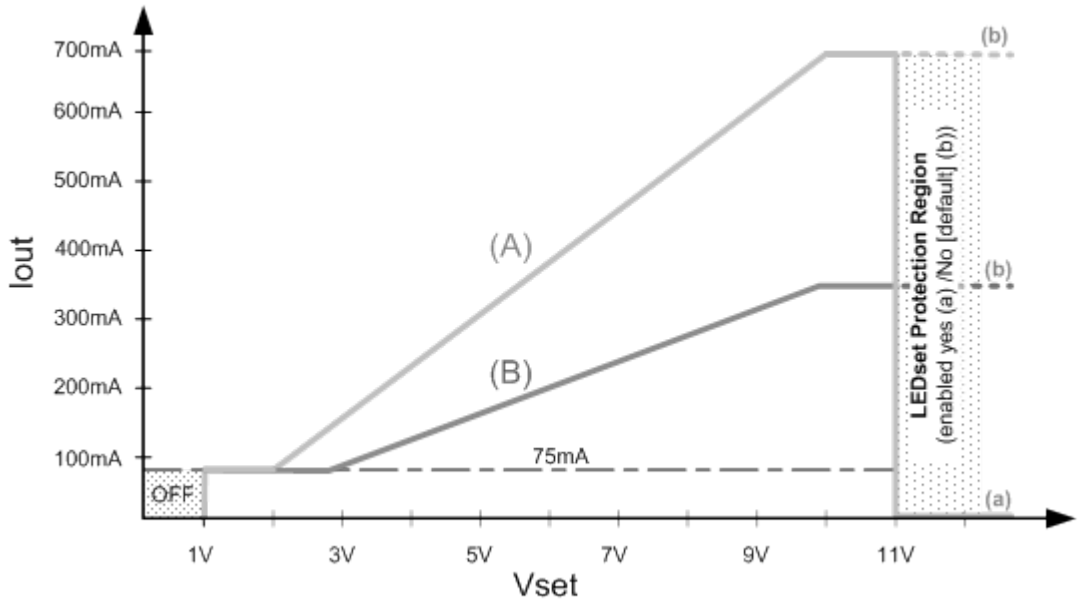
LEDset allows controlling the output current of the control gear. The input voltage of the Vset terminal defines the output current relative to the programmed maximum operating current I_{max} of the control gear (*CSM Module*) and the actual settings of the different modules.

LEDset interface is not isolated to the secondary side of the LED driver output.

NTCset	NTC Input, referenced to GNDset
+12Vset	Auxiliary supply 12V +15/-8%, 15mA max.
Vset	Signal input, included current source 274µA 0V < Vset < 12V +15%
GNDset	Reference ground for +12Vset, NTCset and Vset

LEDset [%] = (Vset-1V)/(10V-1V)

The relation between input voltage and output current is as following:



Case A: I_{max} =700mA, CLM disabled, 3DIM Module = 100%
Case B: I_{max} =350mA, CLM disabled, 3DIM Module = 100%

Note: To prevent LED modules to be damaged by high current due to broken wires on the LEDset interface, the LED current is turned off. This protection mechanism is not Enabled by default, and could be Enabled by 3DIM Tool (software)
Further information regarding functionality and operation could be found under www.osram.com/LEDset

Temperature sensor (NTC)

This control gear offers two further possibilities (Standard/Flexible) to set the temperature protection of the LED module or the luminaire. An external temperature sensor (NTC) must be connected between GNDset and NTCset.

2.2.1.1 Standard (resistor value based), default

If the NTC value falls below a resistance of 6,3 kOhm, the LED power supply starts derating down to 50% and switches the LED Output off if the resistance falls below 4,3 kOhm. The modules are switched on again as soon as the NTC resistance exceeds 5,00 kOhm.

NTC Type	Start Derating Temperature [6,3 kOhm]	End Derating, Switch On Temperature [5,0 kOhm]	Switch Off Temperature [4,3 kOhm]
22K	56 °C	62 °C	67 °C
33k	66 °C	72 °C	77 °C
47k	75 °C	83 °C	87 °C
68k	85 °C	92 °C	97 °C

The threshold would vary on the used NTC component and tolerance

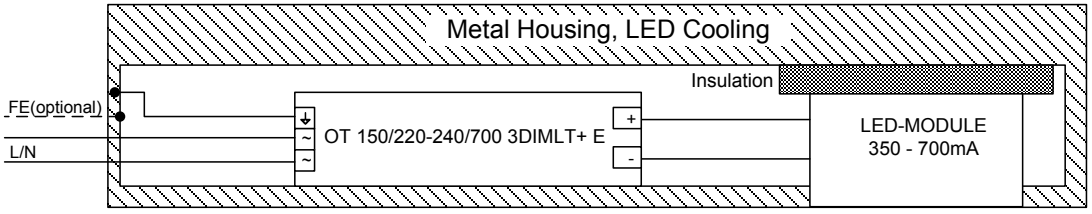
2.2.1.1 Flexible (NTC based)

By default following NTC types are supported in this operating mode:
- Murata 15K 5% NCP18XW153J03RB
- Murata 10K 5% NCP18XH103J03RB
- Murata 15K 3% NCP15XW153E03RC plus a 390 Ohm serial resistor.

The derating curve could be set via the 3DIM Tool (software).

Equipotential Pole

To improve EMI and surge withstand capability of the luminaire, it is recommended to assembly both the control gear and the LED module directly to the same metal part, or to different metal parts electrically connected together. The equi-potential terminal (pink color) of the control gear shall be connected to this metal part, keeping the connection wire as short as possible.



Wrong Wiring

This control gear is inherently protected against wrong wiring. The wrong connections between LED+ with Vset, NTCset and GNDset could damage irreversibly the ECG. All the other wrong wirings, once removed, make the ECG work regularly. LED- and GNDset terminals cannot be connected together.

Installation notes

Live parts of the ECG are separated by double/reinforced insulation against the outer surfaces of the ECG except in the area around the terminals.The luminaire manufacturer is responsible for providing the required clearances and creepage distances and also for the protection against electrical shock, especially for the line and load wires according EN 60598.

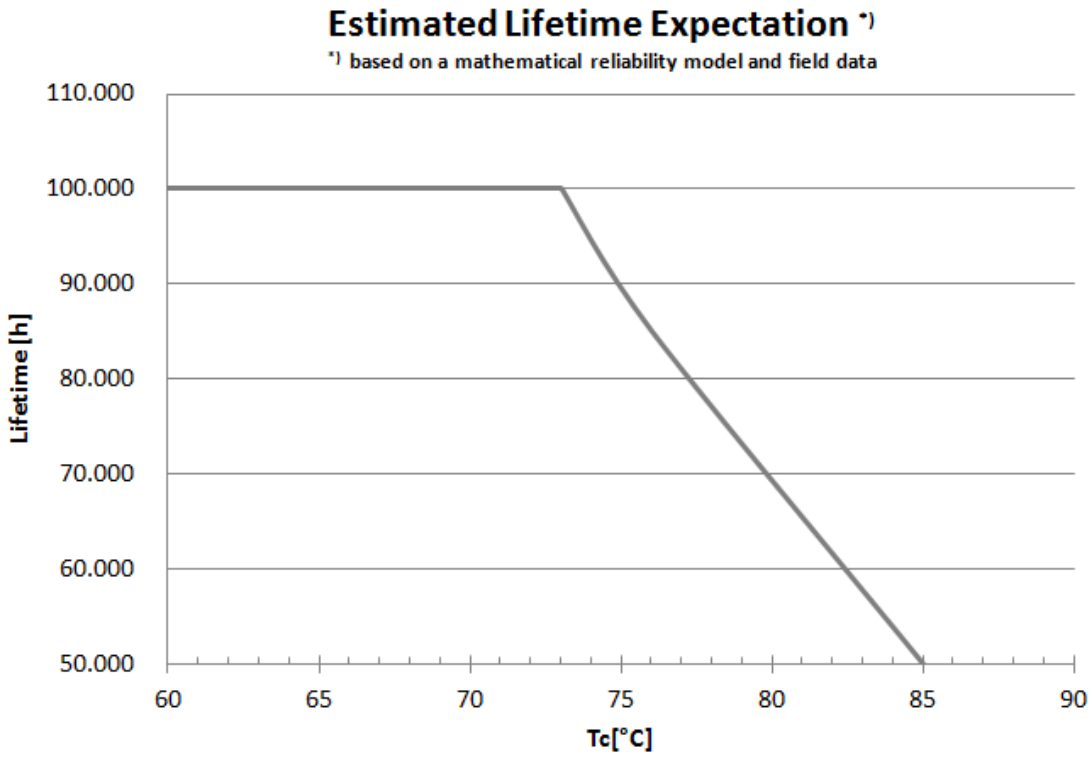
Insulation

	L/N	SD	Equi	DALI	LEDset	LED
L/N	-	-	3750V	1500V	3750V	3750V
SD	-	-	3750V	1500V	3750V	3750V
Equi	3750V	3750V	-	2250V	3750V	3750V
DALI	1500V	1500V	2250V	-	2250V	2250V
LEDset	3750V	3750V	3750V	2250V	-	-
LED	3750V	3750V	3750V	2250V	-	-

Instruction sheet

Please consult the instruction sheet for further important information on e.g. wire stripping and wiring limitations in system installations. The instruction sheet is enclosed with the device or available upon request.

Annex


Estimated Lifetime Expectation *)
*) based on a mathematical reliability model and field data
110.000
100.000
90.000
80.000
70.000
60.000
50.000
Lifetime [h]
60
65
70
75
80
85
90
Tc[°C]