

OPTOTRONIC®

OT DALI 45/220-240/700 LTCS

700mA Constant Current LED Power Supply with DALI and LEDset/DIPswitch

Technical
Information
Edition: Dec. 2012
subject to change






Technical data



Reference:	OT DALI 45/220-240/700 LTCS
For LED modules:	350 - 700 mA LED
Nominal Voltage:	220 – 240 V _{AC/DC}
Line Current, nominal:	225 mA @ 230V
Mains Frequency:	0/50/60 Hz
Protection Class:	II
(Remark)	suitable for class I and class II luminaires
Output Current:	50 - 700 mA _{DC}
(Remark)	+/- 5% (Nominal 350-700mA), see load diagram 350/500/700mA selectable by DIPswitch
Output voltage:	35 - 120 V _{DC}
(Remark)	maximum 120V _{DC}
Output Power:	45 W
(Remark)	Nominal minimum Load = 13W, see load diagram
Rated Power factor:	> 0,95 (full load) @ 230V > 0,90 (half load) @ 230V
Power Loss:	7 W max.
ECG efficiency:	87 %
(Remark)	full load at 230V
Power Loss in standby mode	1,5 W
(Remark):	typical
Input Voltage:	195 – 264 V _{AC}
(Remark)	Permitted voltage range
DC Voltage:	176 – 276 V _{DC}
(Remark)	Permitted voltage range
Dimmable:	DALI / Touch DIM / Touch DIM Sensor
(Remark)	DALI acc. to IEC 62386-101, IEC 62386-102, IEC 62386-207
Dimming Range:	7% - 100% / 14% -100%
(Remark)	for 700mA / 350mA Amplitude modulation
Internal Control:	LEDset
No-load proof:	Yes
Hot plug functionality:	Yes
Short circuit protection:	Automatic, reversible
Overload protection:	Automatic, reversible
Overtemperature protection:	Automatic, reversible
Ambient temperature range, t _a :	-25 °C to +50 °C
Max. case temperature at t _c point:	85°C
Max. case temperature at t _c point in emergency mode	98 °C
ECG Lifetime:	50.000 h
(Remark)	At t _{case} = 75 °C at t _c point and 10% failure rate

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Maximum casing temperature in case of fault:	110 °C
Inrush current:	25 A
<i>(Remark)</i>	$t_{width} = 260 \mu s$ (measured at 50% I_{peak})
Max. no. of ECG @ circuit breakers 10 A (B type):	18
Max. no. of ECG @ circuit breakers 16 A (B type):	47
Max. no. of ECG @ circuit breakers 16 A (B type): in combination with EBN-OS	64
Terminal:	Mains (grey) DALI (red) Functional earth (grey) LEDset (grey [GNDset], purple [Vset], orange [NTCset]; blue [+12Vset]) LEDModule ([+] red/ [-] black)
Cable cross section input side:	0,2 mm ² – 1,5 mm ²
<i>(Remark)</i>	Solid and flexible
Wire preparation length Input side:	8,5 – 9,5 mm
Cable cross section output side:	0,2 mm ² – 1,5 mm ²
<i>(Remark)</i>	Solid and flexible
Wire preparation length output side:	8,5 – 9,5 mm
Max. cable length - system:	2 m
Geometry (l x b x h):	123 x 79 x 33 mm (K3)
Weight:	240 g
IP Code:	IP20
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
Emergency lighting	Suitable for Emergency Luminaires acc. to IEC 60598-2-22
Emergency Ballast Lumen Factor (EBLF) at 25 °C	≥ 0,98
Surge capability:	L-N: 1kV, L/N – Functional Earth: 2kV
Galvanic isolation primary/secondary :	3,75 kVrms
<i>(Remark)</i>	SELV equivalent
Approvals:	  

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Ordering/Version information

	Version	EAN 10 (1 pc)	EAN 40 (20 pcs)
OT DALI 45/220-240/700 LTCS	AA32184	4008321819192	4008321819208

Remark:

An optional cable clamp is available. This cable clamp can be snapped onto the ECG and thus converts it into an ECG suitable for independent installation. Suitable cables are listed in cable clamp datasheet.

	EAN 10 (1 pc)	EAN 40 (10 pcs)
QT Cable Clamp K3	4008321190741	4008321190758
OTp Cable Clamp	4008321966155	4008321966162

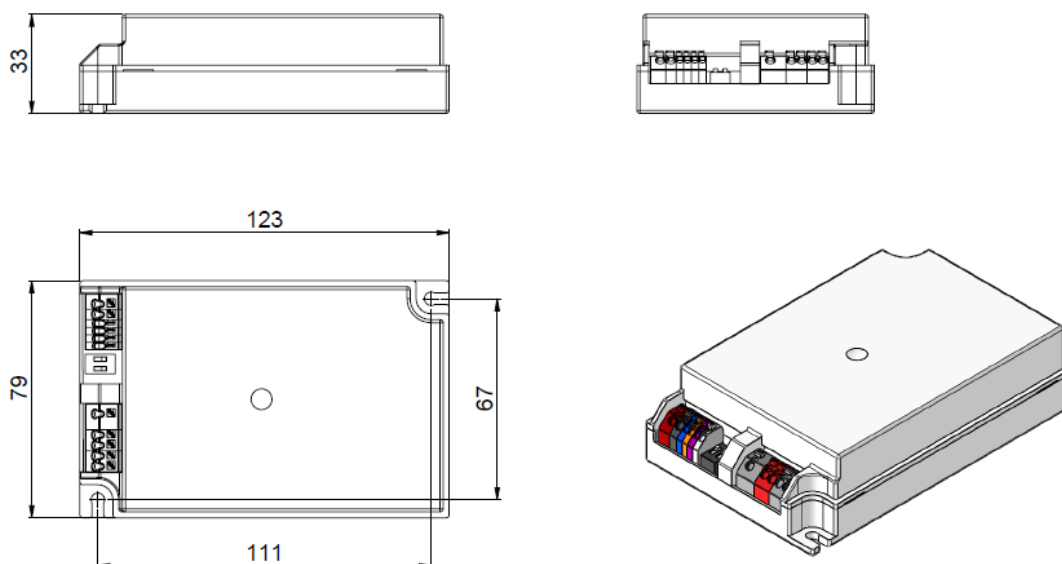
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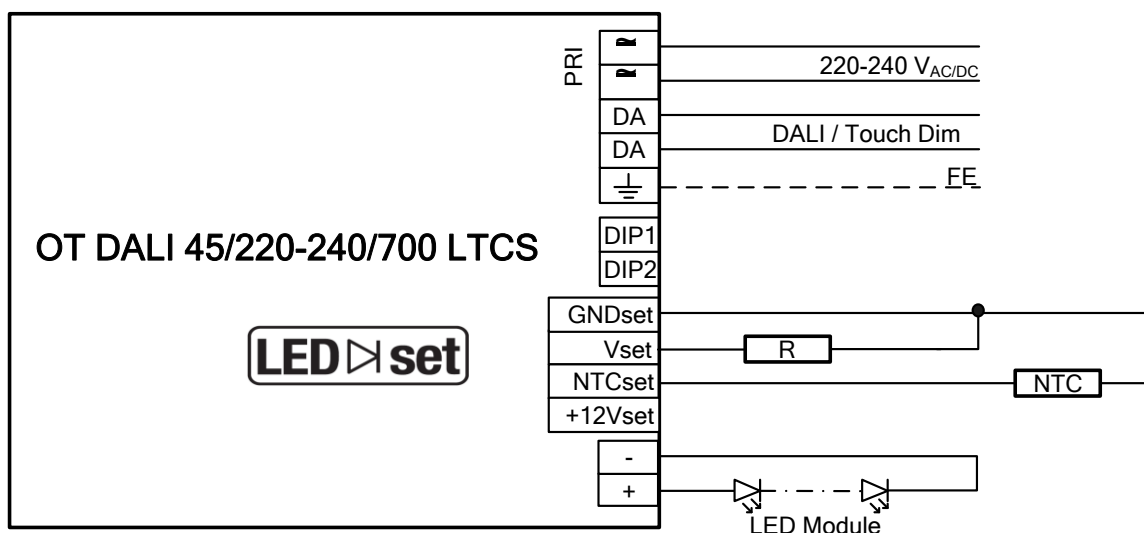
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Geometry

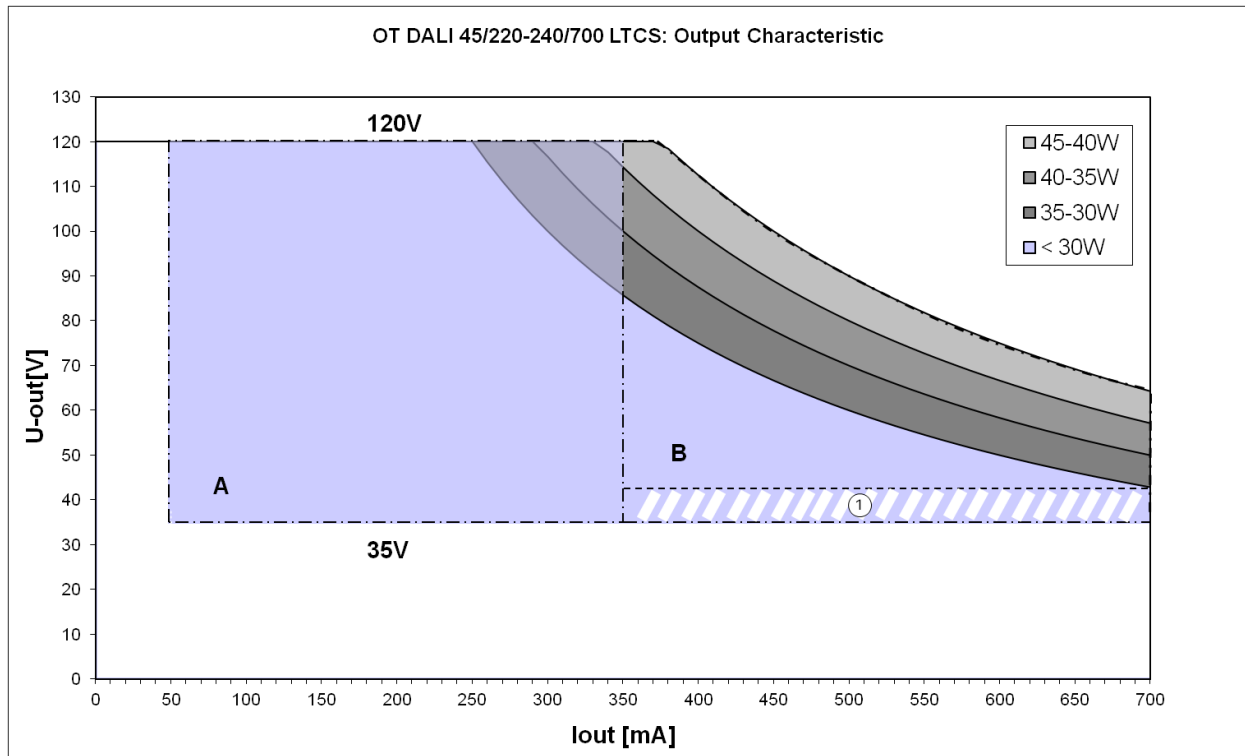


Wiring diagram



Connection example. LEDSet (Vset/NTCset) and DALI/TouchDIM connections are optional

Output Characteristics



[B] Nominal Operating Range, [A] + [B] Absolute Output Power Range

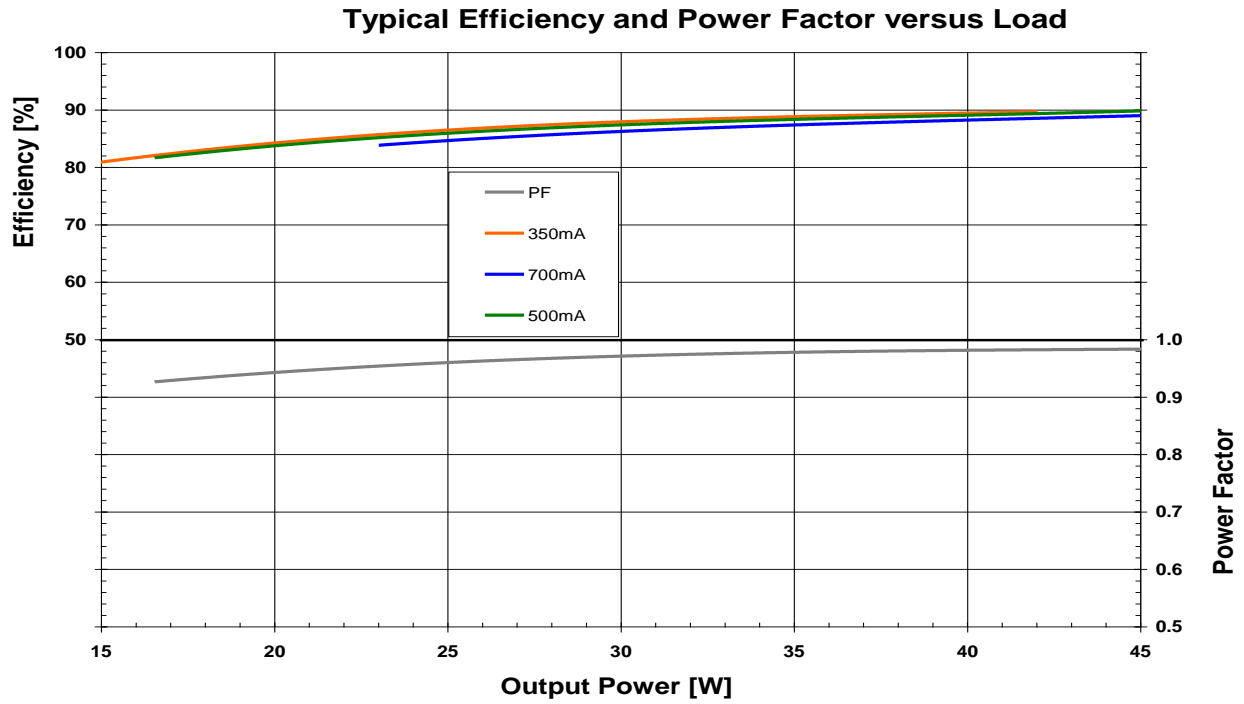
NOTE (1): The forward voltage of LED modules may vary significantly with temperature and current. Dimming down typically reduces the forward voltage. **Ensure the forward voltage of LED modules is always $\geq 35V$, even when dimmed down**, otherwise the reversible protection is triggered resulting in no output power.

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DIPswitch

The nominal output current of the constant current LED power supply is set either by the DIPswitch and the LEDset interface:

Setting	DIP1	DIP2	I _{out_nom}	P max	Vset Open, NTCset open, no digital dimming
D	Off	Off	700mA	45W	I _{out} = 0mA ²⁾
C	On	On	350mA	42W	I _{out} = 350mA
B	On	Off	500mA	45W	I _{out} = 500mA
A ¹⁾	Off	On	700mA	45W	I _{out} = 700mA

1) Factory setting

2) LEDset interface unplug protection is enabled

Settings A, B, C are intended to set the nominal output current to one of the standard values (350,500,700) and optionally use Vset, NTCset and DALI/TouchDIM to dim down the current.

Setting D is intended to use the LEDset interface to define the nominal output current level in the range 50 – 700mA, see the OPTOTRONIC_LEDset_Application_Guide for further details.

Settings A and D differ from the protection against accidental LEDset interface disconnection (enabled in D)

The maximum output current is controlled by the Vset input voltage as following:

I _{out_max}	Vset	DIP switches setting
$I_{out_nom} \cdot (V_{set}-1) / 9$	1V .. 10V	A, B, C, D
0 mA	0V .. 1V	A, B, C, D
I _{out_nom}	10V .. 12V	A, B, C
I _{out_nom}	10V .. 11V	D
0 mA	11V .. 12V	D

LEDset interface

LEDset allows to control the output current of the control gear (ref. to LEDset application note). The input voltage of the Vset pin defines the output current relative to the maximum nominal current of the control gear.

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

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

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

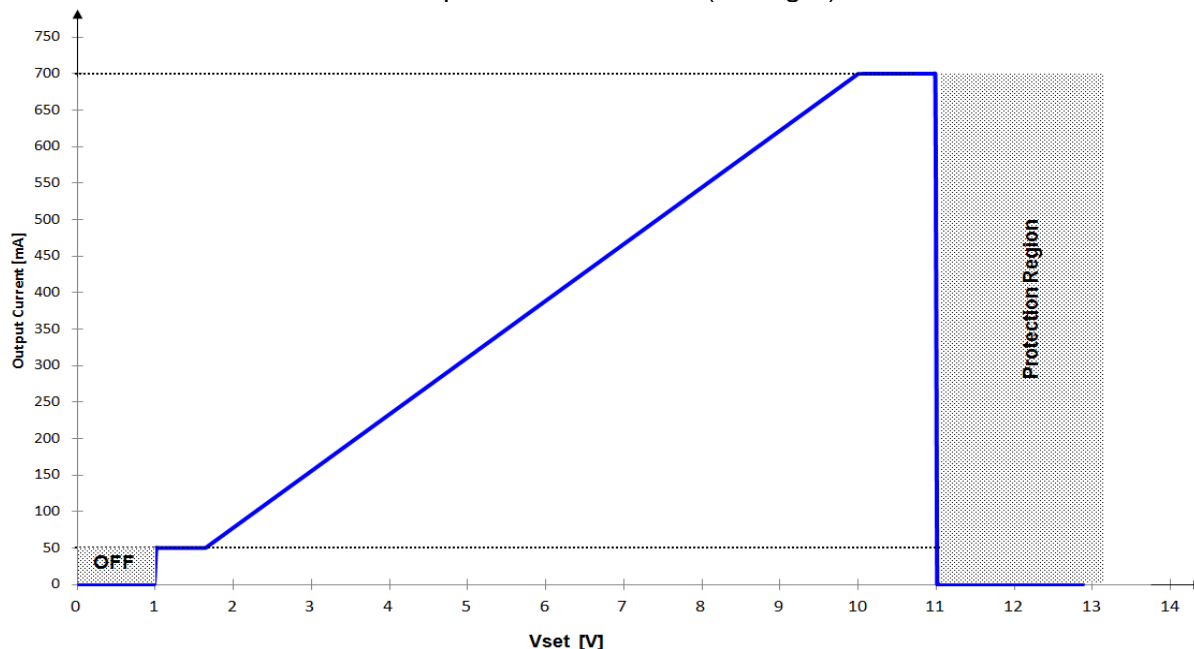
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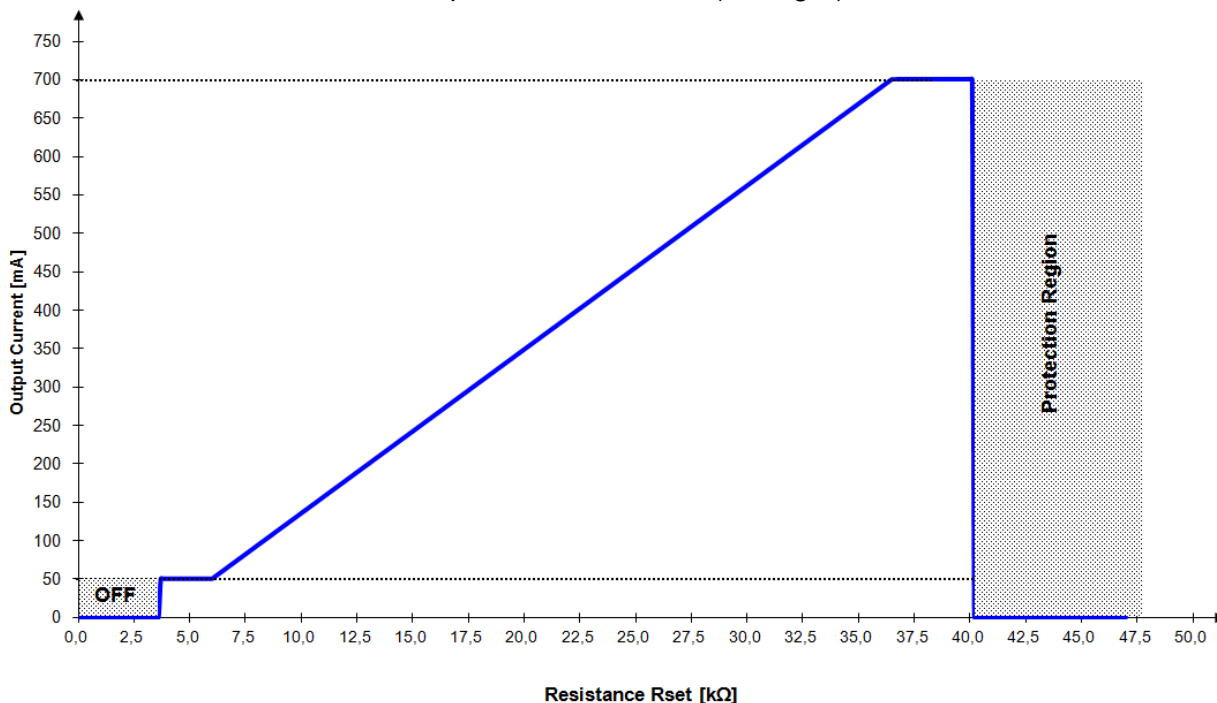
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Output current vs. Vset (setting A)



$$I_{out} = I_{OUT_NOM} \frac{(V_{set} - 1V)}{(10V - 1V)} \text{ between } I_{min} \text{ and } I_{max}$$

Output current vs. Rset (setting A)

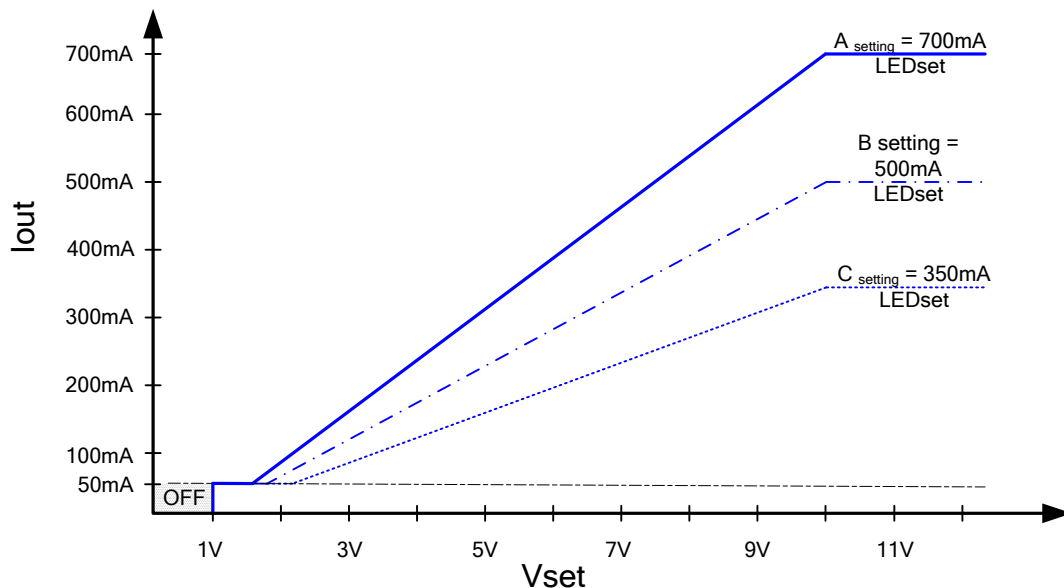


Ex. 47kOhm +/-20% Potentiometer to set the output current

$$R_{set} = \frac{1}{274\mu A} \left[\frac{I_{out}}{I_{OUT_NOM}} * (10V - 1V) + 1V \right] [\Omega] \text{ between } I_{min} \text{ and } I_{max}$$

LEDset and DIPswitch

The output current could also be set in combination with the DIPswitch current pre-selection (350,500 and 700mA) and the LEDset interface. In those three operation modes the ECG does not switch off as soon as Vset exceeds 11V (no protection region).



Temperature sensor (NTCset)

The optional external temperature sensor (NTC) must be connected between GNDset and NTCset. The Iout_nom is linearly reduced from 100% down to 50% depending on the NTC resistor values respectively from 6.3kΩ down to 5.0kΩ, with lower values until 4.3kΩ the output current remain at 50% and then it is switched OFF (it turns ON again automatically with values greater than 5.0kΩ).

The following table reports some example of typical NTC values (Murata NCP18) and related temperature thresholds (NTC resistor tolerance may affect the threshold).

NTC Type [kΩ]	Start Temperature Derating [6.3kΩ] °C	End Temperature Derating [5.0kΩ] °C	Shut down Temperature [4.3kΩ] °C
10	37.7	44.4	49.0
15	45.7	51.7	55.7
22	55.8	62.2	66.5
33	65.8	72.4	76.8
47	75.5	82.5	87.1
68	85.0	92.1	96.9
100	96.0	103.5	108.6

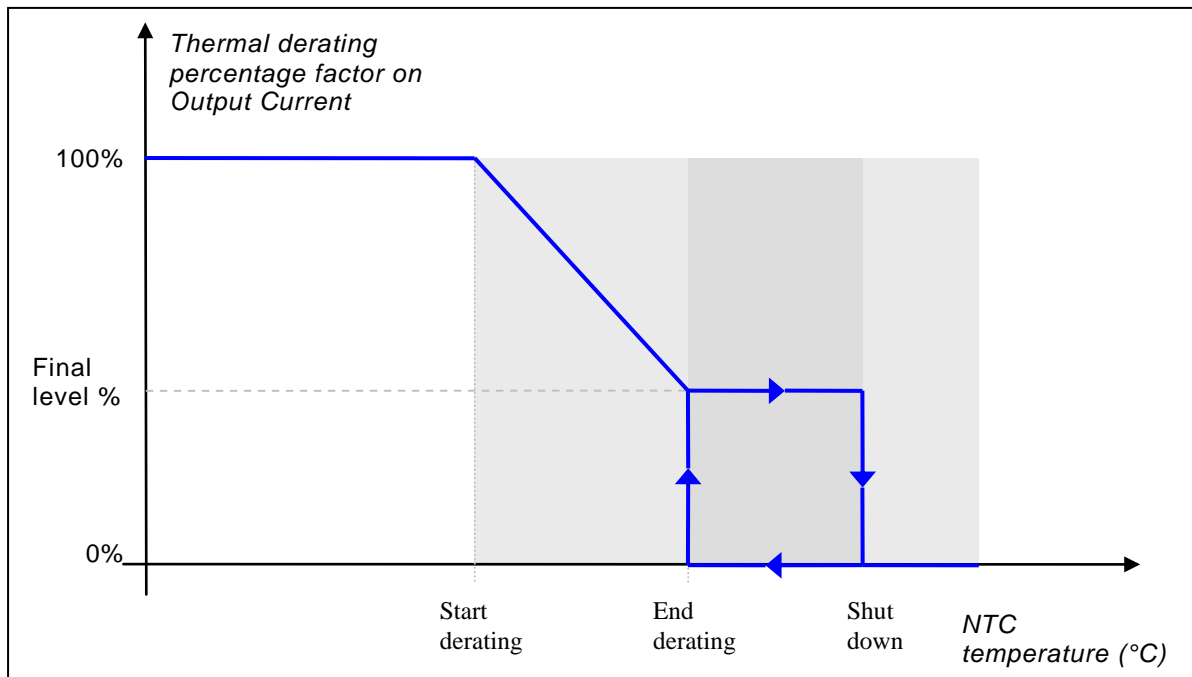
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Threshold would vary on the used NTC component and tolerance.



Internal Thermal protection

The LED power supply is equipped with an integrated temperature protection system, in addition to the external temperature sensor (NTCset). If the product operates at too high temperature, the output current I_{out_nom} is reduced by 50%; the protection is reversible.

DALI operation mode / TouchDIM

The Max DALI level and the Min DALI level parameters are automatically adapted to the Minimum Physical Level each time the user modify the DIPswitch position, the LEDset setting or the dimming curve type is changed from log. to lin. and vice versa.

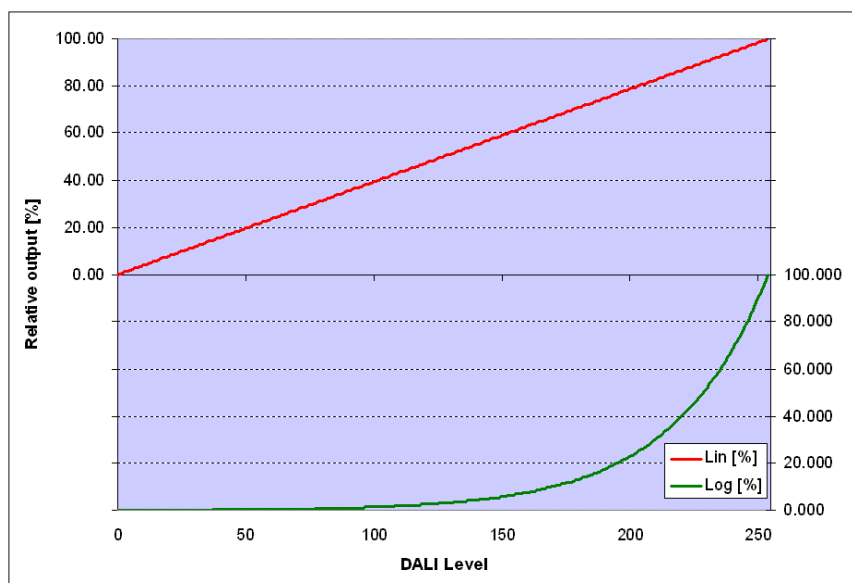
DIP switch	Ledset	DALI physical min Log Curve	DALI physical min Lin Curve
700mA	100%	157	18
700mA	50%	182	37
500mA	100%	170	26
500mA	50%	196	51
350mA	100%	182	37
350mA	50%	208	73

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DC Operation

The power supply can operate also in DC voltage range from 176Vdc to 276Vdc at T_{amb_MAX} 50°C.

Earth connection

Earth connection is not required but may be used to improve EMI performance of the installation.

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 on the secondary side, once removed, make the ECG work regularly. LED- and GNDset terminals cannot be connected together. Vset should not be applied with a voltage in case the power supply isn't supplied.

General notes



Proper and safety usage and installation of the product shall comply to product datasheet, OPTOTRONIC Technical guide, DALI Technical Guide and LEDset application guides. Refer to the latest guides versions available at www.osram.com

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Installation notes

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.

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.