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LED Driver

Indoor 15W Dimmable SI-EPD006460EU



SELV Constant Current LED Driver Wide Operating Range up to 700 mA – Dimmable

Features & Benefits

- Output Current Range: 180 ~ 700 mA (adjustable via LEDset)
- Output Voltage Range: 12 ~ 54 Vdc (SELV equivalent)
- Output Power Range: 7 ~ 27 W
- Dimming Control: DALI, smart dimming down to 1 %
- Input Voltage: 220 ~ 240 V
- Protections: Overload, No Load, Short Circuit, Over Temperature, Over Voltage, Load Hot Plug
- t_a Range: -20 ~ +50 °C
- Expected Lifetime: 100,000 hours at $t_c = 65$ °C
- Long lasting & high reliability
- Very low output current ripple
- Built-in mounting
- Extra small compact housing

Applications

- Downlights, Spotlights and other Indoor Lighting Applications
- Office – Industry – Shop
- Suitable for emergency lighting units



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1. Characteristics

Article	Symbol	Specification			Unit	Note
		Min.	Typ.	Max.		
INPUT SPECIFICATIONS						
Nominal Voltage	V _{in}		220 ~ 240		V _{ac}	
Nominal Frequency	f _{in}		0 / 50 / 60		Hz	Incl. DC or pulse DC
AC Voltage Range		198		264	V _{ac}	
DC Voltage Range		176		276	V	DC or pulse DC
Maximum Voltage				280	V _{ac}	2 hours max. (unit might not operate in this abnormal condition)
Nominal Current	I _{in}		140		mA	
Total Harmonic Distortion	THD			15	%	At full load, 220-240 V, 50 Hz (see graph)
Power Factor	PF	0.95			-	At full load, 220-240 V, 50 Hz (see graph)
Efficiency	η	86			%	At full load, 220-240 V, 50 Hz (see graph)
Power Losses				5	W	At full load
No-load Power			n/a		W	Load switching on output side is safe but not permitted
Stand-by Power				0.35	W	
Protection Class			II		-	Suitable for class I and II luminaires
In-rush Current				20	A _{pk}	t _{width} = 100 μs typ. (at 50% I _{peak})
Units per Circuit Breaker				B16: 80 B10: 45	-	I _{max} = 20 A, t _{width} = 100 μs
OUTPUT SPECIFICATIONS						
Nominal Voltage	V _o		12 ~ 54		V _{dc}	With load
Max. Voltage				60	V _{dc}	Open circuit, No-load protection, restart trials every 1-3 s
Nominal Current	I _o		180 ~ 700		mA	LEDset open: 90 mA LEDset short: 500 mA ±5 % through LEDset interface
Current Ripple				2	%	Ripple / average at 100 Hz, full load
Nominal Power	P _o		7 ~ 27	27	W	LED output
Galvanic Isolation			SELV-equivalent			Output and LEDset to mains – Touch current < 0.7 mA
Touch Current				0.7	mA	According to EN 60598-1 annex G and EN 61347-2-13 annex A
Switchover Time				0.6	s	Both AC and DC mains

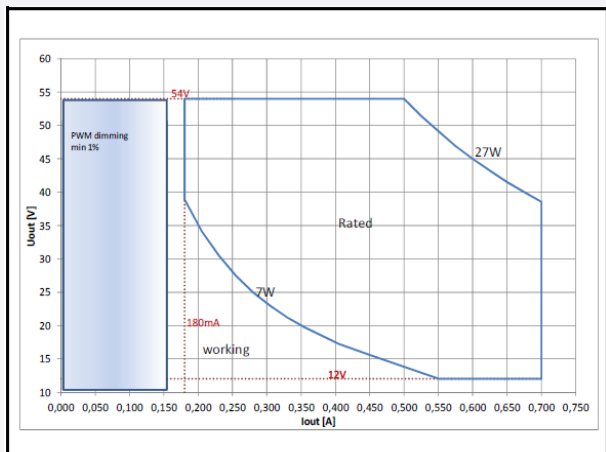
Article	Symbol	Specification			Unit	Note
		Min.	Typ.	Max.		
DIMMING SPECIFICATIONS						
Dimming Control			DALI			
Dimming Range			1 – 100		%	Of selected nominal current
Dimming Technique			Mixed			AM (>160 mA) + PWM (<160 mA)
Frequency		280			Hz	
Galvanic Isolation			Basic / Double			Basic: DALI to primary Double: DALI to secondary
ENVIRONMENTAL SPECIFICATIONS						
Ambient Temperature	t_a	-20		50	°C	
Case Temperature	t_c			75	°C	Measured at t_c point as indicated on the product label
Case Temperature in fault condition				110	°C	
Storage Temperature	t_s	-25		85	°C	Cool down before operating
Relative Humidity		5		85	%	Not condensing
Surge Transient Protection	L / N			±1	kV	According to EN 61547-5.7
IP Rating			IP20		-	Suitable for indoor environment
Mains Switching cycles		100,000			-	
Expected Lifetime		50,000			h	$t_c = 75\text{ °C}$, 0.2 % / 1000 h failure rate (14 h on / 10 h standby per day)
		100,000			h	$t_c = 65\text{ °C}$, 0.1 % / 1000 h failure rate (14 h on / 10 h standby per day)
Dimensions	L x W x H		103 x 67 x 29.5		mm	

Notes:

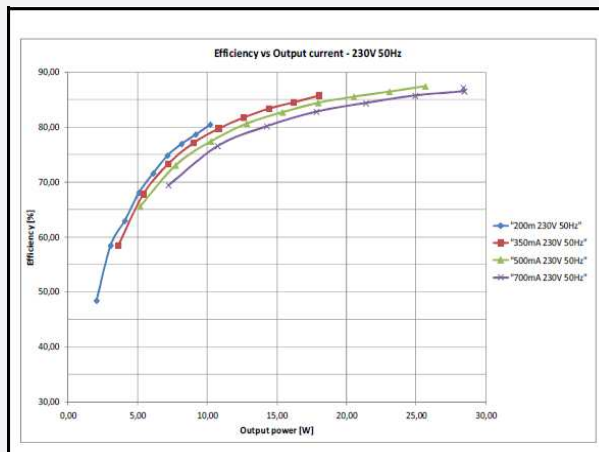
- Standards: EN 61347-1, EN 61347-2-13, EN 55015, EN 61547, EN 61000-3-2, EN 62384, EN 62386
- This LED Power Supply is suitable for emergency lighting fixtures according to EN 60598-2-22, with emergency output factor $EOF_1 = 0.15$ (default value) and related duration time of 10 h at least. Function in emergency is ensured up to $t_a = 80\text{ °C}$ and $t_c = 92\text{ °C}$.
- Max. 2 drivers per luminaire, each driver supplies separately its load (two or more units cannot be connected together on secondary side).

2. Typical Characteristics Graphs

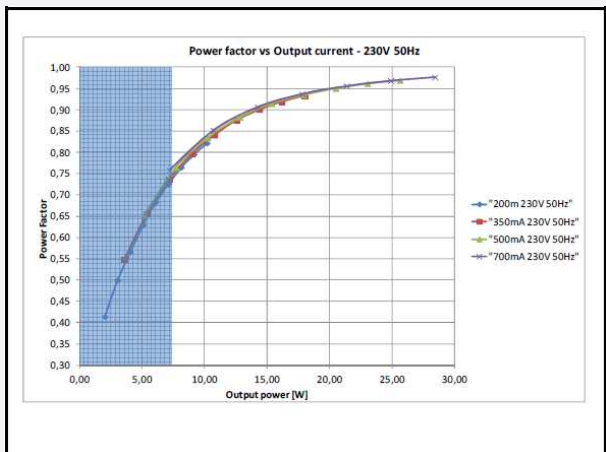
a) Operating Window



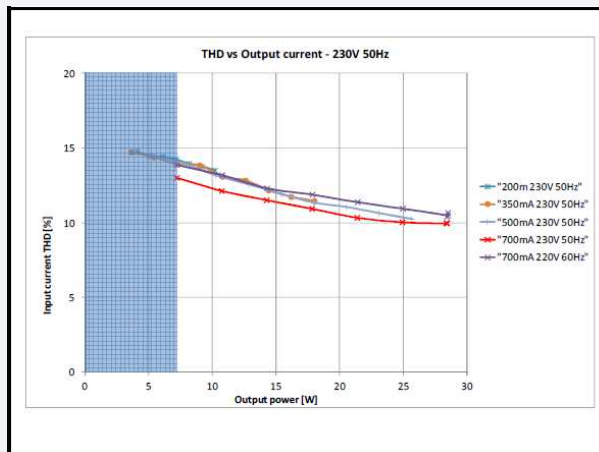
b) Efficiency vs. Load



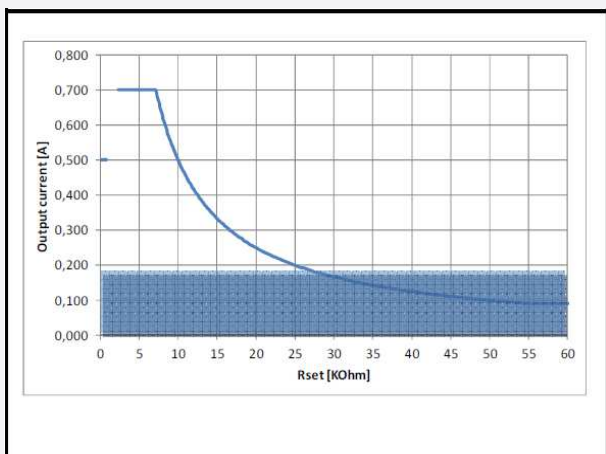
c) Power Factor vs. Load



d) Total Harmonic Distortion vs. Load



e) Output Current vs. Rset



Rset Formula and Standard Current Values

$$I_{OUT[A]} = \frac{5V}{R_{set[\Omega]}} \times 1000$$

I _{out} [mA] nominal	I _{out} [mA] actual	R _{set} [kOhm] E48 series
350	357	14
500	500	10
700	699	7.15

3. Protection

- **Input over voltage protection**

Mains up to 280 Vac, for two hours maximum, will not destroy both the unit and the load; shut down of load might occur in this condition.

- **Output short circuit / under voltage protection**

Shut down of load happens if output voltage is below 12 V (typ. 10 V); the unit automatically tries to switch on the load again every 1 s for 0.5 s delivering the selected nominal current.

- **Output overload protection**

The unit automatically reduces the output current to keep the output power below 27 W.

- **Output over voltage protection**

Shut down of load happens if output voltage exceeds 54 V (typ. 55 V); the unit automatically tries to switch on the load again every 1 s for 0.5 s delivering the selected nominal current.

- **No load operation**

The unit automatically tries to switch on the load delivering the selected nominal current; despite this operation mode is safe for both unit and load, it is not recommended. Do not put a switch between load and unit.

- **Over temperature protection**

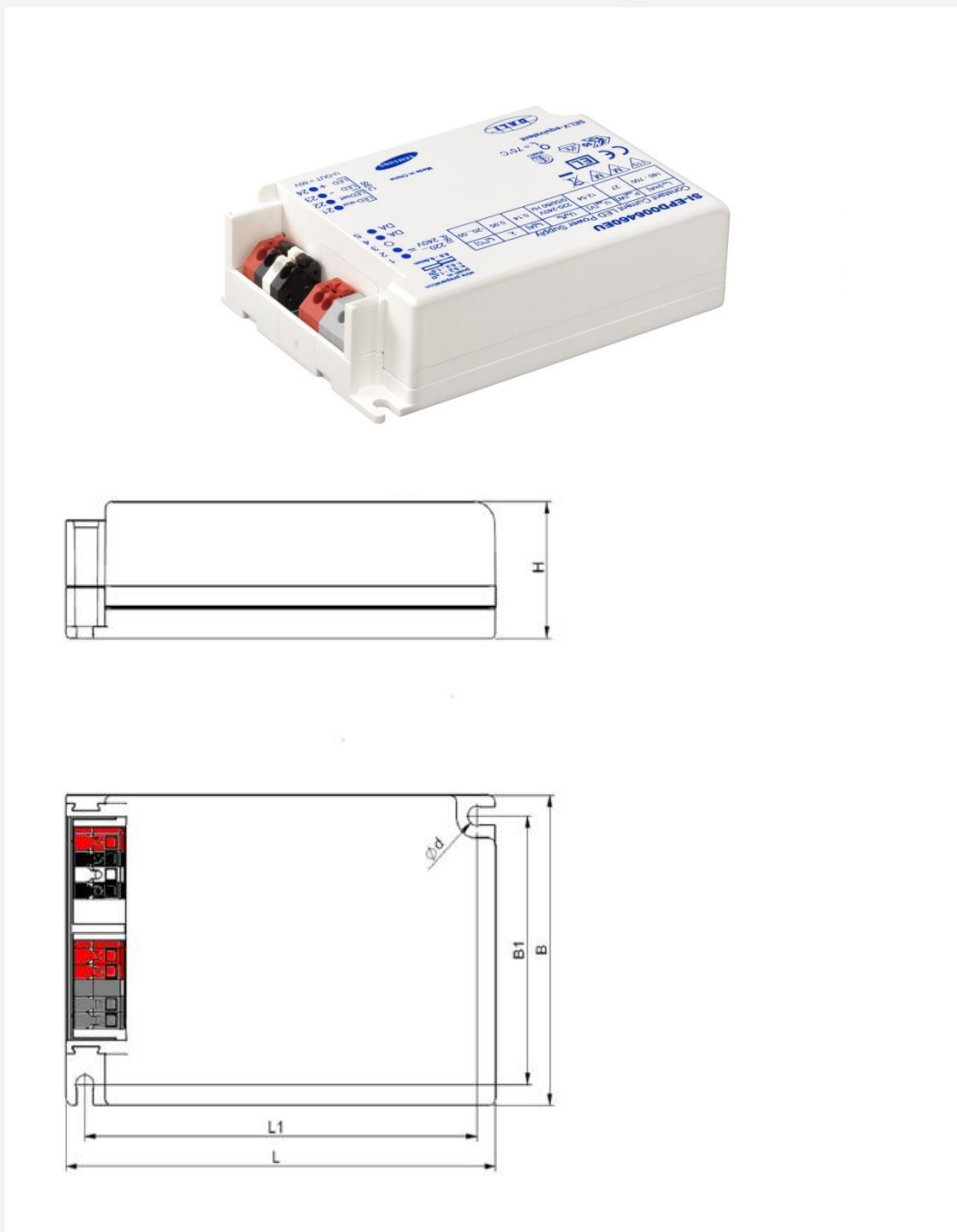
The unit is protected against temporary overheating by automatic reduction of the output current.
The protection is self restoring.

- **Load hot plug protection**

Connection of LED load on secondary side is allowed without damage to the LED; LED will turn on automatically.

4. Outline Drawing & Dimension

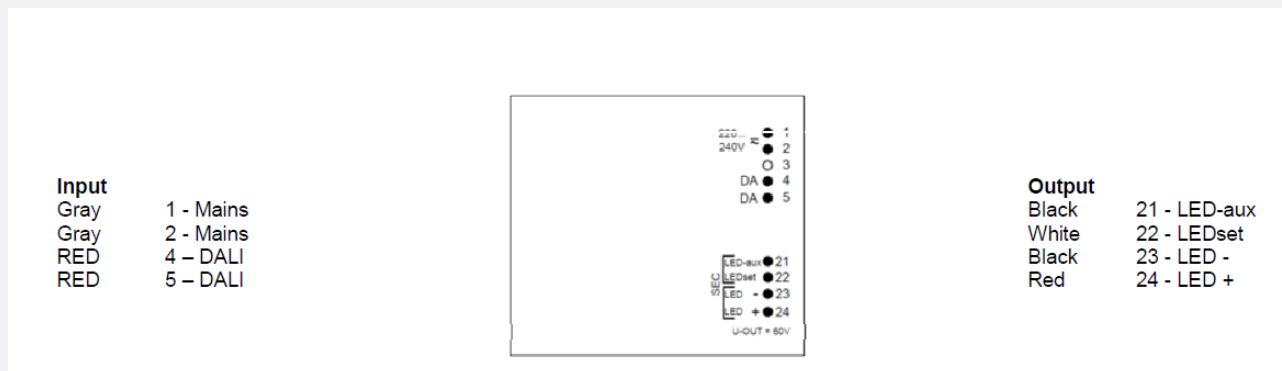
a) Dimension



L	L1	B	B1	H	Unit
103	94	67	58	29.5	mm

Housing material: plastic, white

b) Wiring Diagram



Connectors type (input and output):	Wago 250
Wire cross-section:	solid and flexible: 0.2 - 1.5 mm ²
Wire peeling length:	8 - 9 mm
Load wire length:	Max. 2 m

5. Label Structure

SI-EPD006460EU

Constant Current LED Power Supply

I_{out} [mA]	P_{out} [W]	U_{out} [V]	U_N/f_N	I_N [A]	λ	t_a [°C]
180 - 700	27	12-54	220-240V 0/50/60 Hz	0.14	0.95	-20...50

110 M M

CE **EL**

$t_c = 75^\circ\text{C}$

SELV-equivalent

wire preparation
push in
s: 0.2 - 1.5 mm²
f: 0.2 - 1.5 mm²

8.0 - 9.0mm

PR

220... 1 ● 1
240V ~ 2 ● 2
3 ○ 3
DA ● 4
DA ● 5

SEC

LED-aux ● 21
LEDset ● 22
LED - ● 23
LED + ● 24
U-OUT = 60V

Made in China

6. Packing Structure

Packing material	Max. quantity (pcs)
Outer Box	20

7. Precautions in Handling & Use

- 1) To prevent the LED Driver from any defect, please handle and store it with care
 - Do not drop or give shock
 - Do not store in very humid location or at extreme temperature
 - Do not open or disassemble the product
- 2) Static electricity or surge voltage may damage the components inside LED Driver, as such please observe proper anti-electrostatic working process
 - People handling the Driver should be well grounded (e.g. using ESD wrist band) and wear anti-static working clothes and gloves
 - All related devices and instruments in the production line should be well grounded (e.g. working table, measuring equipment, assembly jigs)
- 3) Observe the correct polarity of output terminal
- 4) Avoid input voltage exceeds the maximum rating, which will cause damage to the circuit and result in malfunction

Legal and additional information.

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