

LF-A1-060U-E110C (67)

Programmable IP67 Isolated LED Driver | Constant Current - Dimmable



Product family features

- 0-10V/PWM/Rx 3-in-1 dimming
- Low THD<10% @70% load, 277Vac
- Rated input voltage: 100-277Vac
- Ta: -40~+55°C
- Ripple current <5%
- Supports CLO and timing control functions
- All-round protections: automatic derating at low input voltage, short circuit, open circuit, over-temperature
- IP67, suitable for Class I light fixtures
- 5 years guarantee



Product family benefits

- High efficiency
- Flicker free
- Long lifetime and high reliability
- Isolated

Typical applications

- For shoebox lights, flood lights, street lights and tunnel lights
- For street lighting

Product parameters

- Output current 300-1100mA
- Output power 13-60W
- Input voltage 100-277Vac
- Output voltage 43-90Vdc
- Efficiency 90%

Electrical data

Input data

Rated AC input voltage	100 ... 277V
AC voltage range	90 ... 305V
AC voltage range at full power	180 ... 277V
Rated DC input voltage	141 ... 391V
DC voltage range	127 ... 431V
Input frequency	50/60Hz
Power factor	$\geq 0.9/277\text{Vac}@70\%$ load; $\geq 0.95/230\text{Vac}@100\%$ load
Current tolerance	$\pm 5\%$ @AC180-305V; $\pm 7\%$ @AC90-180V
Linear adjustment rate	$\pm 5\%$ @full load
Load adjustment rate	V_o : 43-90Vdc $\pm 5\%$ @100-277Vac
Efficiency	89% ¹⁾
Input current	0.7A Max
Inrush current	$<60\text{A}/300\mu\text{s}$ @230Vac, $<70\text{A}/300\mu\text{s}$ @277Vac
Loading number on circuit breaker 10 A (B)	10
Loading number on circuit breaker 10 A (C)	10
Loading number on circuit breaker 16 A (B)	17
Loading number on circuit breaker 16 A (C)	17
Leakage current	$\leq 0.7\text{mA}$
Standby power consumption	-

Output data

Nominal output voltage	43 ... 90V
Nominal output current	300 ... 1100mA
Default output current	670mA
Current setting	Programming
Maximum output power	60W Max@180-277Vac, 45W Max@100-180Vac
Nominal output power	13 ... 60W
Output ripple current	$<5\%$
Flicker	According to IEEE Std 1789-2015
CIE SVM	≤ 0.4
IEC-Pst	≤ 1
Temperature tolerance	$\pm 10\%$
Start-up time	230Vac $<1\text{s}$ @full load
THD	$\leq 10\%$ @70% load 277Vac Single harmonic: harmonic-C $\geq 70\%$ load/230Vac
Device power loss	-

12V AUX

Output voltage	-
Output current	-
Dynamic load	-
Ripple voltage	-

Safety

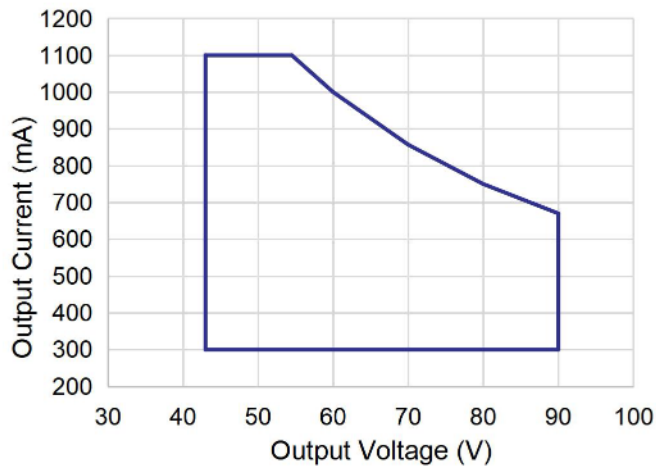
Withstanding voltage	I/P-O/P, I/P-DIM: 3.75kV&5mA&60S; I/P-PE, DIM-PE: 1.5kV&5mA&60S; O/P-PE : 1.3kV&5mA&60S; DIM-O/P: 2.5kV&5mA&60S
Surge capability (L-N)	4 kV (2Ω)
Surge capability (L/N-Ground)	6 kV (12Ω)
Insulation resistance	I/P-PE, I/P-O/P, O/P-PE, I/P-DIM, O/P-DIM, DIM-PE: >100MΩ@500Vdc
Guarantee	5 years ²⁾

1) @output current 1100mA, output voltage 54.5Vdc @230Vac

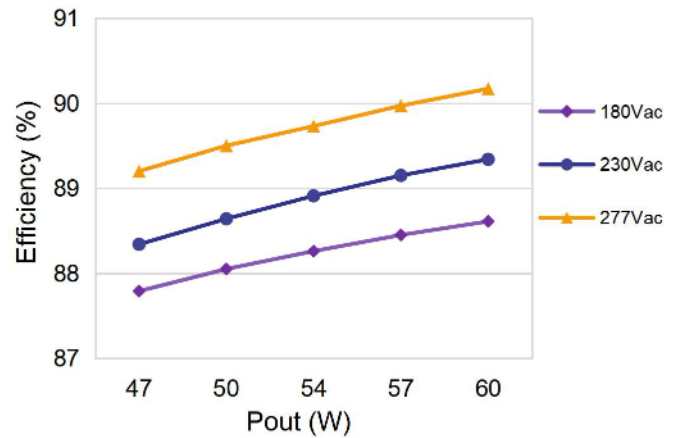
2) 5 years @Tc≤85°C

Characteristic diagrams

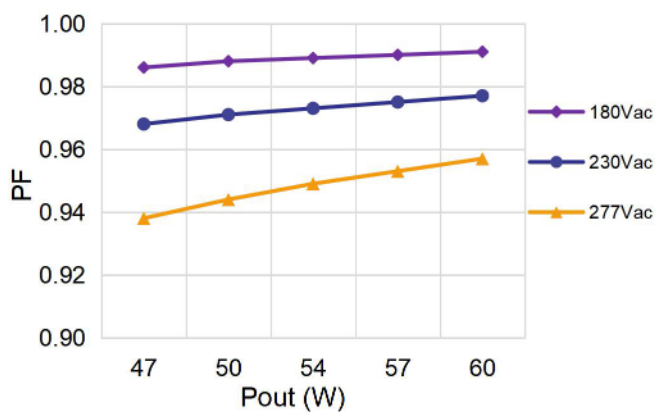
Operating Window



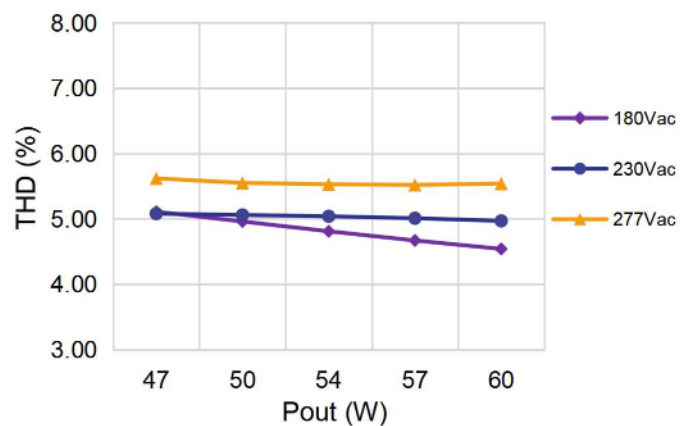
Typical Efficiency vs Load



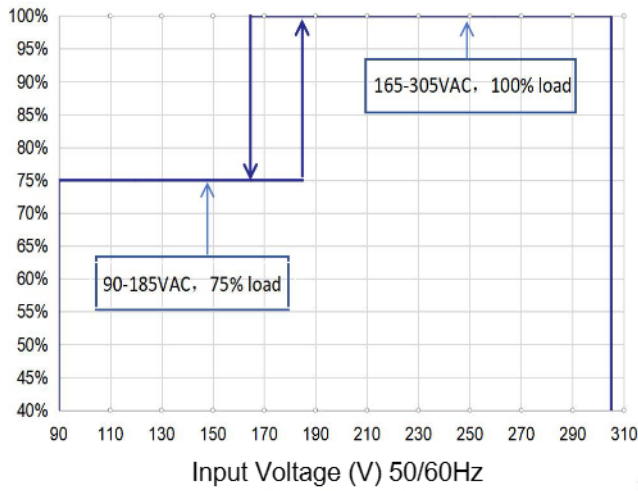
Typical Power Factor vs Load



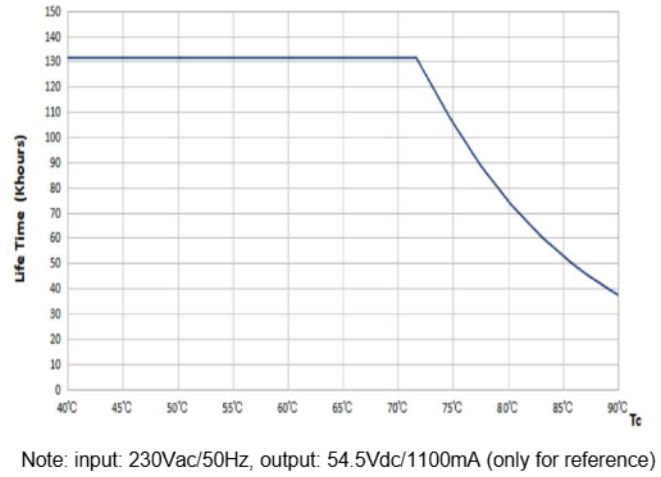
Typical THD vs Load



Load Derating Curve



Lifespan



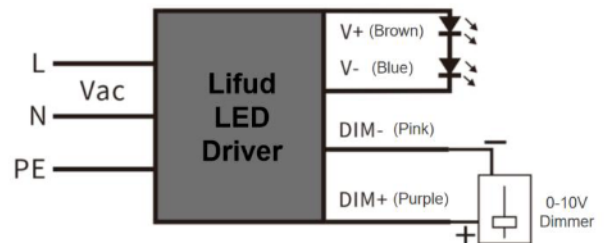
Dimming operation instructions

Parameter	Min.	Typ.	Max.	Note
Output current	300mA	670mA	1100mA	Total output power $\leq 60W$

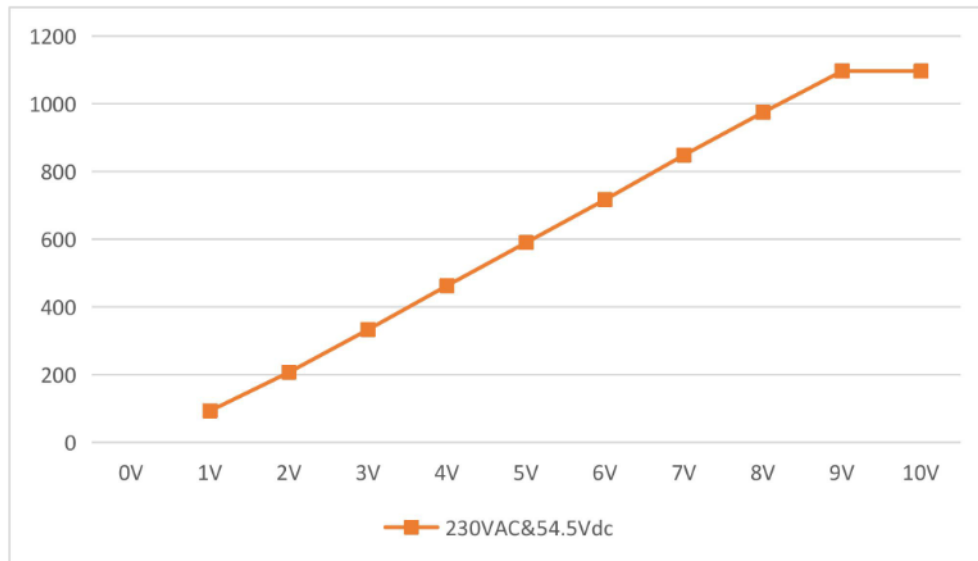
0-10V Dimming Operation

- Connect 0-10V signal to DIM terminal.
- In 0-10V dimming mode, when the input voltage is $0.8V \pm 0.15$, the light turns off; when it's $1.0V \pm 0.15$, the light turns on. (Iout max)
- Dimming depth: 10% (Iout max, typical value)
- DIM+/- (without signal connected): 100% rated current output
- DIM+ output current: 100uA (typical value);
- DIM+ must not be sourced with current.

Wiring Diagram of 0-10V Dimming



Dimming Curve

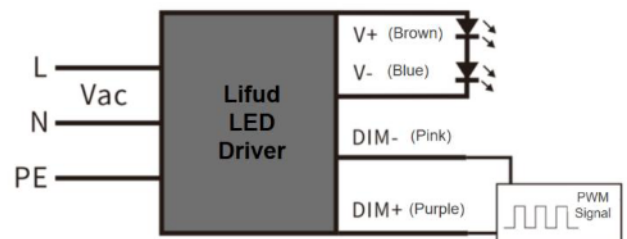


Input: 230Vac; output: 54.5Vdc/1100mA (this data is measured by Lifud 0-10V dimmer and the chart is for reference only)

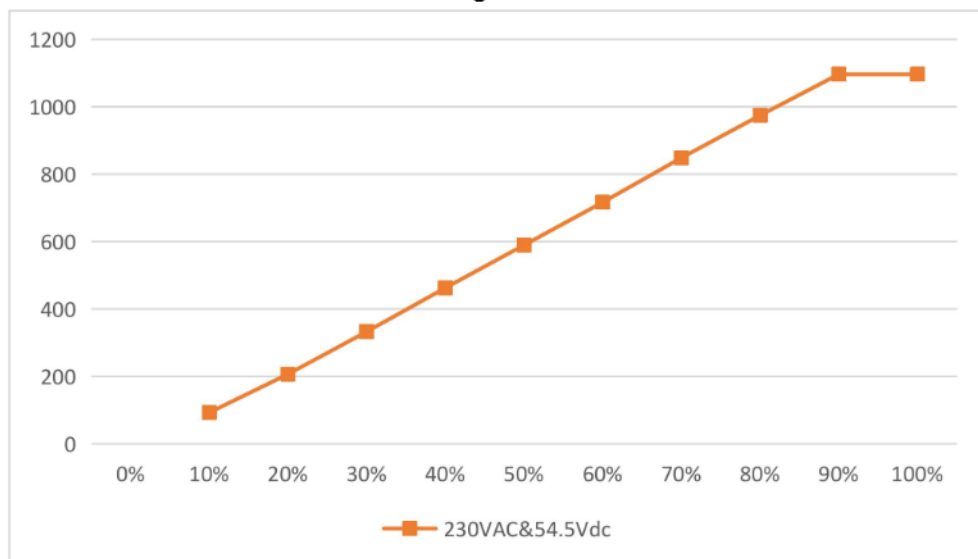
PWM Dimming Operation

- Connect PWM signal to the DIM terminal.
- Dimming depth: 10% (lout max, typical value)
- Compatible signal range: 1000-2000(Hz), amplitude: 9-10(V)
- DIM+/- (without signal connected): 100% rated current

Wiring Diagram of PWM Dimming



Dimming Curve

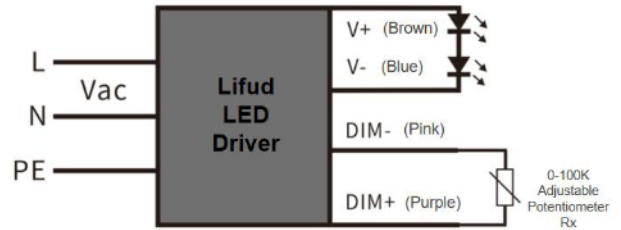


Input: 230Vac; output: 54.5Vdc/1100mA (this data is measured by Lifud PWM signal generator Tektronix and the chart is for reference only)

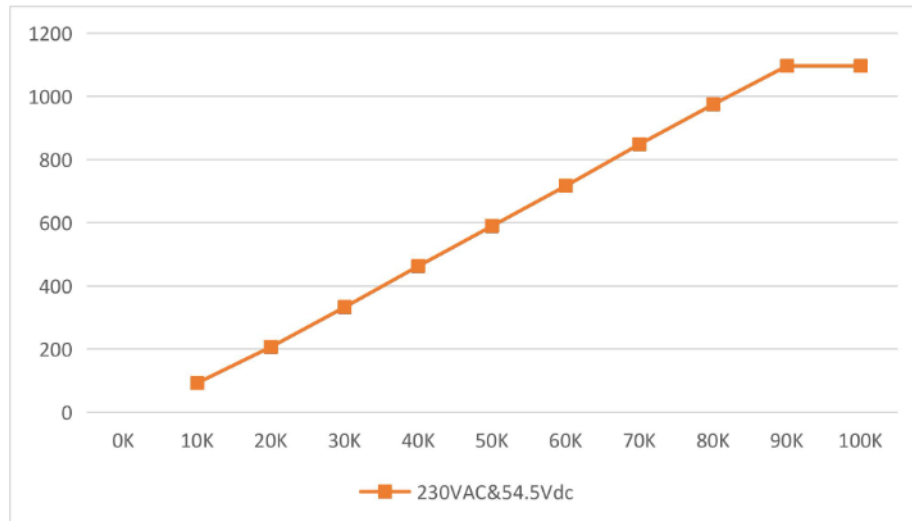
Rx Dimming Operation

- Connect Rx signal to the DIM terminal.
- Range: 0-100KΩ
- Dimming depth: 10% (Iout max, typical value)
- DIM+/- (without signal connected): 100% rated current

Wiring Diagram of Rx Dimming



Dimming Curve



Input: 230Vac; output: 54.5Vdc/1100mA (this data is measured by resistance dimmer and the chart is for reference only)

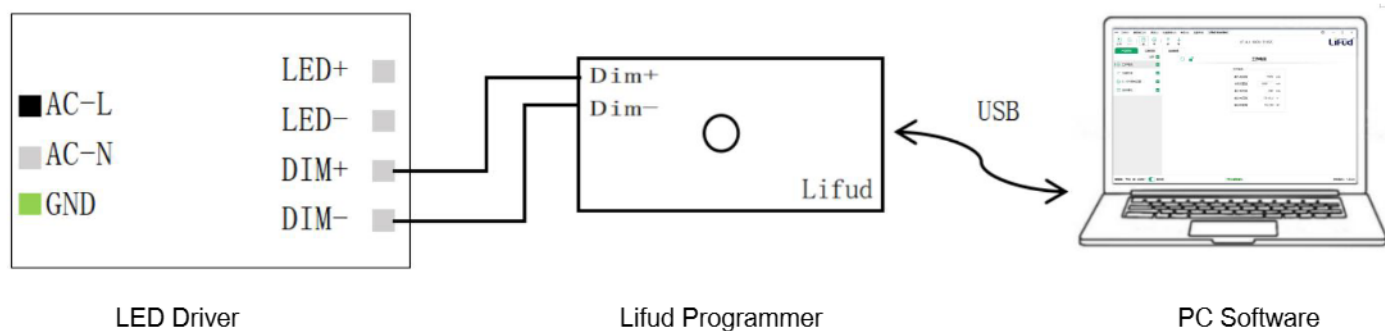
Timing control instructions

Parameter	Min.	Max.	Note
Output brightness	0%	100%	The function does not have power failure memory function. Timing data will be reset after shutdown and will start over on the next power-on.

Programmer tools and software

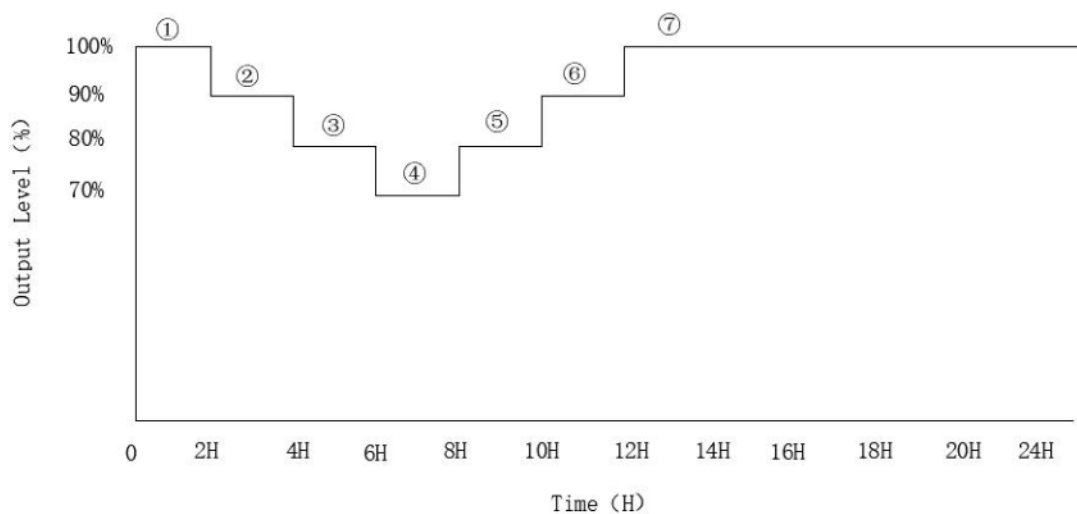
Product	Name	Brand	Model	Software
	Lifud programmer	LIFUD	LF-SCS080A	Lifud SmartSet

Wiring diagram of parameter setting



Time dimming function

Time dimming mode: there are 7 steps in total. You can set the brightness of each step and the operating time of the first to seventh steps.



Note: In the time dimming mode, after the LED driver is powered on, it will work according to the set dimming curve.

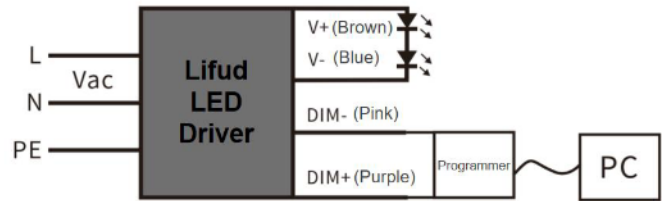
CLO instructions

Parameter	Min.	Max.	Note
Output brightness	70%	100%	/

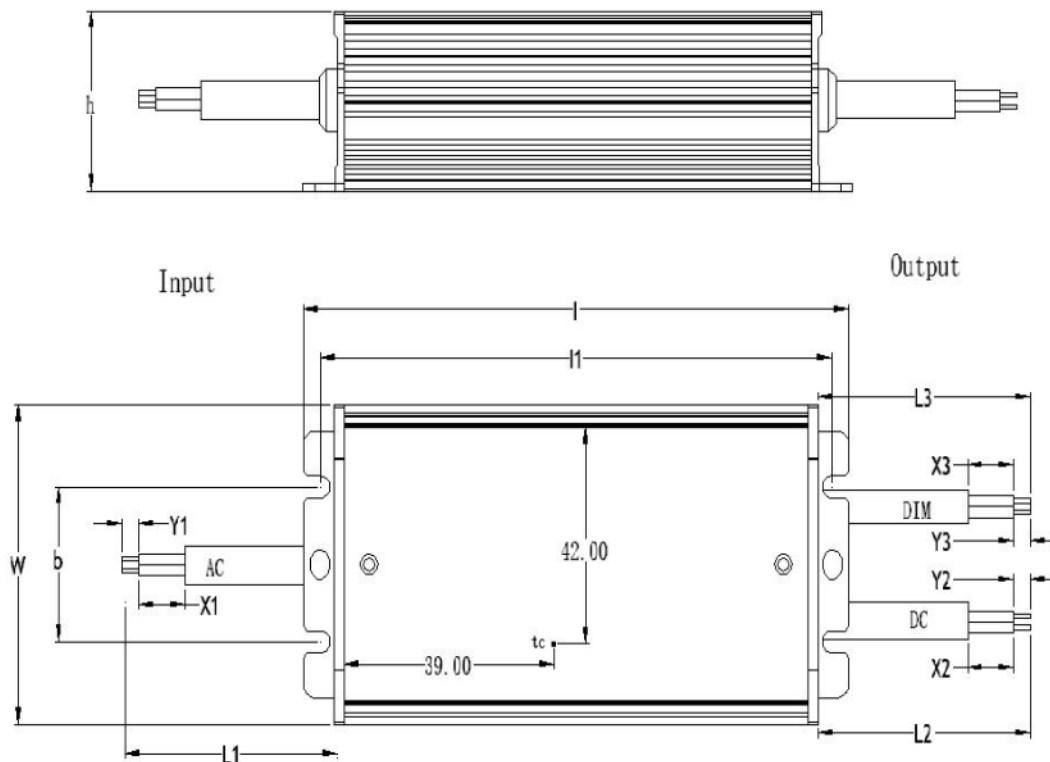
CLO Operation

- Connect the DIM terminal to the programmer and open the PC software.
- Dimming range: 70%-100%
- The CLO function can be enabled or disabled. Check “Enable” to turn on the function; uncheck it to turn off.

Wiring Diagram of CLO



Dimensions



Note: this diagram is a bottom view and Tc point is on the bottom side of the LED driver.

Mounting hole spacing, length(L1)	112mm
Mounting hole spacing, width(b)	32mm
Product weight	490±50g
Wire type, input side	3*1.0mm ² φ8.2±1mm
Wire type, output side	2*1.0mm ² φ7.7±1mm
Wire type, dimming side	2*22AWG φ5.0±0.2mm
Wire color, input side	AC-L Brown; AC-N Blue; PE Yellow&green
Wire color, output side	LED+ Brown; LED- Blue
Wire color, dimming side	DIM+ Purple; DIM- Pink
Wire length, input side (L1)	300±10mm
Wire length, output side (L2)	220±10mm

Wire length, dimming side (L3)	230±10mm
Wire peeled length, input side (X1)	40±4mm
Wire peeled length, output side (X2)	36±4mm
Wire peeled length, dimming side (X3)	60±5mm
Wire tinned length, input side (Y1)	10±1.5mm
Wire tinned length, output side (Y2)	6±1.5mm
Wire tinned length, dimming side (Y3)	10±1.5mm
Length (l)	120±0.5mm
Width (w)	66±0.5mm
Height (h)	37±0.5mm

Colors & materials

Casing material	Metal
Casing color	Silver gray

Temperature & operating conditions

Ambient temperature range	-40°C - +55°C
Maximum temperature at Tc test point	90°C
Temperature range at storage	-40°C - +80°C (6 months in Class I environment)
Humidity range at storage	10-90%RH (no condensation)
Humidity during operation	20-90%RH
Atmospheric pressure	86-106KPa
RoHS	RoHS 2.0 (EU) 2015/863

Capabilities

Dimmable	0-10V/PWM/Rx dimmable
Setting at 0-10V dimming	off: 0.2~2.0±0.15V, on: 0.4~3.0±0.15V, max: 8.0~10.0 ±0.15V@180-277Vac
Open circuit protection	Open-circuit voltage ≤115Vdc
Over-temperature protection	When Tc is 97°C±5°C, it will reduce the current and auto-recover when the Tc decreases to the normal temperature; settable protection temperature @±5°C
Overload protection	-
Short circuit protection	The LED driver will not be damaged even in the state of short circuit for a long time. (Auto-recovery)
Derating at low input voltage	AC90-180V (with under-power protection threshold ranging from AC165-185V. For details, refer to the derating curve)
Max. cable length to lamp/LED module	-
Suitable for fixtures with prot. class	I
Control interface	1 channel
Number of channels	1 channel

Programming

Programmer	LF-SCS080A
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DALI control software	/
APP	Lifud SmartSet

Certificates & standards

Approval marks – approval	ENEC, CE, CB, RCM
Standards	IEC/EN 61347-2-13, IEC/EN 61347-1, IEC/EN 62493 IEC/EN 62384, AS 61347.1, AS 61347.2.13
EMC	EN 55015, EN 61547, EN 61000-3-2,3
Group pulse	5kV (Class B)
ESD	Air 8kV, touch 4kV
Type of protection	IP67

Logistical data

Product	Packaging unit (Pieces/Unit)	Dimensions (L*W*H)	Volume	Gross weight
LF-A1-060U-E110C(67)	16	446mm*332mm*167mm	24.73dm ³	9.18kg±5%

Test equipment & condition

Test equipment	AC power source: CHROMA6530, digital power meter: CHROMA66205, oscilloscope: Tektronix DPO3014, DC electronic load: M9712B, LED board, constant temperature and humidity chamber; lightning surge generator: Everfine EMS61000-5B, rapid group pulse generator: Everfine EMS61000-4A, spectroanalyzer: KH3935, EEC SE7440, flicker tester (flicker-free coefficient test) Everfine LFA-3000, etc.
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If there are no special remarks, the above parameters are tested at the ambient temperature of 25℃, humidity of 50%, maximum output power and input voltage of 230Vac/50Hz.

Additional information

1. It is recommended that user install the over voltage protection, under voltage protection and surge protection devices in the power supply circuits of light fixtures to ensure electricity safety.

2. The LED driver used in combination with the end device is one of the accessories of the whole light fixture, and the EMC of the whole light fixture is not only susceptible to the driver itself, but to the LED light fixture and the whole light fixture's wiring. Thus, the manufacturer of LED light fixture should re-confirm the EMC of the whole light fixture before the whole light fixture is finished.

3. The number of LED drivers that can be connected to a circuit breaker and the inrush current are tested under the same conditions.

4. The PC cover, casing and end cap for assembling the LED driver in the light fixture must meet the fire rating of UL94-V0 or above.

5. When using the LED driver, please pay attention that the total output power should not exceed the maximum rated output power, otherwise the warranty service of LED driver will fail.

6. When conducting withstanding voltage test on LED driver, please short-circuit the input wire L and N; the positive electrode and negative electrode of the output wire; the positive electrode and negative electrode of the dimming wire.

7. It is recommended that the product be installed inside the luminaire housing to ensure reliability.

8. A slight flicker may occur at power-on if the LEDs and the aluminum substrate have excessive parasitic capacitance and the luminaire is grounded. And there may be afterglow during the dimming-to-off process. To avoid this, it is recommended to select a light board with lower parasitic capacitance.

Transportation & storage

Suitable transportation means: vehicles, boats and aeroplanes.

In transit, it is necessary to prepare awnings for rain or sun protection. Moreover, please keep civilized loading and unloading to prevent the vibration or impact on LED driver as much as possible.

The storage of LED driver shall conform to the standard of Class I environment. When using LED drivers which have been stored for more than 6 months, please re-test them firstly. Do not use them unless they are tested to be qualified.

Cautions

Please use Lifud LED driver according to its parameters in the specification, otherwise the LED driver may malfunction.

Using any incompatible light fixtures or those that have not been certified may cause fire, explosion or other risks.

Man-made damage is beyond the scope of Lifud warranty service.

Disclaimer

Subject to change without notice. Errors and omissions excepted. Always make sure to use the most recent release.

Lifud Technology Co., Ltd. reserves the right to interpret any content of this specification.