

Features

- 3 versions selectable: non-dimmable, 3-in-1 dimming & 3-in-1 dimming + 12V AUX output
- Can connect external DIP switch module
- Can connect external light sensor module
- High efficiency up to 94%
- THD <10%
- Output current adjustable via potentiometer
- Surge protection: L-N: 4kV; L/N-GND: 6kV
- Non-isolated; flicker free
- All-round protections: open circuit and short circuit
- Suitable for Class I light fixtures



Applications

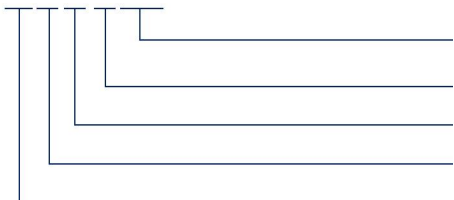
· Flood light · wall light · LED street light · highbay light

Descriptions

LF-FAx060 is a constant current LED driver featuring high efficiency, high PF and low THD. It has 3 selectable versions: non-dimmable, 3-in-1 dimming and 3-in-1 dimming + 12V AUX output. It is equipped with a potentiometer on the top of LED driver to adjust the output current (power).

Product Model

LF - FA A/ B /C 060



- 060: output power: 60W
- C: 3-in-1 dimming (available for external DIP switch module)
- B: non-dimmable
- A: 3-in-1 dimming + 12V (available for external DIP switch module and light sensor module)
- F: non-isolated design; A: serial number

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■ Electrical Characteristics

Model			LF-FAA060				LF-FAB060				LF-FAC060				
Output	Output Current	Adjustable via potentiometer													
		180-300mA													
	Default Current	230mA±5%													
	Flicker	According to IEEE Std 1789													
	Output Current (Optional)	Adjustable via external DIP switch module													
		70%-100%@maximum output current (set by customer) (only for FAA/FAC series)													
	Output Voltage	180-260Vdc (LED)													
	Output Power	60W max.													
	Ripple Current	<10% @≤200Hz													
	Start-up Time	120Vac<1S @full load; 230Vac<0.5S @full load													
	Linear Adjustment Rate	±5%													
	Load Adjustment Rate	±8%													
	Temperature Drift	±3% @Tc 25~75℃													
Input	AC Input Voltage		90-305Vac (rated: 100-277Vac)												
	DC Input Voltage		127-305Vdc (rated: 141-276Vdc)												
	Input Frequency		50/60Hz												
	Input Current		0.75A max.												
	PF		≥0.98/120Vac @50% load; ≥0.95/230Vac @50% load; ≥0.9/277Vac @50% load												
	THD		≤10% 277Vac @full load												
	Efficiency	MIN	90%/120Vac @260Vdc/230mA; 92%/230Vac @260Vdc/230mA				89%/120Vac @260Vdc/230mA; 90.5%/230Vac @260Vdc/230mA				89%/120Vac @260Vdc/230mA; 90.5%/230Vac @260Vdc/230mA				
		TYP	91%/120Vac @260Vdc/230mA; 93%/230Vac @260Vdc/230mA				90%/120Vac @260Vdc/230mA; 92%/230Vac @260Vdc/230mA				90%/120Vac @260Vdc/230mA; 92%/230Vac @260Vdc/230mA				
		MAX	/												
	Inrush Current		<40A/200uS @120Vac, <60A/250uS @230Vac, <80A/200uS @277Vac												
	Loading Quantity on Circuit Breaker (PCS)		Model	B10	C10	D10	B16	C16	D16	B20	C20	D20	B25	C25	D25
			Qty@120Vac ±10%	12	12	12	19	19	19	24	24	24	30	30	30
			Qty@230Vac ±10%	12	20	23	20	33	37	25	41	46	31	52	58
Qty@277Vac ±10%			12	21	27	20	33	44	25	42	55	31	52	69	
Standby Power Consumption		≤0.5W @220Vac/DIM OFF (only for FAA series)													
12V AUX Output (for FAA only)	Output Voltage		+12Vdc (11-14V)												
	Output Current		200mA max.												
	Dynamic Load		Please make sure that it matches the LED driver.												
	Ripple Voltage		≤1V												

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■ Electrical Characteristics

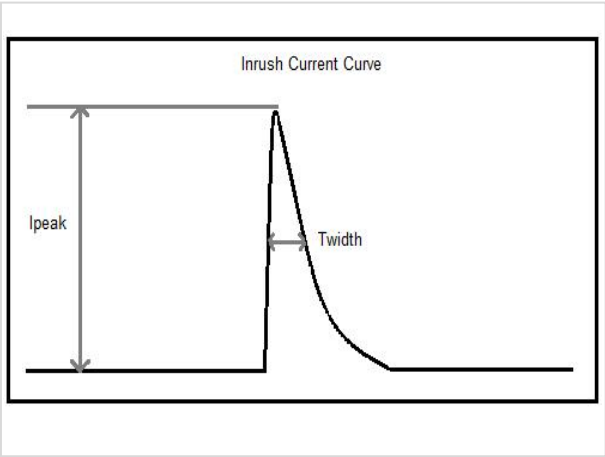
Protections	Surge	L-N: 4kV (2Ω), L/N-PE: 6kV (12Ω)
	Open Circuit	Open-circuit voltage ≤310Vdc
	Short Circuit	≤15W The LED driver will recover by itself and will not be damaged even in the state of short circuit for a long time.
	Grounding Resistance	≤0.1Ω @25A/60S
	Insulation Resistance	≥10MΩ @L/N-PE: 500Vdc/60S/25°C/70%RH
Environment Descriptions	Operation Temperature	-40°C~+50°C
	Operating Humidity	0~95%RH (no condensation)
	Storage Temperature/ Humidity	-40°C~+80°C (6 months in Class I environment); 0~95%RH (no condensation)
	Atmospheric Pressure	86~106kPa
Safety and EMC	Certifications	TUV-ENEC, CE, CB, RCM, SAA, FCC, UL, UKCA
	Withstanding Voltage	L/N-PE: 1.5KVac, <5mA, 60S; L/N-DIM: 3KVac, <5mA, 60S; DIM-PE: 500Vac, <5mA, 60S
	Safety Standards	ENEC: EN61347-1:2015, EN 61347-2-13:2014/A1:2017, EN 62384:2020 CE-LVD: EN 61347-2-13:2014/A1:2017, EN 61347-1:2015, EN 62493:2015 CB: IEC 61347-1:2015, IEC61347-2-3:2014, IEC 61347-2-13:2014/AMD1:2016 SAA: AS 61347.2-13:2018 RCM: AS 61347.2-13:2018 UL: UL8750, CSA 250.13
	EMI	CE-EMC/RCM: EN55015, EN61000-3-2, EN61000-3-3 FCC: PART 15 CLASS B @120Vac FCC: PART 15 CLASS A @277Vac
	EMS	CE-EMC/RCM: EN61000-4-2, 3, 4, 5, 6, 11 According to IEC61000-4-2, 3, 4, 5, 6, 8, 11, 12; IEC61547
	Ringing Wave	4kV
	ESD	Air 8kV, touch 4kV
Other Parameters	IP Rating	/
	RoHS	RoHS 2.0 (EU) 2015/863
	Warranty	5 years (Tc ≤80°C)
	MTBF	>1000Khours@Telcordia SR-332 Issue4
Testing Equipment	AC power source: CHROMA6530, digital power meter: CHROMA66205, oscilloscope: Tektronix DPO3014, DC electronic load: M9712B, LED board, constant temperature and humidity chamber; Everfine EMS61000-5B; Everfine EMS61000-4A, spectroanalyzer: KH3935, hi-pot tester: EEC SE7440, flicker tester (flicker-free coefficient test): LFA-3000, etc.	

■ Electrical Characteristics

Testing Remark	If there are no special remarks, the above parameters are tested at the ambient temperature of 25°C, humidity of 50%, maximum output power and input voltage of 230Vac.
Additional Remarks	1. It is recommended that user install over voltage protection, under voltage protection and surge protection devices in the power supply circuits of light fixtures to ensure electricity safety. 2. 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. 3. 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. 4. It is suggested that user use a slotted screwdriver or a Philips to adjust the output current of LED driver in case that the potentiometer is damaged (the screwdriver should have good insulation at the head, body and handle, and the screwdriver with a 2mm head is recommended as well; what's more, please pay attention that the intensity of torque should not exceed 500g.cm). 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 would be failed. 6. Because there is parasitic capacitance between LEDs and the PCBA, there will be a slight flicker when the PCBA (the light fixture) is grounded and AC is powered on. It's normal for non-isolated products. During the dimming-to-off process, the afterglow current fluctuates, causing a slight flicker, which stabilizes after approximately 5 seconds. It's normal for non-isolated products. To avoid this phenomenon, please choose a light board with lower parasitic capacitance. 7. Please fully inspect the withstanding voltage ability of LEDs and aluminum substrates and the value shall be >2.5kVac. 8. Lifud reserves the right to interpret any of the above parameters.

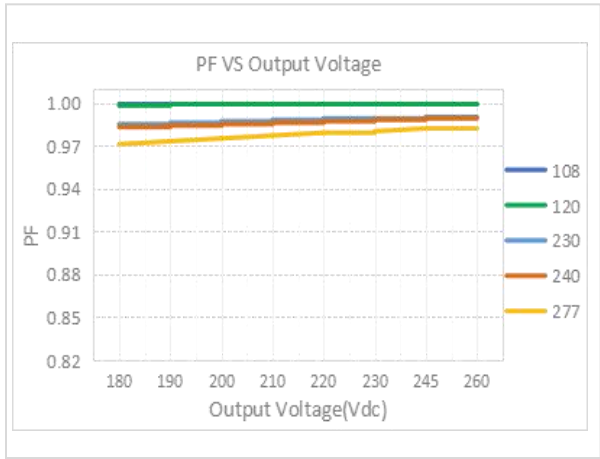
■ Product Characteristics Curves (Typical)

Input Inrush Current

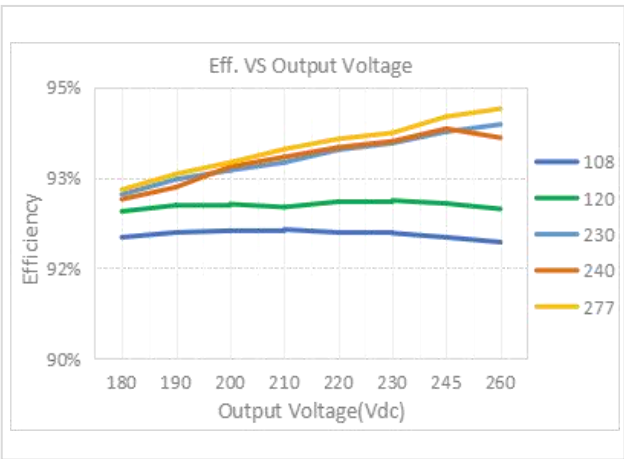


Vin	Ipeak	Twidht
120Vac	29.6A	75uS
230Vac	33.5A	200uS
277Vac	71.2A	88uS

PF Curve

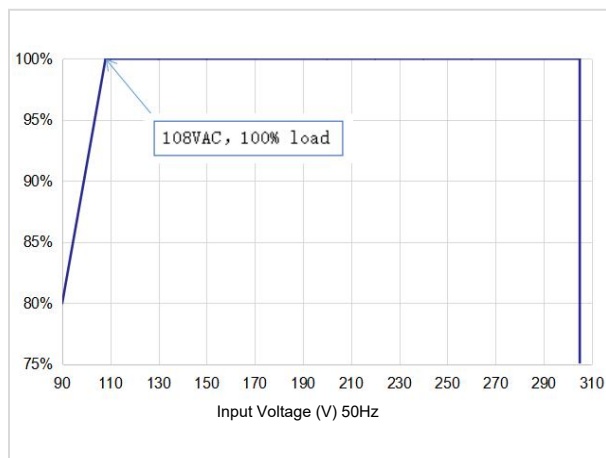


Efficiency Curve

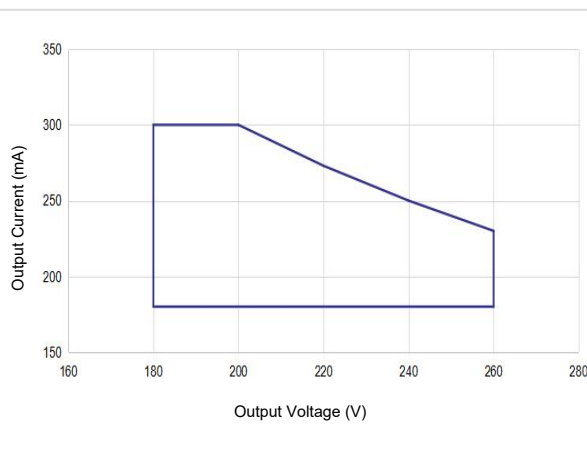


■ Product Characteristic Curves

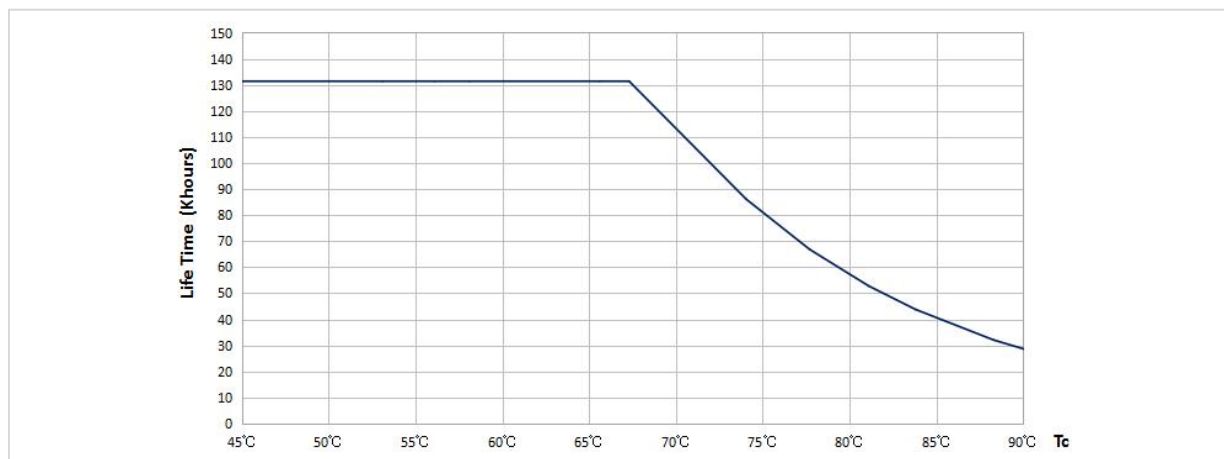
Load Derating Curve



Power Curve



Lifetime Curve



Input: 277Vac/60Hz; output: 200Vdc/300mA (The chart is for reference only)

■ Dimming Operation Instructions

Output current adjustable via built-in potentiometer (adjusting fixed current)

Parameter	MIN	TYP	MAX	Note
Output Current	180mA	230mA	300mA	The total output power should NOT exceed 60W

The initial current of FAA or FAC version (DIP switch version) is adjustable via the potentiometer; the blue wire is connected to DIP switch module (the adjustable current via the DIP switch is susceptible to the one via the potentiometer). Besides, the DIP switch resistance (adjustable resistance via the DIP switch) ranges from 110Ω to 300KΩ. Therefore, when the user sets the output current of LED driver, the adjustment is supposed to range from 70% to 100% of the maximum current so as to meet certifications' standards.

■ Product Definition

Product Terminal

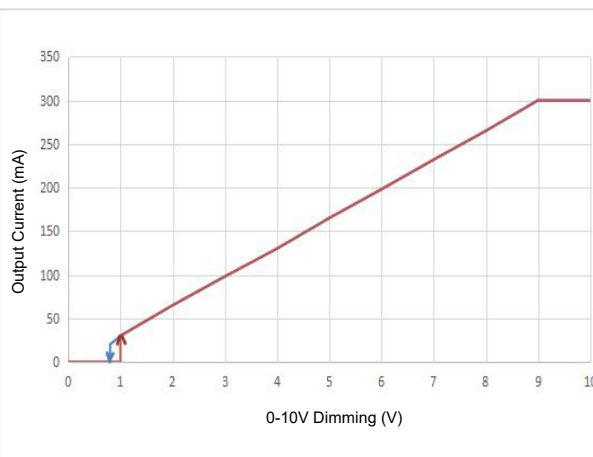
INPUT		OUTPUT	
AC-L	Input terminal of AC live wire	12V+	Positive terminal of AUX output
AC-N	Input terminal of AC neutral wire	B+	Positive terminal of DIP switch (optional)
	Grounding wire	DIM+	Positive terminal of input
		DIM-	Negative terminal of input/DIP switch (optional)
		LED+	Positive terminal of LED driver output
		LED-	Negative terminal of LED driver output

■ Dimming Operation Instructions

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.
- Dimming depth: 10% (typical value), the maximum is <12%
- DIM+/- (without signal connected): 100% rated current output

0-10V Dimming Curve



Input: 230Vac; output: 200Vdc/300mA
(this data is measured by Lifud 0-10V dimmer and the chart is for reference only)

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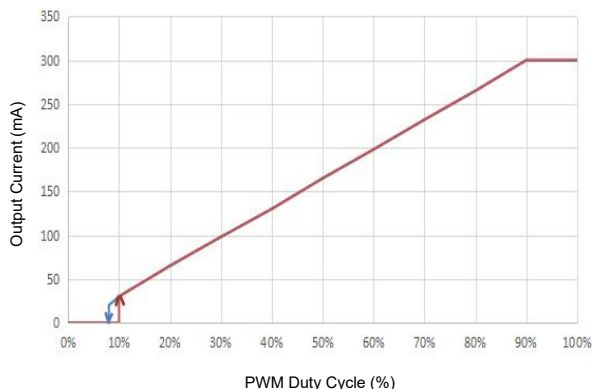
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■ Dimming Operation Instructions

PWM Dimming Operation

- Connect PWM signal to DIM terminal.
- Dimming depth: 10% (typical value), the maximum is <12%
- Compatible signal range: 1000-3000(Hz), high: 9.8-10.2(V), low: 0-0.3(V)
- DIM+/- (without signal connected): 100% rated current

PWM Dimming Curve

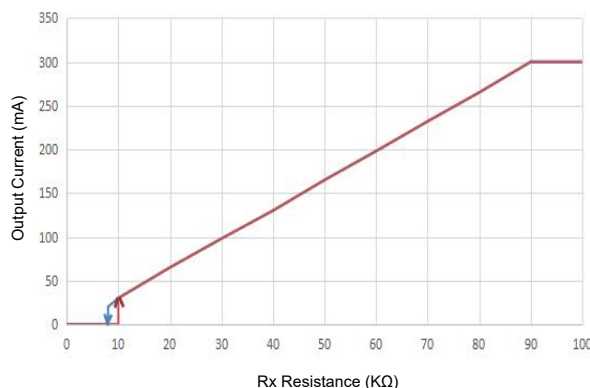


Input: 230Vac; output: 200Vdc/300mA
(this data is measured by Lifud PWM signal generator RIGOL and the chart is for reference only)

Rx Dimming Operation

- Connect Rx signal to DIM terminal.
- Range: 0-100KΩ
- Dimming depth: 10% (typical value), the maximum is <12%
- DIM+/- (without signal connected): 100% rated current

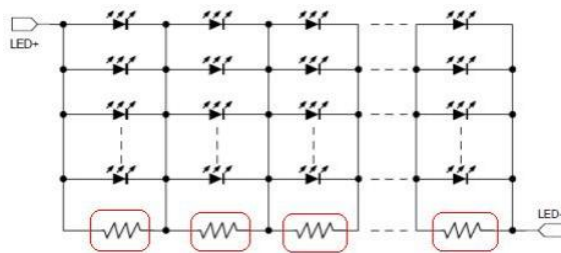
Rx Dimming Curve



Input: 230Vac; output: 200Vdc/300mA
(this data is measured by resistance dimmer and the chart is for reference only)

Dim-to-off "Without Afterglow" Operation

When the dimming signal of FAA/FAC is 0V, the LED driver has no output, but there exists junction capacitance between the aluminum substrate's copper foil and the grounding wire, which will make the LEDs glow slightly. Thus, it is necessary to respectively attach a resistor to every node of LED beads in parallel, and the resistance should match for the parameters of aluminum substrate and LEDs. (reference resistance: 3-5KΩ/size: 1206)



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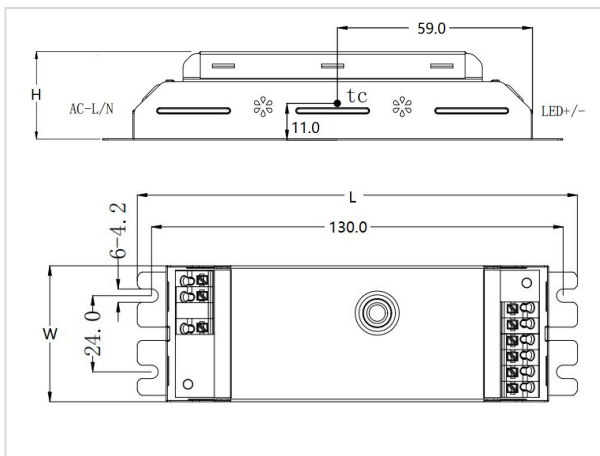
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■ Structure & Dimensions (unit: mm; tolerance: $\pm 1.0\text{mm}$)

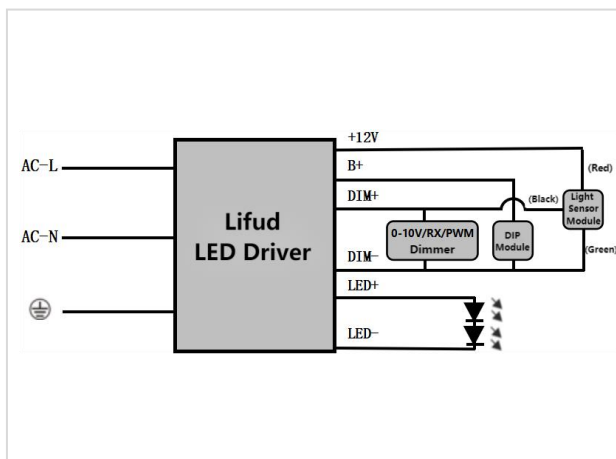
Casing Dimensions

Description	Symbol	Unit (mm)
Length	L	139.0
Width	W	42.8
Height	H	26.5



tc point is on the side of LED driver

Wiring Diagram of External DIP Switch



Remark: pin pitch of 6PIN terminal for user's external DIP switch at driver's output port: 3.5mm; maximum distance between output 6PIN terminal and user's external DIP switch: 20cm (if it exceeds 20cm, the current tolerance would be inaccurate.)

■ Packaging Specifications

Model	LF-FAA/FAB/FAC060
Carton Size	385*285*210mm (L*W*H)
Quantity	8 pcs/layer; 5 layers/ctn; 40 pcs/ctn
Weight	0.170 $\pm$ 0.03 kg/pc; 7.8 $\pm$ 1.2 kg/ctn

■ Transportation and Storage

1. Transportation

- 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.

2. Storage

- 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.

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