

Features



- ◆ Ultra high input voltage range: 180~528Vac;
- ◆ Constant power design, outputs programmable;
- ◆ Output current reconfigurable by infrared controller;
- ◆ 3-in-1 dimmable (M types): 0~10Vdc / PWM signal / Timer dimming;
- ◆ Surge immunity: 4KV line-line, 6KV line-earth;
- ◆ IP67 design for indoor and outdoor applications;
- ◆ Suitable for dry / damp / wet locations;
- ◆ 5 years warranty

Application

- ◆ Suitable for LED architecture lighting, industrial lighting, flood lighting, and roadway lighting, etc.

Description

With 249 to 528V AC input, LHP series is designed for ultra high voltage market (277Vac/347Vac/480Vac), it's especially suitable for North America industrial electrical network. LHP is configurable constant current LED driver with high reliability, Monitored by an infrared based programming device, the fully programmed drivers offer all dimming options and a wide range of output current in a single driver, which deliver maximum flexibility with customized operating settings and intelligent control options for OEMs, as one driver can be programmed for many different luminaire designs. LHP provides built-in timer dimming schedules further increasing the energy savings and CO2 reductions achieved with LED lighting. It also help clients to improve the management of logistics and stock.

Models

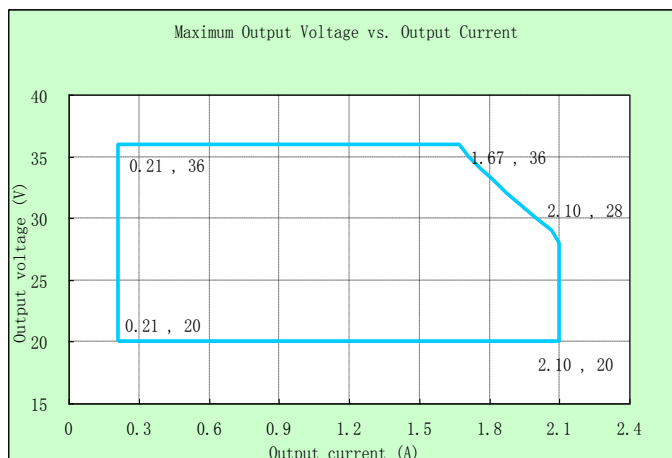
Model	Power(W)	Output voltage range(V)	Output current adjustable range (A)	Full power current adjustable range (A) ⁽²⁾	Default output spec	Typ. Eff. ⁽³⁾	Typ. PF	
							277Vac	480Vac
LHP-060X036 ⁽¹⁾	60	20~36	0.21~2.10	1.67~2.10	20~36V/1.67A	86%	0.98	0.91
LHP-060X062	60	20~62	0.14~1.40	0.97~1.40	20~57V/1.05A	86%	0.98	0.91
LHP-060X090	60	45~90	0.10~0.95	0.67~0.95	45~85V/0.70A	83%	0.98	0.91

Notes:

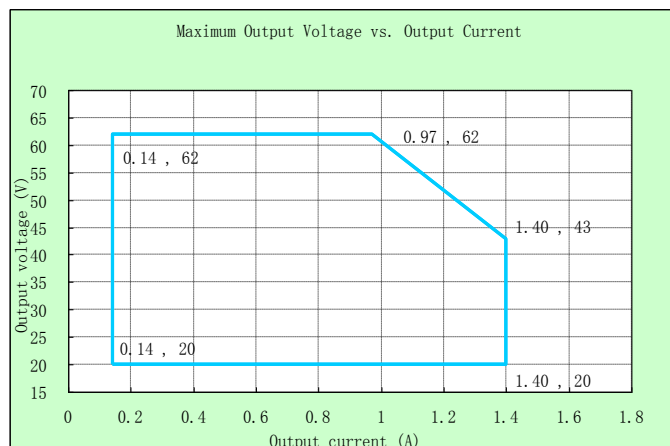
1. X can be M or R, means dimmable or non-dimmable. Take LHP-060X036 for example, LHP-060M036 is programmable and 3-in-1 dimmable; LHP-060R036 is programmable and timer dimmable;
2. Output current adjustable range with constant power at max output power;
3. Measured at full load and 480Vac input (see below "General Specifications" for details).

Output Voltage vs. Current Curve

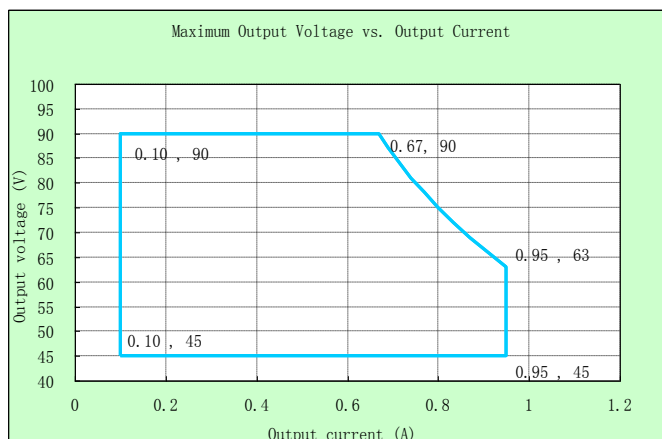
LHP-060X036



LHP-060X062



LHP-060X090



Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	180Vac	200~480Vac	528Vac	
Input Frequency	47HZ	50/60	63Hz	
Leakage Current	-	-	0.75mA	480V/50Hz
Input AC Current	-	-	0.5A	200~480Vac & full Load
Inrush Current	-	-	75A	480Vac & full Load
PF	0.90	0.95	-	277~480Vac & full Load
THD	-	20%	25%	480Vac, 80%~100% Load
THD	-	-	20%	277~347Vac, 80%~100% Load

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%Imax	-	5%Imax	At full load condition
Output Current Setting Range(Iset) LHP-060X036 LHP-060X062 LHP-060X090	0.21A 0.14A 0.10A	-	2.10A 1.40A 0.95A	
Output Current Setting Range With Constant Power LHP-060X036 LHP-060X062 LHP-060X090	1.67A 0.97A 0.67A	-	2.10A 1.40A 0.95A	
Total Output Current Ripple (pk-pk)	-	-	20%	480Vac & full Load , load is LED, ripple is different with difference LED load.
Startup Overshoot Current	-	-	10%	200~480Vac & 100% Load , load is LED
NO Load Output Voltage LHP-060X036 LHP-060X062 LHP-060X090	-	-	45V 75V 105V	
Line Regulation	-	-	1%	Under 25℃±10℃ ambient temperature, 100% load, change input from 220Vac to 480Vac
Load Regulation	-	-	3%	Under 25℃±10℃ ambient temperature, 480Vac input voltage, change load from 50% to 100%
Turn-on Delay Time	-	-	5S	200~480Vac, 100% Load

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 277Vac input LHP-060X036 Io=1.67A Io=2.10A LHP-060X062 Io=1.05A Io=1.40A LHP-060X090 Io=0.70A Io=0.95 A	 84% 83% 85% 84% 82% 82%	 86% 85% 86% 86% 84% 84%		Measured at full load and 25℃ambient Temperature, full load.

Efficiency at 347Vac input					Measured at full load and 25°C ambient Temperature, full load.
LHP-060X036					
Io=1.67A		84.%	86%		
Io=2.10A		84%	85%		
LHP-060X062		84%	86%		
Io=1.05A		84%	86%		
Io=1.40A					
LHP-060X090					
Io=0.70A		82%	84%		
Io=0.95 A		82%	84%		
Efficiency at 480Vac input					Measured at full load and 25°C ambient Temperature, full load.
LHP-060X036					
Io=1.67A		84%	86%		
Io=2.10A		83%	85%		
LHP-060X062		84%	86%		
Io=1.05A		84%	86%		
Io=1.40A					
LHP-060X090					
Io=0.70A		81%	83%		
Io=0.95 A		81%	83%		
Dielectric Strength	Input-Output	-	3750Vac	-	10mA/60S
	Input-PE	-	1600Vac	-	
	Output- PE	-	1600Vac	-	
Grounding Resistance		-	-	0.1Ω	25A/60S
Insulation Resistance		50MΩ	-	-	Input-Output, Input-PE, Output-PE, 500Vdc/60S/25°C/70%RH
MTBF		-	200,000 Hours	-	480Vac,80% Load (MIL-HDBK-217F)
Lifetime		-	50000 Hours	-	480Vac&100% load, 70°C case temperature, refer to lifetime VS Tc curve for details
Operating Case Temperature for Safety Tc _s		-40°C	-	+85°C	
Operating Case Temperature for Warranty Tc _w		-40°C	-	+65°C	
Storage Temperature		-40°C	-	+85°C	Humidity: 20% to 95% RH
Dimensions (L×W×H)mm		207*68*39			
Net Weight		900±50g/PCS			
Reference Packing		L490*L360*140mm, 10PCS/ctn.			

Dimming Specifications

Parameter		Min.	Typ.	Max.	Notes
0~5V/0~10V Absolute Maximum Voltage on the Vdim (+) Pin		-	5V/10V	-	
0~5V/0~10V Source Current on Vdim (+) Pin		-	-	2mA	
Dimming Output Range	LHP-060X036 LHP-060X062 LHP-060X090	10%Imax	-	100%Imax	Imax=2.10A Imax=1.40A Imax=0.95A
	LHP-060X036 LHP-060X062 LHP-060X090	0.21A 0.14A 0.10A	-	2.10A 1.40A 0.95A	
Recommended Dimming Range for 0-5V		0V	-	5V	Default 0-10V/10V PWM Dimming
Recommended Dimming Range for 0-10V		0V	-	10V	
PWM__in High Level		9.7V	-	10.3V	
PWM__in Low Level		0V	-	0.3V	
PWM__in Frequency Range		250Hz		1000Hz	
PWM__in Duty Cycle		1%	-	99%	

Safety & EMC Compliance

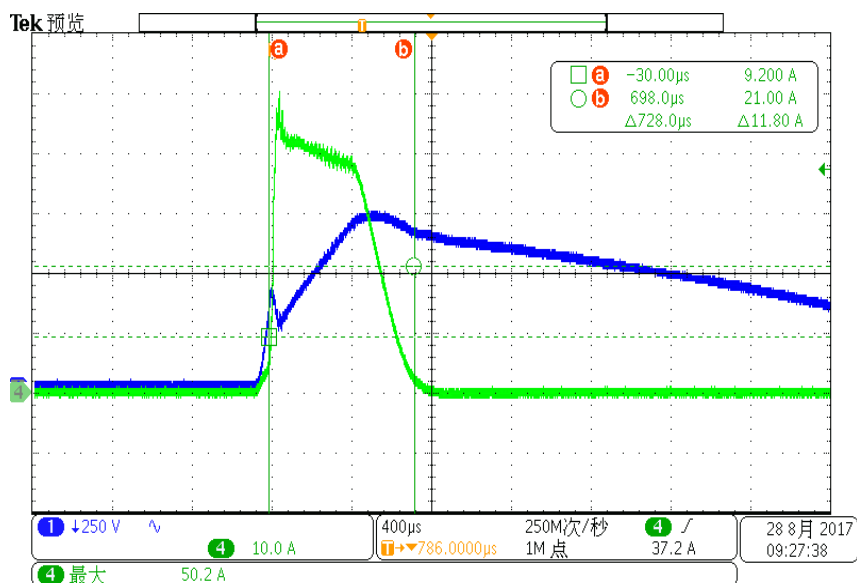
Safety Category	Standards
UL/cUL	UL 8750, CAN/CSA-C22.2 No. 250.13
EMI Standards	Standards
FCC Part 15	ANSI C63.4 Class B
	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired operation.

Safety & EMC Compliance (Continued)

EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient / Burst-EFT
EN 61000-4-5	Surge Immunity Test: AC Power Line: line to line 4 kV, line to earth 6 kV
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips
EN 61547	Electromagnetic Immunity Requirements Applies To Lighting Equipment

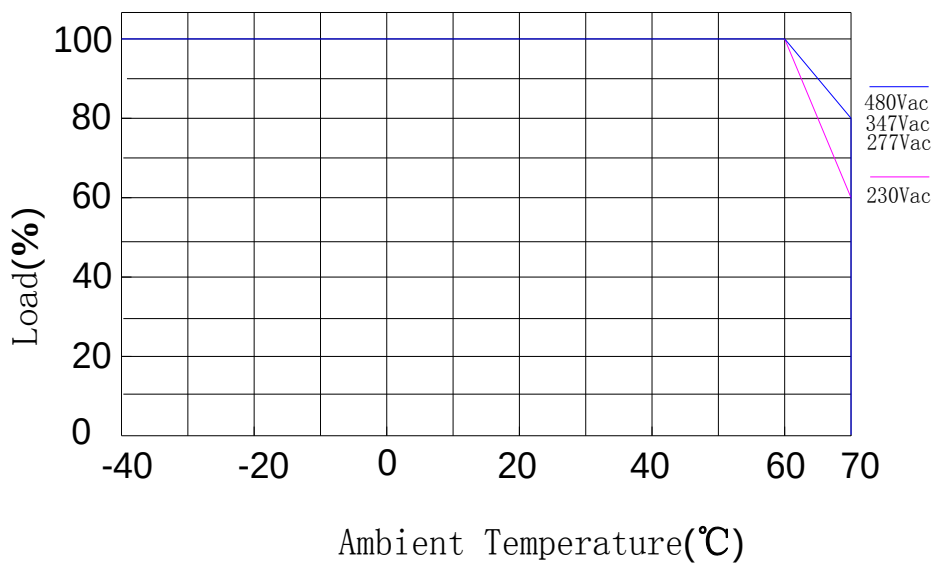
Note: (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself

Inrush Current Waveform

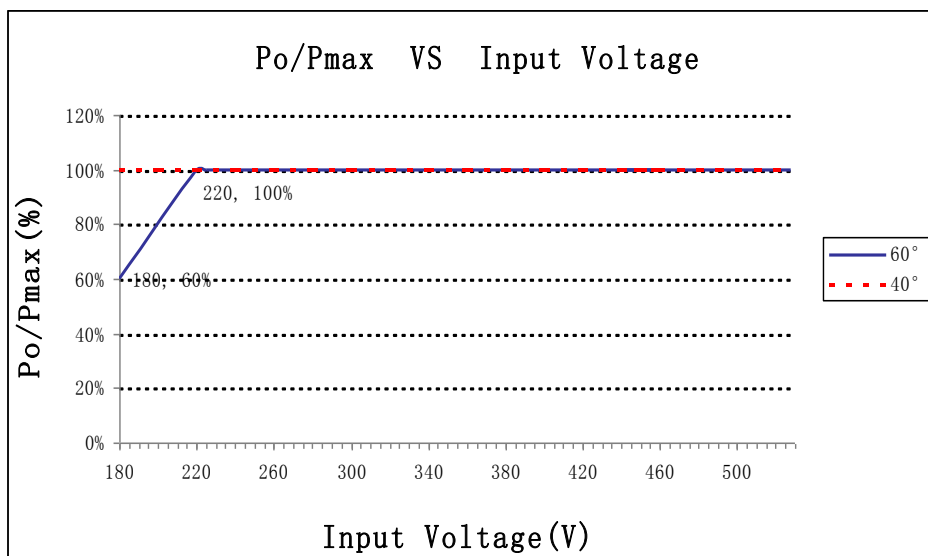


Derating Curve

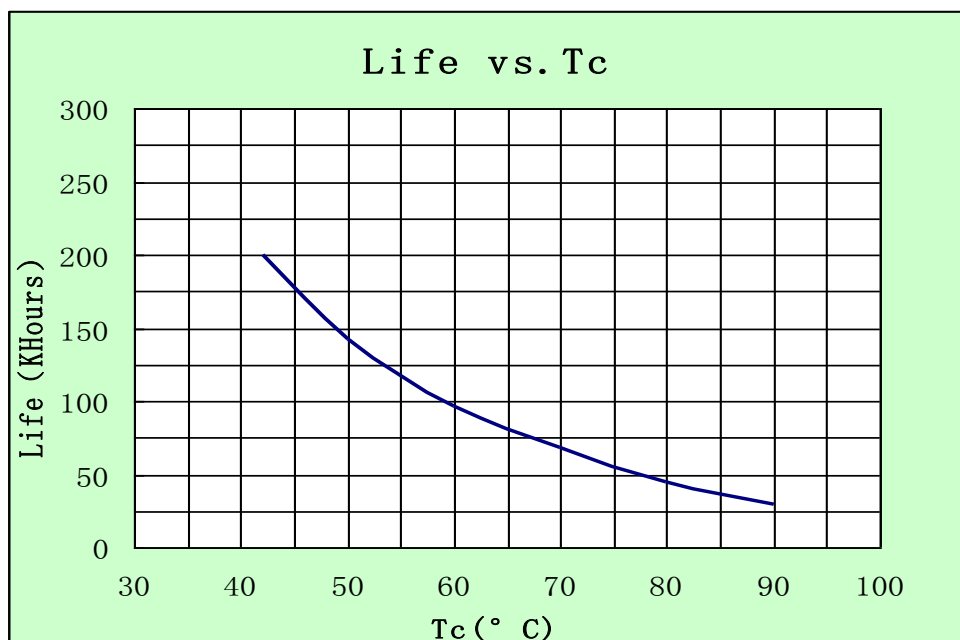
Derating Curve



Output Power vs. Input Voltage Curve

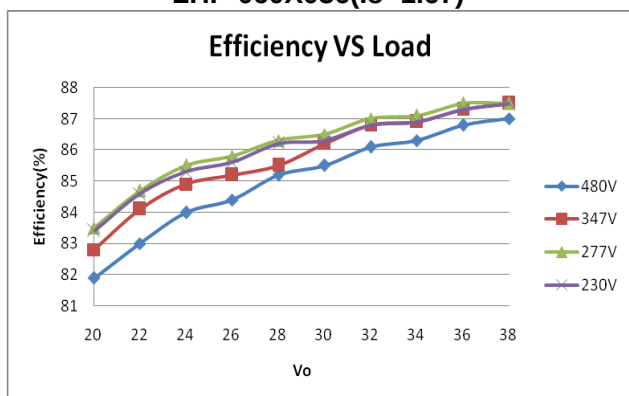


Lifetime vs. Case Temperature

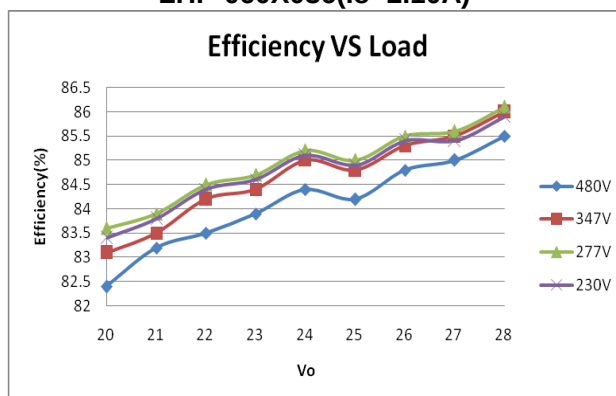


Efficiency vs. Load Curve

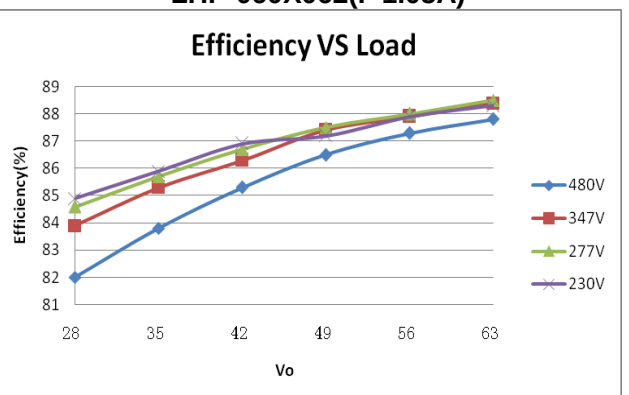
LHP-060X036($I_o=1.67$)



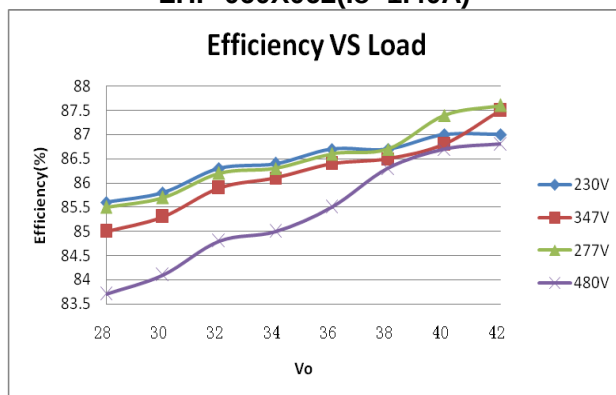
LHP-060X036($I_o=2.10A$)



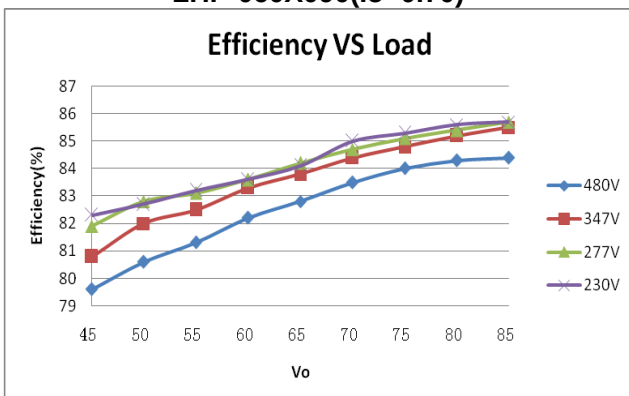
LHP-060X062($I=1.05A$)



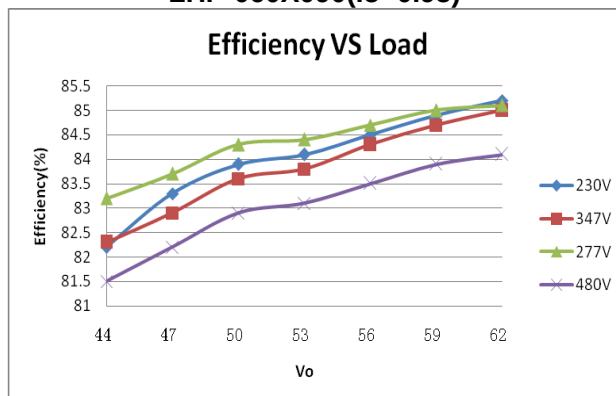
LHP-060X062($I_o=1.40A$)



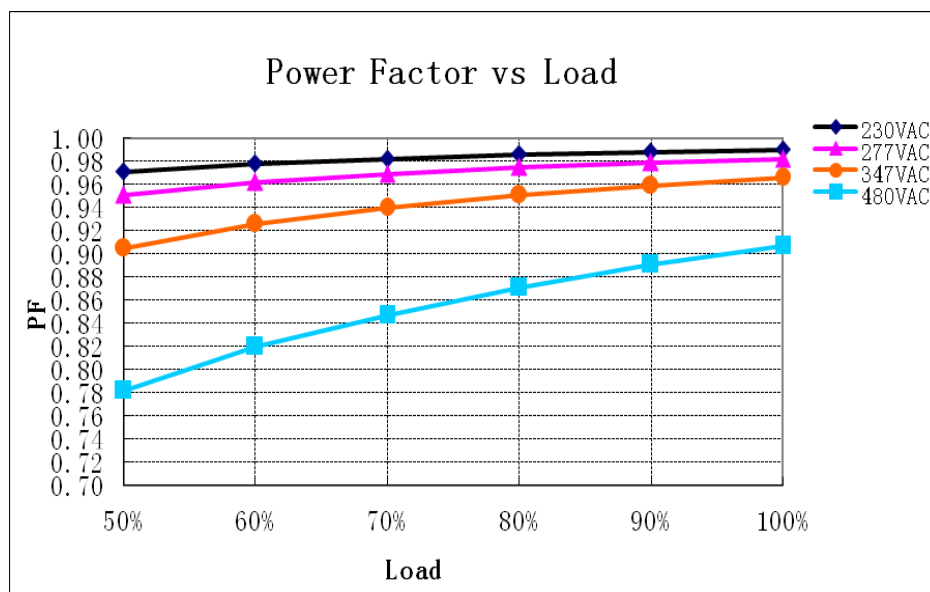
LHP-060X090($I_o=0.70$)



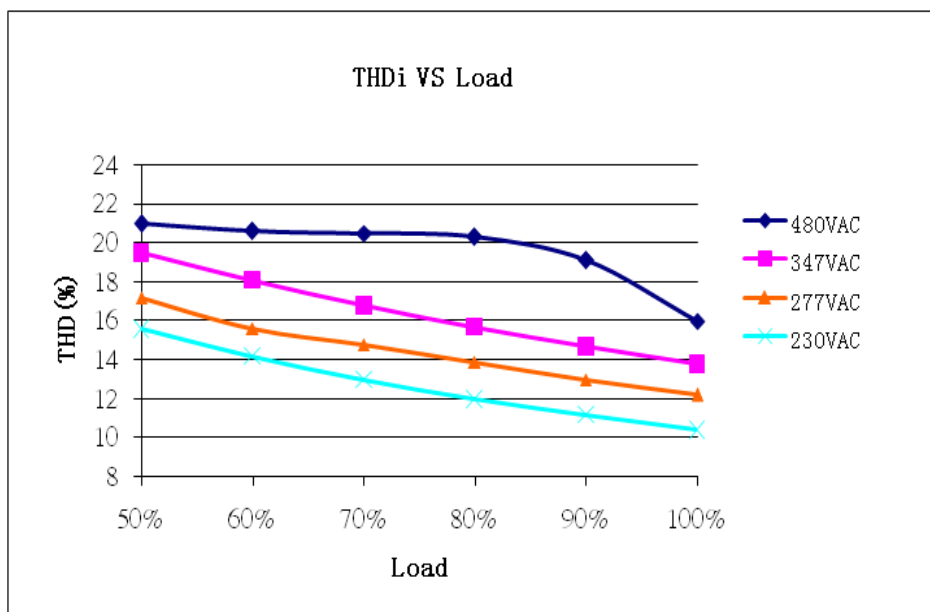
LHP-060X090($I_o=0.95$)



Power Factor vs. Load Curve



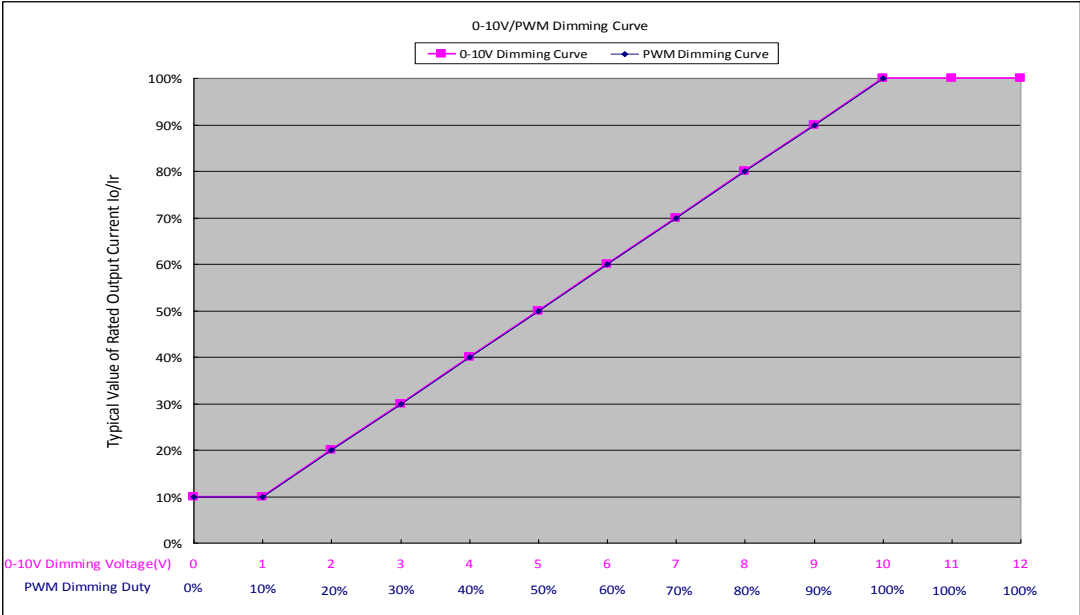
Total Harmonic Distortion Curve



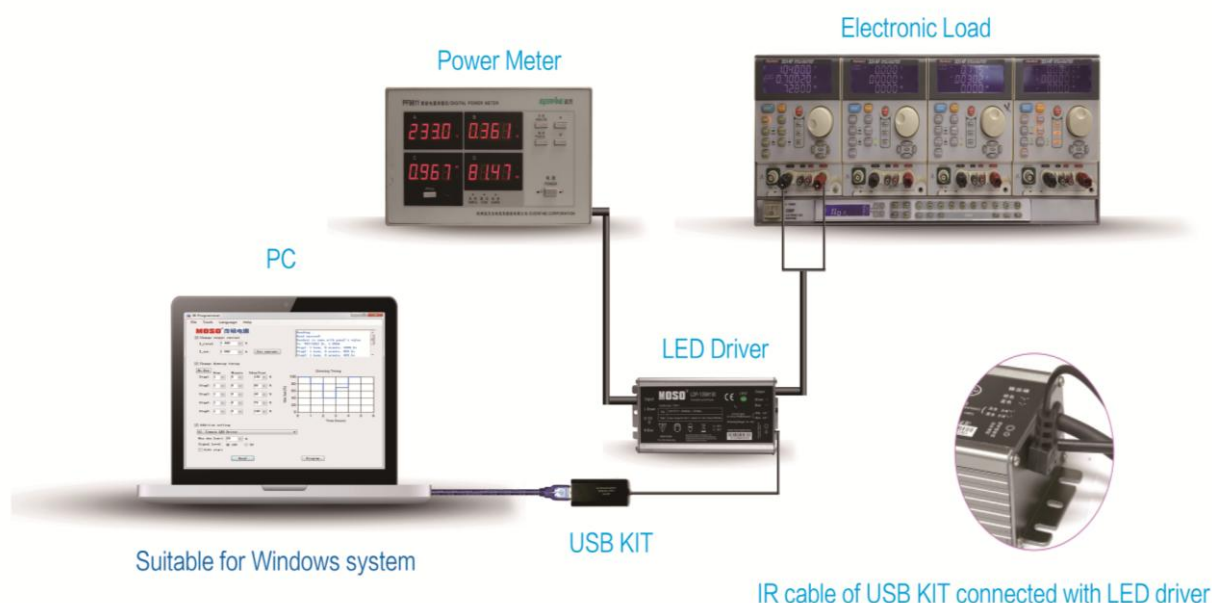
Protection Functions

Parameter	Notes
Over Temperature Protection	Decreases output current, returning to normal after over temperature is removed. The max derating could be 30% (typ.).
Short Circuit Protection	Constant current mode and auto recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed.
Over Voltage Protection	Run into protection model when output voltage exceeds limit, and return to normal when the fault condition is removed.

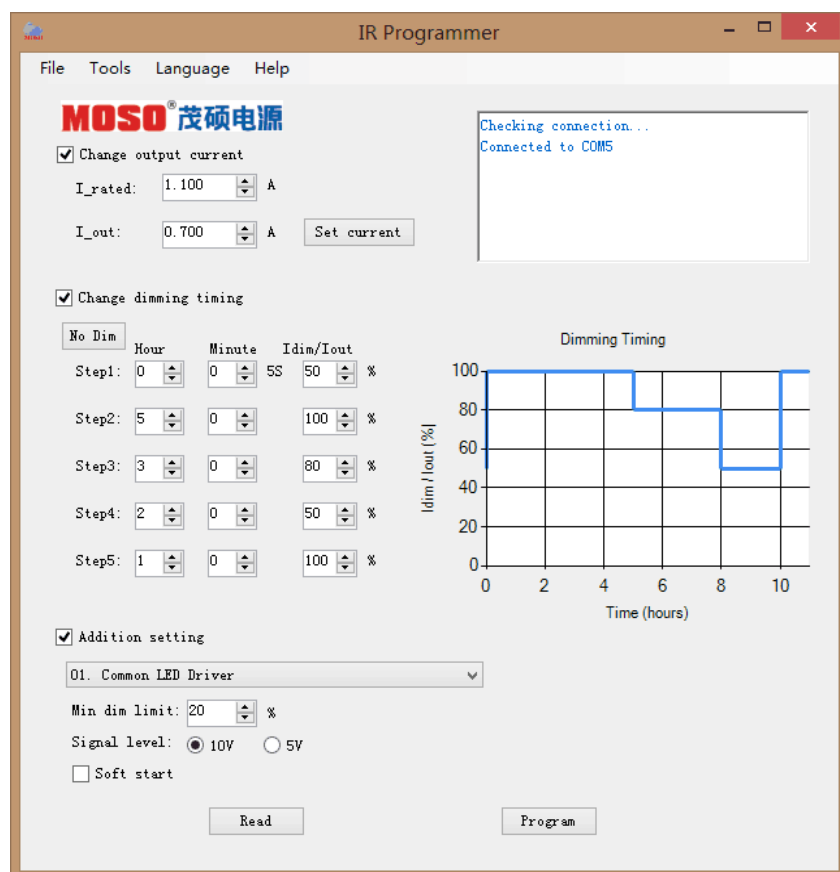
0-10V Dimming/PWM Dimming Curve



Programming Connection



Programming Guide and Software Interface



Programming by Software:

- 1) Read existing setting of the driver
- 2) Change output current;
- 3) Set timer dimming schedules;
- 4) Addition setting
 - Set min. dim value;
 - Set signal level can be 5V or 10V;
 - Set soft start.

Using infrared Controller to Reset Output Current



Operation Instruction:

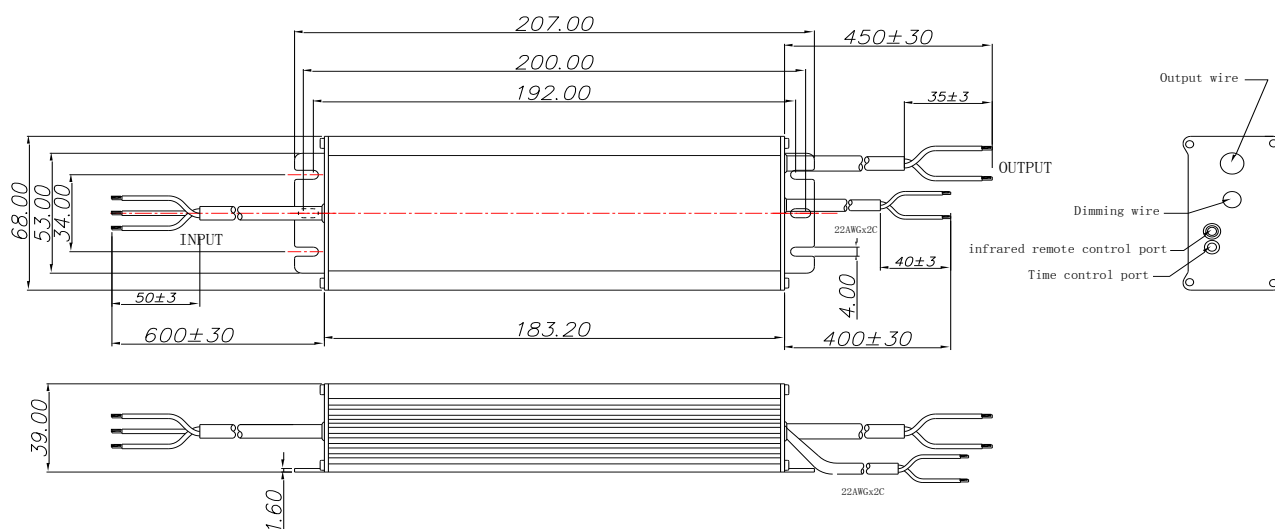
- 1) Insert cable terminal of the infrared controller into the infrared communication port, which is at the DC output side of the LED driver.
- 2) Press "ON" key to power on the controller;
- 3) Within 10S interval, press a function key to adjust output current to the percentage of max delivered current;
 - 10%-100%: Percentage of maximum output current of such driver.
 - + / - : Fine adjustment of output current, increase / decrease 1% each time.
 - ON: Power on controller.
 - OFF: Set min output current of such driver.
 - SET: No function.

Warning:

- Please do not hold "+"key, to avoid the over power protection and unstable output.
- Each step of operation should be done within 10S interval, otherwise the controller is power off automatically.

Mechanical Outline

LHP-060 types



Note: Model LHP-60R no dimming wire.

Wire	Specification
AC Input	UL 3x18AWG L=600mm
DC Output	UL 2x18AWG L=450mm
Dimming	22AWG 2C L=400mm

Revision History

Change Date	Revision	Description of Change		Notes
		Item	From	
2018-05-26	A.1	Datasheets Release	/	