

规格书

ZH-160N 系列 LED 驱动电源

机型名称: ZH-HBG-160NX

概述: 160W 非隔 LED 驱动电源

版本: V1.0

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变更履历表

版本	变更内容描述	日期	操作人
VER:1.0	初次发行	2018/09/19	黄玉梅
VER:1.1	增加辅助电源参数指标, 增加 TC 点位置	2018/10/11	邢宏印

■特性【Characteristic】

- 国际通用交流输入范围(高达 277VAC)
The international AC Input range(Max 277VAC)
- 效率高达 94% (150V 输出时)
Efficiency up to 94%(150V output)
- 保护种类: 短路保护, 过流保护, 过压保护, 过温保护
Protection: Short Circuit, Over-Current, Over-Voltage
Over temperature
- OCP 值可通过输出线和内部电位器调整
OCP value could be adjusted by output wire and inside Potentiometer
- IP67 防护等级, 户内户外安装
IP67 waterproof grade, Suitable for Indoor and Outdoor
- 可选调光功能(0-10Vdc, 1-10Vdc 或 PWM 信号或电阻)
Built-in 3 in 1 dimming function(0-10Vdc, 1-10Vdc, PWM, Resistor)
- 适用于 LED 照明
Used for LED Illumination
- 符合世界照明设备安全标准
Comply with world lighting safety standards
- 内置防雷电路, 可满足共模 10K, 差模 5K(保证电源不出现损坏, 非隔离需考虑灯板绝缘)
Built-in Surge Protection LN-PG 10KV, L-N 5KV, To ensure no damage of power supply. We should think about the insulation of the PCB board.
- 5 年保固 (请参照保修声明)
5 Years warranty(Refer to the warranty statement)



■通用描述

ZH-HBG-160N 系列是我公司研发的高功率因数, 高效率, 高可靠性, 高恒流精度的 LED 驱动电源, 具有功能齐全, 规格多样, 可满足更多不同参数需求的客户, 同时拥有完善的保护功能, 以保证电源和灯具的寿命和可靠性。

ZH-HBG-160N Series were researched and development by our company with high power factor, high efficiency, high reliability LED driver. With complete function and Varied specifications can meet more different parameters requirement form different customs. Still with perfect protection function to ensure the lifetime of driver and lighting.

此电源采用非隔离拓扑结构, 使用时灯板需要做好绝缘处理, 户外使用时灯板需要做好防水处理, 以免造成漏电, 引发不安全因素。

The power supply using an isolated topology, We must make sure the insulation of PCB board while using. To ensure without of leakage and causing insecurity, we must make sure the waterproof of



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N 系列 160W 圆形 LED 驱动电源

PCB board while for outdoor using.

此电源采用双极非隔离拓扑，具有输出纹波低，输入电压范围宽，无频闪等特点。支持超宽的输出电压范围，提高产品通用性，降低库存压力。

The power supply using bipolar unfenced topology, low output ripple, wide input voltage range, no stroboscopic, etc. Support super wide output voltage range, improved product versatility, reduced inventory pressure.

■ 型号列表 Item List

型 号 Model	输出电压范围 Output Voltage	输出电流范围 Output range	最大输出功率 Max Power	输出电流精度 Current Tolerance	效率(典型) Efficiency
ZH-HBG-160N*	90-150V	0.8-1.5A	160W	3%	(150V)94%
ZH-HBG-160N*-300	200-300V	0.5-0.8A	160W	3%	(300V)95%

注：

1. 测试条件：230Vac 输入，满载，25℃。

Test Condition :230Vac Input Full Load 25℃

2. * 可选字母B或N, 默认空位表示无其他可选功能（基础机型）；B字母表示外部三合一调光功能（1-10V，PWM，外接电阻）；B 字母表示外部三合一调光+辅助供电功能。

The optional letters B or N,B letters external triad dimming function (1-10 v, PWM and the external resistance); B letters external 3-in-1 dimming function and auxiliary power supply function.

3. 在调整输出电流时，电源输出功率严禁超出160W, 否则将会引起过载，造成损坏。

When adjusting the output current, output power must lower then 160 w power, otherwise it will cause overload and causing damage.

■ 技术参数规格 Technical Specifications

【1. 输入参数 Input Parameter】

项目 Items	参数 Parameter	最小值 MIN	典型值 TYP	最大值 MAX	备注 Remarks
1.1	输入电压范围 Vac (AC input range/Vac)	100	110-240	277	额定 110-277Vac (Rated 110-277Vac)
1.2	输入频率范围 HZ (Input Frequency/ HZ)	47Hz	---	63Hz	
1.3	最大输入电流 A (Input Current (Max)/A)	---	---	1.8A	Vin=100Vac
1.4	输入浪涌电流 A (Input inrush current/ A)	---	---	30A	Vin=230Vac/50Hz, 冷启动 (Vim=230Vac/50Hz, Cold start)
1.5	功率因数 PF (Power Factor/ PF)	0.95	---	---	Vin=230Vac/50Hz, 满载 (Vin=230Vac/50Hz, full load)
1.6	总谐波失真 THD % Total Harmonic (Distortion/THD %)	---	10%	20%	Vin=100-277Vac/50Hz, 满载 (Vin=100-277Vac/50Hz, full load)

【2. 输出参数 Output Parameter List】

ZH-HBG-160N*

项目 Items	参数 Parameter	最小值 MIN	典型值 TYP	最大值 MAX	备注 Remarks
2.1	输出电流 A (Output current A)	0.8	---	1.5	通过输出端电位器调整 (Adjust by the output terminal potentiometer)
2.2	空载电压 dcV (No load Voltage dcV)	155	---	160	---
2.3	输出电压纹波 (PK-PK) (Output voltage ripple PK-PK)	---	1%	3%	满载 (Full load)
2.4	输出电流纹波 (PK-PK) (Output current ripple PK-PK)	---	10%	15%	满载 (Full load)
2.5	输出负载电压范围 (Output load voltage range)	90	---	150V	Vin=100-265Vac
2.6	效率 (Efficiency)	93%	94%	---	满载 (Full load)
2.7	输出过冲 (Output Overshoot)	---	---	+10%	冷启动输出峰值 (Cold start output peak)
2.8	上升时间 (Rise Time)	---	---	200mS	
2.9	开机延迟时间 (Turn-on Delay TIME)	---	0.8S	2S	100-265Vac

ZH-HBG-160N*-300

项目 Items	参数 Parameter	最小值 MIN	典型值 TYP	最大值 MAX	备注 Remarks
2. 10	输出电流 A (Output current A)	0. 5	---	0. 8	通过输出端电位器调整 (Adjust by the output terminal potentiometer)
2. 11	空载电压 dcV (No load Voltage dcV)	310	---	330	---
2. 12	输出电压纹波 (PK-PK) (Output voltage ripple PK-PK)	---	1%	3%	满载 (Full load)
2. 13	输出电流纹波 (PK-PK) (Output current ripple PK-PK)	---	1%	3%	满载 (Full load)
2. 14	输出负载电压范围 (Output load voltage range)	200	---	300V	Vin=100-265Vac
2. 15	效率 (Efficiency)	94%	95. 5%	---	满载 (Full load)
2. 16	输出过冲 (Output Overshoot)	---	---	+10%	冷启动输出峰值 (Cold start output peak)
2. 17	上升时间 (Rise Time)	---	---	200mS	
2. 18	开机延迟时间 (Turn-on Delay TIME)	---	0. 8S	2S	100-265Vac

【3. 保护功能 PROTECTION FUNCION】

项目 Items	参数 Parameter	最小值 MIN	典型值 TYP	最大值 MAX	备注 Remarks
3. 1	输出过压保护 (Output Over-Voltage Protection)	---	120%	---	过压重启
3. 2	短路保护 (Short Circuit Protection)	可长时间短路不损坏，短路功率 $\leq 10W$ Not damaged with long time short circuit , short circuit power $\leq 10W$			可自恢复, 打嗝模式 (Return to normal status when output limit current to get right)

【4. 环境要求 Environment Requirement】

项目 Items	参数 Parameter	最小值 MIN	典型值 TYP	最大值 MAX	备注 Remarks
4. 1	工作温度 (Operation Temperature)	-40° C	25° C	+70° C	参考降额曲线 (Ref to Derating Curve)
4. 2	贮藏温度	-40° C	25° C	+85° C	



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	(Storage Temperature)				
4.3	工作湿度 (Relative Operation Humidity)	10%RH	---	90%RH	
4.4	贮藏湿度 (Relative Storage Humidity)	5%RH	---	95RH	
4.5	海拔高度 (Height Above Sea Level)	-100m	---	3000m	
4.6	冷却方式 (Cooling Method)	空气自然冷却 (Air Cooling)			

【5. 其他要求 Reliability Requirements】

项目 Items	参数 Parameter	最小值 MIN	典型值 TYP	最大值 MAX	备注 Remarks
5.1	老化 (Burn-in)	50℃的环境下老化 2 时 (Burn-in for 2 hours 50℃)			裸板 (Bare-board)
		50℃的环境下老化 4 时 (Burn-in for 4 hours 50℃)			电源成品 (Power supply)
5.2	平均间隔故障时间估算 (MTBF Estimation)	60000hours	---	---	加速实验验证评估获得 (Accelerated experimental verification evaluation)
5.3	温度系数 (Temperature Coefficient)	-0.02%/℃	---	+0.02%/℃	
5.4	重量 (Weight)	900g	950g	1000g	
5.5	壳温 (Case Temperature)	---	---	90	
5.6	尺寸 (Size)	130*56.8mm (D*H)			±1mm

【6. 安规标准 Safety Standards &EMI/EMS 标准 EMI/EMS Standards】

10.1 安规标准(Safety standards)			
认证 certification	安规标准 Safety standards	状况 condition	备注 Remark
UL	UL8750: 2015	通过	有证书
ETL	CSA C22.2#250.13: 2014 Ed. 2	符合	/
SAA	AS/AZS61347	通过	有证书
TUV/CE	EN61347-1/A1:A1:2011 EN61347-2-13:2014 EN62493:2010	通过	有证书
CQC/CCC	GB 19510.14-2009	符合	/

10.2 安规要求 Safety Requirements			
项目 Projects		技术指标 (Technical indicators)	备注 (Remark)
介电耐压强度 (Dielectric compressive strength)	输入对输出 (Input to output)	---	非隔离, 无法测试
	初级对地 (Junior to ground)	1600Vac/5mA Max / 60 seconds	基本绝缘, 无击穿、无飞弧 The basic insulation, No breakdown, No arcing
	输出对地 (Output to ground)	1600Vac/5mA Max / 60 seconds	基本绝缘, 无击穿、无飞弧 The basic insulation, No breakdown, No arcing
绝缘电阻 (Insulation resistance)	输入对地 (Input to ground)	$\geq 10 \text{ M}\Omega$	测试电压: 500Vdc The test voltage: 500Vdc
接地电阻 (Grounding resistance)		$\leq 0.1 \Omega$	25A/1min
10.3 EMC 要求 (EMC Ask for)			
项目 Projects		标准/级别 Standard/grade	状态 State
传导 CE (Conduction CE)		EN55015:2013+A1: 2015	合格 Pass
辐射 RE (Radiation RE)		EN55015:2013+A1: 2015	合格 Pass
谐波 (Harmonic)		IEC/EN 61000-3-2	Class C
浪涌 (Surge)		IEC/EN61000-4-5	LEVEL 4 判据 B (差模 5KV, 共模 10KV)

备注:

1. 如未特别说明, 所有规格参数均在输入为 230VAC. 25℃环境温度下进行量测。

If not specified otherwise, all specifications and parameters are tested in the input to 230 vac. Under 25 °C temperature measurement.

2. 纹波和噪声测量方法: 使用一条 0.5² mm 双绞线, 同时终端要并联 0.1uf 和 47uf 的电容, 在 20MHZ 带宽下进行量测。

Ripple and noise measurement method: using a squared 0.5 mm twisted pair, and a terminal to 0.1 of and 47of capacitance in parallel, the measurement under 20 MHZ bandwidth

3. 精度: 包含设定误差、线性调整率和负载调整率。

TORLERANCE: contains setting error, linear regulation and load regulation.

4. 低输入电压情况下需减额输出, 具体请参照静态特性曲线图。

While low Input voltage shall be reduced , Need deduction under low input voltage output, Refer to the static characteristic curve.

5. 安规和 EMC 设计 EN60598-1, CNS15233, GB700.1, FCC part18.

Safety and EMC design EN60598-1, CNS15233, GB700.1, the FCC part18.

6. 启动时间是在冷机启动下测得, 频繁的开关机可能使启动时间有所变化。

Cold-Start time is measured under cold machine start, frequent switch machine could change the start up

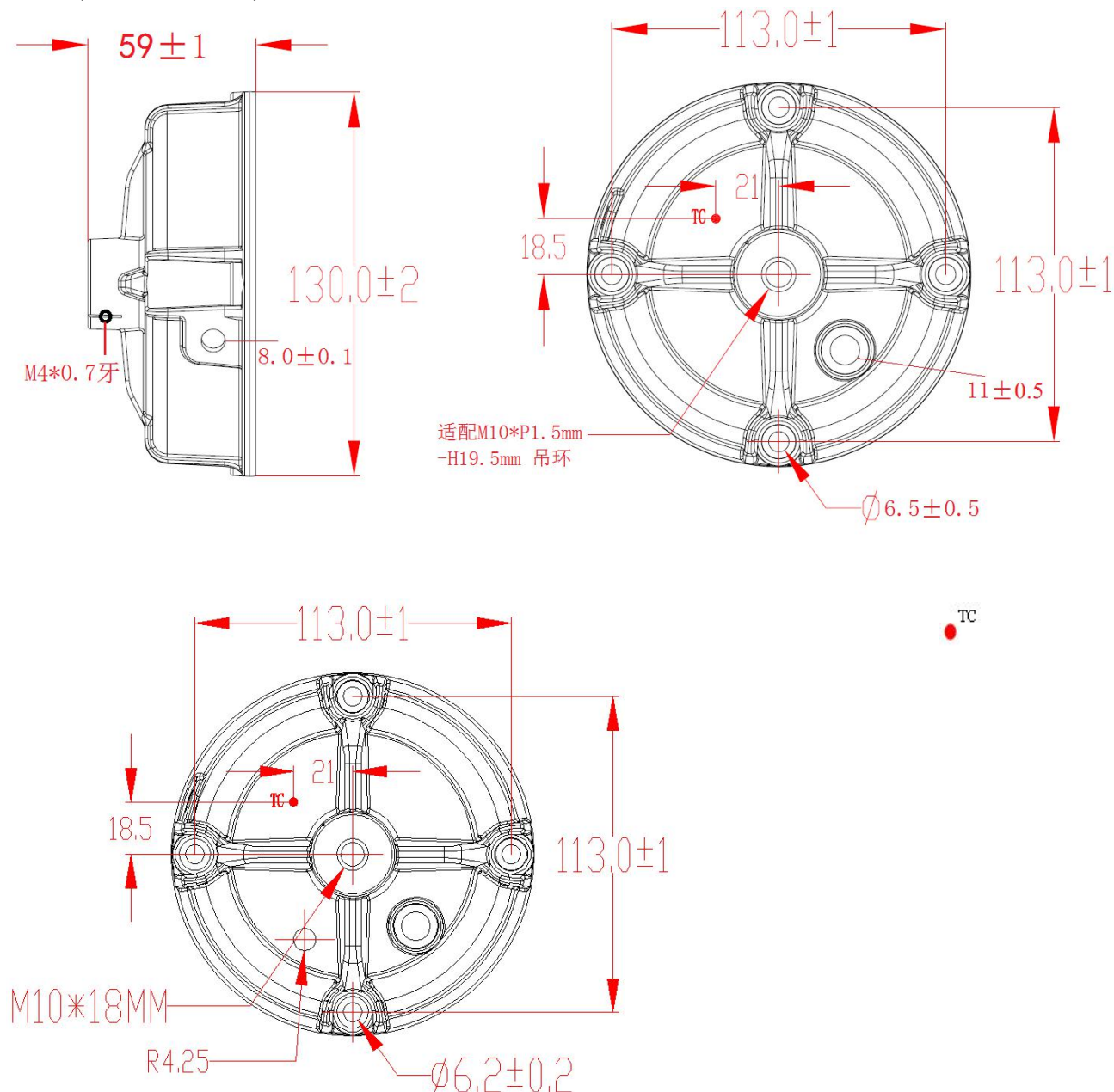
time .

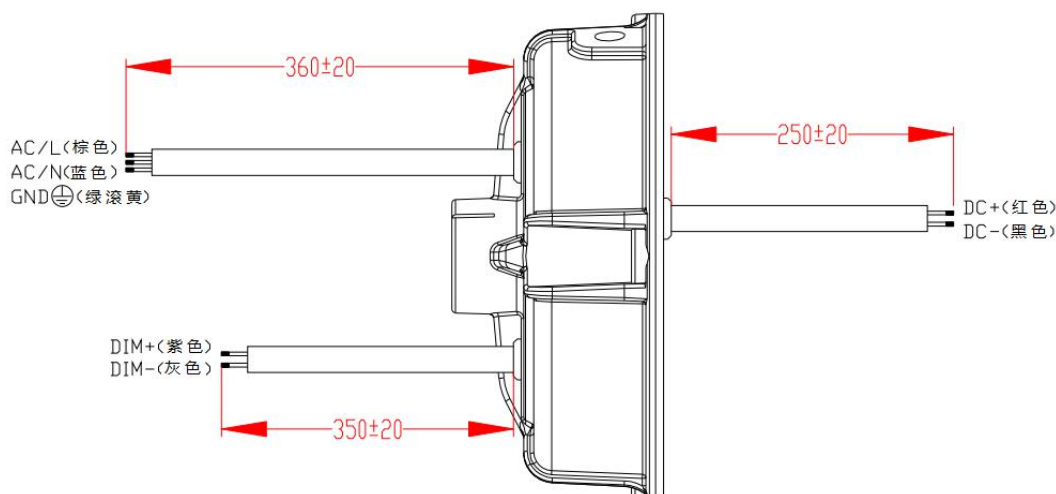
7.电源被视为一个元件与终端设备结合使用，因 EMC 受整套装置影响，终端设备制造商需对整套装置进行 EMC 确认。

Power Supply was seen as a component and terminal equipment used in combination, Because of EMC affected by a whole set of equipment, terminal equipment manufacturers need to confirm EMC with complete equipment

■结构尺寸 Size

Blank:(ZH-HBG-160N*)





■线材说明 Wire instructions

AC 输入线 (AC Input wire)	<p>欧规线材: VDE HO5RN-F 3*1.0² mm, 外径 7.3MM, 外露线长 36cm (±2cm), 其中剥线 4cm (±5mm), 上锡 8mm (±2mm)。</p> <p>European Standard wire: VDE ho5rn-f 3* 1.01mm, external diameter: 7.3mm, The length of exposed wire 36cm(±2cm) Wire stripping 4cm(±5mm) Lead-free leaching 8mm(±2mm)。</p> <p>棕色为 L, 蓝色为 N, 黄绿为 P/E</p> <p>Brown as L, Blue as N, Yellow and Green as P/E</p>
DC 输出线 (DC Output wire)	<p>欧规线材: VDE HO5RN-F 2*1.0² mm, 外径 6.9MM, 外露线长 25cm (±2cm), 其中剥线 4cm (±5mm), 上锡 4mm (±1mm)。</p> <p>European Standard wire: VDE ho5rn-f 2* 1.01mm, external diameter: 6.9mm, The length of exposed wire 25cm(±2cm) Wire stripping 4cm(±5mm) Lead-free leaching 4mm(±1mm)。</p> <p>红色为+, 黑色为-</p> <p>Red as +, Black as -</p>
DIM 调光线 (仅 B 型有此线) (DIM dimming Wire(Only B Model))	<p>#22AWG*2, 外露线长 35cm (±3cm), 紫色线外露 50MM, 灰色线外露 45MM, 上锡 5mm (±1mm)。</p> <p>紫色为 DIM+, 灰色为 DIM-。</p> <p>#22AWG*2, The length of exposed wire 35cm(±3cm), the purple line is exposed for 50MM, and the gray line is exposed for 45MM, Wicking 5mm(±1mm)。</p> <p>Purple as DIM+, Gray as DIM-</p>
供电+调光线	<p>#22AWG*3, 外露线长 35cm (±3cm), 红色线外露 50MM, 紫色线外露 45MM, 灰色线外</p>

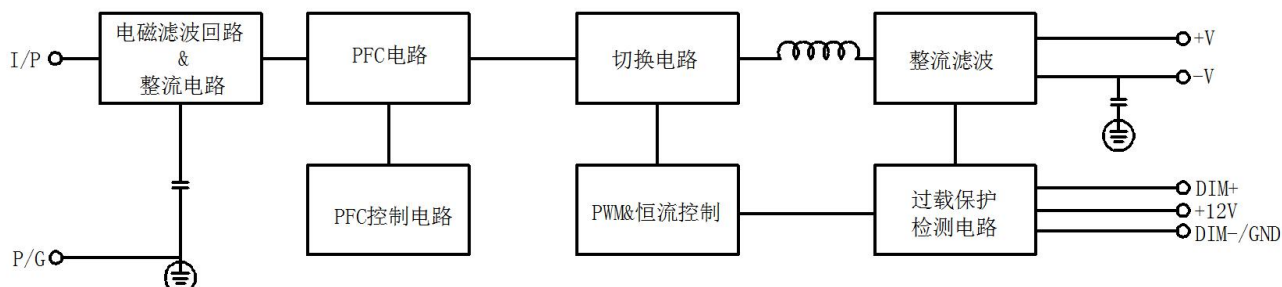
(仅 H 型有此线)	露 40MM,上锡 5mm (± 1 mm)。
(Power	红色为+12V,紫色为 DIM+, 灰色为 GND/DIM-。
Supply+Dimming	#22AWG*3 ,The length of exposed wire35cm(± 3 cm) , The red line is exposed for 50MM, the purple line is
Wire(Only H	exposed for 45MM, and the gray line is exposed for 40MM,Wicking 5mm(± 1 mm)
Model)	Red as +12V ,Purple as DIM+,Gray as GND/DIM-。

■ 标签图档 The label image file

注：标签为激光雕刻于外壳上盖表面（亦可按客户要求设定版面内容，或粘贴纸质标签），S/N 为产品成品生产日期随订单实际生产日期变动

Note:The label is designed for the laser to be carved on the outer surface of the shell (or to set the layout or paste the paper label as required by the customer).S/N changes the production date of the finished product with the actual production date of the order.

■ 电路结构方框图 Block Diagram

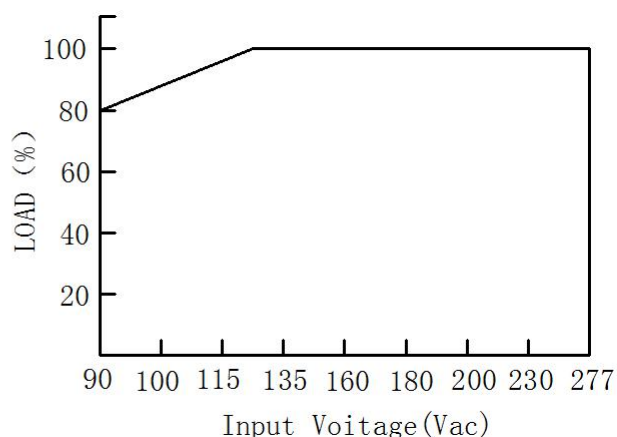
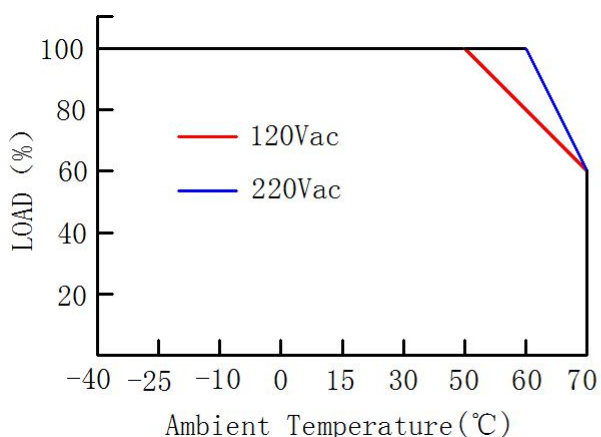


■ 环境与输入电压减额曲线

环境温度与输出功率

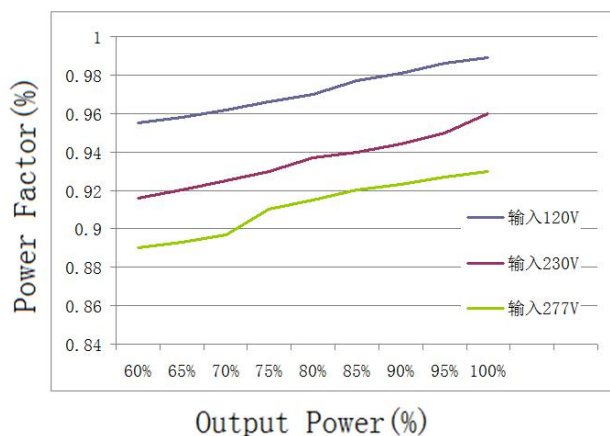
Reliability Curve/Static Characteristic

输出功率与输入电压

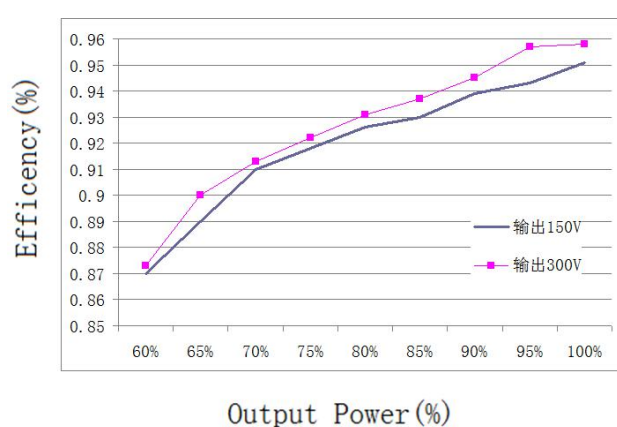


■ 功率因数特性和效率曲线 Power Factor Characteristic

功率因数与输出功率

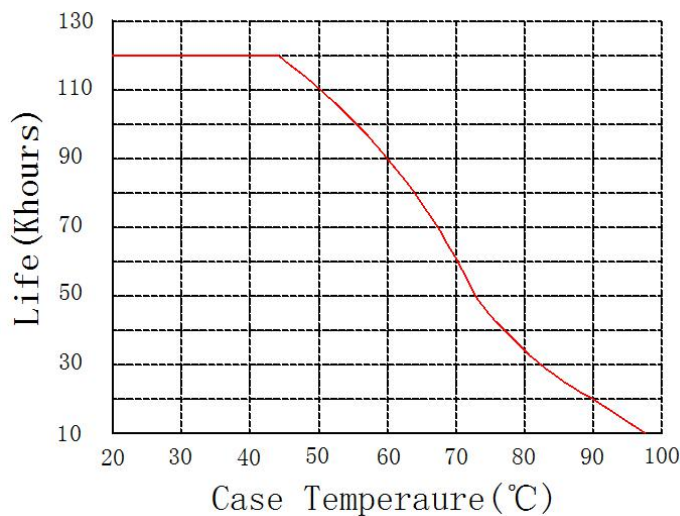


输出功率与效率 (230VAC)



■ 壳温寿命 The shell temperature life

外壳温度与寿命

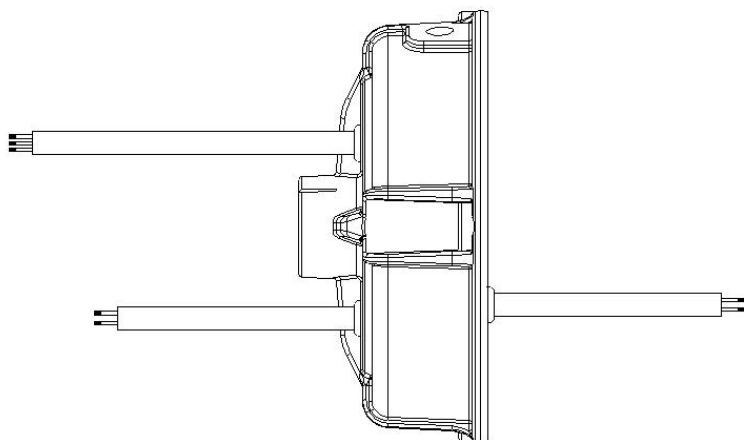


■ LED 模块驱动方式

建议驱动输出端直接连接 LED 光源，不宜在输出端和 LED 光源之间加装其他控制器件。

LED driver method has two ways .one called directly method another called with led method.

■ 调光操作方法（仅限 B 型） The method of dimming (Only B series)



※ 在 DIM 和 DIM-间连接 1~10Vdc 直流电压或 10V PWM 信号，即可调整输出恒电流的数值

Connecting 1-10v dc or 10v PWM signal between DIM and DIM-,then value of output constant current can be adjusted

※ 调整输出电流的参考电阻值（典型值）

The reference value of resistance of adjusting output current (TYP)

电阻阻值	10K Ω	20K Ω	30K Ω	40K Ω	50K Ω	60K Ω	70K Ω	80K Ω	90K Ω	100K Ω	OPEN
额定电流百分比	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%-108%



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※1-10V 调光功能调整输出电流值（典型值）

Output current value of 0-10V dimming function (TYP)

调整伏数	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
额定电流百分比	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%-108%

※10VPWM 信号调整输出电流值（典型值）频率范围：100Hz-3KHz

Output current value of 10VPWM Dimming (TYP)Frequency Range: 100Hz-3KHz

占空比比例	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
额定电流百分比	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%-108%

※ B 型使用内置调光功能不能将 LED 灯源完全变暗。如需要将 LED 完全变暗可选用 H 型。

Led lights can not be darkened completely though B series built-in dimming function.

■调光操作方法（仅限 H 型） The method of dimming (Only H series)

※ H 型是带有辅助电源功能机型，其辅助电源参数指标如下表：

项目 Items	参数 Parameter	最小值 MIN	典型值 TYP	最大值 MAX	备注 Remarks
7.1	输出电压 dcV	12	12.5	13	
7.2	输出电流	---	---	300MA	满载 (Full load)
7.3	输出电压纹波 (PK-PK) (Output voltage ripple PK-PK)	---	50MV	100MV	满载 (Full load)
7.4	短路保护	可长时间短路不损坏，短路功率 $\leq 2W$ Not damaged with long time short circuit , short circuit power $\leq 2W$			可自恢复, 打嗝模式 (Return to normal status when output limit current to get right)

※ 在 DIM 和 DIM-间连接 0~10Vdc 直流电压或 10V PWM 信号，即可调整输出恒电流的数值

Connecting 1-10v dc or 10v PWM signal between DIM and DIM-,then value of output constant current can be adjusted

※ 调整输出电流的参考电阻值（典型值）

The reference value of resistance of adjusting output current (TYP)

电阻阻值	0 K Ω	10K Ω	20K Ω	30K Ω	40K Ω	50K Ω	60K Ω	70K Ω	80K Ω	90K Ω	100K Ω	OPEN
额定电流百分比	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%-108%

※1-10V 调光功能调整输出电流值（典型值）

Output current value of 0-10V dimming function (TYP)



深圳市志和兴业电子有限公司

N 系列 160W 圆形 LED 驱动电源

调整伏数	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
额定电流百分比	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%-108%

※10VPWM 信号调整输出电流值（典型值）频率范围：100Hz-3KHz

Output current value of 10VPWM Dimming (TYP)Frequency Range: 100Hz-3KHz

占空比比例	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
额定电流百分比	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%-108%

※ 建议直接连接 LED，不适合外加驱动器。

Suggesting Connected with LED directly, No more Drives .