2400W单路输出SCN系列开关电源

2400W Single Output SCN Series Power Supply

HF2400W-SCN-**

工业控制 Industrial Control | 安防系统 Security System | 轨道交通 Rail Transportatior | 网络通信 Network/Telecom | 机电设备 Equipment | 电力电气 Electric Power | 新能源 New Energy

■ 产品特点 Features

- 体积小，结构紧凑，内建主动式PFC功能
- 输入交直流两用
- 输入电压范围：180~264Vac/255~370Vdc
- 关键元器件采用国内外知名品牌
- 铝合金制成的外壳
- 宽范围的工作环境温度：-30°C~+70°C
- 具有遥控开关/遥感功能/辅助电源/电源正常信号输出
- 主动并联运行可实现高达7200W (2+1)
- 电源散热方式：智能温控调速风冷
- 低纹波噪声
- 高效率
- 输入与输出间的隔离电压高达3000Vac
- 可承受300Vac输入浪涌电压5S
- 加喷三防保护剂，应对恶劣环境影响
- 过电压等级II
- 输出过载保护、过压保护、短路保护、过温保护
- 安全性能和电磁兼容符合国际和中国的最新标准
- 3年质保
- 尺寸：278*178*63.5mm

- Small size, compact structure, built-in active PFC function
- Suitable for both AC and DC input
- Input voltage range: 180~264Vac/255~370Vdc
- Famous brand components for key parts
- Aluminum alloy enclosure
- Wide range of operating temperature: -30°C~+70°C
- Equipped with remote control switch/ remote sensing function/ auxiliary power supply/ normal power signal output
- Active parallel operation can achieve up to 7200W (2+1)
- Cooling method: intelligent temperature control, speed regulation, air
- Low ripple & noise
- High efficiency
- Isolation voltage from input to output up to 3000Vac
- Withstand 300Vac surge input for 5 seconds
- Add protective coating to withstand the harsh environments
- Overvoltage level II
- Protections: overload/ over voltage/ short circuit/ over temperature
- Meet the latest international and Chinese safety & EMC standards
- 3 years warranty
- Dimension: 278*178*63.5mm

■ 产品介绍 Product Introduction

HF2400W-SCN系列产品是一款金属机壳型智能开关电源。其内置主动式功率因数校正功能，PF可达0.95，具备超薄体积和全面的安全规范。该系列电源支持交直流两用，具有宽广的工作温度范围、高海拔适应能力、低功耗与高效能，效率最高可达92%，高可靠性、以及安全隔离等显著优势，能够有效适配感性和容性负载。另外此电源提供了智能化的远端遥控开/关控制，输出电压远端调整，均流并联使用，内置辅助电源等多项功能以使客户在更多个性化场景使用时获得灵活性和便利性。产品安全可靠，其电磁兼容性及安全性能符合EN55032, EN55035, IEC/EN61000-3-2, 3, IEC/EN61000-4-2, 3, 4, 5, 6, 8, 11, IEC/EN61000-6-2, IEC/EN61000-6-4, IEC/EN62368-1, GB4943.1等国际和中国的最新标准。常规输出电压可提供 24V /27V /36V /48V /54V等多种配置以满足不同需求。如有特殊要求，请联系销售人员进行定制。

The HF2400W-SCN series are the metal enclosed intelligent switching power supply. It features a built-in integrated active PFC function, with PF value up to 0.95, an ultra-thin design, and comprehensive safety specifications. This series have the advantages including AC/DC input compatibility, wide operating temperature range, high altitude adaptability, low standby power consumption and high efficiency, with an efficiency of up to 92%, high reliability and safe isolation. Additionally, this series provide multiple features such as intelligent remote on/off control, remote adjustment of output voltage, parallel operation with current sharing, and a built-in auxiliary power supply, offering customers flexibility and convenience in various personalized scenarios. The products are safe and reliable, and can be applied to both inductive and

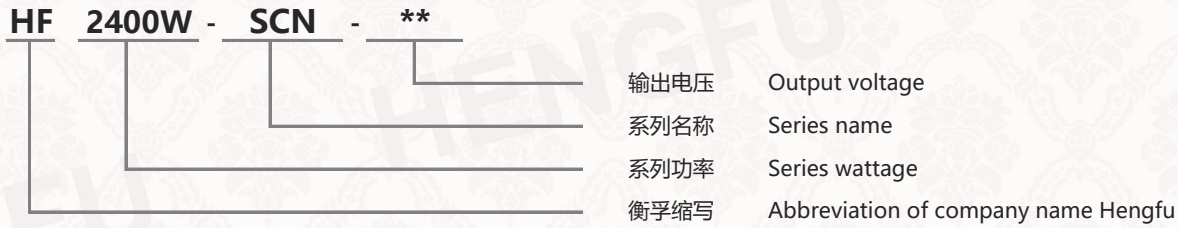
capacitive loads, which comply with the latest international and Chinese EMC & safety standards including EN55032, EN55035, IEC/EN61000-3-2, 3, IEC/EN61000-4-2, 3, 4, 5, 6, 8, 11, IEC/EN61000-6-2, IEC/EN61000-6-4, IEC/EN62368-1, and GB4943.1. Normal output voltage such as 24V /27V /36V /48V /54V is available, and other special requirements can be customized upon request.

■ 应用领域 Diverse Application

广泛应用于工业控制、自动化机械、农业机械、激光设备、仪器仪表、光伏储能、新能源汽车、充电桩、通信设备、医疗器材、智能家居、安防系统、轨道交通、电力电气等领域。

It can be widely used in various fields such as industrial control, automation machinery, agricultural machinery, laser equipment, instruments and apparatuses, photovoltaic energy, new energy vehicles, charging station, telecom equipment, medical equipment, smart home, security system, rail transportation, electric power.

■ 型号编码 Model Definition



■ 电气规格 Electrical Specifications

型号 Model No.	额定输出电压 DC Voltage	额定输出电流 Rated Current	输出电流范围 Current Range	额定功率 Rated Power	纹波与噪声[4] Ripple & Noise	效率 (Typ.) Efficiency
HF2400W-SCN-24	24V	100A	0~100A	2400W	≤150mVp-p	90%
HF2400W-SCN-48	48V	50A	0~50A	2400W	≤200mVp-p	91%

■ 输入电气特性 Input Electrical Characteristics [1]		参数 & 测试条件 Parameters & Test Conditions
额定输入电压	Rated input voltage	200-240Vac (280-340Vdc)
输入电压范围	Input voltage range	180~264Vac (255~370Vdc)
额定输入频率	Rated input frequency	50/60Hz
输入频率范围	Input frequency range	47~63Hz
输入电流	Input current	15A/230Vac
输入启动冲击电流	Input inrush current	＜65A/230Vac，冷启动 cold start
输入漏电流	Input leakage current	＜1mA/240Vac
功率因数	Power factor	＞0.95/230Vac

■ 输出电气特性 Output Electrical Characteristics [1]		24V	48V			
输出电压调节范围	Output voltage adjust range	22 ~ 28V	43 ~ 56V			
电网调整率[2]	Line regulation[2]	±0.5%				
负载调整率[3]	Load regulation[3]	±0.5%				
输出电压精度	Output voltage tolerance	±1%				
启动时间	Set up time	<1000ms/230Vac				
上升时间	Rise time	<80ms/230Vac				
保持时间	Hold up time	≥10ms/230Vac				
输出过载保护	Output overload protection	105%-112% 用户可调节的连续恒流限制或带5秒延迟关闭的恒流限制（电源重新上电后方可恢复） User adjustable continuous constant current limiting or constant current limiting with delay shutdown after 5S, re-power on to recover				

输出过压保护	Over voltage protection	115~150% 关断模式（电源重新上电后方可恢复） Shut off mode, re-power on to recover
输出短路保护	Short circuit protection	恒流限制延迟5秒后关闭输出电压（电源重新上电后方可恢复） Constant current limiting with delay shutdown after 5S, re-power on to recover
输出过温度保护	Over temperature protection	关闭输出电压，温度下降后自动恢复 Shut off output voltage, auto recovery after temperature goes down

■ 工作环境 Working Conditions		参数 & 测试条件 Parameters & Test Conditions [1]
工作温度	Operating temperature	-30℃~+70℃（参考减额曲线图 refer to derating curve）
储存温度	Storage temperature	-40℃~+85℃
工作湿度	Operating humidity	20%~90%RH，无凝露 non-condensing
储存湿度	Storage humidity	10%~95%RH，无凝露 non-condensing
温度漂移系数	Temperature coefficient	±0.03%
工作海拔[5]	Operating altitude[5]	≤2000m
冷却方式	Cooling method	智能温控调速风冷 intelligent temperature control, speed regulation, air cooling
冲击实验	Impact test	半正弦波，加速度20G，持续时间11ms，沿X,Y,Z 轴各进行3次冲击 Half sine wave, acceleration 20G, duration 11ms, 3 cycles each along X,Y,Z axes
振动实验	Vibration test	正弦波，振动频率10~500Hz，加速度2G，每个扫频循环10min，沿X,Y,Z 轴各进行6个扫频循环 Sine wave, vibration frequency 10-500Hz, acceleration 2G, 10min/ cycle, 6 cycles each along X,Y,Z axes
三防（水、尘、腐）	Protective coating	有 Yes

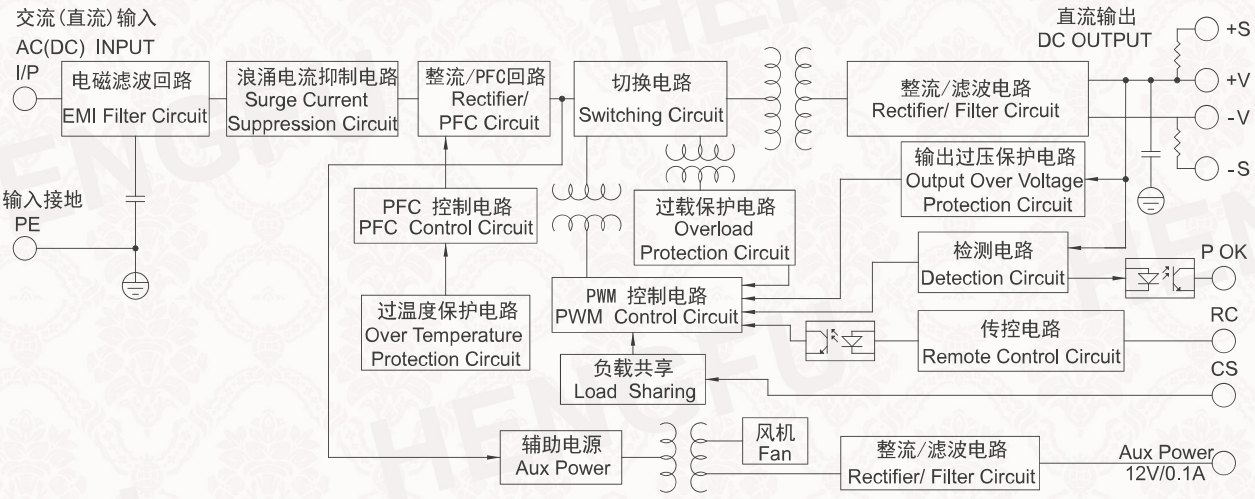
■ 安规和电磁兼容（Safety & EMC）[7]		参数 & 测试条件 Parameters & Test Conditions [1]
安全标准	Safety standards	符合 meet IEC/EN62368-1, GB4943.1
电磁兼容标准	EMC standards	符合 meet EN55032 Class A, EN55035, EN61000-4-2, 3, 4, 5, 6, 8, 11, IEC/EN61000-6-2, 4,
过电压等级	Over voltage category	OVC Ⅱ (IEC/EN62368-1, GB4943.1, 工作海拔 operating altitude ≤ 2000m)
绝缘强度（输入-输出）	Withstand voltage (I/P-O/P)	3.0KVac/1min
绝缘强度（输入-地）	Withstand voltage (I/P-FG)	2.0KVac/1min
绝缘强度（输出-地）	Withstand voltage (O/P-FG)	0.5KVac/1min
绝缘电阻（输入-输出）	Isolation resistance (I/P-O/P)	＞100MΩ（测试条件 test condition: 500Vdc）
绝缘电阻（输入-地）	Isolation resistance (I/P-FG)	＞100MΩ（测试条件 test condition: 500Vdc）
绝缘电阻（输出-地）	Isolation resistance (O/P-FG)	＞100MΩ（测试条件 test condition: 500Vdc）

■ 外观特性 Appearance Characteristics		参数 Parameters
安装方式	Installation method	机壳型 Enclosed type
外壳材质	Enclosure material	铝合金制成的外壳 Aluminum alloy enclosure
外形尺寸	Dimension	278*178*63.5mm
输入和输出接线端子	Input &output terminal block	Input: 13mm-3P; Output: 铜排 copper bar
端子适用线径	Applicable wire diameter for terminal	6-10AWG
端子螺丝/扭矩	Terminal screw/ torque	M4/1.2N·m

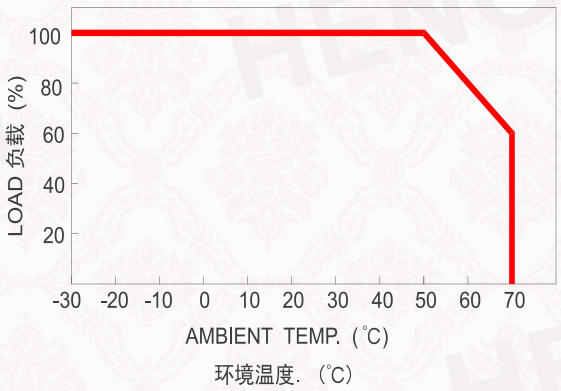
重量	Weight	3.2kg
最小包装量	Packing (MPQ)	4pcs, 13.7kg/CTN

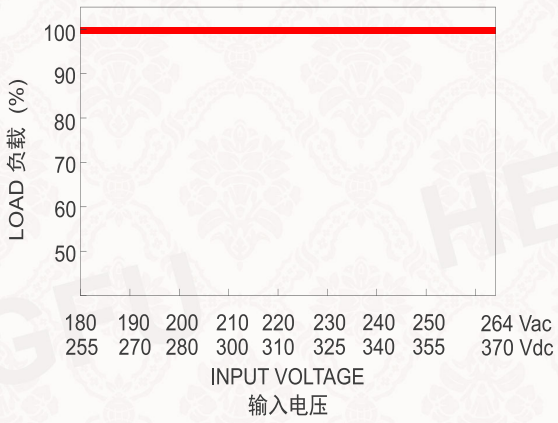
■ 特殊功能参数 Special Functions		参考功能图
远端遥控输出电压（PV）	Remote control output voltage	0~5Vdc
均流	Current sharing	参考功能图 Reference function diagram
外部辅助电源	External auxiliary power supply	12Vdc
遥控开关	Remote ON/OFF control	参考功能图 Reference function diagram
DC_OK 信号	DC OK signal	参考功能图 Reference function diagram
远端补偿	Remote compensation	参考功能图 Reference function diagram
输出电压可程控	Output voltage programmable	参考功能图 Reference function diagram
报警信号 1	Alarm signal output 1	参考功能图 Reference function diagram

■ 方框图 Block Diagram

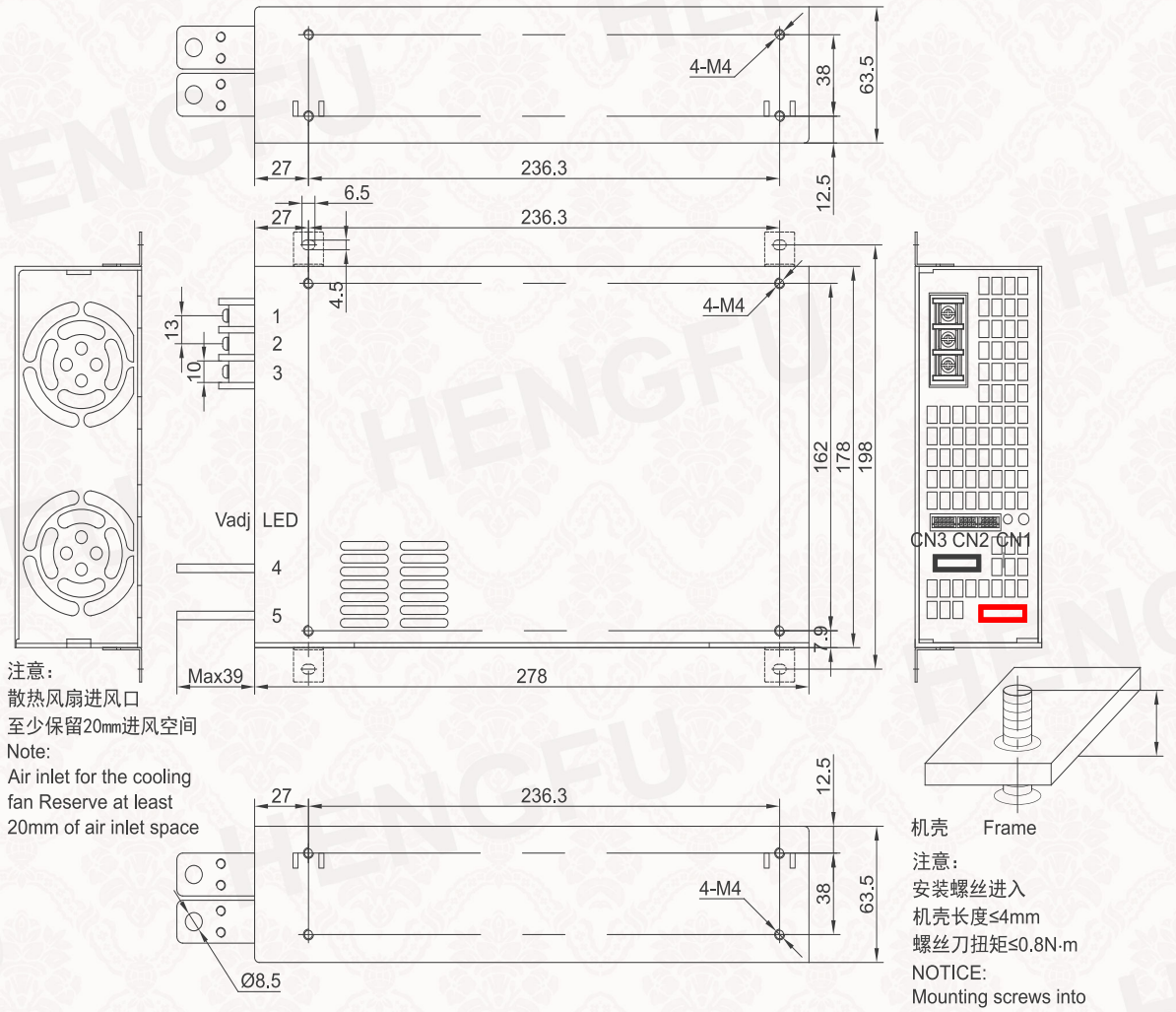


■ 减额曲线图 Derating Curve





■ 安装图纸 Drawing

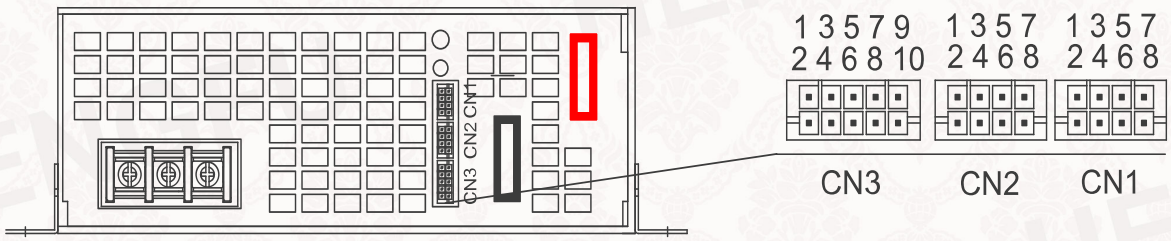


HF-240CN-S-1+3BR+2输出铜排安装图

接线端子排布 Terminal Pin No. Assignment

位号 No.	功能 Function	引脚定义	Pin Definition
1	AC/L	输入AC(L)接线端口 输入DC正极接线端口	AC Input terminal for live line DC Input terminal for positive pole
2	AC(N) DC(-)	输入AC(N)接线端口 输入DC负极接线端口	AC Input terminal for neutral line DC Input terminal for negative pole
3	PE	输入接地端口（与外壳相通）	Protective earth (enclosure is linked to ground)
Vadj	Vadj	输出电压微调电位器ADJ	Trimmer for output voltage adjustment
LED	LED	绿色指示灯点亮表示电源工作状态正常	Green LED light on indicates the power supply is in normal operation
4	-V	输出负极接线端口	DC Ouput terminal for negative pole
5	+V	输出正极接线端口	DC Ouput terminal for positive pole

■ 接线图 Wiring Diagram



CN1和CN2 内部连接：
CN1 and CN2 are connected internally.

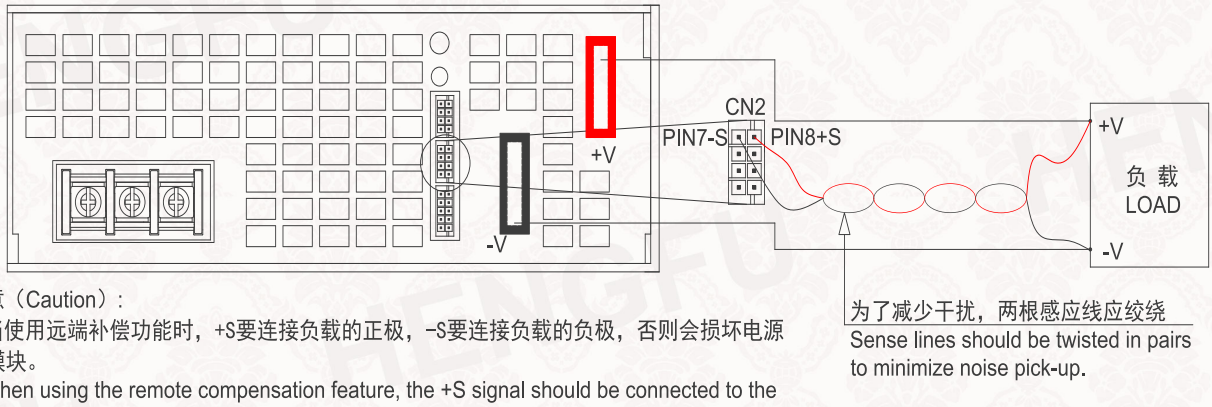
Pin脚编号 Pin No.	功 能 Function	描 述 Description
1	RCG	遥控开关信号地 Remote ON-OFF Ground
2	RC	遥控开关信号 Remote ON-OFF signal
3	PV	外部可调电压输入 Externally adjustable voltage input
4	PS	5V基准电压输出 5V reference voltage output
5、7	-S	感应信号- Inductive signal-
6	CS (Gurrent Share)	均流信号 Current Share
8	+S	感应信号+ Postive sensing for remote sense

CN3 内部连接：
CN3 are connected internally.

Pin脚编号 Pin No.	功 能 Function	描 述 Description
1	P OK GND	电源OK信号地 Power supply OK signal ground
2	P OK	电源OK信号 Power supply OK signal
3	P OK GND2	电源OK2信号地 Power supply OK2 signal ground
4	P OK2	电源OK2信号 Power supply OK2 signal
5	RCG	遥控开关信号地 Remote ON-OFF signal ground
6	RC	遥控开关信号 Remote ON-OFF signal
7	AUXG	12V辅助电源地 12V auxiliary power ground
8	AUX	12V辅助电源输出 12V auxiliary power output
9	OLP	过负载保护模式选择 Overload(OLP) type select
10	OL-SD	过负载保护模式选择 Overload(OLP) type select

■ 接线图 Wiring Diagram

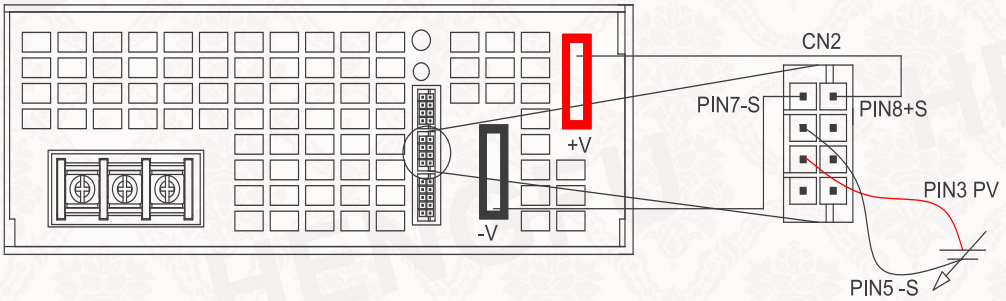
1. 远端补偿 (Remote Sense)
远端补偿对负载线压降补偿最大为0.25V
The Remote Sense compensates voltage drop on the load wiring up to 0.25V



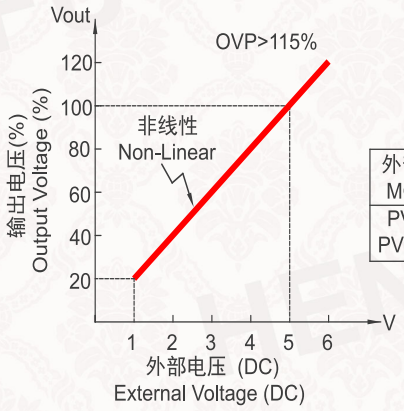
注意（Caution）：
1. 当使用远端补偿功能时，+S要连接负载的正极，-S要连接负载的负极，否则会损坏电源模块。
When using the remote compensation feature, the +S signal should be connected to the positive terminal of the load whereas -S signal to the negative terminal of the load, Otherwise, the power supply module will be damaged.
2.信号端子CN2的Pin7(-S)和Pin8(+S)能够远端补偿0.25V的线缆压降，这个电压包含连接在输出正端和输出负端的线缆压降总和。
The signal terminals CN2 Pin7 (-S) and Pin8 (+S) can remotely compensate for a cable voltage drop of 0.25V, which includes the total voltage drop of the cables connected to the positive and negative output terminals.

■ 接线图 Wiring Diagram

2.外部信号电压调节（External Signal Voltage Adjustment）：
用电位器调节方式无法达到所需的更宽输出电压范围时，可在CN2的PV和-S间连接一外部直流电压，同时+S & +V,-S & -V按下图所示连接。
When the potentiometer adjustment method cannot achieve the required wider output voltage range, an external DC voltage can be connected between PV and -S at CN2, while S & V, -S & -V are connected as shown in the following figure below.

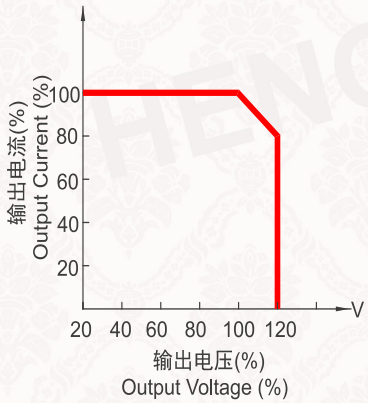


外部电压(DC)
EXTERNAL VOLTAGE (DC)



外部电压 MODEL	12V	24V	48V
PV 范围 PV Range	2.4~13.2V	4.8~28V	9.6~56V

请不要采用PWM信号作为外部电压。
Please do not adopt PWM signal as the EXTERNAL VOLTAGE.

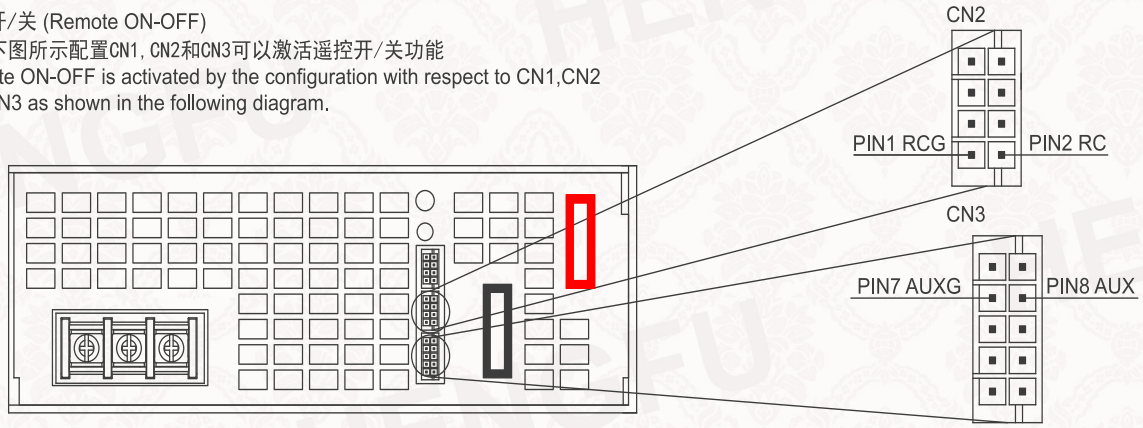


额定电流随输出电压调整变化。
The rated current should change with the Output Voltage Programming accordingly.

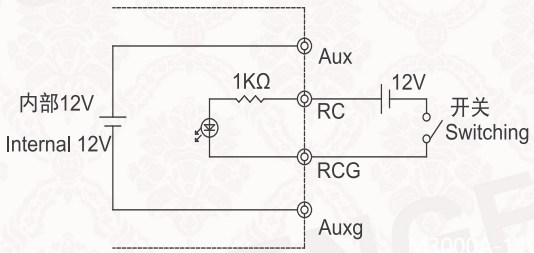
注意（Note）：
(1)工厂默认设置为内部电位器调节输出电压，*CN2*上的*PV(PIN3)* 和*PS(PIN4)* 是用插片短接在一起的。此时拔除插片，电源将没有输出。
The factory default setting is to adjust the output voltage with an internal potentiometer. The PV (PIN3) and (PIN4) on CN2 are shorted together with a jumper. If the jumper is removed, the power supply will have no output.
(2)当需要使用外部电压调节时，请确保CN1或CN2上的*PV(PIN3)*和*PS(PIN4)*不可连接（拔出插片），否则会导致电源损坏。
When external voltage regulation is required, make sure that PV (PIN3) and PS (PIN4) on CN1 or CN2 are not connected (remove the jumper), otherwise, it will cause damage to the power supply.

■ 接线图 Wiring Diagram

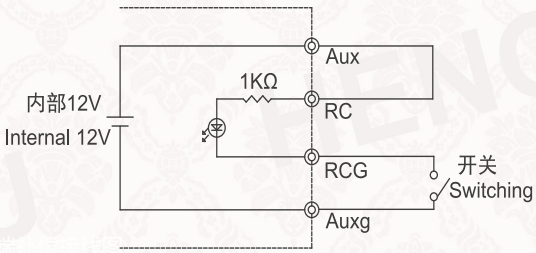
3. 遥控开/关 (Remote ON-OFF)
按照下图所示配置CN1, CN2和CN3可以激活遥控开/关功能
Remote ON-OFF is activated by the configuration with respect to CN1,CN2 and CN3 as shown in the following diagram.



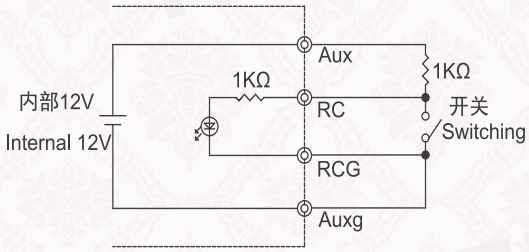
A:用外部电压
Using external voltage source



B:用内部12V辅助输出
Using internal 12V auxiliary output



C:用内部12V辅助输出
Using internal 12V auxiliary output



连接方法
Connection Method

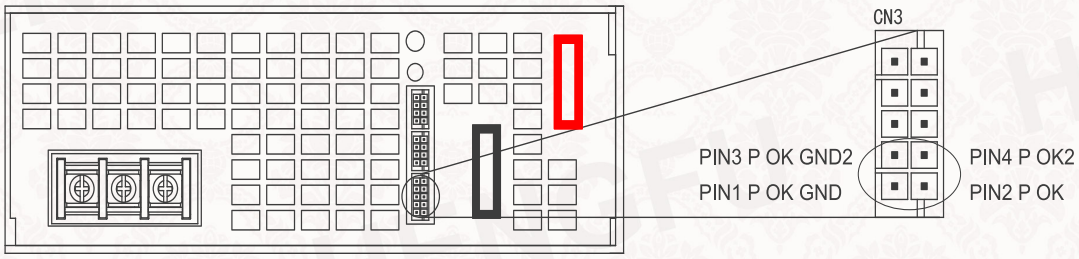
		例如:A Example:A	例如:B Example:B	例如:C Example:C
辅助电源 SW Logic	电源输出打开 Power Supply Output ON	开关打开 SW Open	开关打开 SW Open	开关关闭 SW Close
	电源输出关闭 Power Supply Output Off	开关关闭 SW Close	开关关闭 SW Close	开关打开 SW Open

■ 接线图 Wiring Diagram

4.报警信号输出 (Alarm Signal Output)

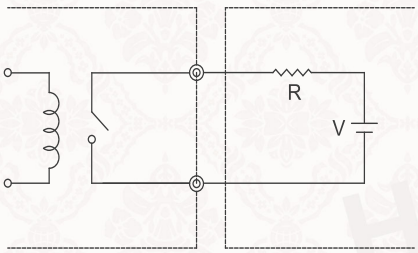
报警信号通过CN3的"*P OK*" & "*P OK GND*" 和"*P OK2*" & "*P OK GND2*" 分别发出继电器触点和TTL信号。

The alarm signals are emitted via relay contacts and TTL signals through CN3's "P OK" & "P OK GND" and "P OK2" & "P OK GND2" respectively.



功 能 Function	描 述 Description	报警提示(P OK，继电器触点) Output of alarm(P OK, Relay Contacts)	报警提示(P OK2,TTL信号) Output of alarm(P OK2, TTL Signal)
P OK	当电源输出电压高于80%的额定输出电压时 信号显示"低" -电源正常 When the power supply output voltage is higher than 80% of the rated output voltage, the signal shows "low" - power supply is normal	低 (500mA时，最大0.5V) Low (0.5V max at 500mA)	低 (10mA时，最大0.5V) Low (0.5V max at 10mA)
	当电源输出电压低于80%的额定输出电压时 信号显示"高"-电源关闭 When the power supply output voltage is less than 80% of the rated output voltage, the signal shows "high" - power supply is off	高或者开路 (外部电压，最大500mA) High or open (External applied voltage, 500mA max.)	高或者开路 (外部电压，最大10mA) High or open (External applied voltage, 10mA max.)

报警解释
Explanation of Alarm
P OK

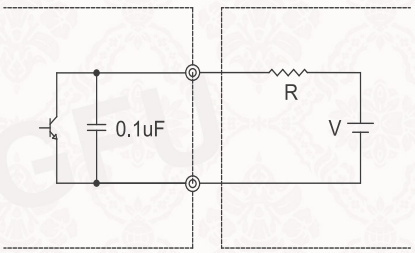


P OK GND

外部电压和电阻
External voltage and R
(最大吸入电流500mA,最大电压20V)
(The max. sink is 500mA and 20V)

电源正常的内部回路(继电器, 共10W)
Internal circuit of P OK (Relay, total is 10W)

报警解释
Explanation of Alarm
P OK2



P OK GND2

外部电压和电阻
External voltage and R
(最大吸入电流10mA,最大电压30V)
(The max. sink is 10mA and 30V)

电源正常的内部回路(集电极开路的方法)
Internal circuit of P OK2 (Open collector method)

■ 接线图 Wiring Diagram

5.选择过载保护模式
Select Overload Protection Type

(1)插入CN3的短路连接器插片,如图1所示,过载保护模式将为恒电流限制延迟5秒后关机,重启恢复.
Insert the short-circuit connector tab into CN3 as shown in Figure 1, the overload protection mode will be constant current limiting, and it shut down after 5 seconds with automatic recovery upon restart.

(2)移除CN3的短路连接器插片,如图2所示,过载保护模式为持续恒电流限制.
Remove the shorting connector tab CN3 as shown in Figure 2, the overload protection mode is continuous constant current limiting.

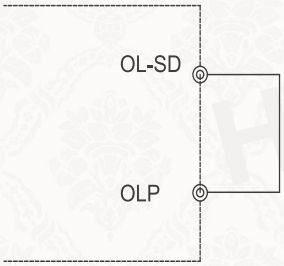
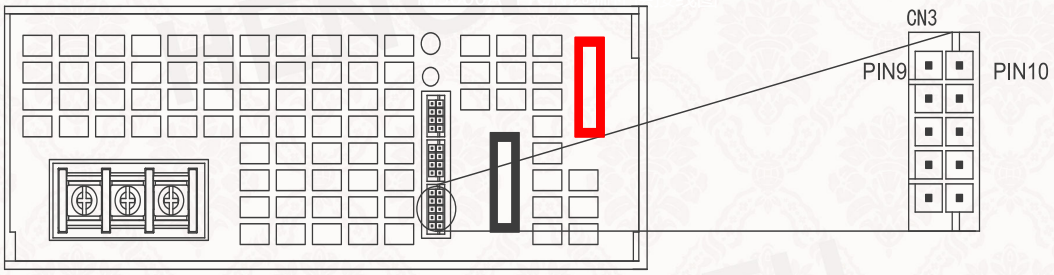


图1:插入CN3的短路连接器
Fig.1:Insert shorting connector into CN3
过载保护模式:恒电流限制延迟5秒后关闭
Overload Protection Type : constant current limiting with delay shutdown after 5 seconds

图2:移除CN3的短路连接器
Fig.2:Remove the shorting connector from CN3
过载保护模式:恒电流限制
Overload Protection Type : constant current limiting



出厂默认设置为CN3上的*OLP(PIN9)*和*OL-SD(PIN10)用短路连接器短接*
The factory default setting is to short OLP(PIN9) and OL-SD(PIN10) on CN3 with a shorting connector。

■ 接线图 Wiring Diagram

6. 均流 (Current Sharing with Remote Sense)

HF该系列产品具有内置主动式均流功能并且可以并联高达3台以提供更高的输出功率:

HF series products feature an integrated active current sharing function and can be connected in parallel with up to 3 units to deliver higher output power.

(1) 电源供应器应用短而粗的导线并联然后连接负载

The power supplies should be paralleled using short and large diameter wiring and then connected to the load.

(2) 各并联单元间的输出电压差异应小于0. 2V

Difference of output voltages among parallel units should be less than 0.2V.

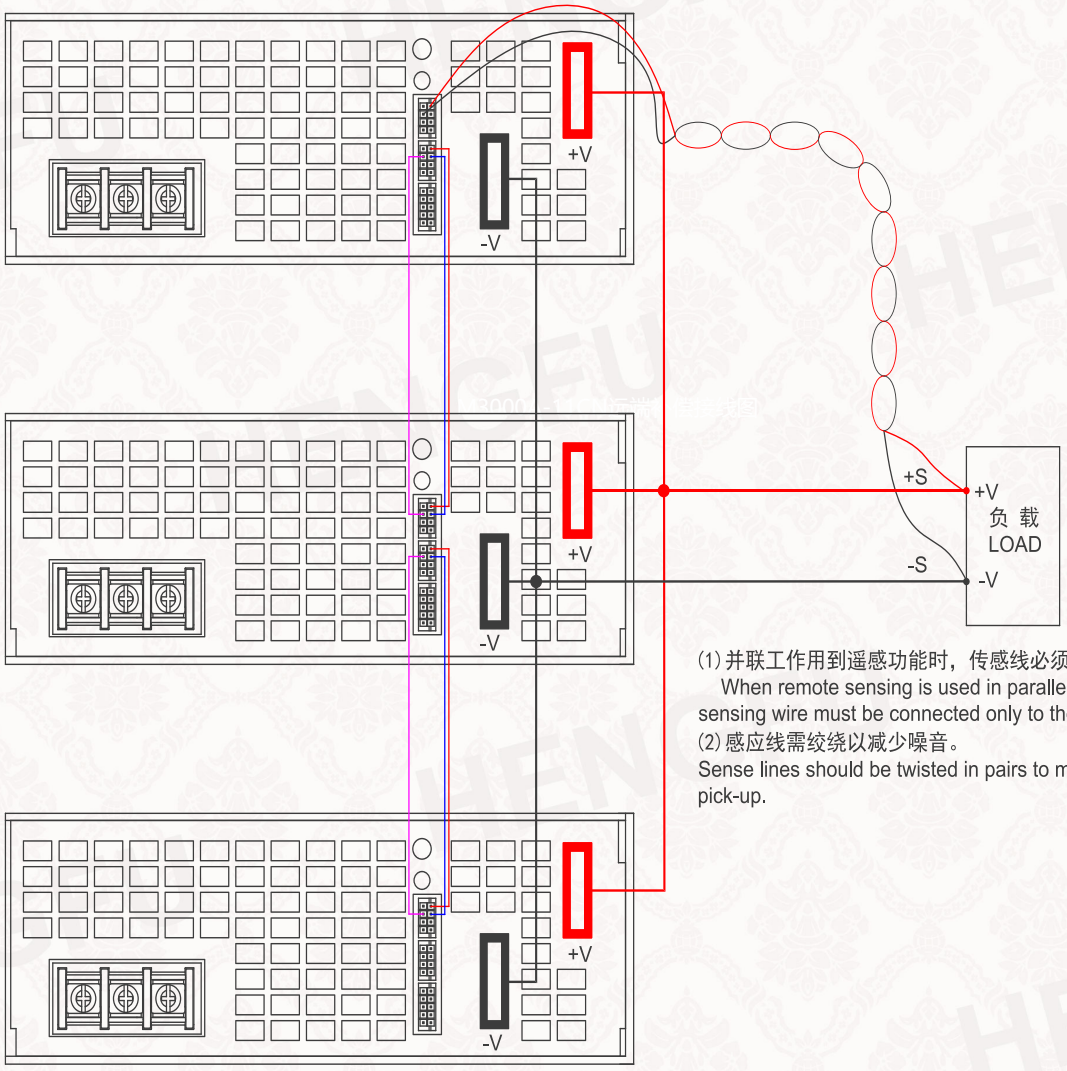
(3) 总输出电流不可超过以下等式的计算值: (并联时的输出电流) = (各组的额定电流) × (组数) ×0. 9

The total output current must not exceed the value determined by the following equation:

Maximum output current at parallel operation=(Rated current per unit)×(Number of unit)×0.9

(4) 当总的输出电流小于总的额定电流的3%时，或者说每个单元的额定电流的3%*电源的数量时，每个电源的电流可能不会达到完全均衡。

When the total output current is less than 3% of the total rated current, or say (3% of Rated current per unit)×(Number of unit) the current shared among units may not be fully balanced.



(1) 并联工作用到遥感功能时，传感线必须连接到主要单元

When remote sensing is used in parallel operation, the sensing wire must be connected only to the master unit

(2) 感应线需绞绕以减少噪音。

Sense lines should be twisted in pairs to minimize noise pick-up.

(1) CN1或CN2上的+S,-S和CS需相互并联连接

+S,-S and *CS* on CN1 or CN2are connected mutually in parallel.

(2) 并联操作条件下，输出电压调整功能不可用

Under parallel operation, the "output voltage programming" function is not available.

■ 备注 Notes

1. 除特殊说明外，上述所有参数的测试条件都在室温=25℃，湿度＜75%RH，输入230Vac和额定负载时测得。
   Unless specially mentioned, all above parameters are measured at ambient temperature 25℃, humidity <75%RH, 230Vac input and rated load.
2. 电网调整率是在额定负载条件下从低电网到高电网的输出电压变化率。
   Line regulation is the output voltage change rate from low line to high line at rated load.
3. 负载调整率是负载电流从额定负载的10%到100%变化时的输出电压变化率。
   Load regulation is the output voltage change rate from 10% to 100% rated load.
4. 纹波和噪声的检测是用20MHz带宽示波器，从被测电源的端口连接一根长30cm的20AWG ($0.5mm^2$) 屏蔽双绞线，且在绞线末端并接上0.1uF高频电容和47uF电解电容后测得。
   Ripple & noise are measured by an oscilloscope at 20MHz of bandwidth, using a 30cm 20AWG ($0.5mm^2$) twisted pair-wire connected to the power supply, terminated with a 0.1uF high-frequency & 47uF electrolytic parallel capacitor.
5. 当工作海拔高于2000米时，工作温度须调降5℃/1000米。
   The ambient temperature derating of 5℃/1000m is needed for operating altitude greater than 2000m.
6. 开关电源被视为用户整机的一个部件，整机是否符合EMC指令还需重新测试并验证。
   The power supply is regarded as a component which will be installed into the final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
7. 开关电源作为用户设备的部件，用户在选择开关电源时须注意，应选择符合设备应用场景和标准的开关电源。如在中国境内对于有3C强制认证要求的应用，应选择有3C认证的开关电源；当在其他国家和地区使用时，也应根据当地的法律法规要求，选择符合相应法律法规标准认证的开关电源。若用户不了解如何选择，可告知我们其设备应用场景和要求，我们可协助用户进行选型。
   As switching power is a component of an equipment or device, during their applications, the final users should select a proper model in according with the real application's circumstances and criteria. For instance, in Chinese Mainland for the applications which have compulsory request on CCC approval, the final users have to select CCC certified models. On the other hands, for the applications in other countries or regions, the final users have to select a proper safety certified model which complies with both the local laws and industrial regulations. When users have confusions or have no idea in model selection, you are welcome to send your inquiry. We will recommend you the matching models based on your specified requests and application fields.
8. 关于产品的安装使用说明及售后政策，请扫描下方二维码《产品使用说明及服务承诺》获取详细内容。
   For installation, usage instructions and after-sales policies of the product, please scan the QR code below "Product Instruction Manual and Service Commitment" to learn more details.
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