

### 产品特点：

- ✓ 高可靠性
- ✓ 效率达 86%
- ✓ 内置主动式 PFC 功能
- ✓ 保护功能完善，短路、过流、过压、过温
- ✓ 符合环保要求 RoHs6.
- ✓ 质保 3 年

### 应用领域：

- ✓ 工业控制
- ✓ 清洁能源
- ✓ 轨道交通
- ✓ 生产制造
- ✓ 对尺寸大小、环境要求十分严酷的场所
- ✓ 对寿命、可靠性要求很高的供配电系统

### Features:

- ✓ High Reliability
- ✓ Universal AC input/full rang
- ✓ 86% efficiency
- ✓ Built-in active PFC , PF> 0.95
- ✓ Protections:Short /Overload/Over voltage/Over temperature
- ✓ Comply with RoHs6
- ✓ 3 years warranty

### Application:

- ✓ Industrial control
- ✓ Clean energy
- ✓ Track and traffic
- ✓ Production and Manufacturing
- ✓ It is very harsh on the size and use environment
- ✓ System with high requirements for life and reliability

# ESF-320-12

## 产品规格书

## PRODUCT SPECIFICATION

制造安全产品 驱动绿色世界 Power a Safe and Green world

Excellent 卓越 Creative 创造 United 协作



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## 基本参数 Basic Parameter

| 项目<br>Item                   | 单位<br>UNIT | 规格<br>Specification | 备注<br>Notes |
|------------------------------|------------|---------------------|-------------|
| 输入电压<br>Input Voltage        | Vac        | 100-240             |             |
| 输出电压<br>Output Voltage       | Vdc        | 12                  |             |
| 输出电压可调范围<br>Adjustable range | V          | 10.8~13.2           |             |
| 额定输出电流<br>Rated current      | A          | 0~26.7              |             |
| 额定功率<br>Rated power          | W          | 320                 |             |
| 纹波电压<br>Ripple&noise         | mVp-p      | 100                 |             |

输出纹波噪声测试条件

- 1)示波器须设置在 20M 赫兹带宽；
- 2)将 0.1uF 的陶瓷电容和 47uF 的电解电容并联在线材末端；
- 3)使用 300mm 的双绞线连接电源和负载。

DC output ripple & noise test conditions

- 1)Oscilloscope should be limited at 20MHz bandwidth;
- 2)Connect 0.1uF ceramic capacitors and 47uF electrolytic capacitors in parallel at the end of the wire;
- 3) Connect the load and power supply with a 300mm twisted pair

## 输入特性 Input Characteristics

| 项目<br>Item               | 单位<br>UNIT | 最小值<br>MIN   | 额定值<br>Rated | 最大值<br>Max | 备注<br>Notes                                 |
|--------------------------|------------|--------------|--------------|------------|---|
| 输入电压<br>Input Voltage    | Vac        | 88           | 230          | 264        | 参考输出降额曲线<br>Refer to output derating curve. |
|                          | Vdc        | 124          | 310          | 370        |   |
| 输入频率<br>Input Frequency  | Hz         |              | 47~63        |            |   |
| 输入电流<br>Input Current    | A          | /            | /            | 2          | 230Vac Full load                            |
|                          |            |              |              | 4          | 115Vac, Full Load.                          |
| 输入冲击电流<br>Inrush Current | A          | /            | /            | 20         | 115Vac, Full Load. cold start.              |
|                          |            |              |              | 40         | 230Vac, Full Load. cold start.              |
| 功率因数<br>Power Factor     | /          | 0.98         | /            | /          | 115Vac, Full Load.                          |
|                          |            | 0.9          |              |            | 230Vac, Full Load.                          |
| 空载损耗<br>No-load loss     | W          | /            |              |            | 230Vac, No Load                             |
| 输入保险<br>Input Fuse       |            | T6.3A/250Vac |              |            |   |

## 输出特性 Output Characteristics

| 项目<br>Item                              | 单位<br>Unit | 最小值<br>Min | 典型值<br>Typ | 最大值<br>Max | 备注<br>Notes  |
|---|------------|------------|------------|------------|--|
| 效率<br>Efficiency                        | %          | 83         | 86         | /          | 230Vac/50Hz, 满载Full Load.  |
| 负载调整率<br>Load Regulation                | %          | /          | ±1         | /          | 230Vac Full~min loadFull Load.   |
| 输入电压调整率<br>Line Regulation              | %          | /          | ±0.5       | /          | 100Vac~264Vac 满载Full Load.   |
| 开机延迟时间<br>Setup Time                    | s          | /          | /          | 3          | 115Vac 满载Full Load.  |
|   | s          | /          | /          | 1.5        | 230Vac 满载Full Load.  |
| 上升时间<br>Rise Time                       | ms         | /          | /          | 80         | 输出从10%上升到90%的时间<br>The output voltages shall rise from 10% to 90% of their output voltage. |
| 保持时间<br>Hold time                       | ms         | 8          | /          | /          | 115Vac, 满载Full Load.   |
| 过冲响应<br>Overshoot & undershoot Response | %          |            |            | ±5         | 开关机时 Power on/off  |
| 负载动态<br>Load dynamic response           | %          | /          | /          | ±5         | 设定周期20ms,升降电流0.1A/us,在50%~100%负载<br>Settling time 20ms R/s 0.1A/us load 50%~100%full load  |

## 环境特性 Environment Characteristics

| 项目<br>ITEM           | 单位<br>UNIT                                      | 最小值<br>MIN  | 典型值<br>Rated | 最大值MAX | 备注<br>Notes  |
|----------------------|---|---|--------------|--------|--|
| 温度<br>Temperature    | ℃   | -30   | 25           | 70     | 工作温度<br>45℃以上需降额使用, 参考降额曲线。<br>Operation Temperature ;<br>45℃ Refer to derating curve. |
|                      |   | -40   | 25           | 85     | 贮藏温度<br>Storage Temperature  |
| 相对湿度<br>Humidity     | ℃   | 5%  | RH           | 90%    | 工作湿度<br>Operation Humidity   |
|                      |   | 5%  | RH           | 95%    |  |
| 振动<br>Vibration      | /   | IEC 60068-2-6, 正弦10-500Hz, 2G, 位移0.35mm, X、Y、Z轴各60分钟;<br>Sine Wave:10-500Hz, 2G, displacement of 0.35mm; 60 min per axis for all X, Y, Z directions |              |        |  |
| 冲击<br>Impact         | /   | IEC60068-2-27,半正弦波: 30G, 持续18ms, 每个方向3次, 共6次<br>Half Sine Wave: 30G for a duration of 18ms, 3 times per direction, 6 times in total                 |              |        |  |
| 海拔高度<br>Altitude     | M   | ≤2000   |              |        |  |
| 冷却方式<br>Cooling Mode | 内置风扇冷却<br>Forced air cooling by built-in DC fan |   |              |        |  |
| 防护等级<br>IP level     | IP20  |   |              |        |  |

## 保护功能 Protection Function

| 项目<br>Item                          | 技术要求<br>Requirement                              | 注释<br>Notes  |
|-------------------------------------|--|--|
| 短路保护<br>Short Circuit Protection    | 电源无损坏, 关闭输出电压<br>No damage shut down O/P voltage | 故障移出后, 电源自动恢复。<br>Recovers automatically after fault condition is removed                    |
| 过流保护<br>Over current Protection     | 105%~140% @ Io                                   | 故障移出后, 电源自动恢复。<br>Recovers automatically after fault condition is removed                    |
| 过压保护<br>Over voltage Protection     | 115~150% @ Vo                                    | 过压发生后, 必须重新启动才能恢复, 放电时间约30-60s<br>Reset must be need when over voltage to get right.         |
| 过温保护<br>Over Temperature Protection | 95°C±5°C   | 关闭输出电压, 温度下降后恢复<br>Shut down O/P voltage. Recovers automatically after temperature goes down |

短路保护时间大于等于60秒/Short Circuit Protection time is above of 60s

## 特殊功能 Signals Function

| 项目<br>Item            | 技术要求<br>Requirement                               |
|-----------------------|---|
| 面板显示<br>Panel display | 电源开启, 绿色LED指示灯亮<br>Green LED lights for power on. |

## 电气安全 Electrical Safety

| 项目<br>Item                   | 测试方法<br>Test Method | 测试条件<br>Test Conditions |
|------------------------------|---------------------|-------------------------|
| 绝缘电压<br>Withstand voltage    | 输入-输出 I/P-O/P       | 1500Vac, 60S, ≤10mA     |
|                              | 输入-大地 I/P-FG        | 1500Vac, 60S, ≤10mA     |
|                              | 输出-大地 O/P-FG        | 500Vac, 60S, ≤10mA      |
| 绝缘阻抗<br>Withstand Resistance | 输入-输出 I/P-O/P       | 500VDC, ≥5MΩ            |
|                              | 输入-大地 I/P-FG        | 500VDC, ≥5MΩ            |
|                              | 输出-大地 O/P-FG        | 500VDC, ≥5MΩ            |
| 泄露电流<br>Leakage Current      | L、N-外壳/L、N-Case     | 3.5mA Max               |
|                              | L、N-PE/L、N-PE       | 3.5mA Max               |
| 接地阻抗<br>PE Resistance        | PE-外壳/PE-Case       | < 0.10hm                |
| 设计标准<br>Design standards     | UL508 工业控制类         |                         |
|                              | EN60950-1 资讯类       |                         |
|                              | UL1310 Class2 类电源   | /                       |
|                              | EN60335-1 家电类       |                         |
|                              | EN61347-1 灯具类       | /                       |
|                              | IEC60601-1 医疗类      | /                       |

## 电磁兼容 Electromagnetic Compatibility

| 项目<br>Item                       | 测试方法<br>Test Method        | 测试条件<br>Test Conditions                                       |
|----------------------------------|----------------------------|---|
| 静电ESD<br>Electrostatic Discharge | IEC 61000-4-2<br>GB17626-2 | Criteria B ;<br>Air Discharge: ±8kV ; Contact Discharge: ±4kV |
| 射频辐射RS<br>Radiated Field         | IEC 61000-4-3<br>GB17626-3 | Criteria A ;<br>80-1000MHz, 3V/M, 80% modulation (1kHz) ;     |

|  |                               |  |
|--|-------------------------------|--|
| 脉冲杂讯EFT<br>Electrical Fast Transient / Burst                   | IEC 61000-4-4<br>GB17626-4    | Criteria B ;<br>±1kV   |
| 雷击<br>Surge  | IEC 61000-4-5<br>GB17626-5    | Criteria B ;<br>Common Mode3): 2kV ; Differential Mode4): 1kV    |
| 射频传导<br>Conducted  | IEC 61000-4-6<br>GB17626-6    | Criteria A ;<br>0.15-80MHz, 3Vrms , 80% modulation (1kHz)        |
| 电源磁场<br>Power Frequency Magnetic Fields                        | IEC 61000-4-8<br>GB17626-8    | /  |
| 脉冲磁场抗扰度试验<br>Impulse magnetic field immunity test              | IEC 61000-4-9<br>GB17626-9    | /  |
| 阻尼振荡磁场抗扰度试验<br>Damped oscillatory magnetic field immunity test | IEC 61000-4-10<br>GB17626-10  | /  |
| 电压瞬断<br>Voltage Dips and Interruptions                         | IEC 61000-4-11<br>GB17626-11  | Voltage Dips<br>>95% reduction,0.5 period<br>Criteria B          |
|  |                               | Voltage Dips<br>>30% reduction,25 period<br>Criteria C           |
|  |                               | Voltage interruptions<br>>95% reduction,250 period<br>Criteria C |
| 低能量脉冲<br>Low Energy Pulse Test (Ring Wave)                     | IEC 61000-4-12<br>GB17626-12  | /  |
| 谐波<br>Harmonic Current Emission                                | IEC/EN 61000-3-2<br>GB17625-1 | Class A  |
| 电磁耐受标准<br>Immunity Generic Standards                           |                               | EN 55024,GB17618资讯类  |
|  | /5)                           | EN55014-2家电类   |
|  | /5)                           | EN60601-1-2医疗类   |
|  | /5)                           | EN61547灯具类   |
|  | /5)                           | EN61000-6-1,EN50082-1,GB/T17799-1轻工业环境                           |
| 传导和辐射通用标准<br>CE&RE   |                               | EN 61000-6-2,EN55082-2,GB/T17799-2工业环境                           |
|  | /5)                           | GB9254, CISPR 32, EN 55032 : Class B 资讯类                         |
|  | /5)                           | GB4824, CISPR 11, EN 55011 : Class B 医疗类                         |
|  | /5)                           | GB17743 , EN55015 , CISPR15 : Class B 灯具类                        |
|  |                               | GB4343-1, CISPR14 , EN55014-1 : Class B 家电类                      |
|  |                               | EN 61000-6-3 , FCC Title 47, EN55011 : Class B 工控类               |
| 电压波动和闪烁<br>Voltage Fluctuation and Flicker                     |                               | IEC/EN 61000-3-3 , GB17625.2                                     |
| 通用电源测试标准<br>Component Power Supply for General                 |                               | EN 61204-3   |

- 1)标准A：规格界限内正常性能Criteria A: Normal performance within the specification limits
- 2) 标准B：可自行恢复的临时性退化或功能丧失Criteria B: Temporary degradation or loss of function which is self-recoverable
- 3) 不对称：共模（线对地）Asymmetrical: Common mode (Line to earth)
- 4)对称：差模（线对线）Symmetrical: Differential mode (Line to line)
- 5) ” / ”：不符合项Non-conformance
- 6) 电源应视为系统内元件的一部分，需结合终端设备进行EMC确认Power should be considered part of the element within the system, to be combined with the terminal device EMC acknowledgment;

## 可靠性数据 Reliability

| 项目<br>Item      | 数据<br>Data  | 测试条件<br>Test Conditions           |
|-----------------|-------------|-----------------------------------|
| 产品老化<br>Burn-in | 100%        | 230Vac , 满载, 40°C±5°C , 4小时       |
| 平均无故障时间<br>MTBF | 220000H Min | 230Vac , 满载, 25°C , MIL HDBK 217F |
|                 | /           | 230Vac , 满载, 40°C , MIL HDBK 217F |

|                               |    |   |
|-------------------------------|----|---|
| 质保<br>Warranty period         | 3年 | 40°C , 230Vac , 80% Load , 24小时工作                                     |
| 设计使用寿命<br>Design Service life | /  | 此项依据实际使用条件推算<br>This calculated based on the actual conditions of use |

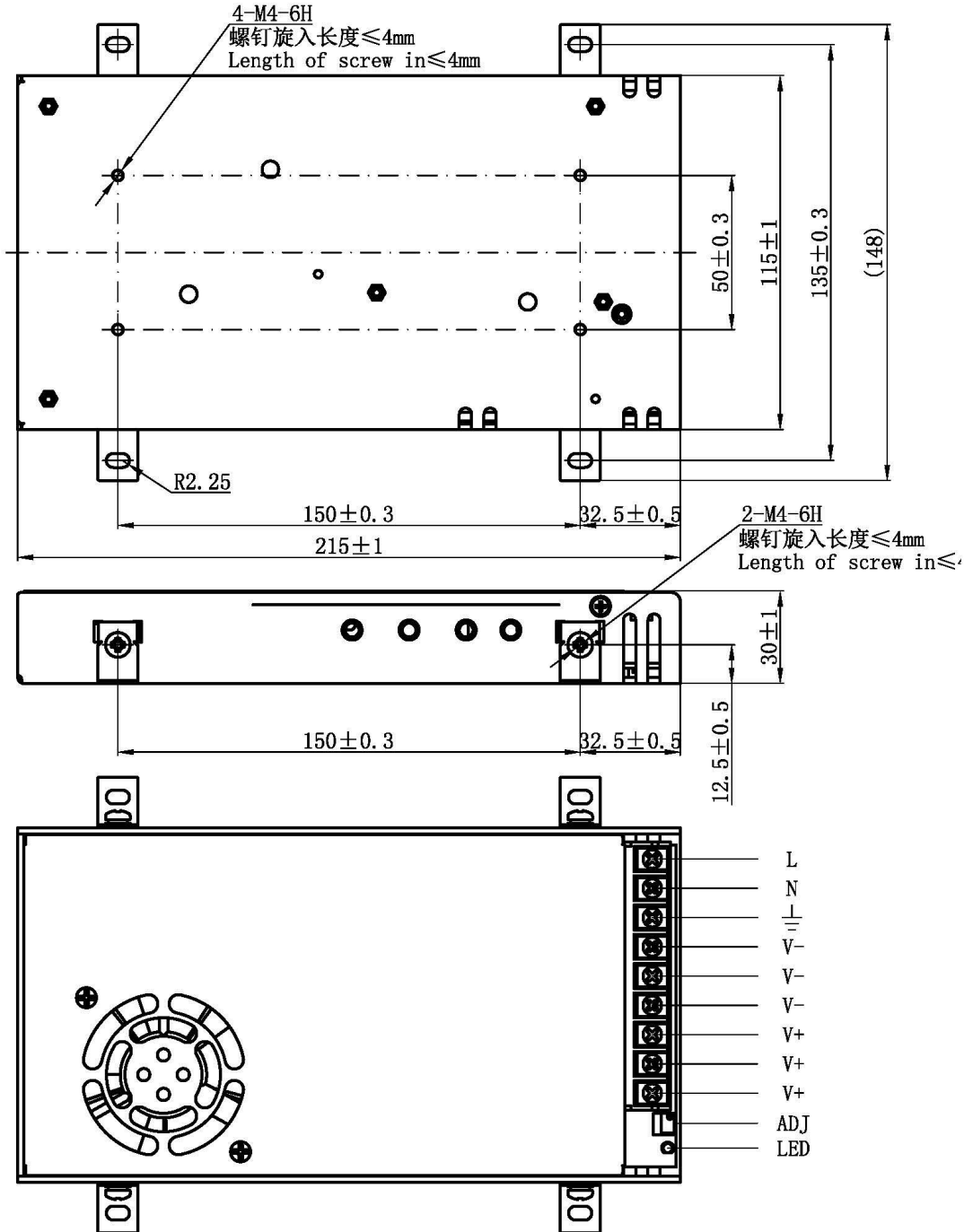
## 结构与安装 Mechanical Installation

| 项目<br>Item              | 数据<br>Data                     | 备注<br>Note   |
|-------------------------|--------------------------------|--|
| 尺寸mm (长宽高)<br>Size      | 215 * 115* 30                  |  |
| 重量Kg<br>Weight          | 1.0                            |  |
| 输入端子<br>Input Terminal  | 脚距9.5mm , 3位/Pitch=9.5mm, 3pin | 最大扭矩0.5N.M, 直插式连接,<br>硬导线横截面0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup><br>柔性导线横截面0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup><br>横截面 AWG 24 ... 12<br>剥线长度10 mm  |
|                         | 9 PIN---L                      |  |
|                         | 8 PIN---N                      |  |
|                         | 7 PIN---FG                     |  |
| 输出端子<br>Output Terminal | 脚距9.5mm , 6位/Pitch=5.0mm, 4pin | 最大扭矩0.4N.M, 直插式连接,<br>硬导线横截面0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup><br>柔性导线横截面0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup><br>横截面 AWG 24 ... 12<br>剥线长度10mm |
|                         | 1 PIN---V+                     |  |
|                         | 2 PIN---V+                     |  |
|                         | 3 PIN---V+                     |  |
|                         | 4PIN---V-                      |  |
|                         | 5PIN---V-                      |  |
| 6 PIN---V-              |                                |  |

## 附件 ( 装配示意图、降额曲线、导轨安装方法 )

### Appendix(Product assembly/Derating curve/Din track mounting)

#### 1. 产品装配示意图 Product assembly



说明:

Introductions:

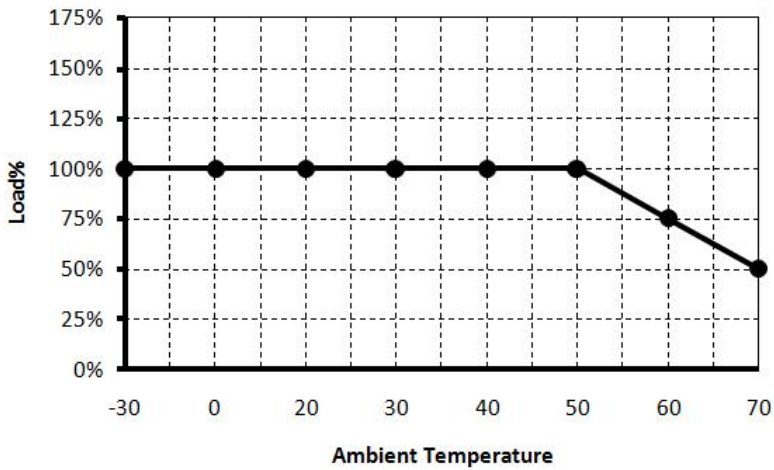
A: 建议扭矩: M3.0 螺钉 < 0.4 N · m; M4.0 螺钉 < 0.6 N · m.

A: Suggested tightening torque: M3.0 screw < 0.4 N · m; M4.0 screw < 0.6 N · m.

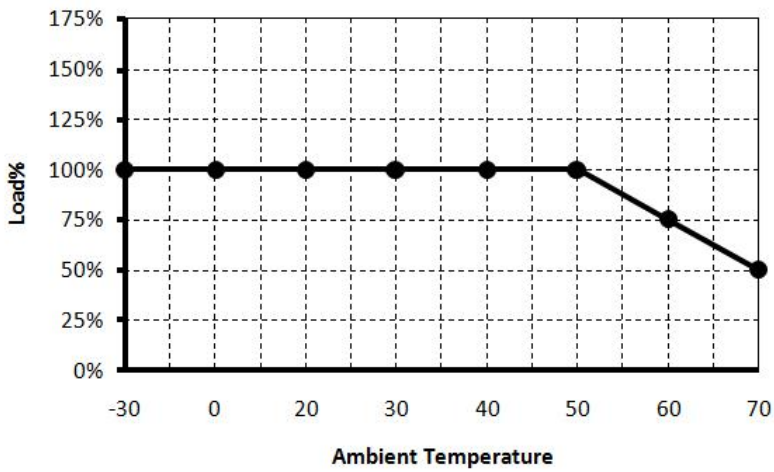
2. 降额曲线 Derating curve:



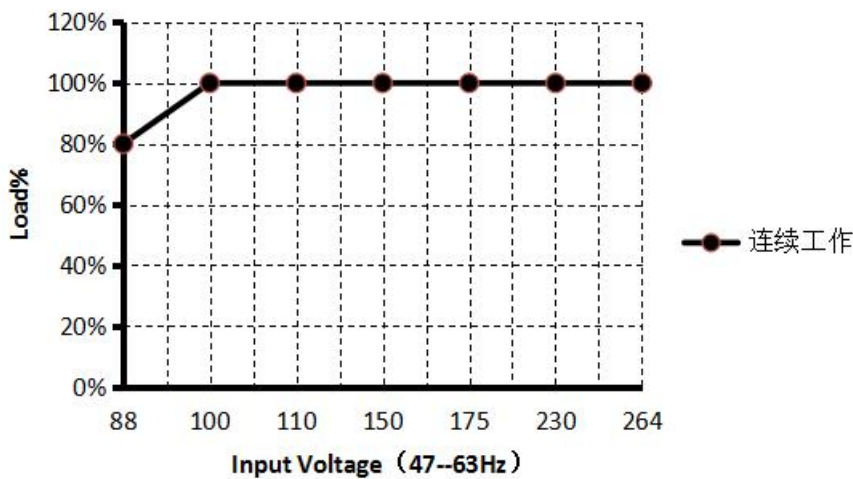
### OUTPUT DERATING CURVE



### OUTPUT DERATING CURVE



### OUTPUT DERATING CURVE



3. 产品安装方法 Standard Mounting:

