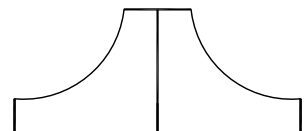




## SM 15K - Series

### 15kW 双向恒功率馈网电源

型号	电压	电流
SM 500-CP-90	0 ... 500 V	-90 ... 90 A
SM 1500-CP-30	0 ... 1500 V	-30 ... 30 A



#### 特性

- 双向电源：15kW 电源 + 负载
- 输出模式：恒压，恒流，恒功率
- 环保节能：放电能量回馈电网
- 瞬态响应：100us 恢复时间
- 上升时间：Min. 1ms @ 10% - 90%
- 下降时间：Min. 1ms @ 90% - 10%
- 极低纹波：Min. 10 mVrms
- 稳定性：50.10E6 @ 8小时
- 工作温度：-20 至 +50度，75%输出@60度
- 保护功能：过压，过流，过功率，短路等

#### 功能

- 交流输入：342 - 528 Vac, 3L+GND
- 程控接口：LAN/LXI & WebViewer 界面
- 电磁兼容：EN61000-6-2, EN61000-6-3 EN55022B
- 极低噪声：温控风扇，能量回馈
- 面板操作：大显示屏，菜单界面
- 数字设置：0.03% 分辨率（电压，电流）
- 效率：> 95%
- 可靠性：长时间，野外，海洋环境工作
- 仿真功能：任意波形、电池模拟、光伏模拟

	SM500-CP-90	SM1500-CP-30
直流输出 voltage current	0 ... 500 V -90 ... 90 A	0 ... 1500 V -30 ... 30 A
交流输入 3 phase, 48 - 62 Hz rated voltage range rated frequency rated current  current (400 V / 3 ph, 15 kW) power factor, 15 kW, 7,5 kW  internal fuses standby AC input power ( $V_o=I_o=0$ ) standby AC input power ( $V_o=V_{max}$ )	342 ... 528 V 380 ... 480 V 50 / 60 Hz maximum 27 A  23 A 0.996, 0.988  30 AT 96 W 180 W	
电源效率 Sink & Source mode: 400 V AC, 3 ph input, 15 kW, 167 V, 90 A 15 kW, 500 V, 30 A	95 % 96 %	
电源调整率		
Load 0 - 100% <b>CV</b> Line 342 - 528 V AC <b>CV</b> (external voltage sense)	2 mV < 1 mV	2 mV < 1 mV
Load 0 - 100% <b>CC</b> Line 342 - 528 V AC <b>CC</b> (internal voltage sense, after warm-up)	8 mA 1 mA	2 mA 1 mA
纹波 + 噪声 Source mode: rms (BW=300 kHz) <b>CV</b> p-p (BW=20 MHz) <b>CV</b>  rms (BW=300 kHz) <b>CC</b> p-p (BW=20 MHz) <b>CC</b>  Source mode: rms (BW=300 kHz) <b>CV</b> p-p (BW=20 MHz) <b>CV</b>  rms (BW=300 kHz) <b>CC</b> p-p (BW=20 MHz) <b>CC</b>  Sink mode: rms (BW=300 kHz) <b>CV</b> p-p (BW=20 MHz) <b>CV</b>  rms (BW=300 kHz) <b>CC</b> p-p (BW=20 MHz) <b>CC</b>  Sink mode: rms (BW=300 kHz) <b>CV</b> p-p (BW=20 MHz) <b>CV</b>  rms (BW=300 kHz) <b>CC</b> p-p (BW=20 MHz) <b>CC</b>  <i>CC-ripple at full load</i>	167 V / 90 A 10 mV 55 mV  45 mA 200 mA  500 V / 30 A 25mV 115mV  45 mA 200 mA  167 V / 90 A 7 mV 35 mV  45 mA 200 mA  500 V / 30 A 10 mV 50 mV  90 mA 320 mA	500 V / 30 A 20 mV 150 mV  12 mA 70 mA  1500 V / 10 A 35mV 250mV  5 mA 25 mA  500 V / 30 A 15 mV 130 mV  10 mA 60 mA  1500 V / 10 A 25 mV 200 mV  3 mA 12 mA
最低电压 @ 放电电流		
@ Sink current:	5.5 V @ -90 A 3.0 V @ -30 A 1.0 V @ -10 A	16.0 V @ -30 A 7.0 V @ -10 A 2.0 V @ -3 A
温度一致性 @ °C <b>CV</b> <b>CC</b>		20.10 <sup>-6</sup> 50.10 <sup>-6</sup>
工作稳定度 after 1 hr warm-up during 8 hrs <b>CV</b> <b>CC</b>  $t_{amb} = 25 \pm 1 \text{ }^\circ\text{C}$ , $V_{in} = 400 \text{ V AC}$ internal voltage sensing for CC-stab.		50.10 <sup>-6</sup> 80.10 <sup>-6</sup>

Notes: 1. Measured at full load  
2. Signal latency depends on the interface used and data traffic.  
3. See 'Safety Instructions' in the manual.

编程速度 <sup>2</sup> (阻性负载)	SM500-CP-90	SM1500-CP-30
<b>上升时间 (10 - 90%)</b> output voltage step time, (load = 15 kW) time, (load = 1500 W)	0 → 167 V 1.5 ms 1 ms	0 → 500 V 1.5 ms 1 ms
output voltage step time, (load = 15 kW) time, (load = 1500 W)	0 → 500 V 4.5 ms 3.5 ms	0 → 1500 V 4.5 ms 3.5 ms
<b>下降时间 (90 - 10%)</b> output voltage step time, (load = 15 kW) time, (load = 1500 W)	167 → 0 V 0.8 ms 0.9 ms	500 → 0 V 0.8 ms 0.9 ms
output voltage step time, (load = 15 kW) time, (load = 1500 W)	500 → 0 V 2.5 ms 3.5 ms	1500 → 0 V 2.8 ms 3.5 ms
<b>DC Output Capacitance</b> X-capacitors (typical) Y-capacitors (typical)	560 μF 145 nF	58 μF 145 nF

	SM500-CP-90	SM1500-CP-30
<b>恢复时间</b> output voltage recovery within di/dt of load step time, @ 50 - 100% load step max. deviation	167 V, load step 45 → 90 A 750 mV 0.8 A/μs 100 μs 2.8 V	500 V, load step 15 → 30 A 2.5 V 0.25 A/μs 100 μs 9.0 V
output voltage recovery within di/dt of load step time, @ 50 - 100% load step max. deviation	500 V, load step 15 → 30 A 500 mV 0.25 A/μs 150 μs 1.2 V	1500 V, load step 5 → 10 A 1 V 0.085 A/μs 150 μs 3.5 V
<b>脉动负载</b> max. tolerable AC component of load current f > 1 kHz f < 1 kHz	15 Arms 90 Apeak	5 Arms 30 Apeak

<b>绝缘隔离</b> AC pwr terminals / DC pwr terminals creepage / clearance AC power terminals / case DC power terminals / case	3750 Vrms (1 min.) 8 mm 2500 Vrms 1000 V DC <sup>3</sup>	3750 Vrms (1 min.) 8 mm 2500 Vrms 1500 V DC <sup>3</sup>
<b>安 规</b>	EN 60950 / EN 61010	
<b>电磁兼容</b> <b>Generic Emission</b> <b>Generic Immunity</b>	<b>EN 61000-6-3</b> , residential, <b>light</b> industrial environment (EN 55022 <b>B</b> ) <b>EN 61000-6-2</b> , industrial environment	
<b>工作温度 @ 满载</b>	- 20 ... 50 °C derate output to 75% at 60 °C	
<b>湿度</b>	max. 95 % RH, non condensing, up to 40 °C max. 75 % RH, non condensing, up to 50 °C	
<b>存储温度</b>	- 40 ... 85 °C	
<b>热 保 护</b>	output shuts down in case of insufficient cooling	
<b>MTBF 平均无故障时间</b>	500 000 hrs	

	SM500-CP-90	SM1500-CP-30
<b>保持时间</b> V <sub>out</sub> = 100%, P <sub>out</sub> = 15kW I <sub>out</sub> = 100%, P <sub>out</sub> = 15kW V <sub>out</sub> = 100%, P <sub>out</sub> = 7.5kW @ 400 V AC input	15 ms 15 ms 35 ms	15 ms 15 ms 35 ms
<b>缓启动时间</b> after mains switch on	2.5 s	
<b>浪涌电流</b>	23 A	

Notes: 1. Measured at full load.  
 2. Signal latency depends on the interface used and data traffic.  
 3. See 'Safety Instructions' in the manual.

串联操作 max. total voltage Master / Slave operation	1000 V <sup>3</sup> M/S interface is under development	1500 V <sup>3</sup> M/S interface is under development
并联操作 Master / Slave operation	maximum 10 units for 11...20 units contact factory	M/S interface is under development
遥测补偿 max. voltage drop per load lead	default 1 V, can be set to 10 V	
保护设置 Voltage adjust range Current adjust range Power adjust range	0 ... 101 % 0 ... 101 % 0 ... 101 %	
数字编码电位器 front panel control with knobs resolution	15 bits.	
表头显示 scale voltage scale current scale power accuracy read output	4 digit 0.0 ... 500.0 V -90.0 ... 90.0 A -15000 ... 15000 W 0.2% + 2 digit	4 digit 0.0 ... 1500.0 V -30.0 ... 30.0 A -15000 ... 15000 W 0.2% + 2 digit

安 装	stacking of units allowed, air flow is from left to right
交流输入端子	screw Terminals for wire 4 mm <sup>2</sup> , 3 phase + earth (no neutral), CON A
直流输出端子	M8 bolts, CON B1 & CON B2
编程接口连接器	standard with RJ45-connector for Ethernet at rear panel, LAN
机柜锁	input for contact at rear panel, CON F
制冷噪声 audio noise level airflow	low noise blower, fan speed adapts to temperature of internal system ca. 50 dBA at full load, 25 °C ambient temperature, 1 m distance ca. 65 dBA at full load, 50 °C ambient temperature, 1 m distance From left to right
密封度 - 保护等级	IP20
安装尺寸 front panel: h x w behind front panel: h x w x d	132 x 483 mm (19", 3 U) 128 x 448 x 591 mm (excluding feet) <i>no extra depth is required with optional interfaces assembled.</i>
重 量	27 kg

Notes: 1. Measured at full load.  
2. Signal latency depends on the interface used and data traffic.  
3. See 'Safety Instructions' in the manual.

CV= Constant Voltage, CC= Constant Current  
CP= Constant Power

Specifications measured at  
 $T_{amb} = 25 \pm 5 \text{ }^\circ\text{C}$  and  $V_{in} = 400 \text{ VAC}$ ,  
50 Hz, 3 phase, unless otherwise noted.

The information in this document is  
subject to change without notice.

## 典型应用

# 汽车电器测试 和 汽车测试系统

# 激光元器件测试 和 激光器驱动

# PWM 直流电机驱动

# 汽车电池仿真 和 汽车动力总成测试

# 精密电流源

# 10nm 光刻机应用

# 电池电芯、电池组、电池包测试

# 自动生产线测试系统

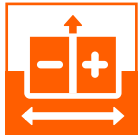
# 等离子溅射应用

# 太阳能逆变器测试 (光伏PV曲线模拟)

# 航空航天 和 军用系统

# 高能粒子加速器应用

## 标准配置



### 双向 (二相限) 操作

- # 15kW 电源
- # 15kW 负载

应用：仿真电池特性

电池充放电测试

PWM 直流电机驱动



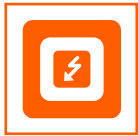
### 数字设置

- 精密数字编码电位器
- 分辨率 0.03%



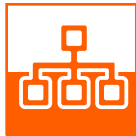
### 内置波形发生器

- 任意波形输出
- 可脱机独立运行



### 高压绝缘隔离

- 1000V for SM500-CP-90
- 1500V for SM1500-CP-30



### 以太网接口 LXI

- WebViwer 窗口
- 设置 编程 测量 控制



### USB 接口

- A 数据交换
- B 控制脱机运行

## 可选配置



### 可选控制接口

可以现场安装

- Digital I/O
- Isolated Contacts
- Serial controller with multiple protocols  
RS 232, RS 485, RS 422 and USB (Device)

Order Codes :

- INT MOD DIG
- INT MOD CON
- INT MOD SER

Under development are:

- Simulation Interface
- Isolated Analog Programming
- Master / Slave controller

## WebViewer 控制界面



