全系列电源供应器
产品目录

The Complete Power Supply Range
Product Catalogue

2015 / 2016



Elektro-Automatik

通用电源系统

EA Elektro-Automatik公司于1974年由电子工程师Helmut Nolden先生创立。公司初期主要生产小型固定式和可调式电源，供工业、实验室和业余爱好者使用。随着EA技术团队能力的逐渐提高和持续创新，开发出更多不仅能满足特定客户的精准要求，也符合市场的普遍需求的产品。公司凭藉这些卓越品质的电源产品和系统很快就暂露头角。根据客户不同的定位并开发出创新产品，成为本公司现在及未来高科技解决方案的发展方向。核心研发部位于德国菲尔森-Viersen，生产基地分布于德国本部和远东地区。EA已经为现在和未来的市场需求做好了充分的准备。因具备专有的核心技术，高度的灵活性和极短的生产週期，使得EA成为许多知名公司和重要机构的首选供应商。

Power supply systems for universal applications

With this vision electronics engineer Helmut Nolden founded **EA Elektro-Automatik** in 1974. At the beginning production was chiefly of small fixed and adjustable power supply units for industrial, laboratory and hobby use. The high technical competence of the EA team and the continuous strive for innovation enabled the company to deliver ever more products, satisfying precise customer requirements and general market needs. In this way the company quickly made a name for itself as a highly qualified supplier of power supply units and systems. Distinct customer orientation and innovative product development lead to high-tech solutions of today and tomorrow. With the core of R&D based in the headquarter in Viersen and production facilities in Germany and Far East, EA is well prepared for the market requirement of the present and the future. Everything points to expansion. Know-how, flexibility and short production cycles make EA a preferred supplier to numerous well-known companies and significant institutes.

完整电源系列

EA的产品系列纵、横范围同样宽广，几乎能满足实验室、工业或教育领域的每一个需求。实验室和工业用电源产品，电子负载，逆变器，内嵌式、导轨式和19“插拔式电源，以及其它大功率产品奠定了坚固的基础，从而使EA能为客户量身定做最适合的电源产品与系统。

The complete power supply program

The equally wide and deep product spectrum of EA covers almost every need in laboratory, industrial or education environment. Laboratory and industrial power supplies, electronic loads and inverters, built-in, DIN-rail and 19“ plug-in power supplies and many more power products build the basis upon which EA is also able to offer power supply units and systems tailored to customer requirements.

为客户最佳利益而研制产品

开发和创新是EA的重要基础，因此我们的产品总是引领技术前沿。所有EMI测量和安规测试都在厂内完成。

专业的电源开发团队在产品系列上展现出强劲优势，创造出例如：电能反馈型电子负载，带自动调整输出的实验室电源，不同凡响的功率密度的内嵌式、导轨式和19“插拔式电源，所有此类产品由于其高效性能，使能源得到最佳利用。

Development for optimal customer benefit

Development and innovation is of fundamental importance to EA. Through this, EA units have always been at the technological leading edge. All EMI measurements and safety tests are carried out in-house.
A development team specialised in power supply demonstrates its strength over the product line. Examples of such are electronic loads for energy feedback, laboratory power supplies with auto-ranging output, built-in, DIN-rail and 19“ plug-in power-supplies with outstanding power density, all of which have in common an optimal energy usage by high efficiency.

位于Viersen的EA公司总部

EA building in Viersen



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电源系统

EA电源供应器和系统因其稳定的高品质而享有盛名。
我们的品质管理系统，已通过DIN ISO 9001认证，并长期维持稳定的高水准，保证技术可靠性和极低的退货率。这起始于原材料入库，到整个生产过程，直至最后的品质控制。在最后测试过程中，所有**EA**生产的工业类产品都要经过“老化测试”。该测试利用电量反馈型电子负载来操作，这样周围环境不仅不会有热量散发的影响，反而将所有测试设备产生的电流直接转化为230 V AC电压，反馈给市电循环使用。.

Power supply systems

EA power supply units and systems are renowned for their constant high quality.
A quality management system, certified under DIN ISO 9001 and maintained at a constant high level, guarantees technical reliability and an extremely low return rate. This begins at goods-in and continues through the complete production process to final control. Within the final testing all industrial units from **EA** undergo a „burn-in test“. Where possible these are carried out using an electronic load with energy recovery, so that the environment is not simply impacted by heat emission, but rather the direct current, produced by all test units, is converted to 230 V AC and fed back into the public supply.

研发部和结构部

Research and development department



EMI测试与老化测试间

EMI laboratory and burst test



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技术生产

我们产品与系统的概念定位、设计、技术开发与规格制定全部由公司内各相关部门共同完成。将研发取得的技术优势直接转化为成品，于是，**EA**再一次以灵活输出级的实验室功率产品引领技术前沿。

科技生产意味着极其灵活的生产流程。因此，我们能在最短时间内对特定客户需求作出回应：这样能缩短新产品和系统开发周期，我们还保证用尽可能短的反馈时间应对客户的紧急需求.

Technology production

Concept, design, technical development and specification of our units and systems is invariably carried out in-house. The technical advantage gained by the development is converted straight away into finished products. Thus, once again, it was **EA** who led the way with a flexible output stage for laboratory power units.

Technology production means extremely flexible production processes. Thus it is possible to react to specific customer requirements within the shortest time scales: a necessity as the development cycles for new equipment and systems becomes ever shorter. Also we guarantee the shortest possible reaction time for our customers in emergency situations.

半自动组装线 / **Semi-automatic assembly**



成品测试间 / **Test bay for finished units**

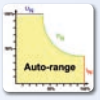


SMD贴装线 / **SMD assembly line**



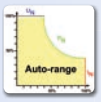
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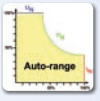


EA-PSI 8000 T / EA-PSI 9000 DT
可编程实验室直流电源
Programmable Laboratory Power Supplies
320 W - 1,5 kW
12-23





EA-PSI 9000 2U / EA-PSI 9000 3U - 24U
可编程 & 重载型实验室直流电源
Programmable & Heavy Duty Laboratory Power Supplies
1000 W - 90 kW
24-43

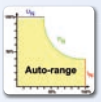



EA-PS 8000 T
可编程实验室直流电源
Programmable Laboratory Power Supplies
320 W - 1,5 kW
44-47

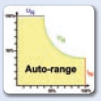




EA-PS 9000 1U / EA-PS 9000 2U / EA-PS 9000 3U
可编程实验室用 & 重载型直流电源
Programmable Laboratory & Heavy Duty Power Supplies
640 W - 90 kW
48-63

EA-PSE 9000 3U
可编程实验室用 & 重载型直流电源
Programmable Laboratory & Heavy Duty Power Supplies
3.3 kW - 15 kW
64-69

EA-PSI 5000 / EA-PS 5000
可编程实验室直流电源
Programmable Laboratory Power Supplies
160 W - 640 W
70-77





EA-PS 2000 B
带单路或三路输出的实验室电源
Laboratory Power Supplies with one or three outputs
USB
100 W - 332 W
78-81



EA-PS 3000 B
带模拟接口的实验室电源
Laboratory Power Supplies with Analog Interface
160 W - 650 W
82-83

EA-HV 9000
高压直流电源
High Voltage Power Supplies 2000 W

1.2 kV - 12 kV 0.17 A - 1.67 A

84-85



EA-PSI 800 R
带模拟接口的机柜安装式直流电源
Rack Mount Power Supplies with analog interface

320 W - 5 kW

86-89



EA-PS 800 R
带模拟接口的机柜安装式直流电源
Rack Mount Power Supplies with Analog Interface

320 W - 5 kW

90-93



EA-PS 500 / EA-PS 1501 T
开关模式固定电压直流电源 150 W - 300 W
Switched Mode Fixed Voltage Power Supplies 150W - 300 W

15 W通用电源

94



EA-FET
大电流FET开关
DC High Current FET Switch

95



EA-PS 800 KSM
导轨式直流电源
DIN Rail Power Supplies

10 W - 100 W

96-97



EA-PS 800 SM
导轨式直流电源
DIN Rail Power Supplies

80 W - 480 W

98-99



EA-PS 800 19“
符合DIN 41494标准的19“插拔式直流电源
19“ Plug-In Power Supplies DIN 41494 compliant

80 W - 240 W

100-105





EA-PS 1000
重型可调开关模式直流源
Heavy duty, adjustable switching DC Sources
1.5 kW - 240 kW
106-109



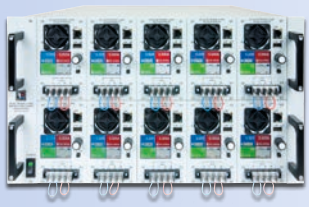
EA-EL 3000
可编程直流电子负载
Programmable Electronic Loads
400 W
110-113



EA-EL 9000 DT
桌面式可编程直流电子负载
Programmable Electronic Loads in Desktop enclosure
300 W - 1200 W
114-117



EA-EL 9000 B
19"柜式可编程直流电子负载
Programmable Electronic Loads in 19" enclosure
1200 W - 7200 W
按需还供>7200 W的型号 / upon request
118-121



EA-ELR 5000
电能反馈式多通道直流电子负载
Electronic Multi Channel DC Loads with Energy Recovery
19" Rack
320 W - 3200 W
122-125



EA-ELR 9000
电能反馈式可编程直流电子负载
Programmable Electronic Loads with Energy Recovery
3,5 kW - 10,5 kW
按需还供>10.5 kW的型号 / upon request
126-129

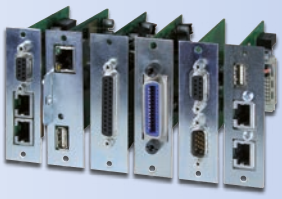


EA-BCI 800 R
可编程电池自动充电器
Programmable Automatic Battery Chargers
320 W - 1.5 kW
130-134



EA-BC 800 R
铅酸电池自动充电器
Automatic Battery Chargers for Lead Acid Batteries
320 W - 1,5 kW
135-136

EA-IF Interfaces
可更换数字接口
Replaceable digital interfaces
USB, RS232, CAN, GPIB, Analog, Ethernet, Profibus
für/for PS 8000, PSI 8000, EL 3000, EL 9000
137-138



EA-IF-AB Interfaces
AnyBus接口模块系列，适合ELR 9000, PSI 9000系列
AnyBus Interface Modules for ELR 9000, PSI 9000

RS232, SR485, CANopen, Profibus, Profibus etc.
139-140



EA-ENS2
自动隔离模块
Automatic Isolation Unit Module
141



EA-UTA12 / EASYSOFT / EA POWER CONTROL
电源产品用通用型数字转模拟适配器
Universal digital-to-analog adapter for power supplies
Software–软件
142-144





EA-UPS 700
TS35导轨安装式直流UPS
DC UPS Units for DIN-Rail TS35

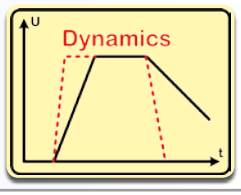
150 W - 500 W
145

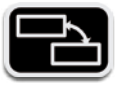


EA-CABINETS, EA-OPTION HS
12U - 42U整套机柜系统
Cabinets 12U - 42U as kit system

HS - 高速跃变 / High Speed
146-152





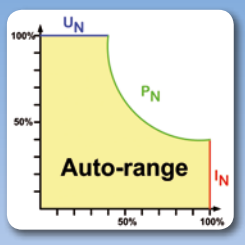
各特征与选项的符号释义	**Meaning of the symbols for features and options**
 范围可调的电压控制符号	Voltage control with adjustable voltage
 范围可调的电流控制符号	Current control with adjustable current
 范围可调的功率控制符号	Power control with adjustable power
 范围可调的内阻控制符号（可选）	Internal resistance control with adjustable resistance
 过压保护，可调或自动	Overvoltage protection, adjustable or automatic
 过流保护，可调	Overcurrent protection, adjustable
 过功率保护，可调	Overpower protection, adjustable
过温保护	Overtemperature protection
 内置模拟接口	Integrated analog interface
 并联操作用共享总线	Share Bus for parallel connection
 19“机柜外壳	19“ rack compliant enclosure
 函数发生器	Function generator
有汇总功能的主从操作	Master-slave feature with totals formation

 内置USB端口，或可选内置USB接口卡	Built-in USB port or optional plug-in USB interface card
 内置RS232数字接口卡，可选	Optional, digital plug-in interface card RS232
 可选或机器预装内置Ethernet数字接口卡	Optional or installed, digital plug-in interface card Ethernet
 可选内置数字接口卡IEEE/GPIB（可拆装），或已配置GPIB端口（不可拆装）	Optional, digital plug-in interface IEEE/GPIB (retrofittable) or optionally installed GPIB port (not retrofittable)
 内置CAN数字接口卡，可选	Optional, digital plug-in interface card CAN
 内置Profibus数字接口，可选	Optional, digital plug-in interface card Profibus
 内置水冷器，可选	Optional, built-in watercooler
 配各种工业接口的可拆卸式接口模块，可选	Optional, retrofittable and exchangeable interface modules with various industrial interfaces

U I P R OVP OTP USB RS232 LAN IEEE CAN AI Profi-bus







EA-PSI 8032-20 T

- 宽范围输入电压90...264 V，带主动式PFC
- 效率高达 92%
- 输出功率：320 W 至0...1500 W
- 输出电压：0...16 V 至 0...360 V
- 输出电流：0...4 A 至 0...60 A
- 灵活的功率调整输出级*
- 过压保护（OVP）
- 过温保护（OT）
- 图形显示器指示所有数值和功能
- 显示器指示状态和提示信息
- 可自动检测的远程感测端
- 模拟接口
  - 通过 0...10 V或0...5 V电压可对U / I / P* 编程
  - 通过 0...10 V或0...5 V电压可监控U / I
- 报警管理器，用户配置文档
- 内置函数管理器
- 温控风扇制冷
- 可选多种接口卡
- 可选内阻调整

- **Wide input voltage range 90...264 V, with active PFC**
- **High efficiency up to 92%**
- **Output power ratings: 320 W up to 0...1500 W**
- **Output voltages: 0...16 V up to 0...360 V**
- **Output currents: 0...4 A up to 0...60 A**
- **Flexible, power regulated output stage***
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Graphic display for all values and functions**
- **Status indication and notifications via display**
- **Remote sense with automatic detection**
- **Analog interface with**
  - **U / I / P* programmable via 0...10 V or 0...5 V**
  - **U / I monitoring via 0...10 V or 0...5 V**
- **Alarm management, user profiles**
- **Integrated function manager**
- **Temperature controlled fans for cooling**
- **Optional interface cards**
- **Optional internal resistance regulation**

概要

EA-PSI 8000 T 系列是一款由微处理器控制，采用最新技术设计的实验室电源。标准版已配备多种功能和特征，让用户使用起来更方便、有效。

本产品可设置和存储用户与制程配置文档，这样可改善重复测试或其它应用。

带可调延时报警的扩展监控功能，可监控所有输出参数，从而简化了测试组装，故基本无需外部监控。

输入

采用主动式功率因数校正线路，使产品在90 V_{AC}至264 V_{AC}全世界宽范围输入电压下都适用。功率为1.5 kW的型号在输入电压低于150 V_{AC}时总输出功率将降至1 kW。

* 针对1 kW以上型号

General

The microprocessor controlled laboratory power supplies of series EA-PSI 8000 T cover state-of-the-art technology. They already offer many functions and features in their standard version, making the use of this equipment remarkably easy and most effective.
User and process profiles can be configured, saved and archived so that the reproducibility of a test or other application is improved.
The extensive integrated monitoring functions for all output parameters with adjustable delays of alerts simplify test assembly, such that the usual external monitoring is mostly unnecessary.

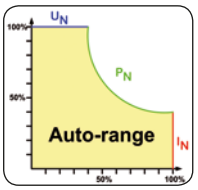
Input

The devices use an active **P**ower **F**actor **C**orrection circuit to enable using it worldwide on a mains input from 90 V_{AC} up to 264 V_{AC}. Models with 1.5 kW will derate their output power to 1 kW below input voltages of 150 V_{AC}.

* Models from 1 kW

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直流输出
本系列有多款不同型号，可选择 0...16 V 和 0...360 V 输出电压，0...4 A 和 0...60 A 输出电流，320 W 和 0...1500 W输出功率的型号。输出端位于产品前面板。1 kW 以上型号的输出功率可灵活调整。可在低电流时输出更高的电压，或在低电压时输出更大的电流，都限制于可调（0..100%）输出功率范围内。



DC output
DC output voltages between 0...16 V and 0...360 V, output currents between 0...4 A and 0...60 A and output power ratings between 320 W and 0...1500 W are available. The output terminal is located on the front panel. Models with 1 kW or higher output power are equipped with a flexible, auto-ranging power stage which provides a higher output voltage at lower output currents, or a higher output current at lower output voltages, always limited to the adjustable (0...100%) output power value.

过压保护 (OVP)
为保护连接负载，可设定一过压保护极限值(OVP)。

若输出电压超过调节极限值，输出被关断，显示器和模拟接口发出一声频报警信号。

报警管理系统
为监控正确的输出电压和电流，可定义上、下限。

若偏差超过该调节极限，应用设备出现下面三种可能性反应：
- 只显示信号；即使错误仍存在，也不影响输出。

- 警告一直持续，消除错误后必须确认警告信息。

- 报警会暂时性地关断输出。

报警和警告可通过声频发出信号。

远程感测
远程感测输入端可直接连到负载设备，以补偿连线上的压降。如果输入端已接上负载，本电源会自动检测并调整输出电压，以确保负载获得准确所需的电压值。

Overvoltage protection (OVP)
In order to protect connected loads, it is possible to adjust an overvoltage protection threshold (OVP).
If the output voltage exceeds the defined threshold, the output is shut off and an acoustic warning signal will be given by the unit together with a status signal in the display and via the analog interface.

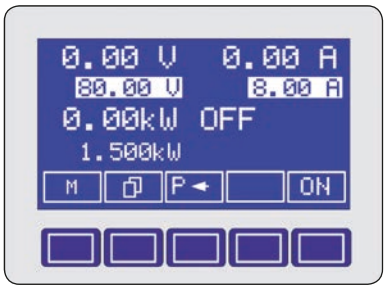
Alarm management
For monitoring the correct output voltage and output current, lower and upper limits can be defined.
If the deviation exceeds the adjusted limits, three possibilities are available as to how the appliance should react.
- Signals are displayed only; even if the fault is still active, without affecting the output
- Warnings remain active and must be acknowledged after the fault is removed
- Alarms will shut off the output instantly in case the deviation exceed the adjusted limits.
Alarms and Warnings can be signalled acoustically.

Remote sensing
The standard sense input can be connected directly to the load in order to compensate voltage drops along the power cables. If the sense input is connected to the load, the power supply will detect this and adjust the output voltage automatically to ensure the accurate required voltage is available at the load.

显示器和控制键
易读型图形显示器清晰显示设定输出值、实际输出值、操作按钮的操作状态和当前功能。

菜单清晰指引用户查阅所有必要信息和调节值。

输出电压、电流和功率的设定值与实际值都显示于图形显示器上，还包括产品的运作状态，菜单指引和按钮当前功能，故用户能直观地操作本产品。



输出电压、电流和功率或可调内阻的调节，由两个旋钮完成。旋钮可在不同菜单设置下更改数值。为避免误操作，可锁定所有操作控制键。

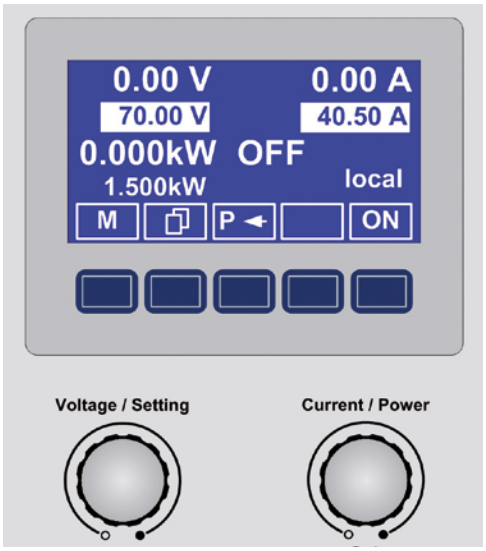
Displays and controls
The easily readable graphic display shows a clear representation of set values, actual output values, the operational state and the current functions of the operation pushbuttons.
For all necessary information and adjustments the user is guided by a clear menu.
Set values and actual values of output voltage, output current and output power are clearly represented on the graphic display.
The operating state of the device, the menu guidance and the current assignment of the pushbuttons are also shown on the display. So the user is able to operate the unit intuitively.
The adjustment of output voltage, output current and output power, or optional internal resistance, is done by two rotary knobs. These knobs are used to change values in the different menus as well. To prevent unintentional operations, all operation controls can be locked.

输出值的预设
若想在不影响输出状态的条件下预设输出电压、电流或功率（针对1 kW以上型号），可先显示设定值，即于实际值的下方。这样用户可预设期望输出电压、电流和功率。在预设清单下课存储4组U / I / P参数块。该清单下的参数块可作为常用需求值或者频繁替换值。

Presetting of output values
In order to preset output values for voltage, current or power (models from 1 kW) without affecting the output condition, the set values are displayed below the actual values. Also four parameter blocks for U / I / P can be stored in a preset list. From this list, parameter sets can be used for frequently required values or in order to jump between values.

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显示器和控制面板 / Display and control panel



实际电压和电流	Actual values voltage and current
预设电压和电流	Preset values voltage and current
实际功率 / 输出状态	Actual value power / status output
预设功率 / 状态	Preset value power / status
按钮功能	Assignment of the pushbuttons
按键面板	Button panel
参数调节用旋钮	Rotary knobs for settings

函数管理器

函数由序列组成，通过控制面板可对其进行修改。

一个函数由最多5个序列组成，可按任意顺序排列，重复次数最多为5次。

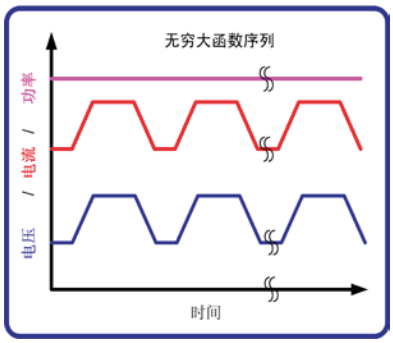
每个序列可设置最大功率或可选内阻，重复次数为一至254次，或者无穷大。

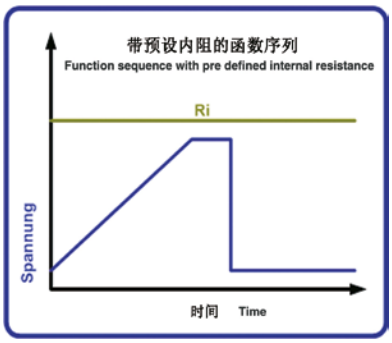
同样地，整个函数段的重复次数可以设置成一至254次，或无穷大。

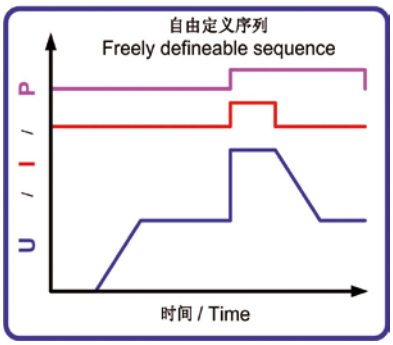
Function manager

Functions consist of sequences and can be modified on the control panel.
Up to five different sequences can be assigned to a function in any succession or be repeated up to five times.

For each sequence, the maximum power, or optionally the internal resistance, and a repetition value from once up to 254 times or endless can be configured.
As well, the repetition of a whole function can be configured from once up to 254 times or endless.







用户配置文档

经控制面板可存储多达四种用户配置文档。

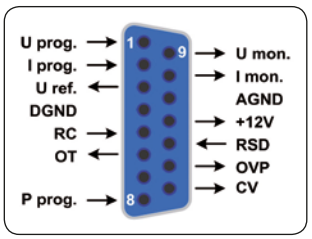
用户配置文档专门用来设置和存储用户指定的参数块。

User profiles

Via the control panel up to four different user profiles can be stored.
The user profiles are designed to set and save user specified parameter blocks.

模拟接口

内置模拟接口位于产品前面板。它提供有模拟接口输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流（1 kW以上型号）。模拟输出端接上0 V...10 V或0 V...5 V电压，可监控输出电压、电流和功率。此外，还有几个输入端和输出端，用来控制和监控产品状态。



P prog.引脚仅针对1 kW以上型号 /
P prog. only with models from 1 kW

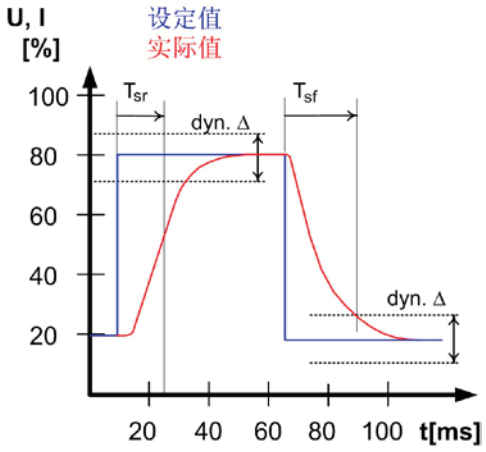
Analog Interface

The built-in analog interface is located on the front of the device and provides inputs to set voltage, current and power (models from 1 kW) from 0...100% via a control voltage of 0 V...10 V or 0 V...5 V. To monitor output voltage and current, analog outputs of 0 V...10 V or 0 V...5 V can be read out. Furthermore, several inputs and outputs are available for controlling and monitoring the device status.

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监控功能

本系列所有型号都具有电压与电流曲线监控功能。可以对其进行配置，以便对有此种需求的测试步骤进行过压与过流，或者欠压与欠流（ΔU, ΔI），以及上升与下降时间（t_{SR}, t_{SF}）的监控。在所有此类情况下，产品不仅监控其状态，而且会发出通知或报警。
下面为图解：

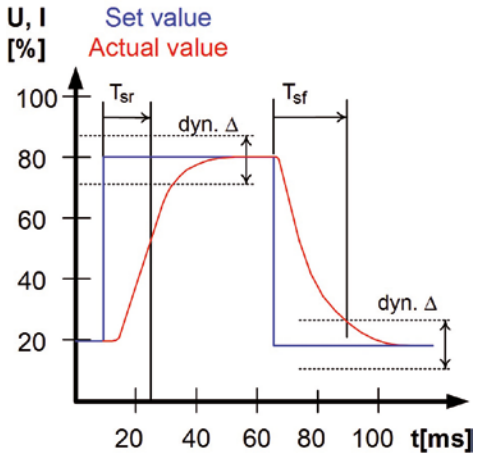


选购件

- 可利用RS232、CAN、USB、GPIB (IEEE)、Profibus或Ethernet绝缘数字接口卡，经电脑控制本产品。接口插槽位于产品后板，方便用户插上新接口或替换当前接口。产品会自动检测接口，并提示需要进行少许配置或不用配置。随接口卡附有一张光盘，上面存储有一适用于RS232/USB/GPIB/Ethernet的免费Windows软件，可以控制和监控，记录数据和排序。也可参考137和143页。
- 电隔离模拟接口，与内置模拟接口相比，其功能更广
- 模拟可调内阻
- 高速跃变（仅针对1 kW以上产品，也见152页）

Supervision features

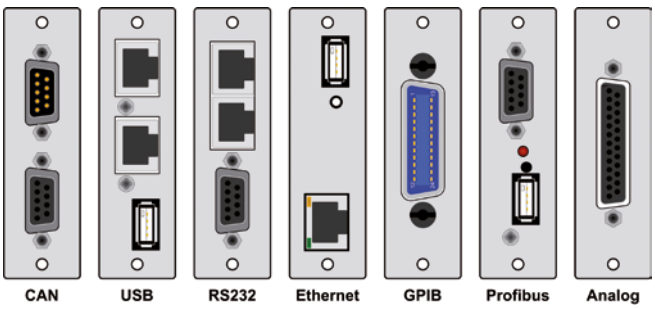
All models of this series offer supervision features for voltage and current steps. The supervision is configurable to monitor voltage or current over- and undershooting (ΔU, ΔI), as well as rise and fall times (t_{SR}, t_{SF}) during test procedures which require to follow certain demands. In all cases, the device will supervise the condition and generate a notification or alert.
Representation:

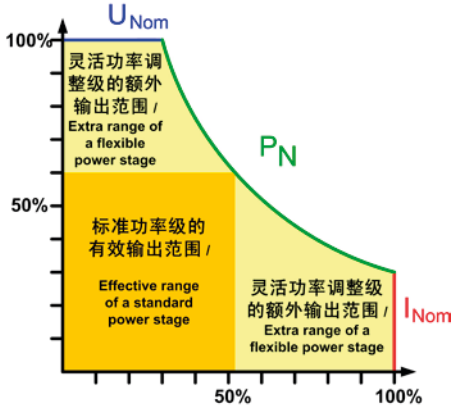


Options

- Isolated digital interface cards for RS232, CAN, USB, GPIB (IEEE), Profibus or Ethernet to control the device by PC. The interface slot is located on the rear panel, making it easy for the user to plug in a new interface or to replace an existing one. The interface will be automatically detected by the device and requires no or only little configuration. Included with the interface cards is a free Windows software for RS232/USB/GPIB/Ethernet, which provides control and monitoring, data logging and semi-automatic sequences. See pages 137 and 143.
- Analog, galvanically isolated interface card with extended features compared to the built-in analog interface
- Simulated, adjustable internal resistance
- High speed ramping (only for models from 1 kW, also see page 152)

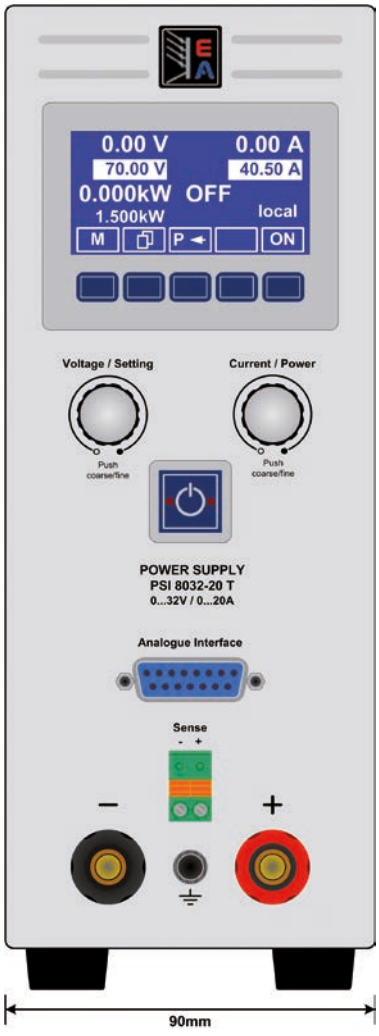
接口卡类型 / **Interface cards**





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技术参数	Technical Data	Series EA-PSI 8000 T / 系列
AC输入电压	Input voltage AC	90...264 V, 1ph+N
-频率	- Frequency	45...65 Hz
-功率因数	- Power factor	>0.99
DC输出电压	Output voltage DC	
-精确度	- Accuracy	<0.2%
- 0-100% 的负载调整率	- Load regulation 0-100%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%
-负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms
-负载从10-90%上升需时	- Rise time 10-90%	最长30 ms
-过压保护	- Overvoltage protection	可调，范围为0...110% U_{nenn} / adjustable, 0...110% U_{nom}
输出电流	Output current	
-精确度	- Accuracy	<0.2%
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%
输出功率	Output power	1000 W以上型号可调 / Adjustable with models from 1000 W
-精确度	- Accuracy	<1%
过压类别	Overvoltage category	2
保护功能	Protection	OT, OVP, OCP, OPP (从/from 1000 W起) [2]
隔离耐压	Isolation	
-输入对外壳	- Input to enclosure	2500 V DC
-输入对输出	- Input to output	2500 V DC
-输出对外壳	- Output to enclosure	DC-对PE最大耐压为300 V / Max.300 V on DC- against PE
污染等级	Pollution degree	2
保护级别	Protection class	1
模拟编程	Analog interface	内置15-针D-Sub母插 / Built in, 15-pole D-Sub, female
-输入范围	- Input range	0...5 V 或 / or 0...10 V (可转换 / switchable)
- U / I 的精确度	- Accuracy U / I	0...10 V: <0.2% 0...5 V: <0.4%
串联操作	Series operation	可实现，任意一直流负极对PE最大有300 V DC的电压转移 / Possible, with max. potential shift of 300 V DC of any DC minus against PE
并联操作	Parallel operation	可实现，经模拟接口可执行主从操作 / Possible, with master-slave via analog interface
安全标准	Standards	EN 60950, EN 61326, EN 55022 等级 B / Class B
制冷	Cooling	风扇 / Fan
工作温度	Operation temperature	0...50°C
储存温度	Storage temperature	-20...70°C
相对湿度	Relative humidity	<80% 无凝结 / non-condensing
使用高度	Operation altitude	<2000 m
重量	Weight	320 W - 650 W: 3.8 kg 1000 W - 1500 W: 6.5 kg
产品尺寸 (宽x高x深) [1]	Dimensions (WxHxD) [1]	320 W - 650 W: 90x240x280 mm 1000 W - 1500 W: 90x240x395 mm

型号	电压	电流	功率	效率	U最大时的纹波[4]	I最大时的纹波[4]	编程 / Programming [3]			订购编号
Model	Voltage	Current	Power	Efficiency	Ripple U max. [4]	Ripple I max. [4]	U (typ.)	I (typ.)	P (typ.)	Ordering number
PSI 8016-20 T	0...16 V	0...20 A	320 W	90.5%	40 mV_{PP} / 4 mV_{RMS}	60 mA_{PP} / 10 mA_{RMS}	4 mV	5 mA	-	09200400
PSI 8032-10 T	0...32 V	0...10 A	320 W	89%	100 mV_{PP} / 10 mV_{RMS}	35 mA_{PP} / 7 mA_{RMS}	9 mV	3 mA	-	09200401
PSI 8065-05 T	0...65 V	0...5 A	325 W	92%	150 mV_{PP} / 20 mV_{RMS}	12 mA_{PP} / 3 mA_{RMS}	18 mV	2 mA	-	09200402
PSI 8032-20 T	0...32 V	0...20 A	640 W	90.5%	100 mV_{PP} / 8 mV_{RMS}	65 mA_{PP} / 10 mA_{RMS}	9 mV	5 mA	-	09200403
PSI 8065-10 T	0...65 V	0...10 A	650 W	91%	150 mV_{PP} / 10 mV_{RMS}	25 mA_{PP} / 3 mA_{RMS}	18 mV	3 mA	-	09200404
PSI 8160-04 T	0...160 V	0...4 A	640 W	92%	120 mV_{PP} / 20 mV_{RMS}	3 mA_{PP} / 1 mA_{RMS}	43 mV	1.5 mA	-	09200405
PSI 8080-40 T	0...80 V	0...40 A	0...1000 W	93%	10 mV_{PP} / 4 mV_{RMS}	19 mA_{PP} / 7 mA_{RMS}	20 mV	11 mA	0.27 W	09200406
PSI 8360-10 T	0...360 V	0...10 A	0...1000 W	93%	30 mV_{PP} / 11 mV_{RMS}	1 mA_{PP} / 0.45 mA_{RMS}	88 mV	3 mA	0.27 W	09200408
PSI 8080-60 T	0...80 V	0...60 A	0...1500 W	93%	10 mV_{PP} / 4 mV_{RMS}	19 mA_{PP} / 7 mA_{RMS}	20 mV	16 mA	0.41 W	09200407
PSI 8360-15 T	0...360 V	0...15 A	0...1500 W	93%	50 mV_{PP} / 8 mV_{RMS}	1 mA_{PP} / 0.45 mA_{RMS}	88 mV	4 mA	0.41 W	09200409

[1] 仅为外壳尺寸，非产品整体尺寸 / Enclosure only, not overall
[2] 见第153 页/ See page 153
[3] 无产品错误时的可编程分辨率 / Programmable resolution without device error
[4] RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

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EA-PSI 9080-60 DT

- 宽范围输入电压90...264 V，带主动式PFC
- 效率高达 92%
- 输出功率：320 W至0...1500 W
- 输出电压：0...40 V 至 0...750 V
- 输出电流：0...4 A 至 0...60 A
- 功率自动调整输出*
- 有过压保护（OVP）
- 有过温保护（OT）
- 触摸屏显示器显示所有数值、状态与提示信息
- 隔离模拟接口
  - 通过 0...10 V或0...5 V电压可对U / I / P / R编程
  - 通过 0...10 V或0...5 V电压可监控U / I
- 内置USB端口与以太网端口（电隔离）
- 内置函数发生器
- 光伏阵列模拟
- 内阻模拟与调节
- 低噪音
- 带提手与斜撑架的桌面式外壳
- 40 V型号符合SELV (EN 60950)
- 配放电电路(在10 s内U_{out} < 60 V)
- 支持SCPI指令语言

- **Wide input voltage range 90...264 V with active PFC**
- **High efficiency up to 92%**
- **Output power ratings: 0...320 W up to 0...1500 W**
- **Output voltages: 0...40 V up to 0...750 V**
- **Output currents: 0...4 A up to 0...60 A**
- **Flexible, power regulated output stage***
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Intuitive touch panel with display for all values, status and functions**
- **Galvanically isolated analog interface with**
  - **U / I / P / R programmable via 0...10 V or 0...5 V**
  - **U / I monitoring via 0...10 V or 0...5 V**
- **USB port and Ethernet built in (galv. isolated**
- **Integrated function generator**
- **Photovoltaic array simulation**
- **Internal resistance simulation and regulation**
- **Low noise**
- **Desktop enclosure with carrying handle and tilt stand**
- **40 V models compliant to SELV (EN 60950)**
- **Discharge circuit (U_{out} < 60 V in ≤ 10 s)**
- **SCPI command language supported**

概要

EA-PSI 9000 DT 系列是一款由微处理器控制的实验室电源，为用户提供友好、交互式操作理念，配有一系列标准功能。输出参数，监控功能与其它设定的排布整齐且舒服。

所有输出参数的监控功能可以减少测试设备，几乎不需安装外部监控硬件与软件。

控制面板上配有两个旋钮，一个按钮，两个 LED 灯。触摸屏为彩显屏，上面显示所有重要数值与状态，用户仅通过手指的几次按触就能方便地操作它。

若集成到半自动与远程控制测试台与自动化系统，本产品的后板还有一组接口（模拟与数字）。

* 针对1 kW以上型号

General

The microprocessor controlled laboratory power supplies of series EA-PSI 9000 DT offer a user-friendly, interactive handling concept, along with a extensive set of standard features, which can facilitate operating them. Configuration of output parameters, supervision features and other settings is smart and comfortable.

The implemented supervision features for all output parameters can help to reduce test equipment and make it almost unnecessary to install external supervision hardware and software.

The clear control panel with its two knobs, one pushbutton, two LEDs and the touch panel with colour display for all important values and status enable the user to handle the device easily with a few touches of a finger.

For the integration into semi-automatic and remotely controlled test and automation systems, the devices offer a set of interfaces (analog and digital) on their rear side.

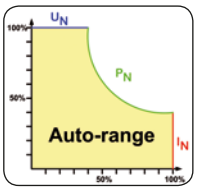
* Models from 1 kW

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交流输入
本系列采用主动式功率因数校正，使产品在全世界范围内都适用，输入电压为90 V_{AC}至264 V_{AC}。功率为1.5 kW的型号在输入电压低于150 V_{AC}时总输出功率将降至1 kW。

AC Input
The equipment uses an active **P**ower **F**actor **C**orrection to enable using it worldwide on a mains input from 90 V_{AC} up to 264 V_{AC}. Models with 1.5 kW will derate their output power to 1 kW below input voltages of 150 V_{AC}.

功率段自动分布
本系列所有型号的输出功率都可灵活调整。可在低电流时输出高电压，或在低电压时输出大电流，但总限定在最大额定输出功率的范围内。这些型号的最大设定功率也可调。因此，仅用一台产品却能应用于广范围的应用中。



Auto-ranging power stage
All models are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. The maximum power set value is adjustable with these models. Therefore, a wide range of applications can already be covered by the use of just one unit.

直流输出
本系列有多款不同型号，可选择0...40 V和0...750 V输出电压，0...4 A和0...60 A输出电流，320 W和0...1500 W输出功率的型号。

因此不论通过手动还是远程控制（模拟或数字接口），都可对0%至100%之间的电流、电压与功率连续调节。
输出端位于产品前面板。

与其他电源系列相比，PSI 9000 DT系列还有一额外的内置输出滤波器，它使产品纹波减至更低，所以直流输出电压的噪音也很低。

DC output
DC output voltages between 0...40 V and 0...750 V, output currents between 0...4 A and 0...60 A and output power ratings between 320 W and 0...1500 W are available.
Current, voltage and power can thus be adjusted continuously between 0% and 100%, no matter if manually or remotely controlled (analog or digital).
The output terminals are located on the front side of the devices.

Compared to other power supply series, the PSI 9000 DT feature a built-in, additional output filter to achieve much lower ripple, i. e. low noise on the DC output voltage.

放电电路
额定输出电压为200 V或以上的产品对其输出电容配有一放电电路。在空载或带很小负载的情况下，它能保证危险的输出电压在直流输出关闭后降至60 V DC以下。该电压值被认为是对人身安全有危险的极限电压。

Discharge circuit
Models with a nominal output voltage of 200 V or higher include a discharge circuit for the output capacities. For no load or low load situations, it ensures that the dangerous output voltage can sink to under 60 V DC after the DC output has been switched off. This value is considered as limit for voltages dangerous to human safety.

保护功能 (OVP)
为保护连接负载，可设定一过压保护极限值(OVP)，以及过流保护极限值(OCP)与过功率保护极限值(OPP)。

若因故达到这些极限值，直流输出立即被关断，显示器和模拟接口发出一状态信号。

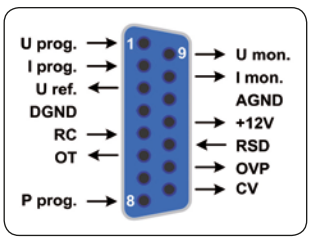
还有一过温保护功能，当产品过热时也会关闭直流输出。

Protective features
For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP) and overpower (OPP).
As soon as one of these thresholds is reached for any reason, the DC output will be immediately shut off and a status signal will be generated on the display and via the interfaces.
There is furthermore an overtemperature protection, which will shut off the DC output if the device overheats.

远程感测
远程感测输入端可直接连到负载设备，以补偿连线上的压降。如果输入端已接上负载，本电源会自动检测并调整输出电压，以确保负载获得准确所需的电压值。

Remote sensing
The standard sense input can be connected directly to the load in order to compensate voltage drops along the cables. If the sense input is connected to the load, the power supply will detect this and adjust the output voltage automatically to ensure the accurate required voltage is available at the load.

内置模拟接口
内置模拟接口位于产品后面板。它提供有模拟接口输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流与功率。模拟输出端接上0 V...10 V或0 V...5 V电压，可监控输出电压与电流。此外，还有几个输入脚和输出脚，用来控制和监控产品状态。

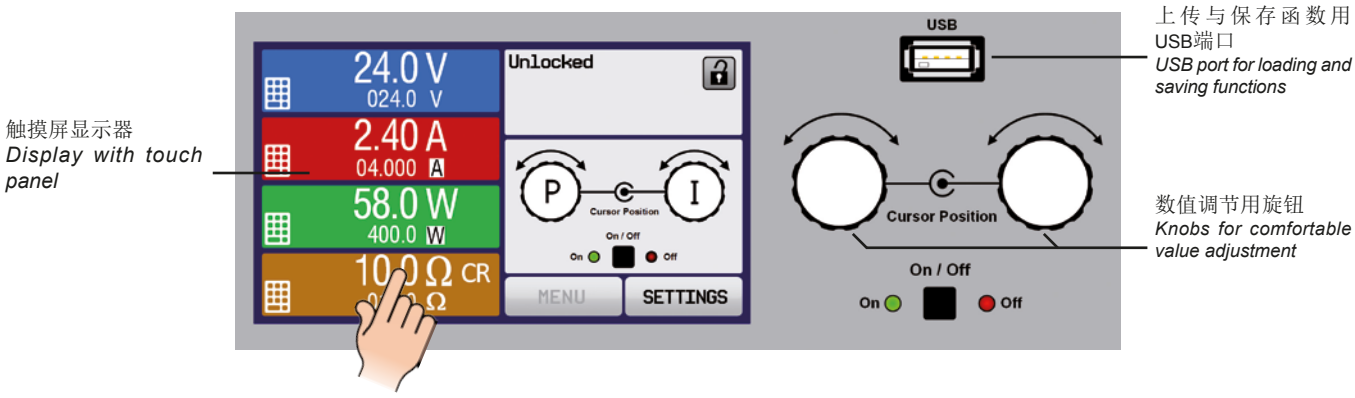


Built-in analog interface
There is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current and power from 0...100% through control voltages of 0 V...10 V or 0 V...5 V. To monitor the output voltage and current, there are analog outputs with voltage ranges of 0 V...10 V or 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

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显示器与控制面板

Display and control panel



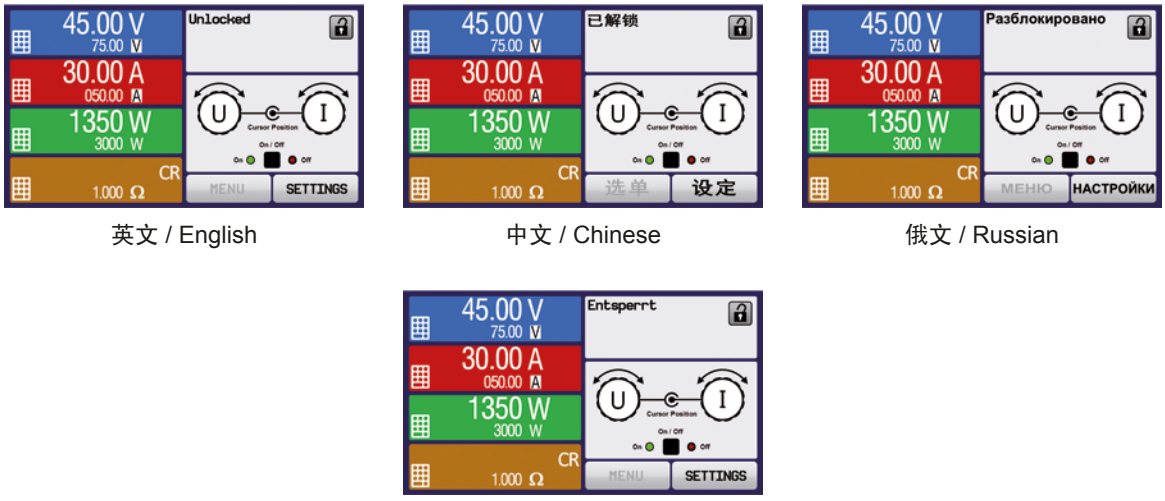
设定与实际输出电压、电流与功率都清晰显示于彩屏上。彩色的TFT屏幕为触摸式，用手指能控制产品所有功能。

通过旋钮，或者数字键盘直接输入参数，也可调节设定电压、电流、功率或阻止（内阻模拟）。

若想防止意外操作，可锁定所有操作键。

Set values and actual values of output voltage, output current and output power are clearly represented on the graphic display. The colour TFT screen is touch sensitive and can be intuitively used to control all functions of the device with just a finger.
Set values of voltage, current, power or resistance (internal resistance simulation) can be adjusted using the rotary knobs or entered directly via a numeric pad.
To prevent unintentional operations, all operation controls can be locked.

多语言控制面板 / Multi-language control panel



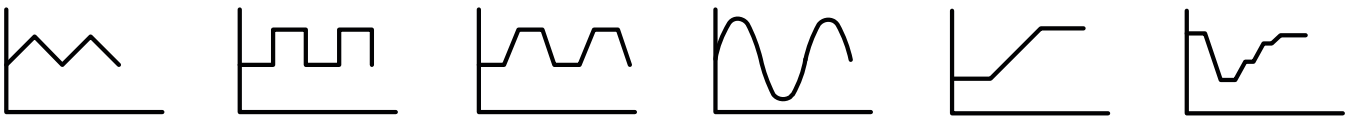
函数发生器

本系列所有型号都配有函数发生器。它能形成多种典型函数，如下所示，并应用到输出电压或输出电流上。发生器可通过前面板的触摸屏或经其中一数字接口完全可控与配置。

预设的函数为用户提供一切需要的参数，比如Y偏移值，时间 / 频率或幅度，形成整套配置。

Function manager

All models within this series include a true function generator which can generate typical functions, as displayed in the figure below, and apply them to either the output voltage or the output current. The generator can be completely configured and controlled by using the touch panel on the front of the device, or by remote control via one of the digital interfaces.
The predefined functions offer all necessary parameters to the user, such as Y offset, time / frequency or amplitude, for full configuration ability.



三角形 *Triangle* | 矩形 *Rectangle* | 梯形 *Trapezoid* | 正弦 *Sine* | 阶跃式 *Ramp* | DIN 40839

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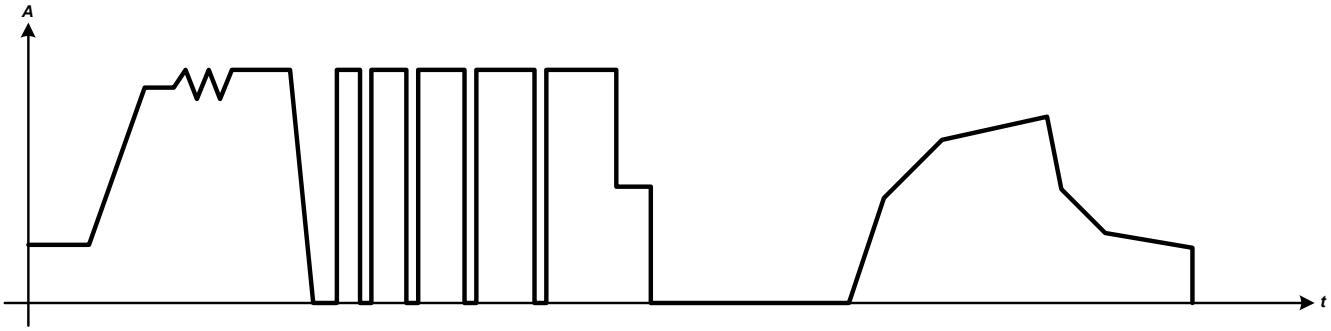
除了基于任意发生器形成的标准函数外，还可访问该基础发生器，创建并执行一套复杂的函数，将其分开在多达100个序列内。在研发与生产过程中可用它来做测试。

通过产品前板的USB端口可以从标准的U盘上传序列或者存储序列，从而可在不同的测试序列间变换。

我们可以虚构一个复杂函数的例子（40个序列），假设它在任意发生器下实践。可以在产品上创建该函数，也可从外部上传或保存：

Additionally to the standard functions, which are all based upon a so-called arbitrary generator, this base generator is accessible for the creation and execution of complex sets of functions, separated into up to 100 sequences. These can be used for testing purposes in development and production.
The sequences can be loaded from and saved to a standard USB flash drive via the USB port on the front panel, making it easy to change between different test sequences.

Fictional example of a complex function (40 sequences) as it can be realised with the arbitrary generator. The function can be created on the device or externally and then loaded or saved:



此外还有一个XY发生器，可用来形成其它函数，比如UI或IU，用户可在（CSV文档）表格格式内定义，或者用USB软件上传。

对于光伏方面的测试，可使用用户可调关键参数形成一个PV曲线。还可应用固件升级，安装更多的特性参数供用户选择。



There is furthermore a XY generator, which is used to generate other functions, such as UI or IU, which are defined by the user in form of tables (CSV file) and then loaded from USB drive.
For photovoltaics related tests, a PV curve can be generated and used from user-adjustable key parameters. Even more characteristics can be installed for user selection by applying future firmware updates.

输出值的预设
在不影响输出状态的条件下可预设输出状态，这些参数也显示于显示器上，于实际值的下方。

用户通过该功能可预设期望的电压、电流和功率值。用旋钮完成，或者直接从触摸屏上输入。有五个用户配置文档供用户选择，只需激活另外一个不同的配置文档，就可在常用设定值间轻易转换。

监控功能
本系列所有型号都具有电压与电流曲线监控功能。可以对其进行配置，以便监控过压与过流，或者欠压与欠流。其反馈形式，可通过下面几种可选形式来通知：

- 仅显示*信号*，即使错误仍然存在，也不影响输出

- *警告*信息一直存在，错误移除后必须确认该信息方可

- *报警*信息将关断输出

控制软件
本产品还配有适合Windows系统下操作的控制软件，可以远程控制多台同型号产品，甚至不同型号产品。有一个界面显示所有设定值与实际值，SCPI与ModBus指令的直接输入模式，固件升级功能，以及被命名为“排序”的半自动化控制表格。

Presetting of output values
To set output values without a direct impact on the output condition, the set values are also shown on the display, positioned below the actual values.
With this, the user can preset required values for voltage, current and power. It is either done by using the rotary knobs or by direct input on the touch panel. The five user profiles furthermore enable the user to switch easily between often used set values, just by activating a different user profile.

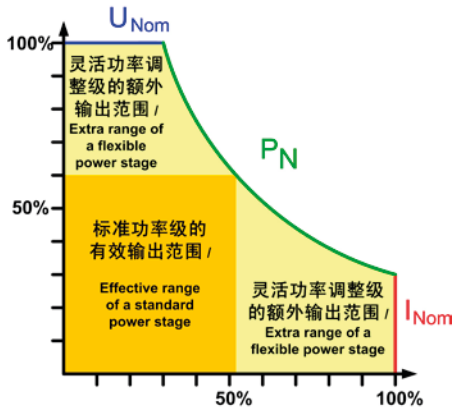
Supervision features
All models of this series offer supervision features for voltage and current steps. The supervision is configurable to monitor voltage or current over- and undershooting. As a reaction, the device can generate a notification of selectable type:
- *Signals* are displayed only; even if the fault is still active, without affecting the output
- *Warnings* remain active and must be acknowledged after the fault is removed
- *Alarms* will instantly shut off the output

Control software
Included with the device is a control software for Windows PC, which allows for the remote control of multiple identical or even different types of devices. It has a clear interface for all set and actual values, a direct input mode for SCPI and ModBus commands, a firmware update feature and the semi-automatic table control named “Sequencing”.

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技术参数	Technical Data	Series EA-PSI 9000 DT / 系列
AC输入电压	**Input AC**	
-电压	- Voltage	90...264 V, 1ph+N
-频率	- Frequency	45...65 Hz
-功率因数	- Power factor	>0.99
-功率降额	- Derating	Models / 1500 W型号: < 150 V AC 降至 / to $P_{out\ max}$ 1000 W
DC输出电压	**Output voltage DC**	
-精确度	- Accuracy	<0.1%
-0-100% 的负载调整率	- Load regulation 0-100%	<0.05%
-±10% ΔU_{AC}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%
-负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms
-负载从10-90%上升需时	- Rise time 10-90%	最长. 30 ms
-过压保护	- Overvoltage protection	可调，范围为0...110% U_{henn} / adjustable, 0...110% U_{nom}
输出电流	**Output current**	
-精确度	- Accuracy	<0.1%
-0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%
-±10% ΔU_{AC}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%
输出功率	**Output power**	
-精确度	- Accuracy	<1%
过压类别	**Overvoltage category**	2
保护功能	**Protection**	OT, OVP, OCP, OPP (2
隔离耐压	**Isolation**	
-输入对外壳	- Input to enclosure	2500 V DC
-输入对输出	- Input to output	2500 V DC
-输出对外壳	- Output to enclosure	负极：最大400 V DC；正极：最大400 V DC +输出电压 / Negative: max. 400 V DC, positive: max. 400 V DC + output voltage
污染等级	**Pollution degree**	2
保护级别	**Protection class**	1
模拟编程	**Analog interface**	内置15-针D-Sub母插，电隔离 / Built in, 15-pole D-Sub (female), galvanically isolated
-输入范围	- Input range	0...5 V 或 / or 0...10 V (可转换 / switchable)
- U / I / P / R的精确度	- Accuracy U / I / P / R	0...10 V: <0.1% 0...5 V: <0.2%
串联操作	**Series operation**	可实现，任意直流负极端对PE最大有400 V DC的电压转移 / Possible, with max. potential shift of 400 V DC of any DC minus against PE
并联操作	**Parallel operation**	经模拟接口可实现 / Possible, via analog interface
安全标准	**Standards**	EN 60950, EN 61326, EN 55022 等级 B / Class B
制冷	**Cooling**	风扇 / Fan
工作温度	**Operation temperature**	0...50°C
储存温度	**Storage temperature**	-20...70°C
相对湿度	**Relative humidity**	<80% 无凝结 / non-condensing
使用高度	**Operation altitude**	<2000 m
机械特征	**Mechanics**	
- 重量	- Weight	320 W - 650 W: ≈ 6.5 kg 1000 W - 1500 W: ≈ 7.5 kg
- 产品尺寸（宽x高x长）(1	- Dimensions (WxHxD) (1	320 W - 650 W: 276x103x355 mm 1000 W - 1500 W: 276x103x415 mm

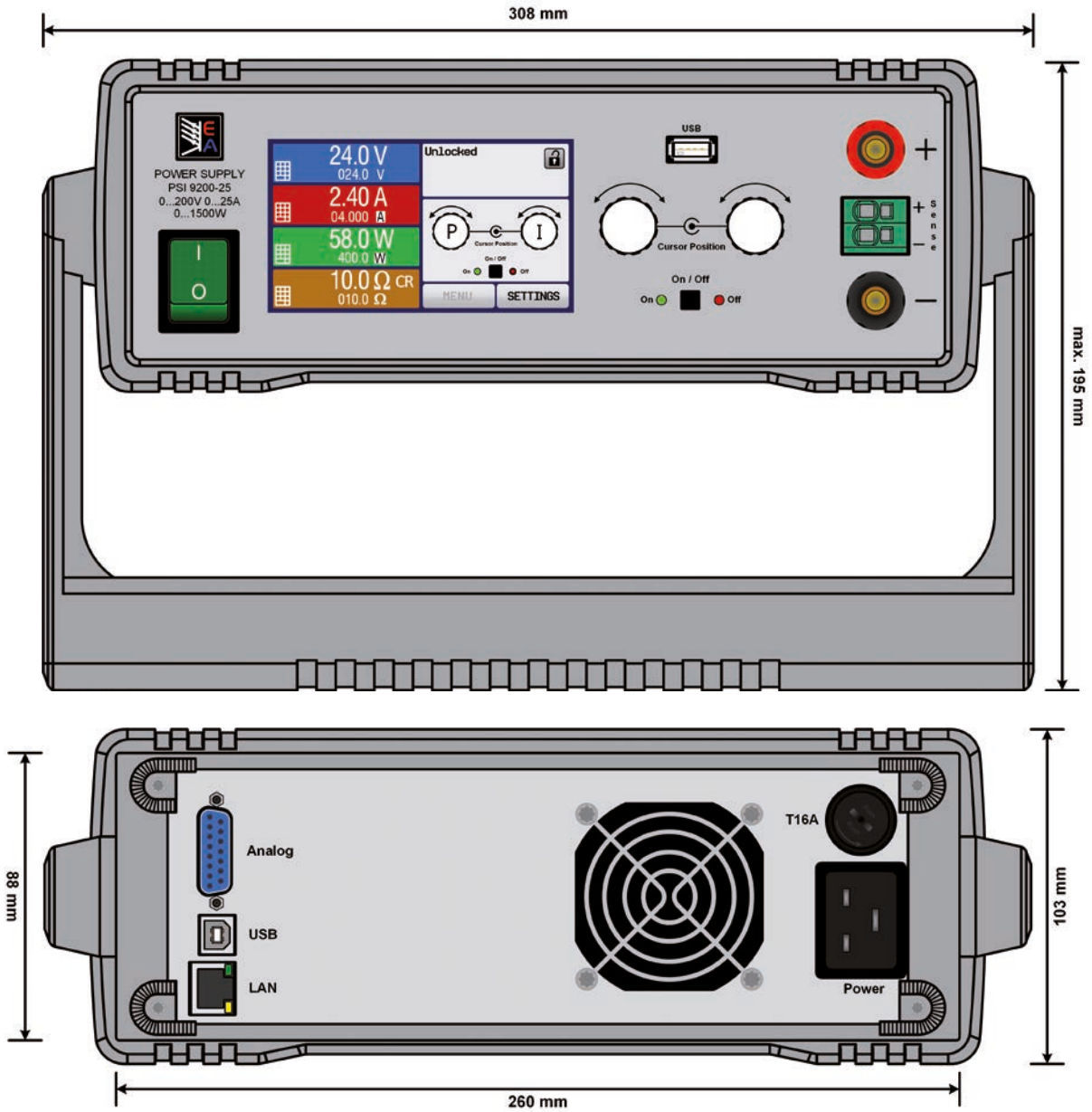
1 仅为产品外壳主体尺寸 / Body only



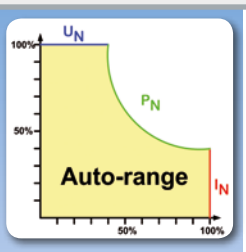
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型号	电压	电流	功率	效率	U最大时的纹波(4	I最大时的纹波(4	编程 / Programming (3			订购编号
Model	**Voltage**	**Current**	**Power**	**Efficiency**	**Ripple U max.**	**Ripple I max.**	**U (typ.)**	**I (typ.)**	**P (typ.)**	**Ordering number**
PSI 9040-20 DT	0...40 V	0...20 A	0...320 W	≤88%	12 mV_{PP} / 1.4 mV_{RMS}	2.2 mA_{RMS}	1.5 mV	0.8 mA	0.012 W	06200500
PSI 9080-10 DT	0...80 V	0...10 A	0...320 W	≤89%	26 mV_{PP} / 3 mV_{RMS}	1.1 mA_{RMS}	3.1 mV	0.4 mA	0.012 W	06200501
PSI 9200-04 DT	0...200 V	0...4 A	0...320 W	≤89%	43 mV_{PP} / 7 mV_{RMS}	0.4 mA_{RMS}	7.6 mV	0.2 mA	0.012 W	06200502
PSI 9040-40 DT	0...40 V	0...40 A	0...640 W	≤89%	12 mV_{PP} / 1.4 mV_{RMS}	1.6 mA_{RMS}	1.5 mV	1.5 mA	0.024 W	06200503
PSI 9080-20 DT	0...80 V	0...20 A	0...640 W	≤91%	14 mV_{PP} / 1.6 mV_{RMS}	1.2 mA_{RMS}	3.1 mV	0.8 mA	0.024 W	06200504
PSI 9200-10 DT	0...200 V	0...10 A	0...640 W	≤92%	31 mV_{PP} / 5 mV_{RMS}	0.6 mA_{RMS}	7.6 mV	0.4 mA	0.024 W	06200505
PSI 9080-40 DT	0...80 V	0...40 A	0...1000 W	≤92%	6.8 mV_{PP} / 0.8 mV_{RMS}	1.8 mA_{RMS}	3.1 mV	1.5 mA	0.038 W	06200506
PSI 9200-15 DT	0...200 V	0...15 A	0...1000 W	≤93%	56 mV_{PP} / 9 mV_{RMS}	1.8 mA_{RMS}	7.6 mV	0.6 mA	0.038 W	06200507
PSI 9360-10 DT	0...360 V	0...10 A	0...1000 W	≤93%	94 mV_{PP} / 16 mV_{RMS}	2.7 mA_{RMS}	13.7 mV	0.4 mA	0.038 W	06200508
PSI 9500-06 DT	0...500 V	0...6 A	0...1000 W	≤93%	62 mV_{PP} / 13 mV_{RMS}	0.6 mA_{RMS}	19.1 mV	0.2 mA	0.038 W	06200509
PSI 9750-04 DT	0...750 V	0...4 A	0...1000 W	≤93%	58mV_{PP} / 16 mV_{RMS}	0.4 mA_{RMS}	28.6 mV	0.2 mA	0.038 W	06200510
PSI 9080-60 DT	0...80 V	0...60 A	0...1500 W	≤92%	6.8 mV_{PP} / 0.8 mV_{RMS}	1.8 mA_{RMS}	3.1 mV	2.3 mA	0.057 W	06200511
PSI 9200-25 DT	0...200 V	0...25 A	0...1500 W	≤93%	56 mV_{PP} / 9 mV_{RMS}	1.8 mA_{RMS}	7.6 mV	1 mA	0.057 W	06200512
PSI 9360-15 DT	0...360 V	0...15 A	0...1500 W	≤93%	94 mV_{PP} / 16 mV_{RMS}	2.7 mA_{RMS}	13.7 mV	0.6 mA	0.057 W	06200513
PSI 9500-10 DT	0...500 V	0...10 A	0...1500 W	≤93%	62 mV_{PP} / 13 mV_{RMS}	0.6 mA_{RMS}	19.1 mV	0.2 mA	0.057 W	06200514
PSI 9750-06 DT	0...750 V	0...6 A	0...1500 W	≤93%	58mV_{PP} / 16 mV_{RMS}	0.4 mA_{RMS}	28.6 mV	0.2 mA	0.057 W	06200515

(1 可编程分辨率不含产品错误 / Programmable resolution disregarding device errors
(2 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(3 为标准型号的订购编号，装3W选项功能的则为另外不同的编号 / Ordering number of the standard version, models with option 3W installed have different ordering numbers



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EA-PSI 9080-120 2U

- 宽范围输入电压90...264 V，带主动式PFC
- 效率高达 93%
- 输出功率：0...1000 W 至0...3000 W
- 输出电压：0...40 V 至 0...750 V
- 输出电流：0...4 A 至 0...120 A
- 灵活的功率调整输出级
- 各种保护功能（OVP, OCP, OPP, OTP）
- 直观的TFT触摸屏可显示数值、状态与通知
- 远程感测端
- 隔离模拟接口
  - 通过 0...10 V或0...5 V电压可对U / I / P编程
  - 通过 0...10 V或0...5 V电压可监控U / I
- 具有真实函数发生器
- 光伏方阵模拟功能
- 内阻模拟与调整
- 温控风扇制冷
- 符合SELV标准 (EN 60950)的40 V产品型号
- 配放电电路(在10 s内U_{out} < 60 V)
- 对更大的动态反应有高速选项
- 内置USB端口
- 可选数字接口模块或选择安装IEEE/GPIB端口
- 支持SCPI指令语言

- **Wide input voltage range 90...264 V with active PFC**
- **High efficiency up to 93%**
- **Output power ratings: 0...1000 W up to 0...3000 W**
- **Output voltages: 0...40 V up to 0...750 V**
- **Output currents: 0...4 A up to 0...120 A**
- **Flexible, power regulated output stage**
- **Various protection circuits (OVP, OCP, OPP, OTP)**
- **Intuitive TFT touch panel with display for values, status and notifications**
- **Remote sensing**
- **Galvanically isolated analog interface with**
  - **U / I / P programmable via 0...10 V or 0...5 V**
  - **U / I monitoring via 0...10 V or 0...5 V**
- **Integrated true function generator**
- **Photovoltaic array simulation**
- **Internal resistance simulation and regulation**
- **Temperature controlled fans for cooling**
- **40 V models according to SELV (EN 60950)**
- **Discharge circuit (U_{out} < 60 V in ≤ 10 s)**
- **High speed variants for increased dynamics**
- **USB port integrated**
- **Optional, digital interface modules or alternatively installed IEEE/GPIB port**
- **SCPI command language supported**

概要

EA-PSI 9000 2U 系列是一款由微处理器控制的实验室电源。它立足于让用户易懂、且可交互式操作的概念，配备一套完整的标准功能。输出参数，监控功能与其它设定，以及可更换式数字接口模块配合极其巧妙且操作轻松。

所有输出参数的监控功能可帮助用户减少测试设备，几乎可不用安装外部监控硬件与软件。由两旋钮，一个按钮，两个 LED 以及 TFT 彩色触摸屏组成的控制面板，让用户动用一下手指，轻触几下就能轻易操作本设备。

若应用到半自动与远程控制测试和自动化系统内，本产品后面还配有一套接口（模拟与数字的都有）。

General

The microprocessor controlled laboratory power supplies of series EA-PSI 9000 2U offer a user-friendly, interactive handling concept, along with a remarkable set of standard features, which can facilitate operating them. Configuration of output parameters, supervision features and other settings, as well as the replaceable digital interface modules is smart and comfortable.

The implemented supervision features for all output parameters can help to reduce test equipment and make it almost unnecessary to install external supervision hardware and software. The clear control panel with its two knobs, one pushbutton, two LEDs and the touch panel with colour TFT display for all important values and status enable the user to handle the device easily with a few touches of a finger.

For the integration into semi-automatic and remotely controlled test and automation systems, the devices offer a set of interfaces (analog and digital) on their rear side.

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AC输入

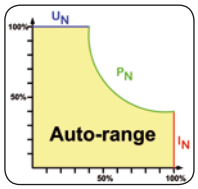
本系列采用主动式功率因数校正，1.5 kW以下的产品适用于90 V_{AC}至264 V_{AC}的全球性输入电压。功率为1.5 kW的型号在输入电压低于150 V_{AC}时总输出功率将降至1 kW，而3 kW的型号在输入电压低于205 V_{AC}时总输出功率将降至2.5 kW。

AC input

All units are provided with an active **P**ower **F**actor **C**orrection circuit and models up to 1.5 kW are suitable for a worldwide usage on a mains supply from 90 V_{AC} up to 264 V_{AC}. With the 1.5 kW models, the output power is automatically reduced to 1 kW if the supply voltage is <150 V_{AC} and with the 3 kW models is reduced to 2.5 kW at <205 V_{AC}.

功率级别自动调整

本系列所有型号的输出功率都可灵活调整。可在低电流时输出高电压，或在低电压时输出大电流，但总是受限于最大额定输出功率范围内。本系列的最大功率值可调，因此仅用一台产品却能应用于广范围的应用中。



Auto-ranging power stage

All models are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. The maximum power set value is adjustable with these models. Therefore, a wide range of applications can already be covered by the use of just one single unit.

直流输出

本系列有多款不同型号，可选择0...40 V和0...750 V输出电压，0...4 A和0...120 A输出电流，0...1000 W和0...3000 W输出功率的型号。
因此不管是手动还是远程控制 （模拟或数字），都可在0%与100%之间连续调节电流、电压与功率。

输出端位于产品后面板上。

DC output

DC output voltages between 0...40 V and 0...750 V, output currents between 0...4 A and 0...120 A and output powers between 0...1000 W and 0...3000 W are available.
Current, voltage and power can thus be adjusted continuously between 0% and 100%, no matter if manually or remotely controlled (analog or digital).
The output terminal is located on the rear panel of the devices.

放电电路

额定输出电压为200 V或以上的产品对其输出电容配有一放电电路。在空载或带很小负载的情况下，它能保证危险的输出电压在直流输出关闭后降至60 V DC以下。该电压值被认为是对人身安全有危险的极限电压。

Discharge circuit

Models with a nominal output voltage of 200 V or higher include a discharge circuit for the output capacities. For no load or low load situations, it ensures that the dangerous output voltage can sink to under 60 V DC after the DC output has been switched off. This value is considered as limit for voltages dangerous to human safety.

保护功能

为保护连接设备，可给产品设定一过压保护极限值(OVP)，以及过流(OCP)与过功率(OPP)保护极限值。

一旦因任何缘故超过了这三个极限值中的一个，直流输出会被立即切断，在显示器和接口端会发出一状态信号。

本产品还有过温保护，如果产品过热，它会关断直流输出。

Protective features

For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP) and overpower (OPP).
As soon as one of these thresholds is reached for any reason, the DC output will be immediately shut off and a status signal will be generated on the display and via the interfaces.
There is furthermore an overtemperature protection, which will shut off the DC output if the device overheats.

远程感测

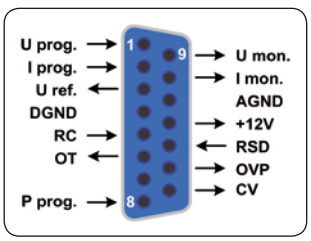
远程感测输入端可直接连到负载设备，以补偿连线上一定程度的压降。如果感测输入端已接到负载上，本电源会自动检测并调整输出电压，以确保负载获得准确所需的电压值。

Remote sensing

The standard sensing input can be connected directly to the load in order to compensate for voltage drops along the power cables, up to a certain level. Once the sense input is connected to the load, the power supply will adjust the output voltage automatically to ensure the accurate required voltage is available at the load.

内置模拟接口

产品后面板上装有一隔离模拟接口。它提供模拟接口输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流与功率。模拟输出脚接上0 V...10 V或0 V...5 V电压，可监控输出电压与电流。此外，还有几个输入脚和输出脚，可用来控制和监控产品状态。



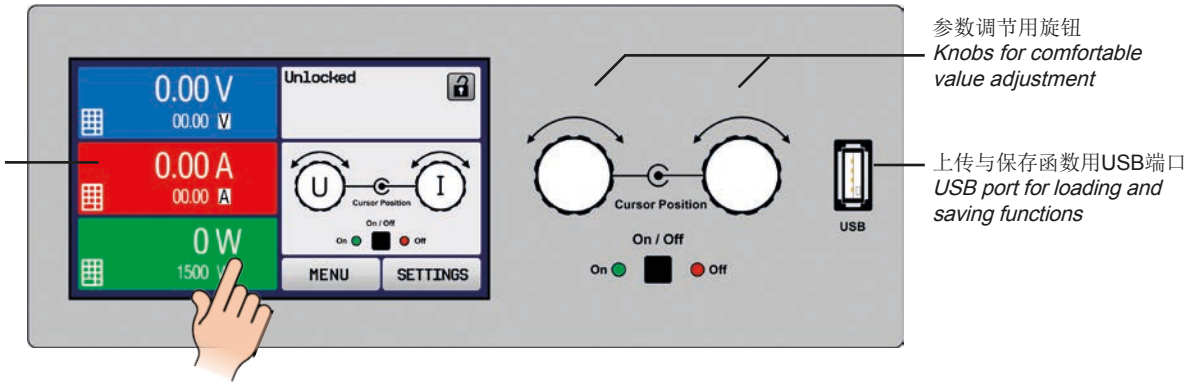
Built-in analog interface

There is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current and power from 0...100% through control voltages of 0 V...10 V or 0 V...5 V. To monitor the output voltage and current, there are analog outputs with voltage ranges of 0 V...10 V or 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

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显示器与控制面板

Display and control panel



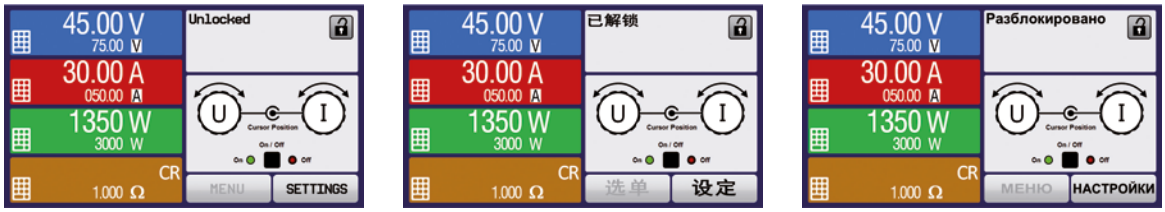
设定与实际输出电压、电流与功率都清晰显示于彩屏上。彩色的TFT屏幕为触摸式，用手指能控制产品所有功能。

通过旋钮，或者数字键盘直接输入参数，也可调节设定电压、电流、功率或阻止（内阻模拟）。

若想防止意外操作，可锁定所有操作键。

Set values and actual values of output voltage, output current and output power are clearly represented on the graphic display. The colour TFT screen is touch sensitive and can be intuitively used to control all functions of the device with just a finger.
Set values of voltage, current, power or resistance (internal resistance simulation) can be adjusted using the rotary knobs or entered directly via a numeric pad.
To prevent unintentional operations, all operation controls can be locked.

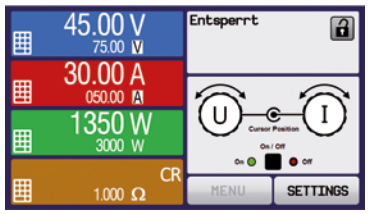
多语言控制面板 / Multi-language control panel



英文 / English

中文 / Chinese

俄文 / Russian



德文 / German

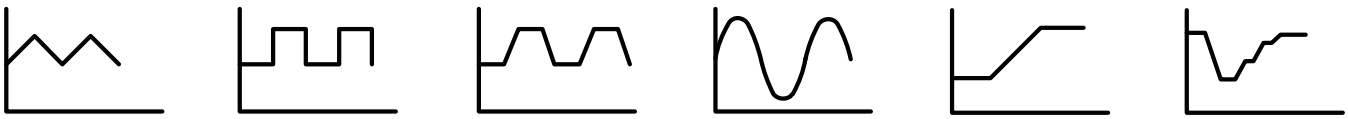
函数发生器

本系列产品都具有一可形成如下典型函数的真实函数发生器，并能将这些函数曲线应用于输出电压或输出电流上。发生器可通过前板的触摸屏设置或某一数字接口远程配置。

预定义函数会为用户提供所有必要的参数，如Y偏差值，时间/频率或幅度，一套完整的配置参数。

Function generator

All models within this series include a true function generator which can generate typical functions, as displayed in the figure below, and apply them to either the output voltage or the output current. The generator can be completely configured and controlled by using the touch panel on the front of the device, or by remote control via one of the digital interfaces.
The predefined functions offer all necessary parameters to the user, such as Y offset, time / frequency or amplitude, for full configuration ability.



Triangle 三角形 | Rectangle 矩形 | Trapezoid 梯形 | Sine 正弦 | Ramp 坡行 | DIN 40839

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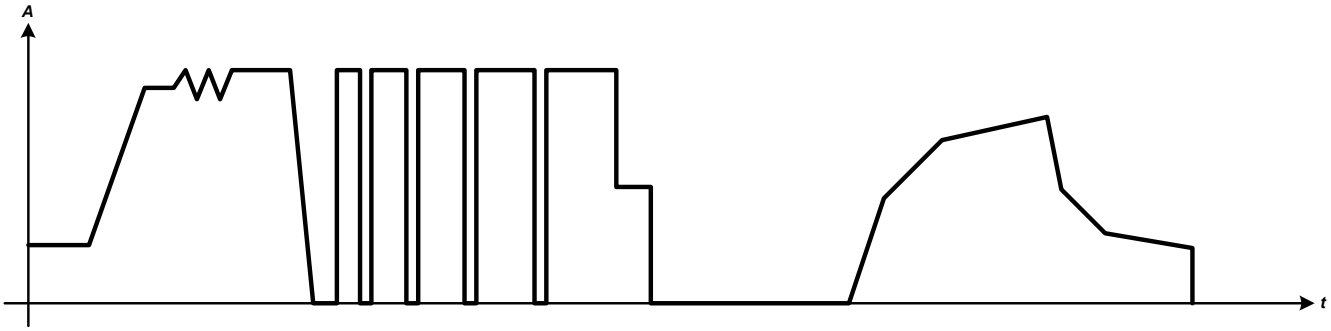
除了基于任意发生器产生的标准函数外，它还可形成某些复杂的函数，并分为多达100组序列。这些一般用于研发和生产的测试上。

通过前板的USB端口可将这些序列上载使用或存储于一标准U盘上，这样方便更换不同的测试序列。

下图是一个任意发生器可实现的由40个序列组成的复杂曲线，仅为虚构范例。可以在产品外或者于产品上创建，然后上载使用或保存：

Additionally to the standard functions, which are all based upon a so-called arbitrary generator, this base generator is accessible for the creation and execution of complex sets of functions, separated into up to 100 sequences. Those can be used for testing purposed in development and production.
The sequences can be loaded from and saved to a standard USB flash drive via the USB port on the front panel, making it easy to change between different test sequences.

Fictional example of a complex function (40 sequences) as it can be realised with the arbitrary generator. The function can be created on the device or externally and then loaded or saved:



此外还有一个XY发生器，能产生如UI或IU这类的函数，一般用户以表格（CSV文档）形式定义，然后从U盘上上传。

针对光伏相关的测试，还可形成PV曲线，当做用户可调关键参数。
甚至通过后续的固件升级，可安装更多的曲线特性，供用户选择。



There is furthermore a XY generator, which is used to generate other functions, such as UI or IU, which are defined by the user in form of tables (CSV file) and then loaded from USB drive.
For photovoltaics related tests, a PV curve can be generated and used from user-adjustable key parameters. Even more characteristics can be installed for user selection by applying future firmware updates.

主-从
所有产品默认有一个串联主从总线。通过它可并联最多的10台同型号产品，或串联起来，将实际电压、电流与功率累加，成更大的系统。该操作完全可由产品控制面板完成，或远程控制（经数字通讯接口）完成。

控制软件
本产品还配有适合Windows系统下操作的控制软件，可以远程控制多台同型号产品，甚至不同型号产品。有一个界面显示所有设定值与实际值，SCPI与ModBus指令的直接输入模式，固件升级功能，以及被命名为“排序”的半自动化控制表格。

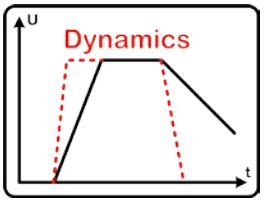
Master-Slave
All models feature a serial master-slave bus by default. It can be used to connect up to 10 units of identical models in parallel operation or even series operation to a bigger system with totals formation of the actual value of voltage, current and power. The configuration is either completely done on the control panels of the units or via remote control (digital communication interface).

Control software
Included with the device is a control software for Windows PC, which allows for the remote control of multiple identical or even different types of devices. It has a clear interface for all set and actual values, a direct input mode for SCPI and ModBus commands, a firmware update feature and the semi-automatic table control named “Sequencing”.

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高速选项

本系列除了标准型号外，还有一个高速版（品名后缀为：HS）。该版本输出电压动态的反应有很大提升，上升和下降时间极度减少，全归因于产品输出端安排了小电容与合理的电压控制器。见152页。我们可以做个比较：PSI 9080-60 2U标准型号的输出电容为5440 µF，而同型号带高速功能的仅为86 µF。



在产品的技术规格表下，特别分开列出了HS型号的特殊参数。

由于输出电容减小这个优势，随之带来一个劣势，就是从恒流（CC）转换到恒压（CV）时，噪音更大，输出电压会过冲更多，或者在带载阶跃时负尖峰更高。过冲高度可能会达到额定输出电压的10%，有时也取决于连接的负载类型（阻性负载，容性负载，感性负载）。

选购件

- 适合RS232、CAN、CANopen、Modbus TCP、Profibus、Profinet/IO、Devicenet或Ethernet的绝缘数字接口模块。接口插槽位于产品后板（仅针对标准型号），方便用户插上新模块或替换当前模块。产品会自动检测接口，并提示需要进行少许的配置或不用配置。也可参考139页。

- 还可安装带固定GPIB端口的三位接口（3 W），而非接口模块用的默认插槽。

High speed versions

Alternatively to the standard models of this series, so-called high speed versions (product name appendix: HS) of the standard models are available. They offer significantly improved output voltage dynamics, along with decreased rise and fall times, all due to lower output capacity and an optimised voltage controller. Also see page 152.
For comparison: the base version of model PSI 9080-60 2U has 5440 µF output capacity, while the corresponding high speed version only has 86 µF.
In the technical specifications tables below, the HS models are listed separately with extra, high-speed relevant and significant specifications.
Together with the advantages from the reduced output capacity there are also unavoidable disadvantages, like higher noise (ripple) and higher overshoots of the output voltage after crossover from constant current (CC) to constant voltage (CV) or higher undershoots on load steps. The height of the overshot can reach up to 10% of the nominal output voltage of the particular model and is also depending on the kind of the attached load (resistive, capacitive, inductive).

Options

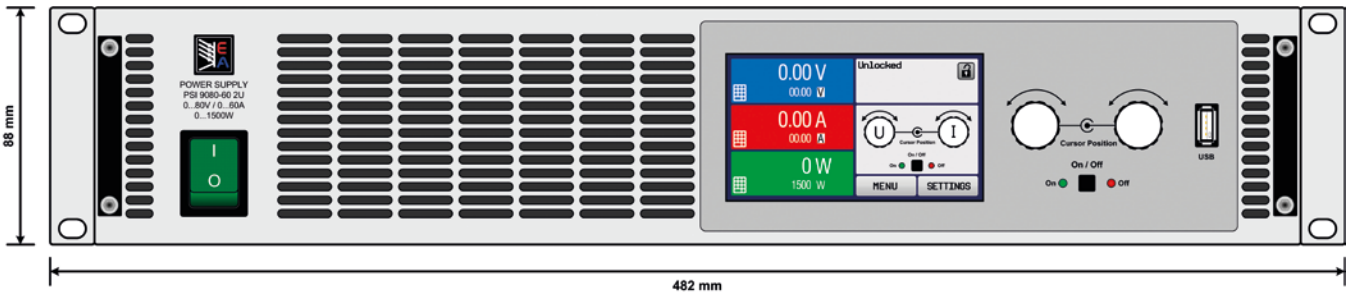
- Isolated digital interface modules for RS232, CAN, CANopen, Modbus TCP, Profibus, Profinet/IO, Devicenet or Ethernet. The interface slot is located on the rear panel (standard models only), making it easy for the user to plug in a new interface or to replace an existing one. The interface will be automatically detected by the device and requires no or only little configuration. Also see page 139.

- Three-way interface (3W) with a rigid GPIB port installed instead of the default slot for retrofittable interface modules.

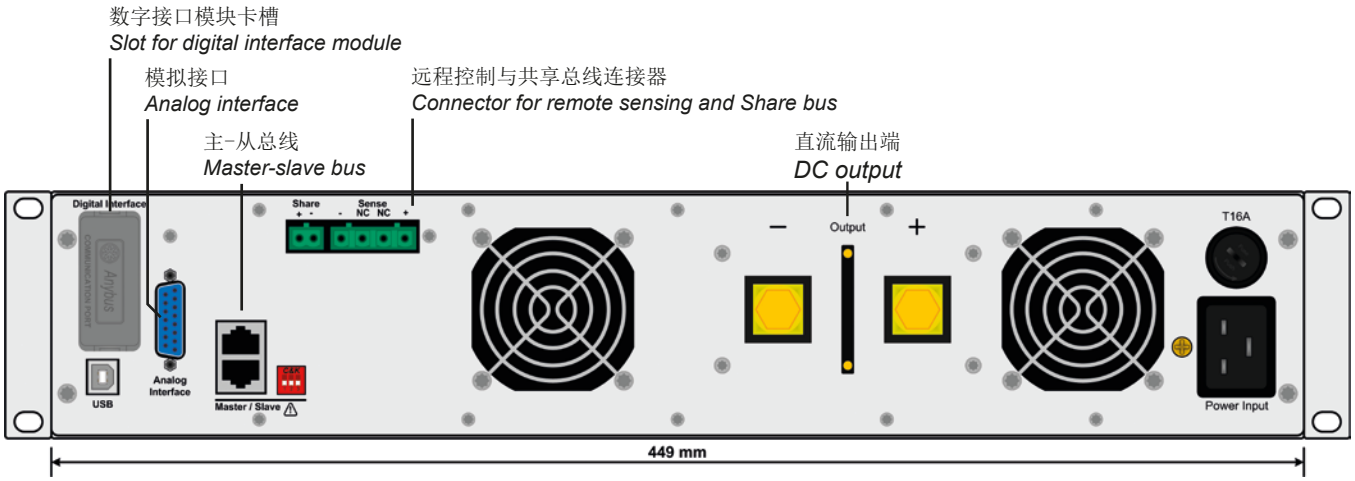
数字接口卡 / Digital interfaces



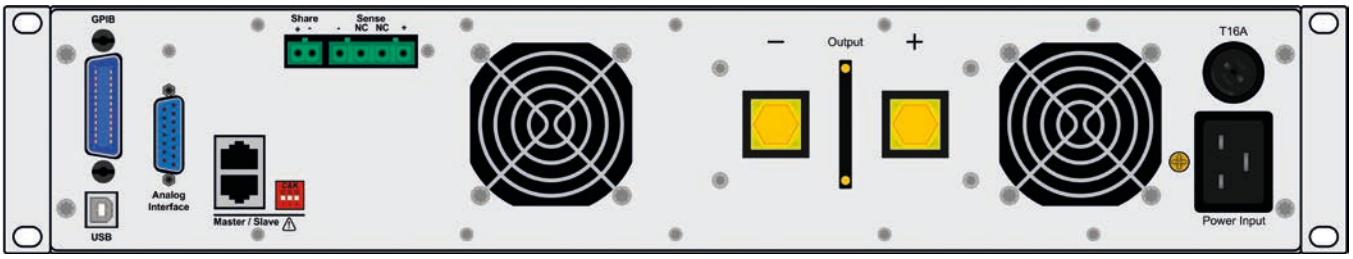
产品图 / Product views



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标准型号的后视图 / Rear view of base model



带3W选项的后视图 / Rear view with option 3W

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技术参数	Technical Data	Series EA-PSI 9000 2U / 系列	
AC输入电压	**Input AC**		
- 电压	- Voltage	90...264 V, 1ph+N (针对 / Models 1000 W - 1500 W) 180...264 V, 1ph+N (针对 / Models 3000 W)	
- 频率	- Frequency	45...66 Hz	
- 功率因数	- Power factor	>0.99	
- 功率降额	- Derating	型号 / Models 1500 W: < 150 V AC 降至 / to $P_{out\ max}$ 1000 W 型号 / Models 3000 W: < 207 V AC 降至 / to $P_{out\ max}$ 2500 W	
DC输出电压	**Output voltage DC**		
-精确度	- Accuracy	<0.1%	
-0-100% 的负载调整率	- Load regulation 0-100%	<0.05%	
-±10% ΔU_{AC}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	
-负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms (标准型号 / Standard models) <5 ms (带高速选项功能的型号 / High speed versions)	
- 负载从10-90%上升需时	- Rise time 10-90%	最长30 ms (标准型号 / Standard models) 最长10ms (H带高速选项功能的型号 / High speed versions)	
- 过压保护	- Overvoltage protection	可调，范围为0...110% U_{nenn} / adjustable, 0...110% U_{nom}	
输出电流	**Output current**		
- 精确度	- Accuracy	<0.2%	
-0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	
-±10% ΔU_{AC}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	
输出功率	**Output power**		
- 精确度	- Accuracy	<1%	
过压类别	**Overvoltage category**	2	
保护功能	**Protection**	OTP, OVP, OCP, OPP, PF (1	
隔离耐压	**Isolation**		
- 输入对外壳	- Input to enclosure	2500 V DC	
- 输入对输出	- Input to output	2500 V DC	
- 输出对外壳	- Output to enclosure	负极：最大400 V DC；正极：最大400 V DC +输出电压 / Negative: max. 400 V DC, positive: max. 400 V DC + output voltage	
污染等级	**Pollution degree**	2	
保护级别	**Protection class**	1	
显示器与面板	**Display and panel**	带触摸屏的图形显示器 / Graphics display with touch panel	
数字接口	**Digital interfaces**		
- 内置型	- Built-in	1x 通讯用A型USB / 1x USB type B for communication 1x GPIB（带3 W可选功能 / 1x GPIB (optional with option 3 W)	
- 插槽型	- Slot	1x 可更换的插入式模块(仅针对标准型号) / 1x for retrofittable plug-in modules (standard models only)	
模拟接口	**Analog interface**	内置15-针D-Sub母插，电隔离 / Built in, 15-pole D-Sub (female), galvanically isolated	
- 输入范围	- Input range	0...5 V 或 / or 0...10 V (可转换 / switchable)	
- U / I / P / R的精确度	- Accuracy U / I / P / R	0...10 V: <0.1%	0...5 V: <0.2%
- 控制信号	- Control signals	远程开-关，直流输出开-关，内阻模式开-关 / Remote on-off, DC output on-off, resistance mode on-off	
- 状态信号	- Status signals	过压 / Overvoltage, 过温 / Overtemperature	
并联操作	**Parallel operation**	可实现，通过真实主-从操作，可连接多达10台产品（经共享总线) / yes, with true master-slave, up to 10 units (via Share bus)	
安全标准	**Standards**	EN 60950, EN61326, EN 55022 Class B 等级 B	
制冷	**Cooling**	风扇 / Fan(s)	
工作温度	**Operation temperature**	0...50°C	
储存温度	**Storage temperature**	-20...70°C	
相对湿度	**Humidity**	<80%	
使用高度	**Operation altitude**	<2000 m	
机械特征	**Mechanics**	1000 W / 1500 W	3000 W
- 重量 (2	- Weight (2	11.5 kg	14.7 kg
- 产品尺寸（宽x高x长）(3	- Dimensions (W H D) (3	19“ 2 HE/U 465 mm	19“ 2 HE/U 465 mm

(1 见第153页/ See page 153
(2 为标准型号参数，带选项功能的则会有变化 / Standard version, models with options may vary
(3为标准型号的外壳尺寸，非整体尺寸，且带选项功能的还会有变化 / Enclosure of the standard version and not overall size, versions with options may vary

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标准型号规格 / Standard models

型号	电压	电流	功率	效率	纹波 / Ripple [2]		编程 / Programming [1]			订购编号 [3]
Model	**Voltage**	**Current**	**Power**	**Efficiency**	**U (max.)**	**I (max.)**	**U (typ.)**	**I (typ.)**	**P (typ.)**	**Ordering number**
PSI 9040-40 2U	0...40 V	0...40 A	0...1000 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	3.7 mA_{RMS}	≈1.5 mV	≈1.5 mA	≈38 mW	06230319
PSI 9080-40 2U	0...80 V	0...40 A	0...1000 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	3.7 mA_{RMS}	≈3 mV	≈1.5 mA	≈38 mW	06230304
PSI 9200-15 2U	0...200 V	0...15 A	0...1000 W	≤93%	164 mV_{PP} / 34 mV_{RMS}	2.2 mA_{RMS}	≈7.6 mV	≈0.6 mA	≈38 mW	06230305
PSI 9360-10 2U	0...360 V	0...10 A	0...1000 W	≤93%	210 mV_{PP} / 59 mV_{RMS}	1.6 mA_{RMS}	≈13.7 mV	≈0.4 mA	≈38 mW	06230306
PSI 9500-06 2U	0...500 V	0...6 A	0...1000 W	≤93%	190 mV_{PP} / 48 mV_{RMS}	0.5 mA_{RMS}	≈19 mV	≈0.23 mA	≈38 mW	06230307
PSI 9750-04 2U	0...750 V	0...4 A	0...1000 W	≤93%	212 mV_{PP} / 60 mV_{RMS}	0.3 mA_{RMS}	≈28.6 mV	≈0.15 mA	≈38 mW	06230308
PSI 9040-60 2U	0...40 V	0...60 A	0...1500 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	5.6 mA_{RMS}	≈1.5 mV	≈2.3 mA	≈57 mW	06230320
PSI 9080-60 2U	0...80 V	0...60 A	0...1500 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	5.6 mA_{RMS}	≈3 mV	≈2.3 mA	≈57 mW	06230309
PSI 9200-25 2U	0...200 V	0...25 A	0...1500 W	≤93%	164 mV_{PP} / 34 mV_{RMS}	3.3 mA_{RMS}	≈7.6 mV	≈1 mA	≈57 mW	06230310
PSI 9360-15 2U	0...360 V	0...15 A	0...1500 W	≤93%	210 mV_{PP} / 59 mV_{RMS}	2.4 mA_{RMS}	≈13.7 mV	≈0.6 mA	≈57 mW	06230311
PSI 9500-10 2U	0...500 V	0...10 A	0...1500 W	≤93%	190 mV_{PP} / 48 mV_{RMS}	0.7 mA_{RMS}	≈19 mV	≈0.4 mA	≈57 mW	06230312
PSI 9750-06 2U	0...750 V	0...6 A	0...1500 W	≤93%	212 mV_{PP} / 60 mV_{RMS}	0.5 mA_{RMS}	≈28.6 mV	≈0.23 mA	≈57 mW	06230313
PSI 9040-120 2U	0...40 V	0...120 A	0...3000 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	11 mA_{RMS}	≈3 mV	≈4.6 mA	≈114 mW	06230321
PSI 9080-120 2U	0...80 V	0...120 A	0...3000 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	11 mA_{RMS}	≈1.5 mV	≈4.6 mA	≈114 mW	06230314
PSI 9200-50 2U	0...200 V	0...50 A	0...3000 W	≤93%	164 mV_{PP} / 34 mV_{RMS}	6.5 mA_{RMS}	≈7.6 mV	≈1.9 mA	≈114 mW	06230315
PSI 9360-30 2U	0...360 V	0...30 A	0...3000 W	≤93%	210 mV_{PP} / 59 mV_{RMS}	15 mA_{RMS}	≈13.7 mV	≈1.2 mA	≈114 mW	06230316
PSI 9500-20 2U	0...500 V	0...20 A	0...3000 W	≤93%	190 mV_{PP} / 48 mV_{RMS}	1.5 mA_{RMS}	≈19 mV	≈0.8 mA	≈114 mW	06230317
PSI 9750-12 2U	0...750 V	0...12 A	0...3000 W	≤93%	212 mV_{PP} / 60 mV_{RMS}	0.9 mA_{RMS}	≈28.6 mV	≈0.5 mA	≈114 mW	06230318

(1无产品错误时的可编程分辨率 / Programmable resolution without device error
(2 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(3 标准型号的产品编码，带3 W选项功能的编码则会不同 / Ordering number of the standard version, models with option 3 W installed have different Ordering numbers.

高速选项的参数

注意：带高速选项功能的型号主要是其输出电容与噪音（即：纹波）与标准型号不同。

High speed models

Note: the high speeds models primarily differ from the standard models regarding output capacity and noise (i.e. ripple).

型号	电压	电流	功率	U最大时的纹波 [1]	输出电容	下降时间 [2]	订购编号 [3]
Model	**Voltage**	**Current**	**Power**	**Ripple U max. [1]**	**Output capacity**	**Fall time [2]**	**Ordering number [3]**
PSI 9040-40 2U HS	0...40 V	0...40 A	0...1000 W	500 mV_{PP} / 64 mV_{RMS}	86 µF	< 146 ms	06730319
PSI 9080-40 2U HS	0...80 V	0...40 A	0...1000 W	500 mV_{PP} / 64 mV_{RMS}	86 µF	< 146 ms	06730304
PSI 9200-15 2U HS	0...200 V	0...15 A	0...1000 W	450 mV_{PP} / 17 mV_{RMS}	40 µF	< 266 ms	06730305
PSI 9360-10 2U HS	0...360 V	0...10 A	0...1000 W	1200 mV_{PP} / 48 mV_{RMS}	20 µF	< 479 ms	06730306
PSI 9500-06 2U HS	0...500 V	0...6 A	0...1000 W	700 mV_{PP} / 24 mV_{RMS}	15 µF	< 688 ms	06730307
PSI 9750-04 2U HS	0...750 V	0...4 A	0...1000 W	680 mV_{PP} / 44 mV_{RMS}	9 µF	< 1037 ms	06730308
PSI 9040-60 2U HS	0...40 V	0...60 A	0...1500 W	500 mV_{PP} / 64 mV_{RMS}	86 µF	< 146 ms	06730320
PSI 9080-60 2U HS	0...80 V	0...60 A	0...1500 W	500 mV_{PP} / 64 mV_{RMS}	86 µF	< 146 ms	06730309
PSI 9200-25 2U HS	0...200 V	0...25 A	0...1500 W	450 mV_{PP} / 17 mV_{RMS}	40 µF	< 266 ms	06730310
PSI 9360-15 2U HS	0...360 V	0...15 A	0...1500 W	1200 mV_{PP} / 48 mV_{RMS}	20 µF	< 479 ms	06730311
PSI 9500-10 2U HS	0...500 V	0...10 A	0...1500 W	700 mV_{PP} / 24 mV_{RMS}	15 µF	< 688 ms	06730312
PSI 9750-06 2U HS	0...750 V	0...6 A	0...1500 W	680 mV_{PP} / 44 mV_{RMS}	9 µF	< 1037 ms	06730313
PSI 9040-120 2U HS	0...40 V	0...120 A	0...3000 W	500 mV_{PP} / 64 mV_{RMS}	172 µF	< 146 ms	06730321
PSI 9080-120 2U HS	0...80 V	0...120 A	0...3000 W	500 mV_{PP} / 64 mV_{RMS}	172 µF	< 146 ms	06730314
PSI 9200-50 2U HS	0...200 V	0...50 A	0...3000 W	450 mV_{PP} / 17 mV_{RMS}	80 µF	< 266 ms	06730315
PSI 9360-30 2U HS	0...360 V	0...30 A	0...3000 W	1200 mV_{PP} / 48 mV_{RMS}	40 µF	< 479 ms	06730316
PSI 9500-20 2U HS	0...500 V	0...20 A	0...3000 W	700 mV_{PP} / 24 mV_{RMS}	30 µF	< 688 ms	06730317
PSI 9750-12 2U HS	0...750 V	0...12 A	0...3000 W	680 mV_{PP} / 44 mV_{RMS}	18 µF	< 1037 ms	06730318

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 为直流输出带1%负载时的100%-1% U_{Nom} 参数 / 100%-1% U_{Nom} at approx. 1% load on DC output
(3 标准型号的产品编码，带3 W选项功能的编码则会不同 / Ordering number of the standard version, models with option 3 W installed have different Ordering numbers.

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EA-PSI 9200-210 3U

- 多相输入340...460 VAC或 188...229 V_{AC} (US)
- 效率高达95.5%
- 输出功率有：0...3.3 kW, 0...5 kW, 0...6.6 kW, 0...10 kW, 0...15 kW, 还可扩展至150 kW
- 输出电压：0...40 V 至 0...1500 V
- 输出电流：0...30 A 至 0...510 A
  还可扩展至0...5100 A
- 灵活的功率调整输出
- 各种保护功能（OVP, OCP, OPP, OTP）
- 直观的TFT触摸屏可显示数值、状态与通知
- 能自动检测的远程感测端
- 隔离模拟接口
  - 通过 0...10 V或0...5 V电压可对U / I / P编程
  - 通过 0...10 V或0...5 V电压可监控U / I
- 真实函数发生器
- 光伏方阵模拟功能
- 内阻模拟与调整
- 符合SELV标准 (EN 60950)的40 V产品型号
- 配放电电路(在**10 s**内**U_{out} < 60 V)**
- 内置USB端口
- 通过EN 61010 等级B EMC TÜV认证
- 可选数字接口模块或选择安装IEEE/GPIB端口
- 支持SCPI指令语言带菜单的图形显示器

- **Multi-phase input 340...460 V_{AC} or 188...229 V_{AC} (US)**
- **High efficiency up to 95,5%**
- **Output power ratings: 0...3.3 kW, 0...5 kW, 0...6.6 kW, 0...10 kW, 0...15 kW, expandable up to 150 kW**
- **Output voltages: 0...40 V up to 0...1500 V**
- **Output currents: 0...30 A up to 0...510 A**
  Expandable up to 0...5100 A
- **Flexible, power regulated output stage**
- **Various protection circuits (OVP, OCP, OPP, OTP)**
- **Intuitive TFT touch panel with display for values, status and notifications**
- **Remote sense with automatic detection**
- **Galvanically isolated, analog interface with**
  - **U / I / P programmable via 0...10 V or 0...5 V**
  - **U / I monitoring via 0...10 V or 0...5 V**
- **Integrated true function generator**
- **Photovoltaic array simulation**
- **Internal resistance simulation and regulation**
- **40 V models according to SELV (EN 60950)**
- **Discharge circuit (U_{out} < 60 V in ≤ 10 s)**
- **USB port integrated**
- **EMC TÜV approved for EN 61010 Class B**
- **Optional, digital interface modules or alternatively installed IEEE/GPIB port**
- **SCPI command language supported**

概要
EA-PSI 9000 3U 系列是一款由微处理器控制的高效实验室电源，其标准型号配备多种功能和特征。交互式菜单导航功能让用户使用起来极其方便、有效。

可对用户和进程文档进行编辑、存储，以及再次上载，从而改善重复测试或其它应用。

为了达到更大的输出功率，可配置高达150 kW和42U的机柜，以便满足客户需求。

General
The microprocessor controlled high efficiency laboratory power supplies of series EA-PSI 9000 3U offer multiple functions and features in their standard version. User-friendly, interactive menu navigation makes the use of this equipment remarkably easy and most effective.

User and process profiles can be edited, saved and archived so that the reproducibility of a test or other application is improved.

In order to achieve even higher output power, cabinets with up to 150 kW and up to 42U size can be configured to suit the user's requirements.

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交流输入

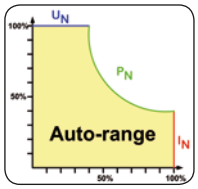
本系列所有型号都采用主动式**PFC**功率因数校正线路，专为在340 V 至 460 V AC（欧标型号）或188 V 至229 V AC（美标型号）三相供电条件下操作而设计。

AC input

All models are provided with an active **P**ower **F**actor **C**orrection circuit and are designed for a usage on a three-phase supply with 340 V up to 460 V AC (european models) or 188V up to 229V AC (US models).

功率自动调整

本系列所有型号的输出功率都可灵活调整。可在低电流时输出高电压，或在低电压时输出大电流，但总是受限于最大额定输出功率范围内。本系列的最大功率值可调，因此仅用一台产品却能应用于广范围的应用中。



Auto-ranging power stage

All models are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. The power set value is adjustable with these models. Therefore, a wide range of applications can already be covered by the use of just one unit.

直流输出

本系列有多款不同型号，可选择0...40 V和0...1500 V输出电压，0...40 A和0...510 A输出电流，0...3.3 kW，0...5 kW，0...6.6 kW，0...10 kW或0...15 kW输出功率的各个型号。输出端位于产品后板。

DC output

DC output voltages between 0...40 V and 0...1500 V, output currents between 0...40 A and 0...510 A and output power ratings of 0...3.3 kW, 0...5 kW, 0...6.6 kW, 0...10 kW or 0...15 kW are available. The output terminal is located on the rear panel.

放电电路

额定输出电压为200 V或以上的产品对其输出电容配有一放电电路。在空载或带很小负载的情况下，它能保证危险的输出电压在直流输出关闭后降至60 V DC以下。该电压值被认为是对人身安全有危险的极限电压。

Discharge circuit

Models with a nominal output voltage of 200 V or higher include a discharge circuit for the output capacities. For no load or low load situations, it ensures that the dangerous output voltage can sink to under 60 V DC after the DC output has been switched off. This value is considered as limit for voltages dangerous to human safety.

保护功能

为保护连接负载，可设定一过压保护极限值(OVP)。，以及过流(OCP)与过功率(OPP)保护极限值。

一旦因任何缘故超过了这三个极限值中的一个，直流输出会被立即切断，在显示器和接口端还会发出一状态信号。

本产品还有过温保护，如果产品过热，它会关断直流输出。

Protective features

For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP) and overpower (OPP).
As soon as one of these thresholds is reached for any reason, the DC output will be immediately shut off and a status signal will be generated on the display and via the interfaces.
There is furthermore an overtemperature protection, which will shut off the DC output if the device overheats.

远程感测

远程感测输入端可直接连到负载设备，以补偿连线上一定程度的压降。如果感测输入端已接到负载上，本电源会自动检测并调整输出电压，以确保负载获得准确所需的电压值。

Remote sensing

The standard sense input can be connected directly to the load in order to compensate voltage drops along the power cables up to a certain level. If the sensing input is connected to the load, the power supply will adjust the output voltage automatically to make ensure the accurate required voltage is available at the load.

扩展功能

按照客户需求可将多个单机产品进行不同的组合，能装入最高为42U的机柜，从而获得高达150 kW的总功率。

本产品标配并联链接模式。使用内置主从总线，在主机上可形成总功率、总电压与总电流。也可见146页说明。

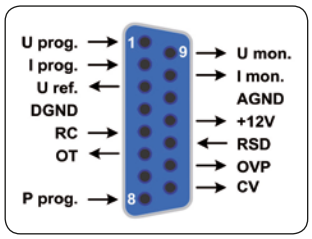
Extensibility

The singles units can be combined into various configurations upon request, also in cabinets of up to 42U, in order to build systems of up to 150 kW total power.
Parallel connection is the standard connection mode and there will be total formation of power, voltage and current on the main unit, by using the standard built-in master-slave bus. Also see page 146.

模拟接口

产品后面板上装有一隔离模拟接口。它提供模拟接口输入脚，接上0 V...10 V或0 V...5 V控制电压，可设置0...100%的设定电压、电流与功率。

模拟输出脚接上0 V...10 V或0 V...5 V电压，可监控输出电压与电流。此外，还有几个输入脚和输出脚，可用来控制和监控产品状态。



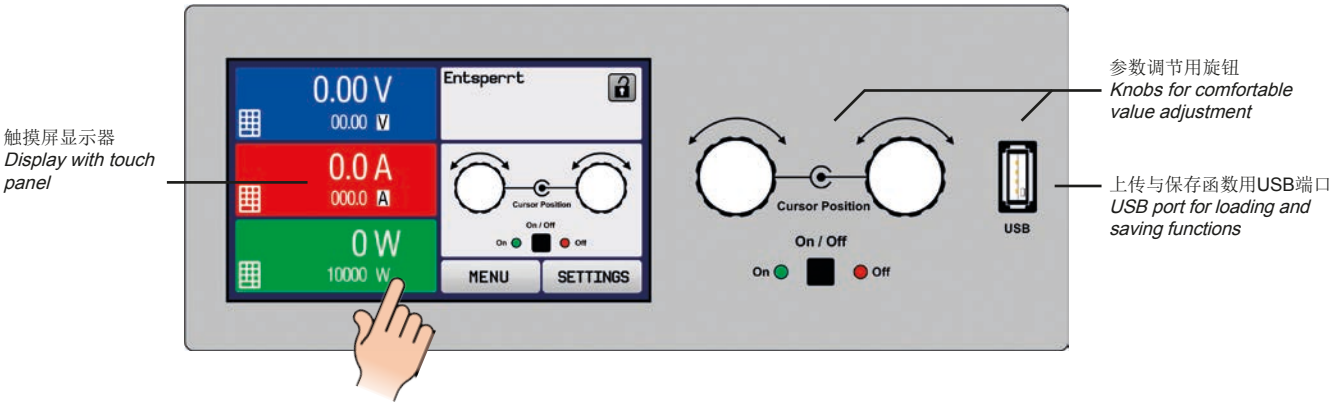
Analog interface

There is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current and power from 0...100% through control voltages of 0 V...10 V or 0 V...5 V.
To monitor the output voltage and current, there are analog outputs with voltage ranges of 0 V...10 V or 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

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显示器与控制面板

Display and control panel



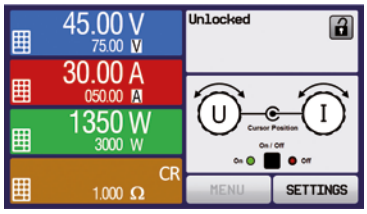
设定与实际输出电压、电流与功率都清晰显示于彩屏上。彩色的TFT屏幕为触摸式，用手指能控制产品所有功能。

通过旋钮，或者数字键盘直接输入参数，也可调节设定电压、电流、功率或阻止（内阻模拟）。

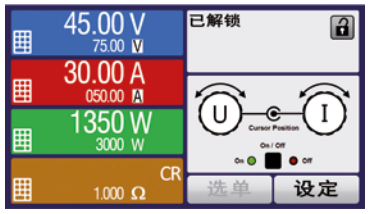
若想防止意外操作，可锁定所有操作键。

Set values and actual values of output voltage, output current and output power are clearly represented on the graphic display. The colour TFT screen is touch sensitive and can be intuitively used to control all functions of the device with just a finger.
Set values of voltage, current, power or resistance (internal resistance simulation) can be adjusted using the rotary knobs or entered directly via a numeric pad.
To prevent unintentional operations, all operation controls can be locked.

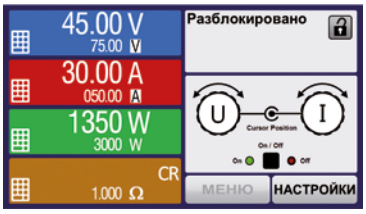
多语言控制面板 / Multi-language control panel



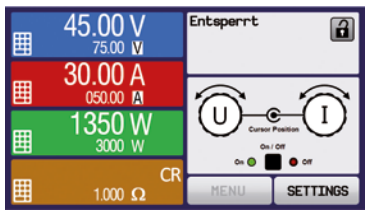
英文 / English



中文 / Chinese



俄文 / Russian



德文 / German

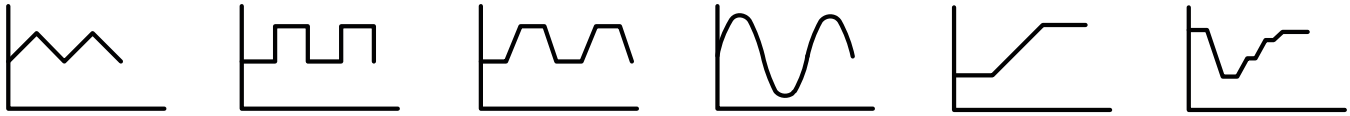
函数发生器

本系列产品都具有一可形成如下典型函数的真实函数发生器，并能将这些函数曲线应用于输出电压或输出电流上。发生器可通过前板的触摸屏设置或某一数字接口远程配置。

预定义函数会为用户提供所有必要的参数，如Y偏差值，时间/频率或幅度，一套完整的配置参数。

Function generator

All models within this series include a true function generator which can generate typical functions, as displayed in the figure below, and apply them to either the output voltage or the output current. The generator can be completely configured and controlled by using the touch panel on the front of the device, or by remote control via one of the digital interfaces.
The predefined functions offer all necessary parameters to the user, such as Y offset, time / frequency or amplitude, for full configuration ability.



Dreieck 三角形 | Rechteck 矩形 | Trapez 梯形 | Sinus 正弦 | Rampe 坡行 | DIN 40839

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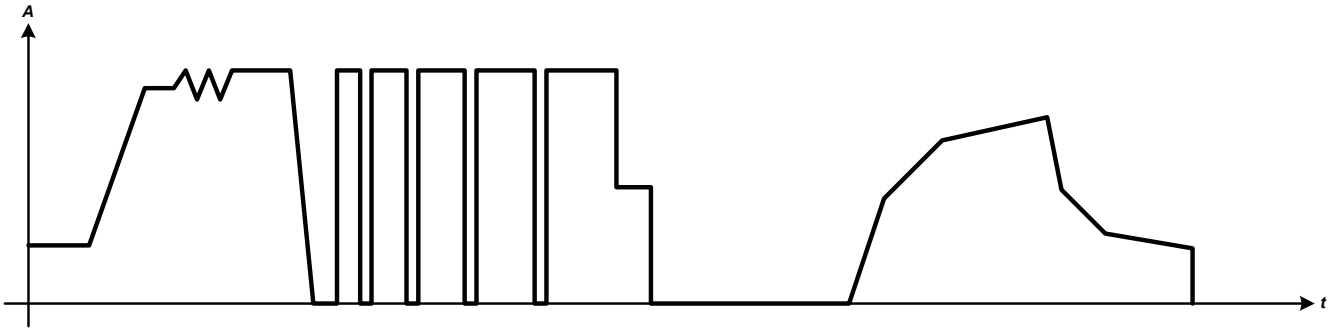
除了基于任意发生器产生的标准函数外，它还可形成某些复杂的函数，并分为多达100组序列。这些一般用于研发和生产的测试上。

通过前板的USB端口可将这些序列上载使用或存储于一标准U盘上，这样方便更换不同的测试序列。

下图是一个任意发生器可实现的由40个序列组成的复杂曲线，仅为虚构范例。可以在产品外面或者于产品上创建，然后上载使用或保存：

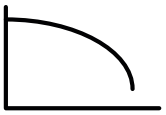
Additionally to the standard functions, which are all based upon a so-called arbitrary generator, this base generator is accessible for the creation and execution of complex sets of functions, separated into up to 100 sequences. Those can be used for testing purpose in development and production.
The sequences can be loaded from and saved to a standard USB flash drive via the USB port on the front panel, making it easy to change between different test sequences.

The figure below shows a fictional example of a complex function of 40 sequences, as it can be realised with the arbitrary generator. The function can be created on the device or externally and then loaded or saved:



此外还有一个XY发生器，能产生如UI或IU这类的函数，一般用户以表格（CSV文档）形式定义，然后从U盘上上传。

针对光伏相关的测试，还可形成PV曲线，当做用户可调关键参数。
甚至通过后续的固件升级，可安装更多的曲线特性，供用户选择。



There is furthermore a XY generator, which is used to generate other functions like UI or IU, which are defined by the user in form of tables (CSV file) and then loaded from USB drive.
For photovoltaics related tests, a PV curve can be generated and used from user-adjustable key parameters.
Even more characteristics can be installed for user selection by applying future firmware updates.

主-从总线
所有产品默认有一个串联主从总线。通过它可并联最多的10台同型号产品，或串联起来，将实际电压、电流与功率累加，成更大的系统。该操作完全可由产品控制面板完成，或远程控制（经数字通讯接口）完成。

Master-slave
All models feature a digital master-slave bus by default. It can be used to connect up to 16 units of identical models in parallel operation to a bigger system with totals formation of the actual value of voltage, current and power. The configuration of the master-slave system is either completely done on the control panels of the units or by remote control via any of digital communication interfaces. Handling of the master unit is possibly by manual or remote control (any interface).

控制软件
本产品还配有适合Windows系统下操作的控制软件，可以远程控制多台同型号产品，甚至不同型号产品。有一个界面显示所有设定值与实际值，SCPI与ModBus指令的直接输入模式，固件升级功能，以及被命名为“排序”的半自动化控制表格。

Control software
Included with the device is a control software for Windows PC, which allows for the remote control of multiple identical or even different types of devices. It has a clear interface for all set and actual values, a direct input mode for SCPI and ModBus commands, a firmware update feature and the semi-automatic table control named “Sequencing”.

选购件
- 适合RS232、CAN、CANopen、Modbus TCP、Profibus、Profinet/IO、Devicenet或Ethernet的绝缘数字接口模块。接口插槽位于产品后板（仅针对标准型号），方便用户插上新模块或替换当前模块。产品会自动检测接口，并提示需要进行少许的配置或不用配置。也可参考139页。
- 还可安装带固定GPIB端口的三位接口（3 W），而非接口模块用的默认插槽
- 高速跃变(仅针对1 kW以上产品，见152页)*
- 水冷模块**

* 并非针对所有电压 – 请咨询获取更多信息
** 一般只有200 V以下型号才有, 按需也可针对其它型号

Options
- Digital interface modules for RS232, CAN, CANopen, Modbus TCP, Profibus, Profinet/IO, Devicenet or Ethernet. The interface slot is located on the rear panel (standard models only), making it easy for the user to plug in a new interface or to replace an existing one. The interface will be automatically detected by the device and requires no or only little configuration. See page 139.
- Three-way interface (3 W) with a rigid GPIB port installed instead of the default slot for retroffitable interface modules.
- High Speed ramping (see page 152) *
- Water Cooling **

* not for all voltages - please enquire for availability
** generally available for models up to 200 V, for other models upon request

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技术参数	Technical Data	Series EA-PSI 9000 3U / 系列
AC输入电压	**Input AC**	
- 电压	- Voltage standard	欧标型号 / European models: 340...460 V, 2ph/3ph 美标型号 / US models: 188...229 V, 2ph/3ph
- 频率	- Frequency	45...65 Hz
- 功率因数	- Power factor	>0.99
DC输出电压	**Output voltage DC**	
-精确度	- Accuracy	<0.1%
- 0-100% 的负载调整率	- Load regulation 0-100%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%
- 负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms
- 负载从10-90%上升需时	- Slew rate 10-90%	最长30 ms
- 过压保护	- Overvoltage protection	可调，范围为0...110% U_{nenn} / adjustable, 0...110% U_{nom}
- 直流端关闭时空载放电需时	- No load discharge time on DC off	100% U 针对 / to <60 V; 少于10 s / less than 10 s
输出电流	**Output current**	
- 精确度	- Accuracy	<0.2%
- 0-100% ΔU_{DC}时的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%
输出功率	**Output power**	
- 精确度	- Accuracy	<1%
过压类别	**Overvoltage category**	2
保护功能	**Protection**	OT, OVP, OPP, PF, OCP (2
隔离耐压	**Isolation**	
- 输入对外壳	- Input to enclosure	2500 V DC
- 输入对输出	- Input to output	2500 V DC
- 输出对外壳	- Output to enclosure (PE)	根据型号不同而不同，详见后面表格 / Depending on model, see model table
污染等级	**Pollution degree**	2
保护级别	**Protection class**	1
显示器与面板	**Display and panel**	带触摸屏的图形显示器 / Graphics display with touch panel
数字接口	**Digital interfaces**	
- 内置型	- Built-in	1x 通讯用A型USB / 1x USB type B for communication 1x GPIB（带3 W可选功能 / 1x GPIB (optional with option 3 W)
- 插槽型	- Slot	1x 可更换的插入式模块（仅针对标准型号） / 1x for retrofittable plug-in modules (standard models only)
模拟编程	**Analog interface**	内置15-针D-Sub母插 / Built in, 15-pole D-Sub, female
-输入范围	- Input range	0...5 V 或 0...10 V (可转换) / 0...5 V or 0...10 V (switchable)
- U / I / P / R的精确度	- Accuracy U / I / P / R	0...10 V: <0.1% 0...5 V: <0.2%
-控制信号	- Control signals	远程开-关，直流输出开-关，内阻模式开-关 / Remote on-off, DC output on-off, resistance mode on-off
-状态信号	- Status signals	过压 / Overvoltage, 过温 / Overtemperature
串联操作	**Series operation**	可实现，但取决于直流负极对地的隔离耐压 / possible, but depending on the isolation of DC- against PE
并联操作	**Parallel operation**	可实现，通过真实主从操作，可连接多达10台产品 / yes, with true master-slave, up to 10 units
安全标准	**Standards**	EN 61326, IEC 1010, EN 61010 EMC通过TÜV认证，且符合 / EMC TÜV approved according to IEC 61000-6-2:2005 IEC 61000-6-3:2006 等级 B
制冷	**Cooling**	风扇，也可选：水冷 / Fans (optional: water)
工作温度	**Operation temperature**	0...50°C
储存温度	**Storage temperature**	-20...70°C
相对湿度	**Relative humidity**	<80%, 无凝结 / non-condensing
使用高度	**Operation altitude**	<2000 m
产品尺寸 (宽x高x长) (1	**Dimensions (W H D)** (1	19“ 3 HE/U 609 mm

(1 仅为外壳尺寸，非产品整体尺寸 / Enclosure only, not overall
(2见第153页/ See page 153

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技术参数	Technical Data	PSI 9040-170 3U	PSI 9080-170 3U	PSI 9200-70 3U	PSI 9360-40 3U
DC输出电压	Output voltage DC	0...40 V	0...80 V	0...200 V	0...360 V
- 纹波 (1	- Ripple (1	<200 mV_{PP} <16 mV_{RMS}	<200 mV_{PP} <16 mV_{RMS}	<300 mV_{PP} <40 mV_{RMS}	<320 mV_{PP} <55 mV_{RMS}
- 感测端电压补偿	-Sense compensation	~ 1 V	~ 2 V	~ 5 V	~ 7.5 V
隔离电压	Isolation				
- 输出负极 <-> PE	- Negative output <-> PE	±400 V DC	±400 V DC	±400 V DC	±400 V DC
- 输出正极 <-> PE	- Positive output <-> PE	±400 V DC	±400 V DC	±600 V DC	±600 V DC
输出电流	Output current	0...170 A	0...170 A	0...70 A	0...40 A
- 纹波 (1	- Ripple (1	<80 mA_{RMS}	<80 mA_{RMS}	<22 mA_{RMS}	<18 mA_{RMS}
输出功率	Output power	0...3300 W	0...5000 W	0...5000 W	0...5000 W
效率	Efficiency	~93%	~93%	~95%	~93%
U的编程分辨率	Programming resolution U	≤2 mV	≤4 mV	≤9 mV	≤15 mV
I的编程分辨率	Programming resolution I	≤7 mA	≤7 mA	≤3 mA	≤2 mA
重量 (2	Weight (2	~ 17 kg	~ 17 kg	~ 17 kg	~ 17 kg
订购编号 (3	Ordering number Euro (3	06230350	06230351	06230352	06230353
订购编号 (3	Ordering number US (3	06238350	06238351	06238352	06238353

技术参数	Technical Data	PSI 9500-30 3U	PSI 9750-20 3U	PSI 9040-340 3U	PSI 9040-510 3U
DC输出电压	Output voltage DC	0...500 V	0...750 V	0...40 V	0...40 V
- 纹波 (1	- Ripple (1	<350 mV_{PP} <70 mV_{RMS}	<800 mV_{PP} <200 mV_{RMS}	<320 mV_{PP} <25 mV_{RMS}	<320 mV_{PP} <25 mV_{RMS}
- 感测端电压补偿	-Sense compensation	~ 10 V	~ 15 V	~ 1 V	~ 1 V
隔离电压	Isolation				
- 输出负极 <-> PE	- Negative output <-> PE	±725 V DC	±725 V DC	±400 V DC	±400 V DC
- 输出正极 <-> PE	- Positive output <-> PE	±1000 V DC	±1000 V DC	±400 V DC	±400 V DC
输出电流	Output current	0...30 A	0...20 A	0...340 A	0...510 A
- 纹波 (1	- Ripple (1	<16 mA_{RMS}	<16 mA_{RMS}	<160 mA_{RMS}	<120 mA_{RMS}
输出功率	Output power	0...5000 W	0...5000 W	0...6600 W	0...10000 W
效率	Efficiency	~95.5%	~94%	~93%	~93%
U的编程分辨率	Programming resolution U	≤21 mV	≤31 mV	≤2 mV	≤2 mV
I的编程分辨率	Programming resolution I	≤2 mA	≤1 mA	≤14 mA	≤21 mA
重量 (2	Weight (2	~ 17 kg	~ 17 kg	~ 24 kg	~ 30 kg
订购编号 (3	Ordering number Euro (3	06230354	06230355	06230356	06230363
订购编号 (3	Ordering number US (3	06238354	06238355	06238356	06238363

技术参数	Technical Data	PSI 9080-340 3U	PSI 9200-140 3U	PSI 9360-80 3U	PSI 9500-60 3U
DC输出电压	Output voltage DC	0...80 V	0...200 V	0...360 V	0...500 V
- 纹波 (1	- Ripple (1	<320 mV_{PP} <25 mV_{RMS}	<300 mV_{PP} <40 mV_{RMS}	<320 mV_{PP} <55 mV_{RMS}	<350 mV_{PP} <70 mV_{RMS}
- 感测端电压补偿	-Sense compensation	~ 2 V	~ 5 V	~ 7.5 V	~ 10 V
隔离电压	Isolation				
- 输出负极 <-> PE	- Negative output <-> PE	±400 V DC	±400 V DC	±400 V DC	±725 V DC
- 输出正极 <-> PE	- Positive output <-> PE	±400 V DC	±600 V DC	±600 V DC	±1000 V DC
输出电流	Output current	0...340 A	0...140 A	0...80 A	0...60 A
- 纹波 (1	- Ripple (1	<160 mA_{RMS}	<44 mA_{RMS}	<35 mA_{RMS}	<32 mA_{RMS}
输出功率	Output power	0...10000 W	0...10000 W	0...10000 W	0...10000 W
效率	Efficiency	~93%	~95%	~93%	~95%
U的编程分辨率	Programming resolution U	≤4 mV	≤9 mV	≤15 mV	≤21 mV
I的编程分辨率	Programming resolution I	≤14 mA	≤6 mA	≤4 mA	≤3 mA
重量 (2	Weight (2	~ 24 kg	~ 24 kg	~ 24 kg	~ 24 kg
订购编号 (3	Ordering number Euro (3	06230357	06230358	06230359	06230360
订购编号 (3	Ordering number US (3	06238357	06238358	06238359	06238360

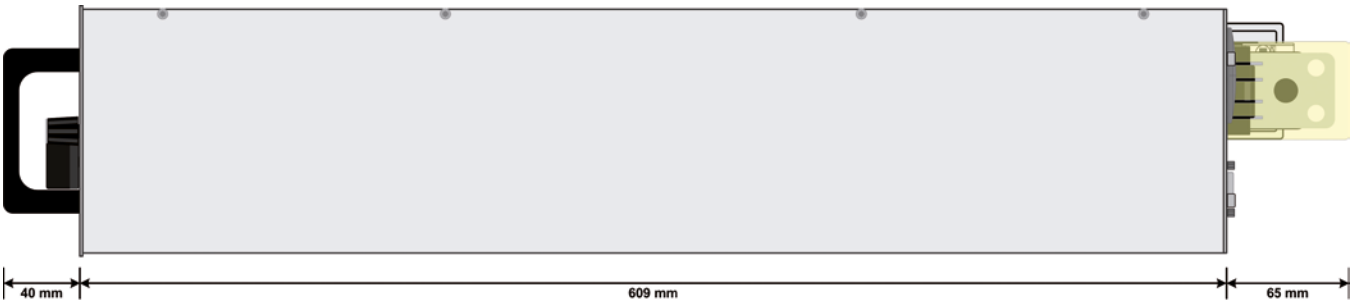
(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 针对标准型号，带可选件的重量会不同 / of standard version, models with options may vary
(3 标准型号的订购编码，带3 W选项功能的编码则会不同 / Ordering number of the base version, models with options installed have different ordering numbers.

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技术参数	Technical Data	PSI 9750-40 3U	PSI 91000-30 3U	PSI 9080-510 3U	PSI 9200-210 3U
DC输出电压	Output voltage DC	0...750 V	0...1000 V	0...80 V	0...200 V
- 纹波 (1	- Ripple (1	<800 mV_{PP} <200 mV_{RMS}	<1600 mV_{PP} <350 mV_{RMS}	<320 mV_{PP} <25 mV_{RMS}	<300 mV_{PP} <40 mV_{RMS}
- 感测端电压补偿	-Sense compensation	~ 15 V	~ 20 V	~ 2.5 V	~ 6 V
隔离电压	Isolation				
- 输出负极 <-> PE	- Negative output <-> PE	±725 V DC	±725 V DC	±400 V DC	±400 V DC
- 输出正极 <-> PE	- Positive output <-> PE	±1000 V DC	±1000 V DC	±400 V DC	±600 V DC
输出电流	Output current	0...40 A	0...30 A	0...510 A	0...210 A
- 纹波 (1	- Ripple (1	<32 mA_{RMS}	<22 mA_{RMS}	<240 mA_{RMS}	<66 mA_{RMS}
输出功率	Output power	0...10000 W	0...10000 W	0...15000 W	0...15000 W
效率	Efficiency	~94%	~95%	~93%	~95%
U的编程分辨率	Programming resolution U	≤31 mV	≤41 mV	≤4 mV	≤9 mV
I的编程分辨率	Programming resolution I	≤2 mA	≤2 mA	≤21 mA	≤9 mA
重量 (2	Weight (2	~ 24 kg	~ 24 kg	~ 30 kg	~ 30 kg
欧版订购编号 (3	Ordering number Euro (3	06230361	06230362	06230364	06230365
美版订购编号 (3	Ordering number US (3	06238361	06238362	06238364	06238365

技术参数	Technical Data	PSI 9360-120 3U	PSI 9500-90 3U	PSI 9750-60 3U	PSI 91500-30 3U
DC输出电压	Output voltage DC	0...360 V	0...500 V	0...750 V	0...1500 V
- 纹波 (1	- Ripple (1	<320 mV_{PP} <55 mV_{RMS}	<350 mV_{PP} <70 mV_{RMS}	<800 mV_{PP} <200 mV_{RMS}	<2400 mV_{PP} <400 mV_{RMS}
- 感测端电压补偿	-Sense compensation	~ 7.5 V	~ 10 V	~ 15 V	~ 30 V
隔离电压	Isolation				
- 输出负极 <-> PE	- Negative output <-> PE	±400 V DC	±725 V DC	±725 V DC	±725 V DC
- 输出正极 <-> PE	- Positive output <-> PE	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC
输出电流	Output current	0...120 A	0...90 A	0...60 A	0...30 A
- 纹波 (1	- Ripple (1	<50 mA_{RMS}	<48 mA_{RMS}	<48 mA_{RMS}	<26 mA_{RMS}
输出功率	Output power	0...15000 W	0...15000 W	0...15000 W	0...15000 W
效率	Efficiency	~93%	~95%	~94%	~95%
U的编程分辨率	Programming resolution U	≤15 mV	≤21 mV	≤31 mV	≤61 mV
I的编程分辨率	Programming resolution I	≤5 mA	≤4 mA	≤3 mA	≤2 mA
重量 (2	Weight (2	~ 30 kg	~ 30 kg	~ 30 kg	~ 30 kg
欧版订购编号 (3	Ordering number Euro (3	06230366	06230367	06230368	06230369
美版订购编号 (3	Ordering number US (3	06238366	06238367	06238368	06238369

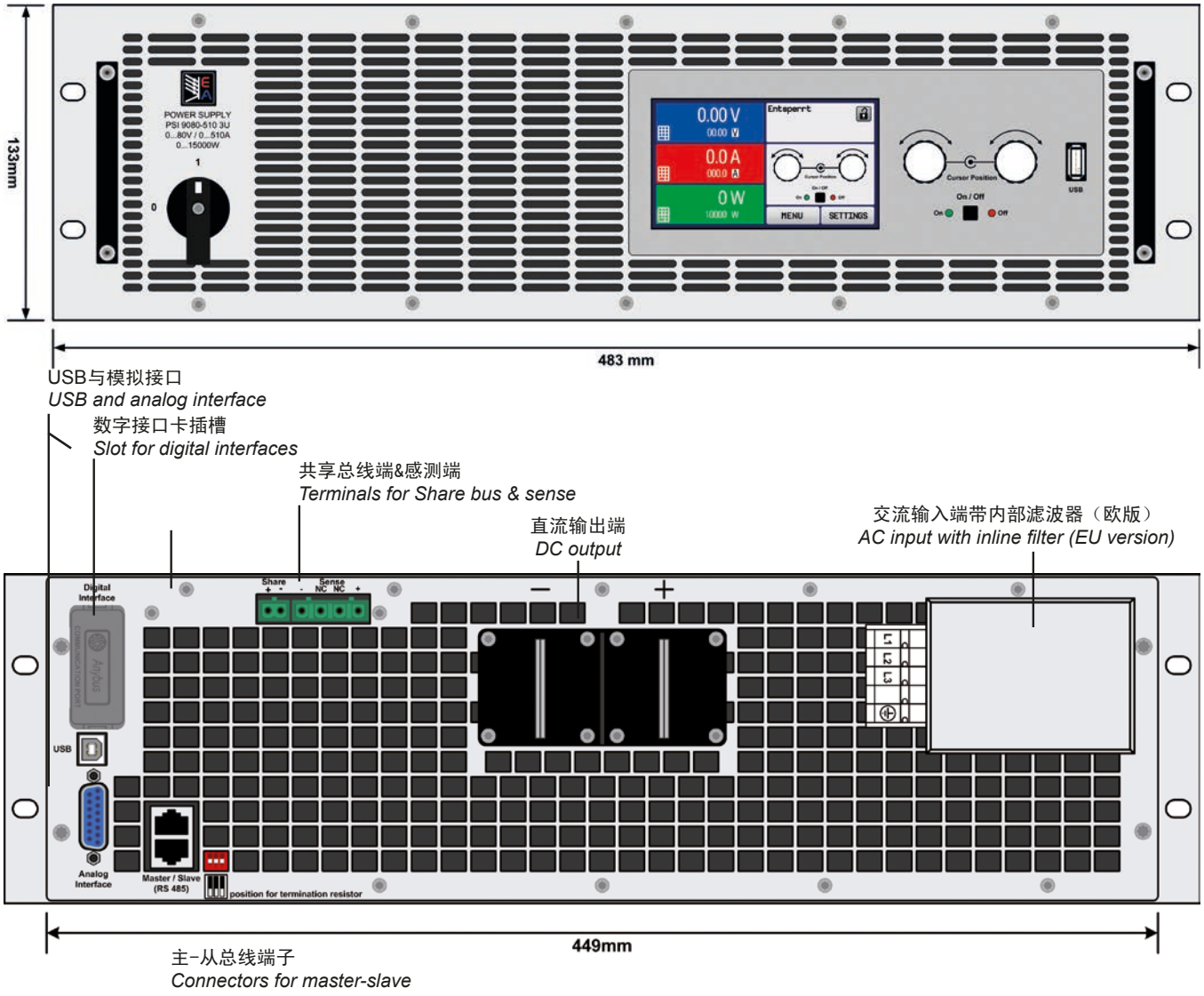
(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 针对标准型号，带可选件的重量会不同 / of standard version, models with options may vary
(3 标准型号的订购编码，带3 W选项功能的编码则会不同 / Ordering number of the base version, models with options installed have different ordering numbers.



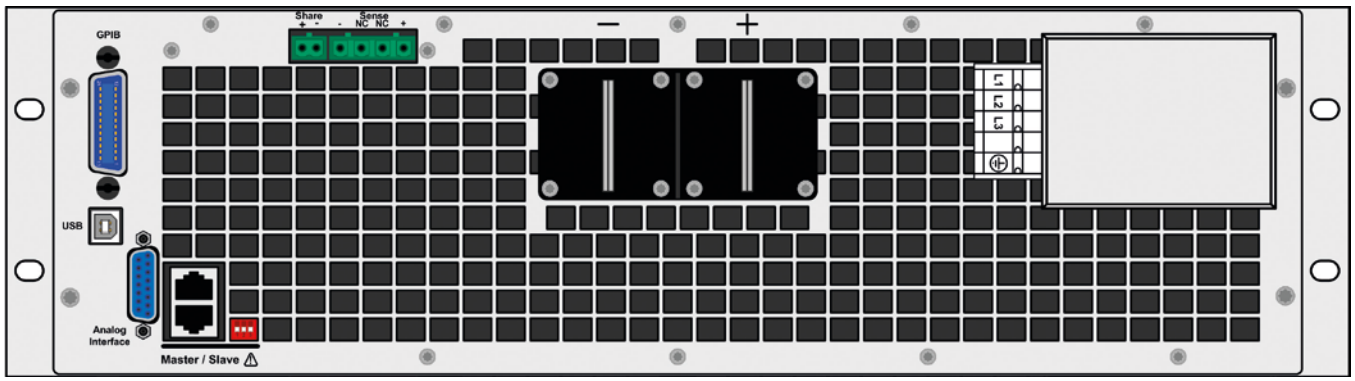
数字接口 / Digital interfaces



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标准型号后视图 / Rear view of base model



配3 W选项功能型号后视图 / Rear view with option 3 W

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EA-PSI 9000 15U



EA-PSI 9000 24U

- 连接三相输入电压400 V 与 50/60 Hz
- 输出功率有：30 kW, 45 kW, 60 kW, 75 kW, 90 kW
- 输出电压有：80 V, 200 V, 360 V, 500 V, 750 V, 1500 V
- 单机的输出电流可达3060 A
- 产品完全预设好，连接线都连好，可随时安装使用
- 装PSI 9000 3U 系列电源会带下列功能：
  - 真实函数发生器
  - 内置USB与模拟接口
  - 可选接口模块插槽，适用于Profinet, Profibus, CAN, CANopen, RS232, Ethernet oder ModBus TCP
  - 支持SCPI与ModBus指令
  - 带彩色TFT触摸屏

- **For three-phase supply 400 V and 50/60 Hz**
- **Output power ratings: 30 kW, 45 kW, 60 kW, 75 kW, 90 kW**
- **Output voltages: 80 V, 200 V, 360 V, 500 V, 750 V, 1500 V**
- **Currents of up to 3060 A from a single device**
- **Pre-configured, pre-wired, ready to be installed**
- **Including power supplies of series PSI 9000 3U with:**
  - **True function generator**
  - **USB and analog interface built in**
  - **Slot for optional interface modules Profinet, Profibus, CAN, CANopen, RS232, Ethernet or ModBus TCP**
  - **Support for SCPI and ModBus commands**
  - **Colour TFT touch panel**

概要

EA-PSI 9000 15U/24U 系列是 PSI 9000 3U 系列大功率型号扩展出来的新产品，全部安装于标准的 19” 机柜内。总共有 30 种不同的配置，形成 5 个不同的功率级别。

一个机柜系统可以被当作一个单独的加大功率的电源产品，除了具有 PSI 9000 3U 系列标准型号的基本功能外，还可手动操作与远程控制。

一般有两个基本款机柜，一款为15 U高，可形成30 kW与45 kW的功率，另一款为24 U高，形成60 kW，75 kW与90 kW的功率。机柜的前后门可锁定，还有四个轮脚也可固定。

一旦机柜被安装于目标位置，仅需将产品装进去即可。

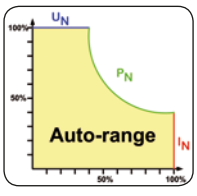
General

The new series PSI 9000 15U/24U extends the power supply series PSI 9000 3U with high power model in standard 19” cabinets. There is a choice of 30 different configurations in 5 different power ratings.
A cabinet system is considered as a single power supply device with extended power, with manual handling and remote control being usual, while offering the same features like the standard models of PSI 9000 3U series.

There will be two base cabinets, one with 15 U of height for 30 kW and 45 kW and one with 24 U of height for 60 kW, 75 kW and 90 kW. The cabinet itself has lockable rear and front doors, as well as four casters which can be fixed.
Once the cabinet is installed on the target location, it only requires to be equipped with units.

功率自动调整

本系列所有型号的输出功率都可灵活调整。可在低电流时输出高电压，或在低电压时输出大电流，但总是受限于最大额定输出功率范围内。本系列的最大功率值可调，因此仅用一台产品却能应用于广范围的应用中。



Auto-ranging power stage

All models are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. The maximum power set value is adjustable with these models. Therefore, a wide range of applications can already be covered by the use of just one unit.

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直流输出

本系列有多款不同型号，可选择0...80 V和0...1500 V输出电压，0...60 A和0...3060 A输出电流，0...30 kW，0...90 kW输出功率的各个型号。
不论产品是手控还是遥控状态（模拟或数字接口），都可对其电流、电压与功率在0%至100%之间连续调节。

输出端位于产品后板。

显示器与控制面板

设定与实际输出电压、电流与功率都清晰显示于彩屏上。彩色的TFT屏幕为触摸式，用手指能直观地控制产品的所有功能。

通过旋钮，或者数字键盘直接输入参数，也可调节设定电压、电流、功率或阻止（内阻模拟）。

若想防止意外操作，可锁定所有操作键。

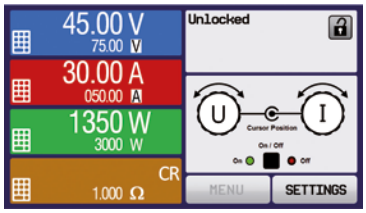
DC output

DC output voltages between 0...80 V and 0...1500 V, output currents between 0...60 A and 0...3060 A and output powers between 0...30 kW and 0...90 kW are available.
Current, voltage and power can thus be adjusted continuously between 0% and 100%, no matter if manually or remotely controlled (analog or digital).
The output terminal is located on the rear panel of the devices.

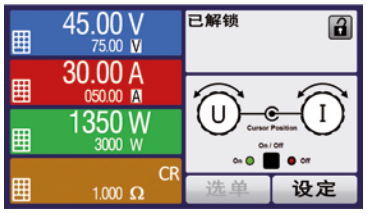
Display and control panel

Set values and actual values of output voltage, output current and output power are clearly represented on the graphic display. The colour TFT screen is touch sensitive and can be intuitively used to control all functions of the device with just a finger.
Set values of voltage, current, power or resistance (internal resistance simulation) can be adjusted using the rotary knobs or entered directly via a numeric pad.
To prevent unintentional operations, all operation controls can be locked.

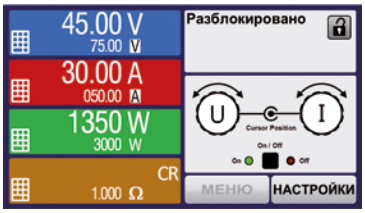
多语言控制面板 / **Multi-language control panel**



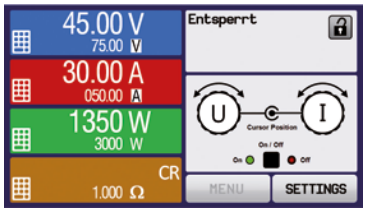
英文 / English



中文 / Chinese



俄文 / Russian



德文 / German

函数发生器

本系列产品都具有一可形成如下典型函数的真实函数发生器，并能将这些函数曲线应用于输出电压或输出电流上。发生器可通过前板的触摸屏设置或某一数字接口远程配置。

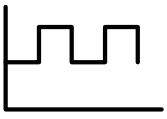
预定义函数会为用户提供所有必要的参数，如Y偏差值，时间/频率或幅度，一套完整的配置参数。.

Function generator

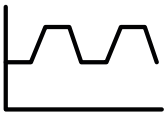
All models within this series include a true function generator which can generate typical functions, as displayed in the figure below, and apply them to either the output voltage or the output current. The generator can be completely configured and controlled by using the touch panel on the front of the device, or by remote control via one of the digital interfaces.
The predefined functions offer all necessary parameters to the user, such as Y offset, time / frequency or amplitude, for full configuration ability.



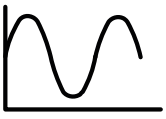
Dreieck
三角形



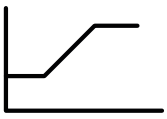
Rechteck
矩形



Trapez
梯形



Sinus
正弦



Rampe
坡行



DIN 40839

选项功能

- 还可提供紧急关闭系统（红色按钮作为紧急关闭开关，任意门接触器，交流切断接触器）

Options

- Emergency off system (emergency off switch as red button, redundant door contacts, contactor for AC cut-off)

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24U 90 kW后视图 / Rear view 24U 90 kW



直流总线端 / DC bus terminal



交流输入端 / AC input terminal

型号	电压	电流	功率	输出电容	供电电流	输出 <-> PE的耐压 Isolation Output <-> PE		高度	订购编号
Model	**Voltage**	**Current**	**Power**	**Output capacity**	**Supply current**	**DC-**	**DC+**	**Height**	**Ordering number**
PSI 9080-1020 15U	0...80 V	0...1020 A	0...30 kW	50,8 mF	≈ 56 A	± 400 V	+ 400 V	15 HE / 15 U	06400601
PSI 9200-420 15U	0...200 V	0...420 A	0...30 kW	15,1 mF	≈ 56 A	± 400 V	+ 600 V	15 HE / 15 U	06400602
PSI 9360-240 15U	0...360 V	0...240 A	0...30 kW	2400 µF	≈ 56 A	± 400 V	+ 600 V	15 HE / 15 U	06400603
PSI 9500-180 15U	0...500 V	0...180 A	0...30 kW	1518 µF	≈ 56 A	± 725 V	+ 1000 V	15 HE / 15 U	06400604
PSI 9750-120 15U	0...750 V	0...120 A	0...30 kW	618 µF	≈ 56 A	± 725 V	+ 1000 V	15 HE / 15 U	06400605
PSI 91500-60 15U	0...1500 V	0...60 A	0...30 kW	168 µF	≈ 56 A	± 1000 V	+ 1500 V	15 HE / 15 U	06400606
PSI 9080-1530 15U	0...80 V	0...1530 A	0...45 kW	76,1 mF	≈ 84 A	± 400 V	+ 400 V	15 HE / 15 U	06400607
PSI 9200-630 15U	0...200 V	0...630 A	0...45 kW	22,7 mF	≈ 84 A	± 400 V	+ 600 V	15 HE / 15 U	06400608
PSI 9360-360 15U	0...360 V	0...360 A	0...45 kW	3600 µF	≈ 84 A	± 400 V	+ 600 V	15 HE / 15 U	06400609
PSI 9500-270 15U	0...500 V	0...270 A	0...45 kW	2277 µF	≈ 84 A	± 725 V	+ 1000 V	15 HE / 15 U	06400610
PSI 9750-180 15U	0...750 V	0...180 A	0...45 kW	927 µF	≈ 84 A	± 725 V	+ 1000 V	15 HE / 15 U	06400611
PSI 91500-90 15U	0...1500 V	0...90 A	0...45 kW	252 µF	≈ 84 A	± 1000 V	+ 1500 V	15 HE / 15 U	06400612
PSI 9080-2040 24U	0...80 V	0...2040 A	0...60 kW	101,5 mF	≈ 112 A	± 400 V	+ 400 V	24 HE / 24 U	06400613
PSI 9200-840 24U	0...200 V	0...840 A	0...60 kW	30,2 mF	≈ 112 A	± 400 V	+ 600 V	24 HE / 24 U	06400614
PSI 9360-480 24U	0...360 V	0...480 A	0...60 kW	4800 µF	≈ 112 A	± 400 V	+ 600 V	24 HE / 24 U	06400615
PSI 9500-360 24U	0...500 V	0...360 A	0...60 kW	3036 µF	≈ 112 A	± 725 V	+ 1000 V	24 HE / 24 U	06400616
PSI 9750-240 24U	0...750 V	0...240 A	0...60 kW	1236 µF	≈ 112 A	± 725 V	+ 1000 V	24 HE / 24 U	06400617
PSI 91500-120 24U	0...1500 V	0...120 A	0...60 kW	336 µF	≈ 112 A	± 1000 V	+ 1500 V	24 HE / 24 U	06400618
PSI 9080-2550 24U	0...80 V	0...2550 A	0...75 kW	127 mF	≈ 140 A	± 400 V	+ 400 V	24 HE / 24 U	06400619
PSI 9200-1050 24U	0...200 V	0...1050 A	0...75 kW	37,8 mF	≈ 140 A	± 400 V	+ 600 V	24 HE / 24 U	06400620
PSI 9360-600 24U	0...360 V	0...600 A	0...75 kW	6000 µF	≈ 140 A	± 400 V	+ 600 V	24 HE / 24 U	06400621
PSI 9500-450 24U	0...500 V	0...450 A	0...75 kW	3795 µF	≈ 140 A	± 725 V	+ 1000 V	24 HE / 24 U	06400622
PSI 9750-300 24U	0...750 V	0...300 A	0...75 kW	1545 µF	≈ 140 A	± 725 V	+ 1000 V	24 HE / 24 U	06400623
PSI 91500-150 24U	0...1500 V	0...150 A	0...75 kW	420 µF	≈ 140 A	± 1000 V	+ 1500 V	24 HE / 24 U	06400624
PSI 9080-3060 24U	0...80 V	0...3060 A	0...90 kW	152,3 mF	≈ 168 A	± 400 V	+ 400 V	24 HE / 24 U	06400625
PSI 9200-1260 24U	0...200 V	0...1260 A	0...90 kW	45,4 mF	≈ 168 A	± 400 V	+ 600 V	24 HE / 24 U	06400626
PSI 9360-720 24U	0...360 V	0...720 A	0...90 kW	7200 µF	≈ 168 A	± 400 V	+ 600 V	24 HE / 24 U	06400627
PSI 9500-540 24U	0...500 V	0...540 A	0...90 kW	4554 µF	≈ 168 A	± 725 V	+ 1000 V	24 HE / 24 U	06400628
PSI 9750-360 24U	0...750 V	0...360 A	0...90 kW	1854 µF	≈ 168 A	± 725 V	+ 1000 V	24 HE / 24 U	06400629
PSI 91500-180 24U	0...1500 V	0...180 A	0...90 kW	504 µF	≈ 168 A	± 1000 V	+ 1500 V	24 HE / 24 U	06400630

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技术参数	Technical Data	Series EA-PSI 9000 15U & EA-PSI 9000 24U / 系列
AC输入	**Input AC**	
- 电压	- Voltage standard	340...460 V, 3ph
- 频率	- Frequency	45...66 Hz
- 功率因数	- Power factor	>0.99
DC输出电压	**Output voltage DC**	
-精确度	- Accuracy	<0.1%
- 0-100% 的负载调整率	- Load regulation 0-100%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%
- 负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms
- 负载从10-90%上升需时	- Slew rate 10-90%	最长 30 ms
- 过压保护	- Overvoltage protection	可调，范围为0...110% U_{Nenn} / adjustable, 0...110% U_{Nom}
- 直流端关闭时空载放电需时	- No load discharge time on DC off	100% U 针对 / to <60 V: 少于 10 s / less than 10 s
输出电流	**Output current**	
- 精确度	- Accuracy	<0.2%
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%
输出功率	**Output power**	
- 精确度	- Accuracy	<1%
过压类别	**Overvoltage category**	2
保护功能	**Protection**	OT, OVP, OPP, PF, OCP (1
隔离耐压	**Isolation**	
- 输入对外壳	- Input to enclosure	2500 V DC
- 输入对输出	- Input to output	2500 V DC
- 输出对外壳 (PE)	- Output to enclosure (PE)	根据型号不同而不同，详见后面表格 / Depending on model, see model table
污染等级	**Pollution degree**	2
保护级别	**Protection class**	1
显示器与面板	**Display and panel**	带触摸屏的图形显示器 / Graphics display with touch panel
数字接口	**Digital interfaces**	
- 内置型	- Built-in	1x 通讯用A型USB / 1x USB type B for communication
- 插槽型	- Slot	1x 可更换的插入式模块 / 1x for retrofittable plug-in modules
模拟编程	**Analog interface**	内置15-针D-Sub母插，电隔离 / Built in, 15-pole D-Sub (female), galvanically isolated
-输入范围	- Input range	0...5 V 或 0...10 V (可转换) / 0...5 V or 0...10 V (switchable)
- U / I / P / R的精确度	- Accuracy U / I / P / R	0...10 V: <0.1% 0...5 V: <0.2%
串联操作	**Series operation**	不可行 / No
并联操作	**Parallel operation**	不可行 / No
安全标准	**Standards**	EN 61326, IEC 1010, EN 61010 IEC 61000-6-3:2006 Class B
制冷	**Cooling**	风扇 / Fans
工作温度	**Ambient temperature**	0...40 °C
储存温度	**Storage temperature**	-20...70 °C
相对湿度	**Relative humidity**	<80%, 无凝露 / non-condensing
使用高度	**Operation altitude**	<2000 m
产品尺寸 (宽x高x长)	**Dimensions (W H D)**	19“ 15 HE / 3U 1000 mm 19“ 24 HE / 3U 1000 mm

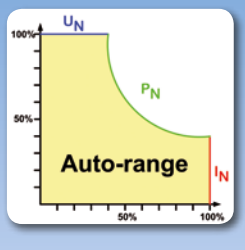
(1 请见153 页/ See page 153

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U
I
OVP
OTP
USB
RS232
LAN
IEEE
CAN
Profi-bus







EA-PS 8032-20 T

- 宽范围输入电压90...264 V，带主动式PFC
- 效率高达 92%
- 输出功率：320 W 至 1500 W
- 输出电压：0...16 V 至 0...360 V
- 输出电流：0...4 A 至 0...60 A
- 灵活的功率调整输出级*
- 有过压保护（OVP）
- 有过温保护（OT）
- 四位数显电压、电流显示器
- LED灯指示状态
- 可自动检测的远程感测端
- 模拟接口
  - 通过 0...10 V或0...5 V电压可对U / I 编程
  - 通过 0...10 V或0...5 V电压可监控U / I
- 温控风扇制冷
- 可选数字接口卡:
  - RS232, CAN, USB, GPIB (IEEE)
  - Profibus, Ethernet/LAN

- **Wide input voltage range 90...264 V with active PFC**
- **High efficiency up to 92%**
- **Output power ratings: 320 W up to 1500 W**
- **Output voltages: 0...16 V up to 0...360 V**
- **Output currents: 0...4 A up to 0...60 A**
- **Flexible, power regulated output stage***
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Four-digit display for voltage and current**
- **Status indication via LEDs**
- **Remote sense with automatic detection**
- **Analog interface with**
  - **U / I programmable via 0...10 V or 0...5 V**
  - **U / I monitoring via 0...10 V or 0...5 V**
- **Temperature controlled fan for cooling**
- **Optional, digital interface cards**
  - **RS232, CAN, USB, GPIB (IEEE)**
  - **Profibus, Ethernet/LAN**

概要
EA-PS8000 T系列是一款由微处理器控制，采用最新技术设计的实验室电源。标准型号配备多种功能和特征，让用户使用起来更方便、有效。

本系列可记忆5组不同的预设值，仅需按下一按钮，即可存储及再次上载这些数值, 故用户可即刻取出频繁使用的设定参数。

输入
采用主动式功率因数校正线路，使产品在90 V_{AC}至264 V_{AC}全世界宽范围输入电压下都适用。

功率为1.5 kW的型号在输入电压<150 V_{AC}时总输出功率将降至1 kW。

* 针对1 kW以上型号

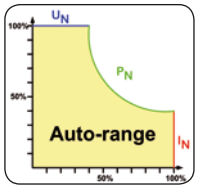
General
The microprocessor controlled laboratory power supplies of series EA-PS 8000 T cover state-of-the-art technology. They already offer many functions and features in their standard version, making the use of this equipment remarkably easy and most effective.
The units are provided with a memory function for five different preset values, with the ability to save and recall these just by the push of a button. Thus frequently used settings are at immediate reach to the user.

Input
The equipment uses an active **P**ower **F**actor **C**orrection circuit to enable using it worldwide on a mains input between 90 V_{AC} and 264 V_{AC}.
The 1.5 kW models are derated, ie. power reduced, to 1 kW at input voltages less than 150 V_{AC}.

* Models from 1 kW

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功率
1 kW 以上型号输出功率可灵活调整，可在低电流时输出更高的电压，或在低电压时输出更大的电流，都由最大额定输出功率来限制。因此一台该产品能涵盖广范围的应用领域。



Power
Models with 1 kW or higher output power are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. Therefore, a wide range of applications can already be covered by the use of one unit.

DC输出
本系列有多种不同型号，可选择0...16 V至0...360 V输出电压，0...4 A至0...60 A输出电流，320 W至1500 W输出功率的型号。
输出端位于产品前板。

DC output
DC output voltages between 0...16 V and 0...360 V, output currents between 0...4 A and 0...60 A and output power ratings between 320 W and 1500 W are available.
The output terminal is located on the front panel.

过压保护(OVP)
为保护连接负载，可设定一过压保护极限值(OVP)。

若输出电压超过调整极限值，输出被关断，LED灯和模拟接口发出状态消息信号。

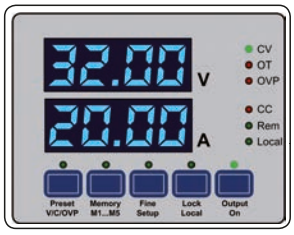
Overvoltage protection (OVP)
In order to protect the connected loads it is possible to adjust an overvoltage protection limit (OVP).
If the output voltage exceeds the adjusted limit, the output is shut off and status signals via a LED and via the analog interface will be generated.

远程感测
用一条连接线将指定输入端与负载设备直接连上，可进行远程感测，以便补偿负载线上的压降。产品会自动检测输入端是否已连接，并直接稳定负载上的电压。该感测输入端位于产品前面板。

Remote sensing
Remote sensing can be done via a dedicated input which is directly connected to the load equipment, in order to compensate voltage drops on the load cables. The power supply detects automatically if the sense input is connected and will stabilise the voltage directly at the load. The remote sensing input terminal is located on the front panel.

显示器和控制键
输出电压和电流清晰显示于两个4位数LED显示器上。LED灯指示产品和按钮的功能状态，为用户提供简便、舒适的操作。

两旋钮可设定输出电压、电流和OVP(过压保护)值，“fine setting“模式可进行高分辨率的调节。在“Lock“ 模式下按钮和旋钮都被锁定，避免无意识的设定值修改。电源开关位于产品后面板，输出关闭按钮则在前面板。



Displays and controls
Output voltage and current are clearly visualised on two 4-digit displays. The functional status of the unit and its buttons are indicated via LEDs, providing easier and most comfortable handling to the user.
Output voltage, current and OVP values can be set by two rotary knobs. A fine setting mode for high resolution adjustment is provided as well. With the „Lock“ mode, buttons and knobs can be locked to prevent unintentional change of settings. The main power switch is located on the back panel, an output shutdown button on the front panel.

输出值的预设
若不想直接将设定输出值传输到输出端，可采用预设功能。

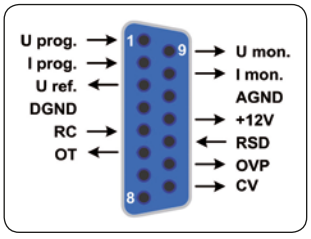
通过此功能用户可预设输出电压、电流和过压保护值(OVP)。

Presetting of output values
To set output values without affecting the output condition, a preset function is implemented.
With this function the user can preset values for the output voltage, output current and overvoltage protection (OVP).

模拟接口
模拟接口位于产品前面板。它具有模拟输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压与电流。在产品设置菜单下可选。

模拟输出脚接上0 V...10 V或0 V...5 V电压，可监控输出电压与电流。此外，还有几个输入脚和输出脚，可用来控制和监控产品状态。

该接口无电隔离特性。



Analog interface
The connection for the analog interface is located on the front of the device. Analog inputs are available here, to set voltage and current from 0...100% in the voltage ranges 0 V...10 V or 0 V...5 V.
To monitor output voltage and current, analog outputs with voltage ranges from 0 V...10 V or 0 V...5 V can be read out. Furthermore, several inputs and outputs are available for controlling and monitoring the device status.
This interface is not galvanically isolated.

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选购件

- 本系列电源可利用RS232，CAN，USB，GPIB (IEEE)、乙太网/LAN或Profibus不同的隔离数字接口，用电脑来控制。接口插槽在产品后板，方便用户插上新接口或替换当前接口。产品会自动检测接口类型，并提示需进行几步设置或不用设置。随接口卡附有适合RS232/USB/GPIB (IEEE)/Ethernet的免费Windows软件，它可控制、监控、记录数据和排序。详情请见137和143页。

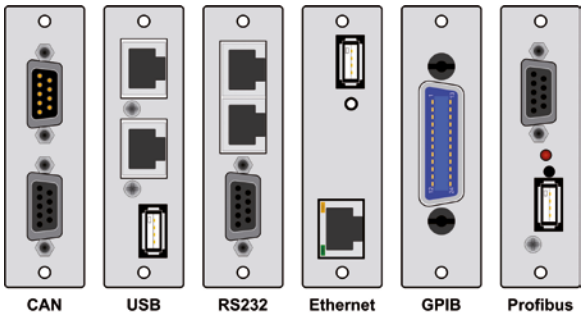
- 高速跃变（仅针对1 kW,以上产品，见152页）

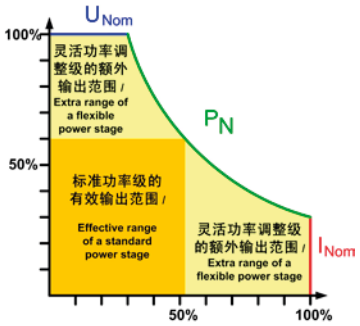
Options

- Isolated digital interface cards for RS232, CAN, USB, GPIB (IEEE), Profibus or Ethernet to control the device by PC. The interface slot is located on the rear panel, making it easy for the user to plug in a new interface or to replace an existing one. The interface will be automatically detected by the device and requires no or only little configuration. Included with the interface cards is a free Windows software for RS232/USB/GPIB/Ethernet, which provides control and monitoring, data logging and semi-automatic sequences. See pages 137 and 143.

- High speed ramping (only for models as from 1 kW, also see page 152)

数字接口 / **Digital interfaces**





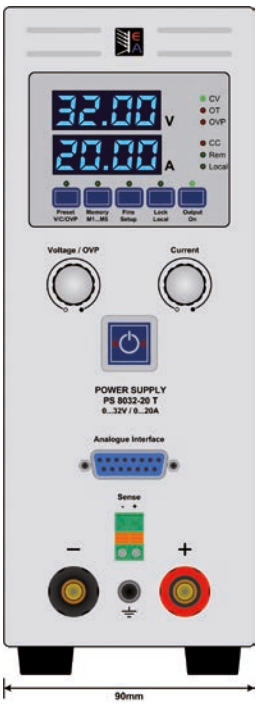


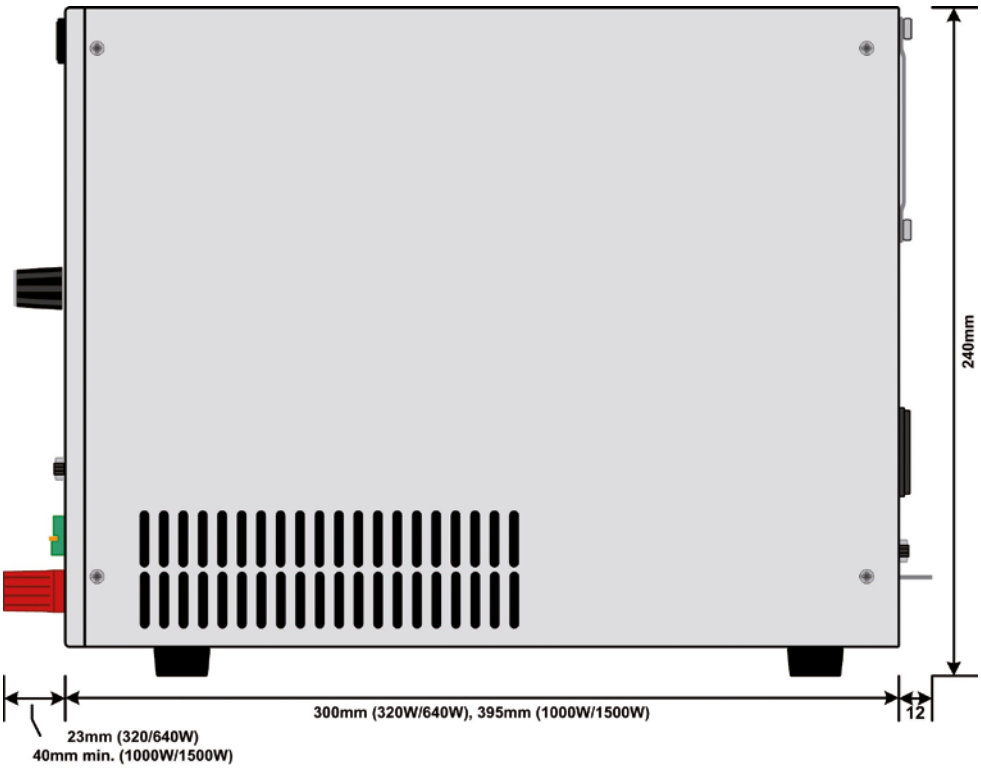
风扇 / Fan

输入插座 / Mains input (320 W-640 W)

电源开关 / Mains switch

接口卡插槽 / Slot for Interface card





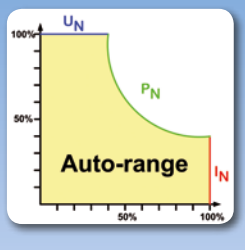
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技术参数	Technical Data	Series EA-PS 8000 T / 系列	
AC输入电压	Input voltage AC	90...264 V, 1ph+N	
- 频率	- Frequency	45...65 Hz	
- 功率因数	- Power factor	>0.99	
DC输出电压	Output voltage DC		
- 精确度	- Accuracy	<0.2%	
- 0-100% 的负载调整率	- Load regulation 0-100%	<0.05%	
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	
- 负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms	
- 负载从10-90%上升需时	- Rise time 10-90%	最长30 ms	
- 过压保护	- Overvoltage protection	可调，0...110% U_{nenn} / adjustable, 0...110% U_{nom}	
输出电流	Output current		
- 精确度	- Accuracy	<0.2%	
- 0-100% ΔU_{DC}时的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	
过压类别	Overvoltage category	2	
保护功能	Protection	OT, OVP, OCP [2]	
隔离耐压	Isolation		
- 输入对外壳	- Input to enclosure	2500 V DC	
- 输入对输出	- Input to output	2500 V DC	
- 输出对外壳	- Output to enclosure	DC-对PE最大耐压为300 V / Max.300 V on DC- against PE	
污染等级	Pollution degree	2	
保护级别	Protection class	1	
模拟接口	Analog interface	内置15-针D-Sub母插 / Built in, 15-pole D-Sub, female	
- 输入范围	- Input range	0...5 V 或 / or 0...10 V (可转换 / switchable)	
- U / I 的精确度	- Accuracy U / I	0...10 V: <0.2%	0...5 V: <0.4%
- 编程分辨率	- Programming resolution	见下表 / See table below	
串联操作	Series operation	可实现，任意直流负极端对PE最大有300 V DC的电压转移 / Possible, with max. potential shift of 300 V DC of any DC minus against PE	
并联操作	Parallel operation	可实现，通过模拟接口执行主从操作 / Possible, with master-slave via analog interface	
安全标准	Standards	EN 60950, EN 61326, EN 55022 等级 B / Class B	
制冷方式	Cooling	风扇 / Fan	
工作温度	Operation temperature	0...50°C	
储存温度	Storage temperature	-20...70°C	
相对湿度	Relative humidity	<80% n.c.	
使用高度	Operation altitude	<2000 m	
重量	Weight	320 W - 650 W: 3.8 kg	1000 W - 1500 W: 6.5 kg
产品尺寸 (宽x高x长) [1]	Dimensions (WxHxD) [1]	320 W - 650 W: 90x240x280 mm	1000 W - 1500 W: 90x240x395 mm

型号	电压	电流	功率	效率	U最大时的纹波[4]	I最大时的纹波[4]	编程 / Programming [3]		订购编号
Model	Voltage	Current	Power	Efficiency	Ripple U max. [4]	Ripple I max. [4]	U (typ.)	I (typ.)	Ordering number
PS 8016-20 T	0...16 V	0...20 A	320 W	90.5%	40 mV_{PP} / 4 mV_{RMS}	60 mA_{PP} / 10 mA_{RMS}	4 mV	5 mA	09200120
PS 8032-10 T	0...32 V	0...10 A	320 W	89%	100 mV_{PP} / 10 mV_{RMS}	35 mA_{PP} / 7 mA_{RMS}	9 mV	3 mA	09200121
PS 8065-05 T	0...65 V	0...5 A	325 W	92%	150 mV_{PP} / 20 mV_{RMS}	12 mA_{PP} / 3 mA_{RMS}	18 mV	2 mA	09200122
PS 8032-20 T	0...32 V	0...20 A	640 W	90.5%	100 mV_{PP} / 8 mV_{RMS}	65 mA_{PP} / 10 mA_{RMS}	9 mV	5 mA	09200123
PS 8065-10 T	0...65 V	0...10 A	650 W	91%	150 mV_{PP} / 10 mV_{RMS}	25 mA_{PP} / 3 mA_{RMS}	18 mV	3 mA	09200124
PS 8160-04 T	0...160 V	0...4 A	640 W	92%	120 mV_{PP} / 20 mV_{RMS}	3 mA_{PP} / 1 mA_{RMS}	43 mV	1.5 mA	09200125
PS 8080-40 T	0...80 V	0...40 A	1000 W	93%	10 mV_{PP} / 4 mV_{RMS}	19 mA_{PP} / 7 mA_{RMS}	20 mV	11 mA	09200126
PS 8360-10 T	0...360 V	0...10 A	1000 W	93%	30 mV_{PP} / 11 mV_{RMS}	1 mA_{PP} / 0.45 mA_{RMS}	88 mV	3 mA	09200128
PS 8080-60 T	0...80 V	0...60 A	1500 W	93%	10 mV_{PP} / 4 mV_{RMS}	19 mA_{PP} / 7 mA_{RMS}	20 mV	16 mA	09200127
PS 8360-15 T	0...360 V	0...15 A	1500 W	93%	50 mV_{PP} / 8 mV_{RMS}	1 mA_{PP} / 0.45 mA_{RMS}	88 mV	4 mA	09200129

[1] 仅为外壳尺寸，非产品整体尺寸 / Enclosure only, not overall
[2] 见第153 页/ See page 153
[3] 无产品错误时的可编程分辨率 / Programmable resolution without device error
[4] RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

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EA-PS 9080-100 1U

- 宽范围输入电压100...264 V，（1500W型号）
- 效率高达 95%
- 输出功率：0..1500 W 或 0..3000 W
- 输出电压：0...40 V 至 0...750 V
- 输出电流：0...6 A 至 0...100 A
- 灵活的功率调整输出级
- 有多种保护电路（OVP, OCP, OPP, OTP）
- 四位带按钮与蓝屏的控制面板，可显示实际值，设定值，状态与报警信息
- 远程感测
- 共享总线支持并联连接
- 电隔离模拟接口
  - 通过 0...10 V或0...5 V电压可对U / I / P 编程
  - 通过 0...10 V或0...5 V电压可监控U / I
- 超低的高度，仅1 U高（44 mm）
- 温控风扇制冷
- 配放电电路(在10 s内U_{out} < 60 V)
- 内置USB与以太网端口
- EMC符合EN 550220 等级B标准
- 支持SCPI指令语言

- **Wide input range 100...264 V (1500W models)**
- **High efficiency up to 95%**
- **Output power ratings: 0..1500 W or 0...3000 W**
- **Output voltages: 0...40 V up to 0...750 V**
- **Output currents: 0...6 A up to 0...100 A**
- **Flexible, power regulated output stage**
- **Various protection circuits (OVP, OCP, OPP, OTP)**
- **Control panel with pushbuttons and blue LCD for actual values, set values, status and alarms**
- **Remote sensing**
- **Share bus for support of parallel connection**
- **Galvanically isolated, analog interface with**
  - **U / I / P programmable via 0...10 V or 0...5 V**
  - **U / I monitoring via 0...10 V or 0...5 V**
- **Very low height of only 1 U (44 mm)**
- **Temperature controlled fans for cooling**
- **Discharge circuit (U_{out} < 60 V in ≤ 10 s)**
- **USB and Ethernet port integrated**
- **EMC according to EN 55022 Class B**
- **SCPI command language supported**

概要

EA-PS 9000 1U系列是一款由微处理器控制，采用最新技术设计的实验室电源。其标准型号配备多种功能和特征，让用户使用起来更方便、有效。所有这些功能全部浓缩在44 mm高度的产品内。

控制面板上清晰地分布有两个旋钮、六个按钮，以及两个LED 灯。同时还有一显示所有数值与状态的蓝色液晶显示器，从而简化了产品的使用。

AC 输入

本系列所有型号都采用**主动式**功率因数校正线路，1.5 kW以下型号可在100 V_{AC}至264 V_{AC}的输入电压范围下使用。
当输入电压降低时其功率级别会自动减少输出功率，因此1.5 kW型号在输入电压为100...1150 V_{AC}时输出功率仍然有1 kW。3 kW型号在输入电压为180...207V_{AC}时则仍可供应2.5 kW。.

General

The microprocessor controlled laboratory power supplies of series EA-PS 9000 1U offer many functions and features in their standard version, making the use of this equipment remarkably easy and most effective. All this comes in a flat design with only 44 mm of height.

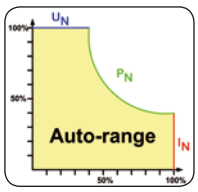
The clearly arranged control panel features two rotary knobs, six pushbuttons and two LEDs. Together with an illuminated, blue LCD display for all values and status it simplifies the use of the device.

AC input

All units are provided with an active **P**ower **F**actor **C**orrection circuit and models up to 1.5 kW are even suitable for a world-wide operation on a supply from 100 V_{AC} up to 264 V_{AC}.
Both power classes reduce the output power automatically when the input supply is low, so the 1.5 kW models can still provide 1 kW power with an input supply of 100...150 V_{AC} and the 3 kW models can still provide 2.5 kW at 180...207 V_{AC}.

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功率
所有型号输出功率可灵活调整。可在低电流时输出更高的电压，或在低电压时输出更大的电流，都由最大额定输出功率来限制。设定功率都可调。因此一台该产品能涵盖广范围的应用领域。



Power
All models are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. The power set value is adjustable with these models. Therefore, a wide range of applications can already be covered by the use of just one unit.

直流输出
本系列有多款不同型号，可选择0...80 V至0...750 V输出电压，0...6 A至0...100 A输出电流，0...1500 W至0...3000 W输出功率的类型。
可对电流、电压与功率在0%与100%之间连续调整，不论是手动调整还是远程控制（数字式或模拟式）。

直流输出端位于产品后板。

DC output
DC output voltages between 0...80 V and 0...750 V, output currents between 0...6 A and 0...100 A and output power ratings of 0...1500 W or 0...3000 W are available.
Current, voltage and power can thus be adjusted continuously between 0% and 100%, no matter if manually or remotely controlled (analog or digital).
The DC output is located on the rear panel of the devices.

放电电路
额定输出电压为200 V或以上的产品对其输出电容配有一放电电路。在空载或带很小负载的情况下，它能保证危险的输出电压在直流输出关闭后降至60 V DC以下。该电压值被认为是对人身安全有危险的极限电压。

Discharge circuit
Models with a nominal output voltage of 200 V or higher include a discharge circuit for the output capacities. For no load or low load situations, it ensures that the dangerous output voltage can sink to under 60 V DC after the DC output has been switched off. This value is considered as limit for voltages dangerous to human safety.

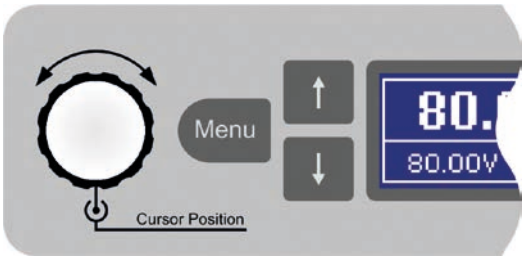
保护功能
为保护连接负载，可给产品设定一过压保护极限值(OVP)，以及过流(OCP)与过功率(OPP)保护极限值。

一旦因任何缘故超过了这三个极限值中的一个，直流输出会被立即切断，在显示器和接口端会发出一状态信号。

本产品还有过温保护功能，如果产品过热，它会关断直流输出。

Protective features
For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP) and overpower (OPP).
As soon as one of these thresholds is reached for any reason, the DC output will be immediately shut off and a status signal will be generated on the display and via the interfaces.
There is furthermore an overtemperature protection, which will shut off the DC output if the device overheats.

显示器和控制键
产品的所有重要信息都于一点阵显示器上清晰可见。
通过该显示器，电压与电流的实际输出值和预设值，(CV, CC, CP) 实际控制状态与其它状态，报警与设置菜单的设定，都清晰显示出来。



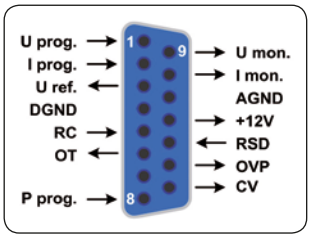
Display and controls
All important information is clearly visualised on a dot matrix display.
With this, information about the actual output values and set values of voltage and current, the actual control state (CV, CC, CP) and other statuses, as well as alarms and settings of the setup menu are clearly displayed.

为使旋钮可以调节参数，只需按一下该旋钮，就可更换数值小数点后的光标位置。所有这些功能都归功于其方便易用的操作方式。
其面板锁定功能可以锁定整个面板，从而避免产品与连接负载出现误操作。

In order to ease adjusting of values by the rotary knobs, pushing them can switch between decimal positions of a value. All these features contribute to an operator friendliness.
With a panel lock feature, the whole panel can be locked in order to protect the equipment and the loads from unintentional misuse.

模拟接口
产品后面板上装有一隔离模拟接口。它提供模拟接口输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流与功率。

模拟输出脚接上0 V...10 V或0 V...5 V电压，可监控输出电压与电流。此外，还有几个输入脚和输出脚，可用来控制和监控产品状态。



Analog interface
There is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current and power from 0...100% through control voltages of 0 V...10 V or 0 V...5 V.
To monitor the output voltage and current, there are analog outputs with voltage ranges of 0 V...10 V or 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

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数字接口卡

本系列所有型号标配有两个电隔离数字端口。分别是1x USB & 1x Ethernet。可通过发送SCPI语言指令或Modbus协议经它们控制和监控产品，GPIB仅支持SCPI语言。

产品的远程控制可由所供软件EA Power Control或者客户定制应用来完成，我们提供有编程文档，以及LabView™ Virtual Instruments (VIs)。.

Digital interfaces

All models features two galvanically isolated, digital interfaces by default. These are 1x USB and 1x Ethernet. Both can be used to control and monitor the devices with SCPI language commands or Modbus protocol.

Remote control of a device can be done either by the included software EA Power Control or by a custom application, which is supported by a programming documentation, as well as LabView™ Virtual Instruments (VIs).

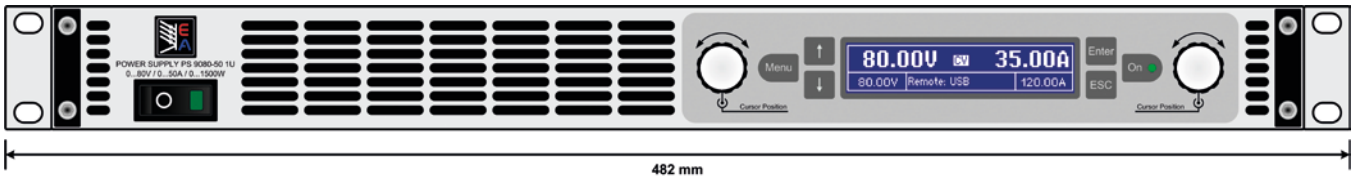
技术参数	Technical Data	Series EA-PS 9000 1U / 系列	
AC输入	**Input AC**		
- 电压	- Voltage	100...264 V, 1ph+N (Models 1500 W / 型号), 180...264 V, 1ph+N (Models 3000 W / 型号)	
- 频率	- Frequency	45...65 Hz	
- 功率因数	- Power factor	>0.99	
- 功率降额	- Derating	型号 / Models 1500 W: < 150 V AC 至 / to $P_{out\ max}$ 1000 W 型号 / Models 3000 W: < 207 V AC 至 / to $P_{out\ max}$ 2500 W	
输出：DC电压	**Output: Voltage DC**		
- 精确度	- Accuracy	<0.1%	
- 0-100% 的负载调整率	- Load regulation 0-100%	<0.05%	
- ±10% Δ U_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	
- 10%-100%负载调整时间	- Regulation 10-100% load	<2.2 ms	
- 从10-90%上升需时(CV)	- Rise time 10-90% (CV)	最长15 ms	
输出：电流	**Output: Current**		
- 精确度	- Accuracy	<0.2%	
- 0-100% ΔI的负载调整率	- Load regulation 0-100% ΔI	<0.15%	
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	
输出：功率	**Output power**		
- 精确度	- Accuracy	<1%	
过压类别	**Overvoltage category**	2	
保护功能	**Protection**	OTP, OVP, OCP, OPP, PF (1	
隔离耐压	**Isolation**		
- 输入对外壳	- Input to enclosure	2500 V DC	
- 输入对输出	- Input to output	2500 V DC	
- 输出对外壳(PE)	- Output to enclosure (PE)	负极：最大为400 V DC，正极：最大为400 V DC + 输出电压 / Negative: max. 400 V DC, positive: max. 400 V DC + output voltage	
污染等级	**Pollution degree**	2	
保护级别	**Protection class**	1	
模拟接口	**Analog interface**	E内置15-针D-Sub母插，电隔离 / Built in, 15-pole D-Sub (female), galvanically isolated	
- 输入范围	- Input range	0...5 V 或 / or 0...10 V (可转换 / switchable)	
- U / I 的精确度	- Accuracy U / I	0...10 V: <0.1% 0...5 V: <0.2%	
串联操作	**Series operation**	可实现，任意直流负极端对PE有最大400 V DC的电压转移) / Possible (with max. potential of all negative outputs 400 V DC against PE)	
- 主-从（Master-Slave）	- Master-Slave	无 / No	
并联操作	**Parallel operation**	可实现，通过共享总线操作或模拟接口 / Possible, via Share Bus operation or via analog interface	
- 主-从（Master-Slave）	- Master-Slave	受限 / Restricted	
安全标准	**Standards**	EN 60950, EN 61326, EN 55022 等级 B / Class B	
制冷方式	**Cooling**	风扇 / Fan(s)	
操作温度	**Operation temperature**	0...50 °C	
储存温度	**Storage temperature**	-20...70 °C	
湿度	**Humidity**	<80%	
使用高度	**Operation altitude**	<2000 m	
机械特性	**Mechanics**	1500 W	3000 W
- 重量 (2	- Weight (2	≈10.5 kg	11 kg
- 产品尺寸（宽x高x长） (3	- Dimensions (W H D) (3	19“ 1 HE/U 463 mm	19“ 1 HE/U 463 mm

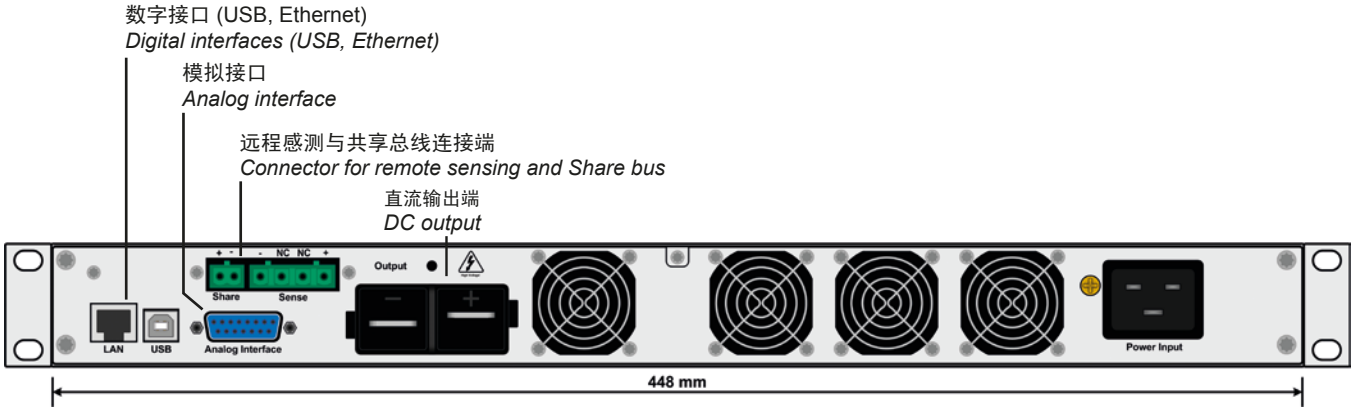
(1 见153页 / See page 153
(2 标准型号，带选项功能的则会不同 / Standard version, models with options may vary
(3 标准型号的外壳尺寸，非整体尺寸，带选项功能的还会有不同 / Enclosure of the standard version and not overall size, versions with options may vary

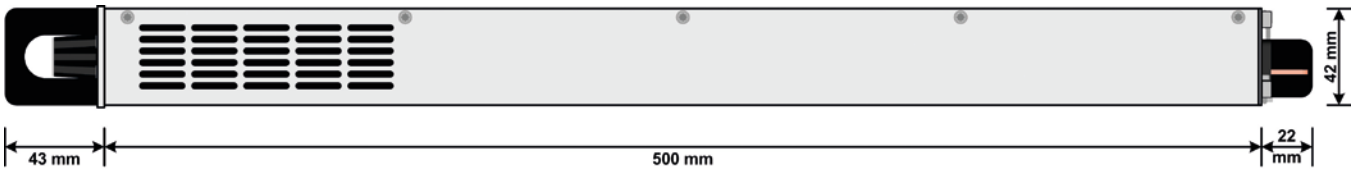
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型号	电压	电流	功率	效率	U最大时的纹波(2	I最大时的纹波(2	编程 / Programming (1		订购编号
Model	**Voltage**	**Current**	**Power**	**Efficiency**	**Ripple U max.**	**Ripple I max.**	**U (typ.)**	**I (typ.)**	**Ordering number**
PS 9080-50 1U	0...80 V	0...50 A	0...1500 W	≤91%	100 mV_{PP} / 5.2 mV_{RMS}	4 mA_{RMS}	3 mV	2 mA	06230400
PS 9200-25 1U	0...200 V	0...25 A	0...1500 W	≤93%	293 mV_{PP} / 51 mV_{RMS}	8 mA_{RMS}	8 mV	1 mA	06230401
PS 9360-15 1U	0...360 V	0...15 A	0...1500 W	≤94%	195 mV_{PP} / 33 mV_{RMS}	1.6 mA_{RMS}	14 mV	0.6 mA	06230402
PS 9500-10 1U	0...500 V	0...10 A	0...1500 W	≤94%	293 mV_{PP} / 63 mV_{RMS}	1.4 mA_{RMS}	20 mV	0.4 mA	06230403
PS 9750-06 1U	0...750 V	0...6 A	0...1500 W	≤95%	260 mV_{PP} / 40 mV_{RMS}	0.6 mA_{RMS}	30 mV	0.25 mA	06230404
PS 9080-100 1U	0...80 V	0...100 A	0...3000 W	≤92%	76 mV_{PP} / 4.2 mV_{RMS}	6 mA_{RMS}	3 mV	4 mA	06230405
PS 9200-50 1U	0...200 V	0...50 A	0...3000 W	≤93%	234 mV_{PP} / 40 mV_{RMS}	10 mA_{RMS}	8 mV	2 mA	06230406
PS 9360-30 1U	0...360 V	0...30 A	0...3000 W	≤93%	156 mV_{PP} / 26 mV_{RMS}	1.9 mA_{RMS}	14 mV	1.5 mA	06230407
PS 9500-20 1U	0...500 V	0...20 A	0...3000 W	≤93%	234 mV_{PP} / 50 mV_{RMS}	1.9 mA_{RMS}	20 mV	0.8 mA	06230408
PS 9750-12 1U	0...750 V	0...12 A	0...3000 W	≤93%	260 mV_{PP} / 40 mV_{RMS}	0.7 mA_{RMS}	30 mV	0.5 mA	06230409

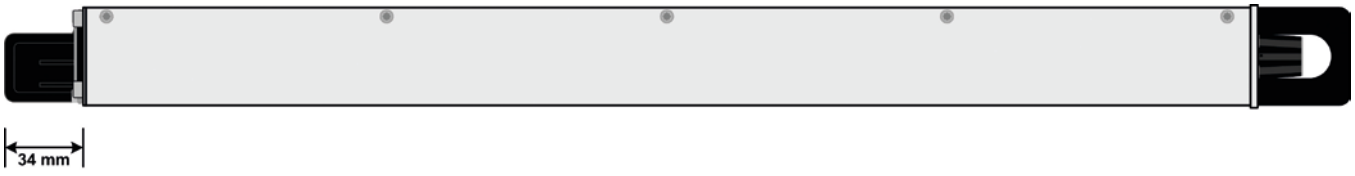
(1 无产品错误时的可编程分辨率 / Programmable resolution without device error
(2 RMS值：在BWL 300KHz下测量的LF值, PP值：在BWL 20MHz下测量的HF值 / RMS value: measures at LF with BWL 300kHz, PP value: measured at HF with BWL 20MHz







右视图 View from the right side



左视图，带直流端子盖 View from the left side, with DC cover

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EA-PS 9080-60 2U

- 多相输入90...264 VAC，带主动式PFC
- 效率高达93%
- 输出功率有：0...1000 W至0...3000 W
- 输出电压：0...40 V 至 0...750 V
- 输出电流：0...4 A 至 0...120 A
- 灵活的功率调整输出
- 各种保护功能（OVP, OCP, OPP, OTP）
- 带按钮与蓝色显示器的控制面板，可显示实际值与设定值、状态与报警
- 隔离模拟接口
  - 通过 0...10 V或0...5 V电压可对U / I / P编程
  - 通过 0...10 V或0...5 V电压可监控U / I
- 温控风扇制冷
- 符合SELV标准 (EN 60950)的40 V产品型号
- 配放电电路(在10 s内U_{out} < 60 V)
- 所有型号都可配高速选项功能
- 内置USB与以太网端口或选择安装IEEE/GPIB端口
- EMC符合EN 55022等级B标准
- 支持SCPI指令语言

- **Wide input voltage range 90...264 V, with active PFC**
- **High efficiency up to 93%**
- **Output power ratings: 0...1000 W up to 0...3000 W**
- **Output voltages: 0...40 V up to 0...750 V**
- **Output currents: 0...4 A up to 0...120 A**
- **Flexible, power regulated output stage**
- **Various protection circuits (OVP, OCP, OPP, OTP)**
- **Control panel with pushbuttons and blue LCD for actual values, set values, status and alarms**
- **Galvanically isolated analog interface with**
  - **U / I / P programmable via 0...10 V or 0...5 V**
  - **U / I monitoring via 0...10 V or 0...5 V**
- **Temperature controlled fans for cooling**
- **40 V models according to SELV (EN 60950)**
- **Discharge circuit (U_{out} < 60 V in ≤ 10 s)**
- **High speed versions of all models**
- **USB and Ethernet port integrated or alternatively installed IEEE/GPIB port**
- **EMC according to EN 55022 Class B**
- **SCPI command language supported**

概要

EA-PS 9000 2U系列是一款由微处理器控制，采用最新技术设计的实验室电源。其标准型号配备多种功能和特征，让用户使用起来更方便、有效。

控制面板上清晰地分布有两个旋钮，六个按钮，以及两个LED 灯。同时还有一显示所有数值与状态的蓝色液晶显示器，从而简化了产品的使用。

AC 输入

本系列所有型号都采用主动式功率因数校正线路，1.5 kW以下型号可在90 V_{AC}至264 V_{AC}的输入电压范围下使用。

1.5 kW型号在输入电压<150 V_{AC}时输出功率减少至1 kW。3 kW型号在输入电压<205 V_{AC}时则降至2.5 kW。

General

The microprocessor controlled laboratory power supplies of series EA-PS 9000 2U offer many functions and features in their standard version, making the use of this equipment remarkably easy and most effective.

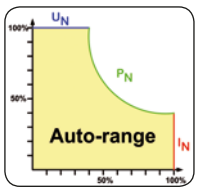
The clearly arranged control panel features two rotary knobs, six pushbuttons and two LEDs. Together with an illuminated, blue LCD display for all values and status it simplifies the use of the device.

AC input

All units are provided with an active **P**ower **F**actor **C**orrection circuit and models up to 1.5 kW are even suitable for a worldwide operation on a supply from 90 V_{AC} up to 264 V_{AC}.
With the 1.5 kW models, the output power is automatically reduced to 1 kW if the supply voltage is <150 V_{AC} and with the 3 kW models is reduced to 2.5 kW at <205 V_{AC}.

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功率
所有型号输出功率可灵活调整。可在低电流时输出更高的电压，或在低电压时输出更大的电流，都由最大额定输出功率来限制。设定功率都可调。因此一台该产品能涵盖广范围的应用领域。



Power
All models are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. The power set value is adjustable with these models. Therefore, a wide range of applications can already be covered by the use of just one single unit.

直流输出
本系列有多款不同型号，可选择0...40 V至0...750 V输出电压，0...4 A至0...120 A输出电流，0...1000 W至0...3000 W输出功率的类型。
可对电流、电压与功率在0%与100%之间连续调整，不论是手动调整还是远程控制（数字式或模拟式）。

直流输出端位于产品后板。

DC output
DC output voltages between 0...40 V and 0...750 V, output currents between 0...4 A and 0...120 A and output power ratings between 0...1000 W and 0...3000 W are available.
Current, voltage and power can thus be adjusted continuously between 0% and 100%, no matter if manually or remotely controlled (analog or digital).
The DC output is located on the rear panel of the devices.

放电电路
额定输出电压为200 V或以上的产品对其输出电容配有一放电电路。在空载或带很小负载的情况下，它能保证危险的输出电压在直流输出关闭后降至60 V DC以下。该电压值被认为是对人身安全有危险的极限电压。

Discharge circuit
Models with a nominal output voltage of 200 V or higher include a discharge circuit for the output capacities. For no load or low load situations, it ensures that the dangerous output voltage can sink to under 60 V DC after the DC output has been switched off. This value is considered as limit for voltages dangerous to human safety.

保护功能
为保护连接负载，可给产品设定一过压保护极限值(OVP)，以及过流(OCP)与过功率(OPP)保护极限值。

一旦因任何缘故超过了这三个极限值中的一个，直流输出会被立即切断，在显示器和接口端会发出一状态信号。

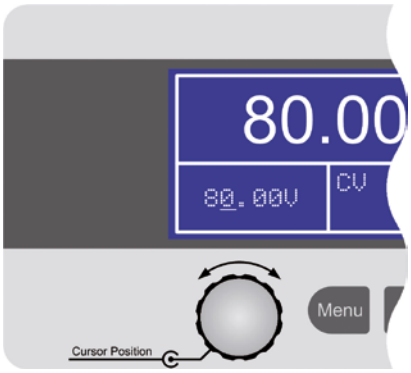
本产品还有过温保护功能，如果产品过热，它会关断直流输出。

Protective features
For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP) and overpower (OPP).
As soon as one of these thresholds is reached for any reason, the DC output will be immediately shut off and a status signal will be generated on the display and via the interfaces.
There is furthermore an overtemperature protection, which will shut off the DC output if the device overheats.

显示器和控制键
产品的所有重要信息都于一点阵显示器上清晰可见。

通过该显示器，电压与电流的实际输出值和预设值，(CV, CC, CP) 实际控制状态与其它状态，报警与设置菜单的设定，都清晰显示出来。

为使旋钮可以调节参数，只需按一下该旋钮，就可更换数值小数点后的光标位置。所有这些功能都归功于其方便易用的操作方式。



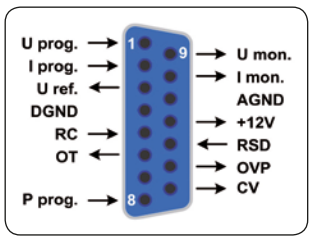
Display and controls
All important information is clearly visualised on a dot matrix display.
With this, information about the actual output values and set values of voltage and current, the actual control state (CV, CC, CP) and other statuses, as well as alarms and settings of the setup menu are clearly displayed.
In order to ease adjusting of values by the rotary knobs, pushing them can switch between decimal positions of a value. All these features contribute to an operator friendliness.

其面板锁定功能可以锁定整个面板，从而避免产品与连接负载出现误操作。

With a panel lock feature, the whole panel can be locked in order to protect the equipment and the loads from unintentional misuse.

模拟接口
产品后面板上装有一隔离模拟接口。它提供模拟接口输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流与功率。

模拟输出脚接上0 V...10 V或0 V...5 V电压，可监控输出电压与电流。此外，还有几个输入脚和输出脚，可用来控制和监控产品状态。



Analog interface
There is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current and power from 0...100% through control voltages of 0 V...10 V or 0 V...5 V.
To monitor the output voltage and current, there are analog outputs with voltage ranges of 0 V...10 V or 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

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数字接口卡

本系列所有型号的后板上标配有两个电隔离数字接口（1x USB & 1x Ethernet, 带3 W选项功能：1x USB & 1x GPIB）。可通过发送SCPI语言指令或Modbus协议经USB与Ethernet端口控制和监控产品，GPIB仅支持SCPI语言。

Digital interfaces

All models features two galvanically isolated, digital interfaces by default (standard: 1x **USB** & 1x **Ethernet**, with option 3 W: 1X USB & 1X GPIB) , which are located on the rear side. USB and Ethernet can be used to control and monitor the devices either with SCPI language commands or Modbus protocol, while with GPIB only SCPI is supported.

软件与编程



通过电脑远程控制本产品，可以使用产品上的EA Power Control软件。它可以同时应用于多台不同或同型号的PS 9000 2U 系列上，进行监控与控制。本软件还有一固件升级工具，以及数据记录功能，还可用半自动表格处理控制产品。

对于更复杂的应用，还提供有一个完整的编程文件，以及LabView VIs可以直接应用。

PS 9000 2U所有型号支持通用SCPI指令语言，以及ModBus通讯协议。但是带3W选项功能的通过GPIB端口仅能使用SCPI语言。

Software and programming

For remote control from a Windows PC there is a software EA Power Control included with the device. It can be used with multiple different or identical models of series PS 9000 2U to monitor and control the units. The software furthermore includes a firmware update tool, as well as a feature to record data and to control the units by a semi-automatic table processing.
For even more sophisticated, customer specific applications there is a complete programming documentation and also LabView VIs for direct implementation available.
All models of series PS 9000 2U support the common command language **SCPI** and the **ModBus** protocol via both, Ethernet and USB. Models with option 3W can only use SCPI via the GPIB port.

远程感测

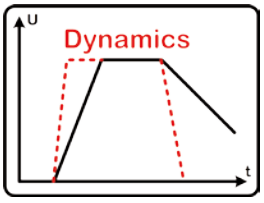
用一条连接线将指定输入端与负载设备直接连上，可进行远程感测，以便补偿负载线上的压降。产品会自动检测输入端是否已连接，并直接稳定负载上的电压。
该感测输入端位于产品后面板。

Remote sensing

Remote sensing can be done via a dedicated input which is directly connected to the load equipment, in order to compensate voltage drops along the load cables. The power supply detects automatically whether the sensing input is connected and will stabilise the voltage directly at the load.
The connection for the remote sensing is located on the rear of the device.

高速版

本系列除了标准型号外，还有一个所谓的告诉版本（产品后缀为：HS）。该版本输出电压动态的反应有很大提升，上升和下降时间极度减少，全归因于产品输出端安排了小电容与合理的电压控制器。见152页。



High speed versions

Alternatively to the standard models of this series, so-called high speed versions (product name appendix: HS) of the standard models are available. They offer significantly improved output voltage dynamics, along with decreased rise and fall times, all due to lower output capacity and an optimised voltage controller. Also see page 152.

我们可以做个比较：PSI 9080-60 2U标准型号的输出电容为5440 µF，而同型号带高速功能的仅为86 µF。

在产品的技术规格表下，特别分开列出了HS型号的特殊参数。

由于输出电容减小这个优势，随之带来一个劣势，就是从恒流（CC）转换到恒压（CV）时，噪音更大，输出电压会过冲更多，或者在带载阶跃时负尖峰更高。过冲高度可能会达到额定输出电压的10%，有时也取决于连接的负载类型（阻性负载，容性负载，感性负载）。

For comparison: the base version of model PS 9080-60 2U has 5440 µF output capacity, while the corresponding high speed version only has 86 µF.
In the technical specifications tables below, the HS models are listed separately with extra, high-speed relevant and significant specifications.
Together with the advantages from the reduced output capacity there are also unavoidable disadvantages, like higher noise (ripple) and higher overshoots of the output voltage after crossover from constant current (CC) to constant voltage (CV) or higher undershoots on load steps. The height of the overshot can reach up to 10% of the nominal output voltage of the particular model and is also depending on the kind of the attached load (resistive, capacitive, inductive).

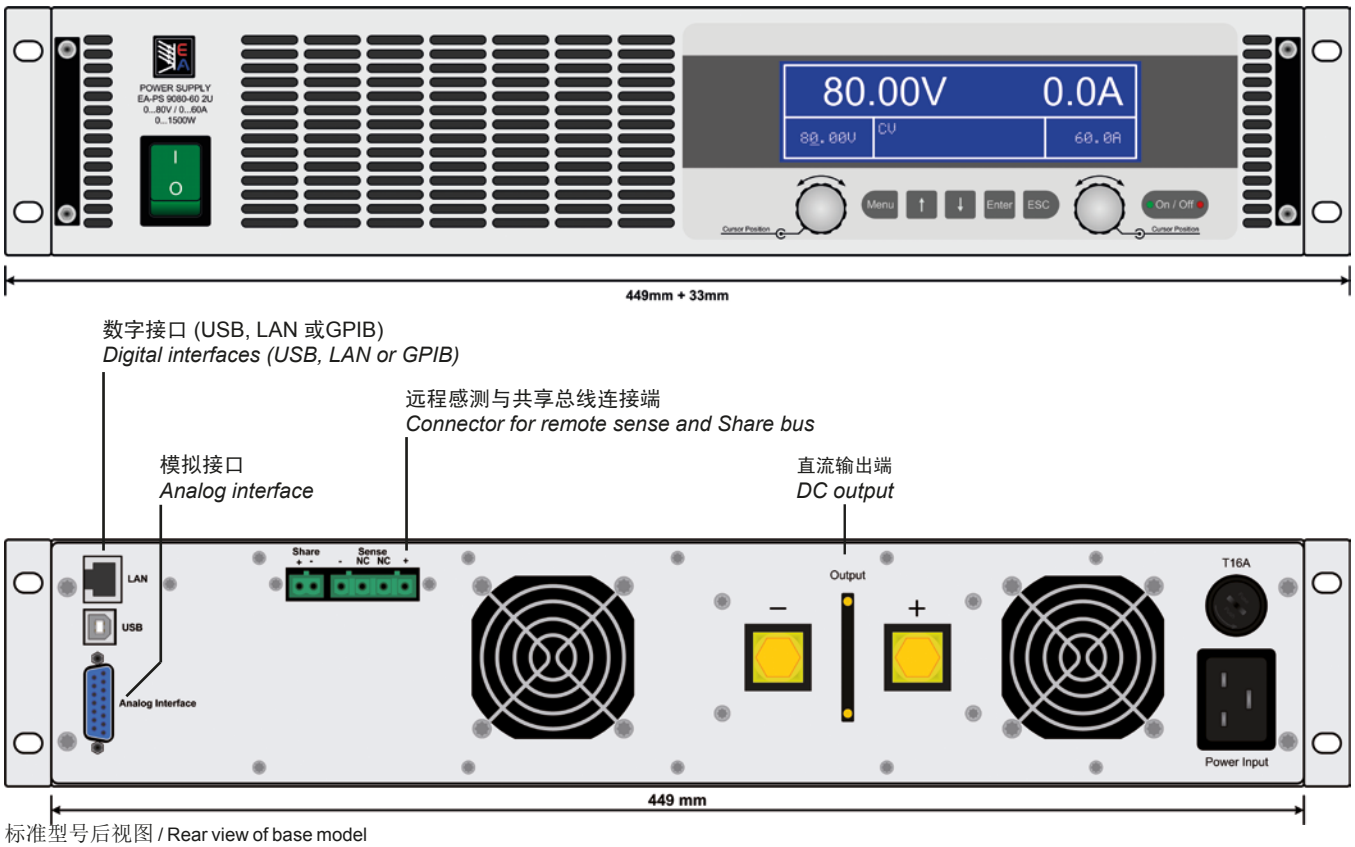
选购件

- 还可安装带固定GPIB端口的三位接口（3 W），代替默认以太网插槽

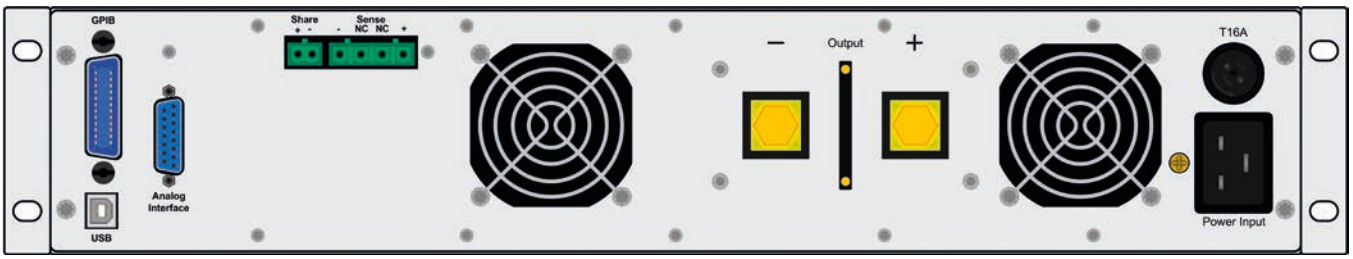
Options

- Three-way interface (3 W) with a rigid GPIB port installed instead of the default Ethernet slot.

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标准型号后视图 / Rear view of base model



配3 W选项功能型号后视图 / Rear view with option 3 W

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技术参数	Technical Data	Series EA-PS 9000 2U / 系列	
AC输入	**Input AC**		
- 电压	- Voltage	90...264 V, 1ph+N (Models 1000 W & 1500 W / 型号), 180...264 V, 1ph+N (Models 3000 W / 型号)	
- 频率	- Frequency	45...65 Hz	
- 功率因数	- Power factor	>0.99	
- 功率降额	- Derating	型号 / Models 1500 W: < 150 V AC 至 / to $P_{out\ max}$ 1000 W 型号 / Models 3000 W: < 207 V AC 至 / to $P_{out\ max}$ 2500 W	
输出：DC电压	**Output: Voltage DC**		
- 精确度	- Accuracy	<0.1%	
- 0-100% 的负载调整率	- Load regulation 0-100% load	<0.05%	
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	
- 负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms	
- 负载从10-90%上升需时	- Rise time 10-90%	最长 30 ms (标准版 / Standard models) 最长 10ms (高速版 / High speed versions)	
输出：电流	**Output: Current**		
- 精确度	- Accuracy	<0.2%	
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	
输出：功率	**Output power**		
- 精确度	- Accuracy	<1%	
过压类别	**Overvoltage category**	2	
保护功能	**Protection**	OTP, OVP, OCP, OPP, PF [1]	
隔离耐压	**Isolation**		
- 输入对外壳	- Input to enclosure	2500 V DC	
- 输入对输出	- Input to output	2500 V DC	
- 输出对外壳	- Output to enclosure	负极：最大为400 V DC，正极：最大为400 V DC + 输出电压 Negative: max. 400 V DC, positive: max. 400 V DC + output voltage	
污染等级	**Pollution degree**	2	
保护级别	**Protection class**	1	
模拟接口	**Analog interface**	内置15-针D-Sub母插 / Built in, 15-pole D-Sub, female	
- 输入范围	- Input range	0...5 V 或 / or 0...10 V (可转换 / switchable)	
- U / I 的精确度	- Accuracy U / I	0...10 V: <0.1% 0...5 V: <0.2%	
串联操作	**Series operation**	可实现，任意直流负极端对PE有最大400 V DC的电压转移) / possible (max. potential of any minus DC output: 400 V DC against PE)	
- 主-从（Master-Slave）	- Master-Slave	无 / no	
并联操作	**Parallel operation**	可实现，通过共享总线操作或模拟接口 / Possible, via Share Bus operation or via analog interface	
- 主-从（Master-Slave）	- Master-Slave	受限 / Restricted	
安全标准	**Standards**	EN 60950, EN 61326, EN 55022 等级 B / Class B	
制冷方式	**Cooling**	风扇 / Fan(s)	
环境条件	**Ambient conditions**	0...50°C，最大80%湿度 / humidity	
储存温度	**Storage temperature**	-20...70°C	
使用高度	**Operation altitude**	<2000 m	
机械特性	**Mechanics**	1000 W / 1500 W	3000 W
- 重量[2]	- Weight [2]	11.5 kg	14.7 kg
- 产品尺寸（宽x高x长） [3]	- Dimensions (W H D) [3]	19“ 2 HE/2U 460 mm	19“ 2 HE/2U 460 mm

[1] 见153页 / See page 153
[2] 标准型号，带选项功能的则会不同 / Standard version, models with options may vary
[3] 标准型号的外壳尺寸，非整体尺寸，带选项功能的还会有不同 / Enclosure of the standard version and not overall size, versions with options may vary

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标准型号规格 / Standard models

型号	电压	电流	功率	效率	U最大时的纹波(2	I最大时的纹波(2	编程 / Programming (1		订购编号 (3
Model	**Voltage**	**Current**	**Power**	**Efficiency**	**Ripple U max. (2**	**Ripple I max. (2**	**U (typ.)**	**I (typ.)**	**Ordering number (3**
PS 9040-40 2U	0...40 V	0...40 A	0...1000 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	53 mA_{PP} / 3.7 mA_{RMS}	0.8 mV	0.8 mA	06230220
PS 9080-40 2U	0...80 V	0...40 A	0...1000 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	53 mA_{PP} / 3.7 mA_{RMS}	1.5 mV	0.8 mA	06230204
PS 9200-15 2U	0...200 V	0...15 A	0...1000 W	≤93%	164 mV_{PP} / 34 mV_{RMS}	11 mA_{PP} / 2.2 mA_{RMS}	4 mV	0.3 mA	06230205
PS 9360-10 2U	0...360 V	0...10 A	0...1000 W	≤93%	210 mV_{PP} / 59 mV_{RMS}	5.5 mA_{PP} / 1.6 mA_{RMS}	7 mV	0.2 mA	06230206
PS 9500-06 2U	0...500 V	0...6 A	0...1000 W	≤93%	190 mV_{PP} / 48 mV_{RMS}	1.9 mA_{PP} / 0.5 mA_{RMS}	10 mV	0.1 mA	06230207
PS 9750-04 2U	0...750 V	0...4 A	0...1000 W	≤93%	212 mV_{PP} / 60 mV_{RMS}	1 mA_{PP} / 0.3 mA_{RMS}	15 mV	0.1 mA	06230208
PS 9040-60 2U	0...40 V	0...60 A	0...1500 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	79 mA_{PP} / 5.6 mA_{RMS}	0.8 mV	1.1 mA	06230219
PS 9080-60 2U	0...80 V	0...60 A	0...1500 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	79 mA_{PP} / 5.6 mA_{RMS}	1.5 mV	1.1 mA	06230209
PS 9200-25 2U	0...200 V	0...25 A	0...1500 W	≤93%	164 mV_{PP} / 34 mV_{RMS}	16 mA_{PP} / 3.3 mA_{RMS}	4 mV	0.5 mA	06230210
PS 9360-15 2U	0...360 V	0...15 A	0...1500 W	≤93%	210 mV_{PP} / 59 mV_{RMS}	8.3 mA_{PP} / 2.4 mA_{RMS}	7 mV	0.3 mA	06230211
PS 9500-10 2U	0...500 V	0...10 A	0...1500 W	≤93%	190 mV_{PP} / 48 mV_{RMS}	2.8 mA_{PP} / 0.7 mA_{RMS}	10 mV	0.2 mA	06230212
PS 9750-06 2U	0...750 V	0...6 A	0...1500 W	≤93%	212 mV_{PP} / 60 mV_{RMS}	1.5 mA_{PP} / 0.5 mA_{RMS}	15 mV	0.1 mA	06230213
PS 9040-120 2U	0...40 V	0...120 A	0...3000 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	158 mA_{PP} / 11 mA_{RMS}	1.5 mV	2.3 mA	06230214
PS 9080-120 2U	0...80 V	0...120 A	0...3000 W	≤92%	114 mV_{PP} / 8 mV_{RMS}	158 mA_{PP} / 11 mA_{RMS}	0.8 mV	2.3 mA	06230221
PS 9200-50 2U	0...200 V	0...50 A	0...3000 W	≤93%	164 mV_{PP} / 34 mV_{RMS}	32 mA_{PP} / 6.5 mA_{RMS}	4 mV	1 mA	06230215
PS 9360-30 2U	0...360 V	0...30 A	0...3000 W	≤93%	210 mV_{PP} / 59 mV_{RMS}	17 mA_{PP} / 5 mA_{RMS}	7 mV	0.6 mA	06230216
PS 9500-20 2U	0...500 V	0...20 A	0...3000 W	≤93%	190 mV_{PP} / 48 mV_{RMS}	6 mA_{PP} / 1.5 mA_{RMS}	10 mV	0.4 mA	06230217
PS 9750-12 2U	0...750 V	0...12 A	0...3000 W	≤93%	212 mV_{PP} / 60 mV_{RMS}	3 mA_{PP} / 0.9 mA_{RMS}	15 mV	0.2 mA	06230218

(1 无产品错误时的可编程分辨率 / Programmable resolution without device error
(2 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(3 标准型号的产品编码，带3 W选项功能的编码则会不同 / Ordering number of the standard version, models with option 3 W installed have different Ordering numbers.

高速选项的参数

注意：带高速选项功能的型号主要是其输出电容与噪音（即：纹波）与标准型号不同。

High speed models

Note: the high speeds models primarily differ from the standard models regarding output capacity and noise (i.e. ripple).

型号	电压	电流	功率	U最大时的纹波 (1	输出电容	下降时间 (2	订购编号 (3
Model	**Voltage**	**Current**	**Power**	**Ripple U max. (1**	**Output capacity**	**Fall time (2**	**Ordering number (3**
PS 9040-40 2U HS	0...40 V	0...40 A	0...1000 W	500 mV_{PP} / 64 mV_{RMS}	86 µF	< 146 ms	06730219
PS 9080-40 2U HS	0...80 V	0...40 A	0...1000 W	500 mV_{PP} / 64 mV_{RMS}	86 µF	< 146 ms	06730204
PS 9200-15 2U HS	0...200 V	0...15 A	0...1000 W	450 mV_{PP} / 17 mV_{RMS}	40 µF	< 266 ms	06730205
PS 9360-10 2U HS	0...360 V	0...10 A	0...1000 W	1200 mV_{PP} / 48 mV_{RMS}	20 µF	< 479 ms	06730206
PS 9500-06 2U HS	0...500 V	0...6 A	0...1000 W	700 mV_{PP} / 24 mV_{RMS}	15 µF	< 688 ms	06730207
PS 9750-04 2U HS	0...750 V	0...4 A	0...1000 W	680 mV_{PP} / 44 mV_{RMS}	9 µF	< 1037 ms	06730208
PS 9040-60 2U HS	0...40 V	0...60 A	0...1500 W	500 mV_{PP} / 64 mV_{RMS}	86 µF	< 146 ms	06730220
PS 9080-60 2U HS	0...80 V	0...60 A	0...1500 W	500 mV_{PP} / 64 mV_{RMS}	86 µF	< 146 ms	06730209
PS 9200-25 2U HS	0...200 V	0...25 A	0...1500 W	450 mV_{PP} / 17 mV_{RMS}	40 µF	< 266 ms	06730210
PS 9360-15 2U HS	0...360 V	0...15 A	0...1500 W	1200 mV_{PP} / 48 mV_{RMS}	20 µF	< 479 ms	06730211
PS 9500-10 2U HS	0...500 V	0...10 A	0...1500 W	700 mV_{PP} / 24 mV_{RMS}	15 µF	< 688 ms	06730212
PS 9750-06 2U HS	0...750 V	0...6 A	0...1500 W	680 mV_{PP} / 44 mV_{RMS}	9 µF	< 1037 ms	06730213
PS 9040-120 2U HS	0...40 V	0...120 A	0...3000 W	500 mV_{PP} / 64 mV_{RMS}	172 µF	< 146 ms	06730221
PS 9080-120 2U HS	0...80 V	0...120 A	0...3000 W	500 mV_{PP} / 64 mV_{RMS}	172 µF	< 146 ms	06730214
PS 9200-50 2U HS	0...200 V	0...50 A	0...3000 W	450 mV_{PP} / 17 mV_{RMS}	80 µF	< 266 ms	06730215
PS 9360-30 2U HS	0...360 V	0...30 A	0...3000 W	1200 mV_{PP} / 48 mV_{RMS}	40 µF	< 479 ms	06730216
PS 9500-20 2U HS	0...500 V	0...20 A	0...3000 W	700 mV_{PP} / 24 mV_{RMS}	30 µF	< 688 ms	06730217
PS 9750-12 2U HS	0...750 V	0...12 A	0...3000 W	680 mV_{PP} / 44 mV_{RMS}	18 µF	< 1037 ms	06730218

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 针对标准型号，带可选件的重量会不同 / of standard version, models with options may vary
(3 标准型号的产品编码，带3 W选项功能的编码则会不同 / Ordering number of the standard version, models with option 3 W installed have different Ordering numbers.

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EA-PS 9080-340 3U

- 多相输入340...460 V_{AC} 或 188...229 V_{AC} (US)
- 效率高达95.5%
- 输出功率有：0...3.3 kW, 0...5 kW, 0...6.6 kW, 0...10 kW, 0...15 kW还可扩展至0...150 kW
- 输出电压：0...40 V 至 0...1500 V
- 输出电流：0...30 A 至 0...510 A
  还可扩展至0...5100 A
- 灵活的功率调整输出
- 各种保护功能（OVP, OCP, OPP, OTP）
- 带按钮的控制面板与蓝色显示器，可显示实际值与设定值、状态与报警
- 隔离模拟接口
  - 通过0...10 V或0...5 V电压可对U / I / P编程
  - 通过0...10 V或0...5 V电压可监控U / I
- 可自动检测的远程感测
- 温控风扇制冷
- 3U高的19“外壳
- 符合SELV标准 (EN 60950)的40 V产品型号
- 放电电路 (在10 s内U_{out} < 60 V)
- 内置USB与以太网端口或选择安装IEEE/GPIB端口
- EMC符合IEC 61000-6-2:2006标准 B等级
- 支持SCPI指令语言

- **Multi-phase input 340...460 V_{AC} or 188...229 V_{AC} (US)**
- **High efficiency up to 95.5%**
- **Output power ratings: 0...3.3 kW, 0...5 kW, 0...6.6 kW, 0...10 kW, 0...15 kW, expandable up to 150 kW**
- **Output voltages: 0...40 V up to 0...1500 V**
- **Output currents: 0...30 A up to 0...510 A**
  Expandable up to 0...5100 A
- **Auto-ranging output stage**
- **Various protection circuits (OVP, OCP, OPP, OTP)**
- **Control panel with pushbuttons and blue LCD for actual values, set values, status and alarms**
- **Galvanically isolated analog interface with**
  - **U / I / P programmable via 0...10 V or 0...5 V**
  - **U / I monitoring via 0...10 V or 0...5 V**
- **Remote sense with automatic detection**
- **Temperature controlled fans for cooling**
- **19“ enclosure in 3U**
- **40 V models according to SELV (EN 60950)**
- **Discharge circuit (U_{out} < 60 V in ≤ 10 s)**
- **USB and Ethernet port integrated or alternatively installed IEEE/GPIB port**
- **EMC TUV approved for IEC 61000-6-2:2006 Class B**
- **SCPI command language supported**

概要

EA-PS 9000 3U系列是一款由微处理器控制的高效实验室电源，其标准型号配备多种功能和特征，用户使用起来非常方便、有效。

控制面板上清晰地分布有两个旋钮，六个按钮，以及两个 LED 灯。同时还有一显示所有数值与状态的蓝色液晶显示器，从而简化了产品的使用。

若想获得更大的输出功率，可按照用户需求，将多台单机装于最高达 42U 的机柜内，以获得高达 150 kW 的功率。也可见 146 页。

交流输入

本系列所有型号都采用主动式PFC功率因数校正线路，专为在 340 V 至 460 V AC（欧标型号）或188 V 至229 V AC（美标型号）三相供电条件下操作而设计。

General

The microprocessor controlled high efficiency laboratory power supplies of series EA-PS 9000 3U offer many functions and features in their standard version, making the use of this equipment remarkably easy and most effective.
The clearly arranged control panel features two rotary knobs, six pushbuttons and two LEDs. Together with an illuminated, blue LC display for all values and status it simplifies the use of the device.
In order to achieve even higher output power than the single units can supply, cabinets with up to 150 kW and up to 42U size can be configured to suit the user‘s requirements. Also see page 146.

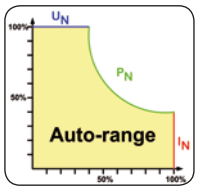
AC input

All models are provided with an active Power Factor Correction circuit and are designed for a usage on a three-phase supply with 340 V up to 460 V AC. (european models) or 188 V up to 229 V AC (US models).

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功率

本系列所有产品输出功率可灵活调整，在低电流时输出更高电压，或在低电压时输出更大电流，都由最大额定输出功率来限制。因此一台该产品能涵盖大范围的应用领域。



Power

The devices are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. Therefore, a wide range of applications can already be covered by the use of just one single unit.

直流输出

本系列有多款不同型号，可选择 0...40 V 和 0...1500 V 输出电压，0...40 A 和 0...510 A 输出电流，0...3.3 kW，0...5 kW，0...6.6 kW，0...10 kW 或 0...15 kW 输出功率的多个型号。输出端位于产品后板。

放电电路

额定输出电压为200 V或以上的产品对其输出电容配有一放电电路。在空载或带很小负载的情况下，它能保证危险的输出电压在直流输出关闭后降至60 V DC以下。该电压值被认为是对人身安全有危险的极限电压。

DC output

DC output voltages between 0...40 V and 0...1500 V, output currents between 0...40 A and 0...510 A and output power ratings of 0...3.3 kW, 0...5 kW, 0...6.6 kW, 0...10 kW or 0...15 kW are available. The output terminal is located in the rear panel.

Discharge circuit

Models with a nominal output voltage of 200 V or higher include a discharge circuit for the output capacities. For no load or low load situations, it ensures that the dangerous output voltage can sink to under 60 V DC after the DC output has been switched off. This value is considered as limit for voltages dangerous to human safety.

保护功能

为保护连接负载，可给产品设定一过压保护极限值(OVP)，以及过流(OCP)与过功率(OPP)保护极限值。

一旦因任何缘故超过了这三个极限值中的一个，直流输出会被立即切断，在显示器和接口端会发出一状态信号。

本产品还有过温保护功能，如果产品过热，它会关断直流输出。

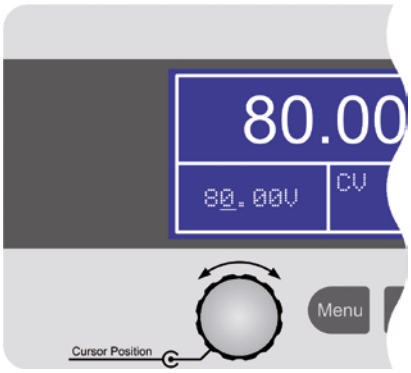
Protective features

For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP) and overpower (OPP).
As soon as one of these thresholds is reached for any reason, the DC output will be immediately shut off and a status signal will be generated on the display and via the interfaces.
There is furthermore an overtemperature protection, which will shut off the DC output if the device overheats.

显示器和控制键

产品的所有重要信息都于一点阵显示器上清晰可见。
通过该显示器，电压与电流的实际输出值和预设值，(CV, CC, CP) 实际控制状态与其它状态，以及报警错误信息与设置菜单的设定，都清晰显示出来。

为使旋钮可以调节参数，只需按一下该旋钮，就可更换数值小数点后的光标位置。所有这些功能都归功于其方便易用的操作方式。



Display and controls

All important information is clearly visualised on a dot matrix display.
With this, information about the actual output values and set values of voltage and current, the actual control state (CV, CC, CP) and other statuses, as well as alarms and settings of the setup menu are clearly displayed.
In order to ease adjusting of values by the rotary knobs, pushing them can switch between decimal positions of a value. All these features contribute to an operator friendliness.

其面板锁定功能可以锁定整个面板，从而避免产品与连接负载出现误操作。

With a panel lock feature, the whole panel can be locked in order to protect the equipment and the loads from unintentional misuse.

扩展功能

可按需求将本系列单机产品组成各种配置，并装于高至42U的机柜内，并联后获得一个总功率高达150 kW的组合系统。也可参考第 146页。

Extensibility

The single units can be combined into various configurations upon request and in cabinets of up to 42U height, in order to build parallel systems of up to 150 kW total power. Also see page 146.

远程感测

标准远程感测输入端可直接连到负载设备，以补偿连线上的压降。如果输入端已接上负载，本电源会自动调整输出电压，以确保负载获得准确所需的电压值。

Remote sensing

The standard sensing input can be connected directly to the load in order to compensate voltage drops along the power cables. If the sensing input is connected to the load, the power supply will adjust the output voltage automatically to ensure the required voltage is available at the load.

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数字接口

本系列所有型号的后板上标配有两个电隔离数字接口（1x USB & 1x Ethernet, 带3 W选项功能：1x USB & 1x GPIB）。可通过发送SCPI语言指令或Modbus协议经USB与Ethernet端口控制和监控产品，GPIB仅支持SCPI语言。

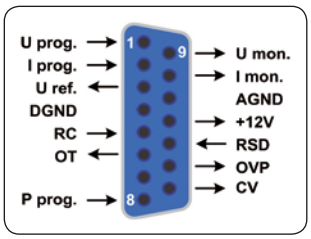
Digital interfaces

All models features two galvanically isolated, digital interfaces by default (standard: 1xUSB & Ethernet, with option 3 W: 1X USB & 1X GPIB) , which are located on the rear side. USB and Ethernet can be used to control and monitor the devices either with SCPI language commands or Modbus protocol, while with GPIB only SCPI is supported.

模拟接口

隔离模拟接口位于产品后板。它有多个模拟输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流和功率。

模拟输出脚接上0 V...10 V或0 V...5 V电压，可监控输出电压和电流。此外，还有几个输入脚和输出脚，可用来控制和监控产品状态。



Analog Interface

There is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current and power from 0...100% through control voltages of 0...10 V or 0...5 V.
To monitor the output voltage and current, there are analog outputs with voltage ranges of 0...10 V or 0...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

选购件

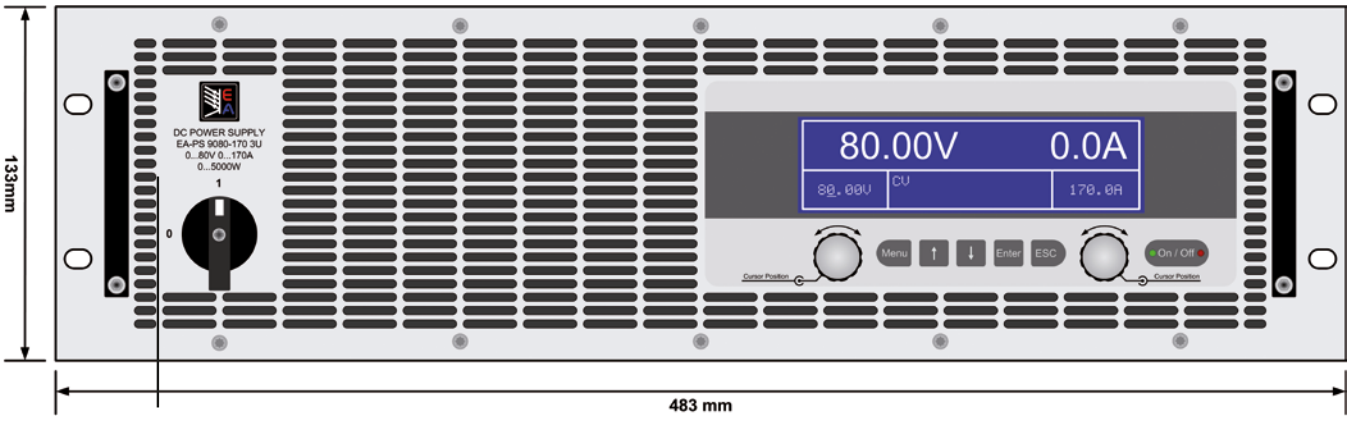
- 高速跃变（也可见152页）*
- 水制冷（仅针对200 V以下型号）
- 还可安装带固定GPIB端口的三位接口（3 W），而非接口模块用的默认插槽

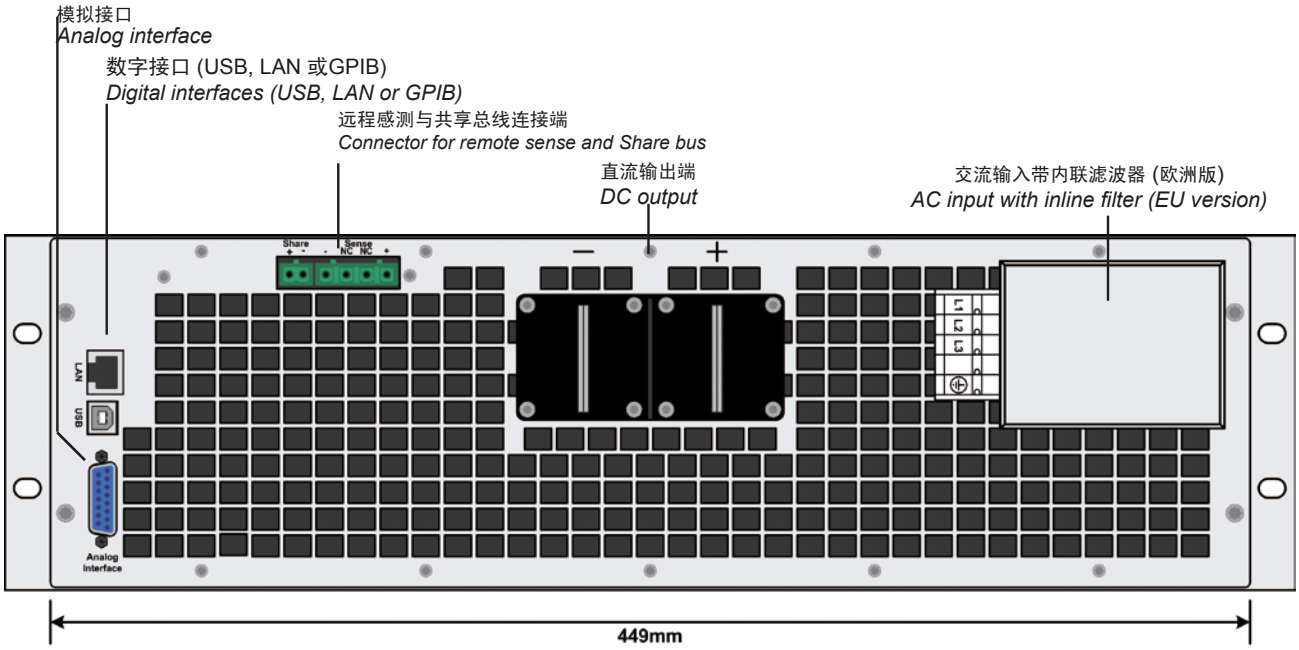
* 并非针对所有电压--具体请咨询

Options

- High speed ramping (see page 152) *
- Water cooling (only for models up to 200 V)
- Three-way interface (3 W) with a rigid GPIB port installed instead of the default slot for retrofittable interface modules.

* not for all voltages - please enquire for availability





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技术参数	Technical Data	Series EA-PS 9000 3U / 系列
AC输入	**Input AC**	
- 电压	- Voltage standard	欧版型号 / European models: 340...460 V, 2ph/3ph 美版型号 / US models: 188...229 V, 2ph/3ph
- 频率	- Frequency	45...65 Hz
- 功率因数	- Power factor	>0.99
输出：DC电压	**Output: Voltage DC**	
- 精确度	- Accuracy	<0.1%
- 0-100% 的负载调整率	- Load regulation 0-100%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%
- 负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms
- 负载从10-90%上升需时	- Slew rate 10-90%	最长30 ms
- 过压保护	- Overvoltage protection	可调，范围为0...110% U_{nenn} / adjustable, 0...110% U_{nom}
- 直流端关闭时空载放电需时	- No load discharge time on DC off	100% U 针对 / to <60 V; 少于10 s / less than 10 s
输出：电流	**Output: Current**	
- 精确度	- Accuracy	<0.2%
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%
输出：功率	**Output power**	
- 精确度	- Accuracy	<1%
过压类别	**Overvoltage category**	2
保护功能	**Protection**	OTP, OVP, OPP, PF, OCP [2]
隔离耐压	**Isolation**	
- 输入对外壳	- Input to enclosure	2500 V DC
- 输入对输出	- Input to output	2500 V DC
- 输出对外壳	- Output to enclosure	根据型号不同而不同，详见后面表格 / Depending on model, see tables
污染等级	**Pollution degree**	2
保护级别	**Protection class**	1
模拟接口	**Analog interface**	内置15-针D-Sub母插，电隔离 / Built in, 15-pole D-Sub (female), galvanically isolated
- 输入范围	- Input range	0...5 V 或 / or 0...10 V (可转换 / switchable)
- U / I / P的精确度	- Accuracy U / I / P	0...10 V: <0.1% 0...5 V: <0.2%
串联操作	**Series operation**	可实现，但取决于直流负极对PE的耐压 / Possible, but depending on the isolation of DC- against PE
- 主-从（Master-Slave）	- Master-Slave	可实现 / Possible
并联操作	**Parallel operation**	可实现，通过共享总线操作或模拟接口 / Possible, via Share Bus operation or via analog interface
- 主-从（Master-Slave）	- Master-Slave	可实现 / Possible
安全标准	**Standards**	EN 60950, EN 61326 通过TÜV认证 / EMC TÜV approved according to IEC 61000-6-2:2005 IEC 61000-6-3:2006 Class B
制冷方式	**Cooling**	风扇，还可选择：水冷 / Fan, optional: water
工作温度	**Operation temperature**	0...50°C
储存温度	**Storage temperature**	-20...70°C
相对湿度	**Relative humidity**	<80%, 无凝露 / non-condensing
使用高度	**Operation altitude**	<2000 m
产品尺寸 (宽x高x长) [1]	**Dimensions (W H D)** [1]	19“ 3 HE/3U 609 mm

[1] 仅为外壳尺寸，非整体尺寸 / Enclosure only, not overall
[2] 见153页 / See page 153

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技术参数	Technical Data	PS 9040-170 3U	PS 9080-170 3U	PS 9200-70 3U	PS 9360-40 3U
DC输出电压	Output voltage DC	0...40 V	0...80 V	0...200 V	0...360 V
- 纹波 (1	- Ripple (1	<200 mV_{PP} <16 mV_{RMS}	<200 mV_{PP} <16 mV_{RMS}	<300 mV_{PP} <40 mV_{RMS}	<320 mV_{PP} <55 mV_{RMS}
- 感测端电压补偿	-Sense compensation	≈1 V	≈2 V	≈5 V	≈7.5 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±400 V DC	±400 V DC	±400 V DC	±400 V DC
- 输出正极对PE	- Positive output <-> PE	±400 V DC	±400 V DC	±600 V DC	±600 V DC
输出电流	Output current	0...170 A	0...170 A	0...70 A	0...40 A
- 纹波 (1	- Ripple (1	<80 mA_{RMS}	<80 mA_{RMS}	<22 mA_{RMS}	<18 mA_{RMS}
输出功率	Output power	0...3300 W	0...5000 W	0...5000 W	0...5000 W
效率	Efficiency	~93%	~93%	~95%	~93%
U的编程分辨率	Programming resolution U	≤2 mV	≤4 mV	≤9 mV	≤15 mV
I的编程分辨率	Programming resolution I	≤7 mA	≤7 mA	≤3 mA	≤2 mA
重量 (2	Weight (2	≈17 kg	≈17 kg	≈17 kg	≈17 kg
欧版订购编号 (3	Ordering number Euro (3	06230250	06230251	06230252	06230253
美版订购编号 (3	Ordering number US (3	06238250	06238251	06238252	06238253

技术参数	Technical Data	PS 9500-30 3U	PS 9750-20 3U	PS 9040-340 3U	PS 9040-510 3U
DC输出电压	Output voltage DC	0...500 V	0...750 V	0...40 V	0...40 V
- 纹波 (1	- Ripple (1	<350 mV_{PP} <70 mV_{RMS}	<800 mV_{PP} <200 mV_{RMS}	<320 mV_{PP} <25 mV_{RMS}	<320 mV_{PP} <25 mV_{RMS}
- 感测端电压补偿	-Sense compensation	≈10 V	≈15 V	≈1 V	≈1 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±725 V DC	±725 V DC	±400 V DC	±400 V DC
- 输出正极对PE	- Positive output <-> PE	±1000 V DC	±1000 V DC	±400 V DC	±400 V DC
输出电流	Output current	0...30 A	0...20 A	0...340 A	0...510 A
- 纹波 (1	- Ripple (1	<16 mA_{RMS}	<16 mA_{RMS}	<160 mA_{RMS}	<120 mA_{RMS}
输出功率	Output power	0...5000 W	0...5000 W	0...6600 W	0...10000 W
效率	Efficiency	≈95.5%	≈94%	≈93%	≈93%
U的编程分辨率	Programming resolution U	≤21 mV	≤31 mV	≤2 mV	≤2 mV
I的编程分辨率	Programming resolution I	≤2 mA	≤1 mA	≤14 mA	≤21 mA
重量 (2	Weight (2	≈17 kg	≈17 kg	≈24 kg	≈30 kg
欧版订购编号 (3	Ordering number Euro (3	06230254	06230255	06230256	06230263
美版订购编号 (3	Ordering number US (3	06238254	06238255	06238256	06238263

技术参数	Technical Data	PS 9080-340 3U	PS 9200-140 3U	PS 9360-80 3U	PS 9500-60 3U
DC输出电压	Output voltage DC	0...80 V	0...200 V	0...360 V	0...500 V
- 纹波 (1	- Ripple (1	<320 mV_{PP} <25 mV_{RMS}	<300 mV_{PP} <40 mV_{RMS}	<320 mV_{PP} <55 mV_{RMS}	<350 mV_{PP} <70 mV_{RMS}
- 感测端电压补偿	-Sense compensation	≈2 V	≈5 V	≈7.5 V	≈10 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±400 V DC	±400 V DC	±400 V DC	±725 V DC
- 输出正极对PE	- Positive output <-> PE	±400 V DC	±600 V DC	±600 V DC	±1000 V DC
输出电流	Output current	0...340 A	0...140 A	0...80 A	0...60 A
- 纹波 (1	- Ripple (1	<160 mA_{RMS}	<44 mA_{RMS}	<35 mA_{RMS}	<32 mA_{RMS}
输出功率	Output power	0...10000 W	0...10000 W	0...10000 W	0...10000 W
效率	Efficiency	≈93%	≈95%	≈93%	≈95%
U的编程分辨率	Programming resolution U	≤4 mV	≤9 mV	≤15 mV	≤21 mV
I的编程分辨率	Programming resolution I	≤14 mA	≤6 mA	≤4 mA	≤3 mA
重量 (2	Weight (2	≈24 kg	≈24 kg	≈24 kg	≈24 kg
欧版订购编号 (3	Ordering number Euro (3	06230257	06230258	06230259	06230260
美版订购编号 (3	Ordering number US (3	06238257	06238258	06238259	06238260

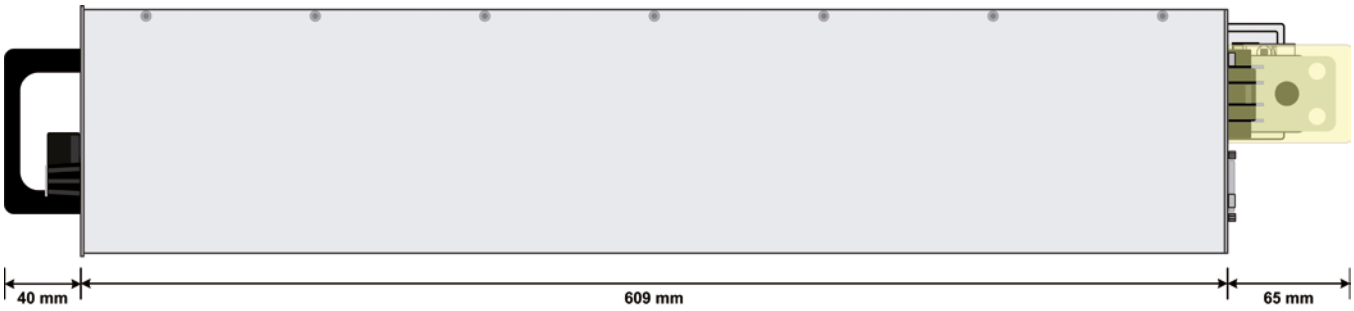
(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 针对标准型号，带可选件的重量会不同 / of standard version, models with options may vary
(3 标准型号的产品编码，带3 W选项功能的编码则会不同 / Ordering number of the standard version, models with option 3 W installed have different Ordering numbers.

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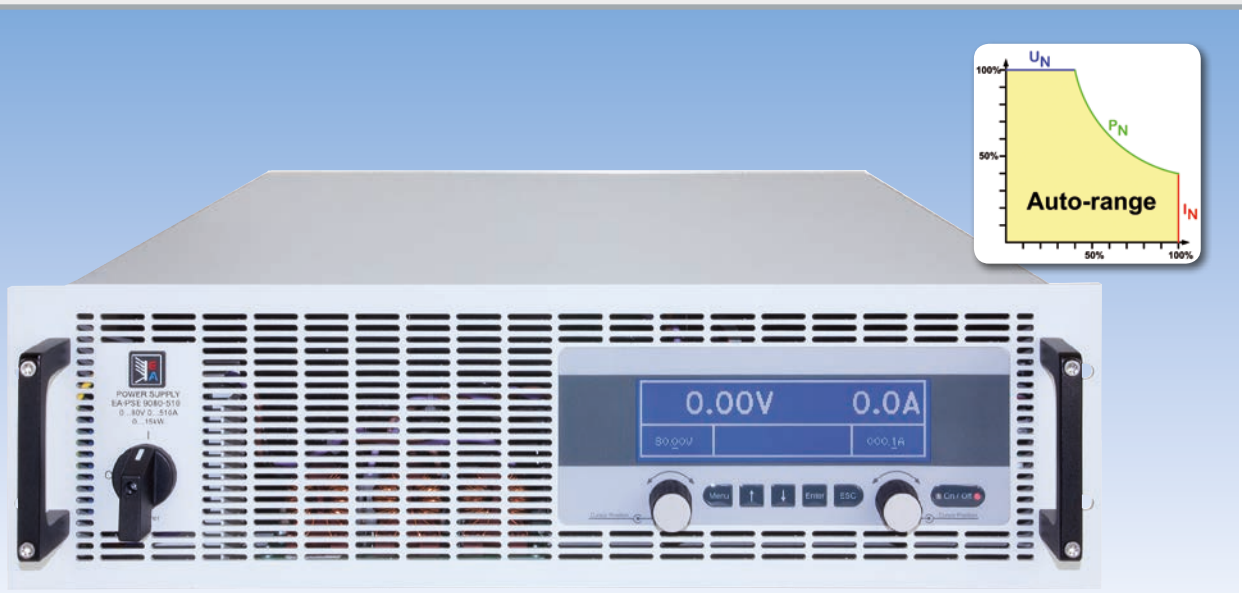
技术参数	Technical Data	PS 9750-40 3U	PS 91000-30 3U	PS 9080-510 3U	PS 9200-210 3U
DC输出电压	Output voltage DC	0...750 V	0...1000 V	0...80 V	0...200 V
- 纹波 (1	- Ripple (1	<800 mV_{PP} <200 mV_{RMS}	<160 mV_{PP} <350 mV_{RMS}	<320 mV_{PP} <25 mV_{RMS}	<300 mV_{PP} <40 mV_{RMS}
- 感测端电压补偿	-Sense compensation	≈15 V	≈20 V	≈2.5 V	≈6 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±725 V DC	±725 V DC	±400 V DC	±400 V DC
- 输出正极对PE	- Positive output <-> PE	±1000 V DC	±1000 V DC	±400 V DC	±600 V DC
输出电流	Output current	0...40 A	0...30 A	0...510 A	0...210 A
- 纹波 (1	- Ripple (1	<32 mA_{RMS}	<22 mA_{RMS}	<240 mA_{RMS}	<66 mA_{RMS}
输出功率	Output power	0...10000 W	0...10000 W	0...15000 W	0...15000 W
效率	Efficiency	≈94%	≈95%	≈93%	≈95%
U的编程分辨率	Programming resolution U	≤31 mV	≤41 mV	≤4 mV	≤9 mV
I的编程分辨率	Programming resolution I	≤2 mA	≤2 mA	≤21 mA	≤9 mA
重量 (2	Weight (2	≈24 kg	≈24 kg	≈30 kg	≈30 kg
欧版订购编号 (3	Ordering number Euro (3	06230261	06230262	06230264	06230265
美版订购编号 (3	Ordering number US (3	06238261	06238262	06238264	06238265

技术参数	Technical Data	PS 9360-120 3U	PS 9500-90 3U	PS 9750-60 3U	PS 91500-30 3U
DC输出电压	Output voltage DC	0...360 V	0...500 V	0...750 V	0...1500 V
- 纹波 (1	- Ripple (1	<320 mV_{PP} <55 mV_{RMS}	<350 mV_{PP} <70 mV_{RMS}	<800 mV_{PP} <200 mV_{RMS}	<2400 mV_{PP} <400 mV_{RMS}
- 感测端电压补偿	-Sense compensation	≈7.5 V	≈10 V	≈15 V	≈30 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±400 V DC	±725 V DC	±725 V DC	±725 V DC
- 输出正极对PE	- Positive output <-> PE	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC
输出电流	Output current	0...120 A	0...90 A	0...60 A	0...30 A
- 纹波 (1	- Ripple (1	<50 mA_{RMS}	<48 mA_{RMS}	<48 mA_{RMS}	<26 mA_{RMS}
输出功率	Output power	0...15000 W	0...15000 W	0...15000 W	0...15000 W
效率	Efficiency	≈93%	≈95%	≈94%	≈95%
U的编程分辨率	Programming resolution U	≤15 mV	≤21 mV	≤31 mV	≤61 mV
I的编程分辨率	Programming resolution I	≤5 mA	≤4 mA	≤3 mA	≤2 mA
重量 (2	Weight (2	≈30 kg	≈30 kg	≈30 kg	≈30 kg
欧版订购编号 (3	Ordering number Euro (3	06230266	06230267	06230268	06230269
美版订购编号 (3	Ordering number US (3	06238266	06238267	06238268	06238269

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 针对标准型号，带可选件的重量会不同 / of standard version, models with options may vary



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EA-PSE 9080-340 3U

- 多相输入电压340...460 V_{AC} 或 188...229 V_{AC} (US)
- 效率高达95.5%
- 输出功率有：0...3.3 kW, 0...5 kW, 0...6.6 kW, 0...10 kW, 0...15 kW还可扩展至0...150 kW
- 输出电压：0...40 V 至 0...1500 V
- 输出电流：0...30 A 至 0...510 A
  还可扩展至0...5100 A
- 灵活的功率调整输出
- 各种保护功能（OVP, OCP, OPP, OTP）
- 带按钮的控制面板与蓝色显示器，可显示实际值与设定值、状态与报警
- 隔离模拟接口
  - 通过0...10 V或0...5 V电压可对U / I / P编程
  - 通过0...10 V或0...5 V电压可监控U / I
- 可自动检测的远程感测
- 温控风扇制冷
- 符合SELV标准 (EN 60950)的40 V产品型号
- 放电电路 (在10 s内U_{out} < 60 V)
- 内置USB与主-从端口
- 可选数字接口模块
- 支持SCPI指令语言

- **Multi-phase input 340...460 V_{AC} or 188...229 V_{AC} (US)**
- **High efficiency up to 95.5%**
- **Output power ratings: 0...3.3 kW, 0...5 kW, 0...6.6 kW, 0...10 kW, 0...15 kW, expandable up to 150 kW**
- **Output voltages: 0...40 V up to 0...1500 V**
- **Output currents: 0...30 A up to 0...510 A**
  Expandable up to 0...5100 A
- **Auto-ranging output stage**
- **Various protection circuits (OVP, OCP, OPP, OTP)**
- **Control panel with pushbuttons and blue LCD for actual values, set values, status and alarms**
- **Galvanically isolated, analog interface with**
  - **U / I / P programmable via 0...10 V or 0...5 V**
  - **U / I monitoring via 0...10 V or 0...5 V**
- **Remote sensing with automatic detection**
- **Temperature controlled fans for cooling**
- **40 V models according to SELV (EN 60950)**
- **Discharge circuit (U_{out} < 60 V in ≤ 10 s)**
- **USB and Master-Slave ports integrated**
- **Optional, digital interface modules**
- **SCPI command language supported**

概要
EA-PSE 9000 3U系列是一款由微处理器控制的高效实验室电源，其标准型号配备多种功能和特征，用户使用起来非常方便、有效。

控制面板上清晰地分布有两个旋钮，六个按钮，以及两个LED 灯。同时还有一显示所有数值与状态的蓝色液晶显示器，从而简化了产品的使用。

若想获得更大的输出功率，可按照用户需求，将多台单机装于最高达 42U 的机柜内，以获得高达 150 kW 的功率。也可见 146 页。

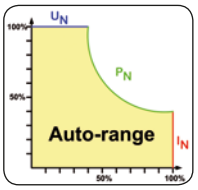
交流输入
本系列所有型号都采用主动式PFC功率因数校正线路，专为在340 V 至 460 V AC（欧标型号）或188 V 至229 V AC（美标型号）三相供电条件下操作而设计。

General
The microprocessor controlled high efficiency laboratory power supplies of series EA-PSE 9000 3U offer many functions and features in their standard version, making the use of this equipment remarkably easy and most effective.
The clearly arranged control panel features two rotary knobs, six pushbuttons and two LEDs. Together with an illuminated, blue LCD display for all values and status it simplifies the use of the device.
In order to achieve even higher output power than the single units can supply, cabinets with up to 150 kW and up to 42U size can be configured to suit the user's requirements. Also see page 146.

AC input
All models are provided with an active Power Factor Correction circuit and are designed for a usage on a three-phase supply with 340 V up to 460 V AC (european models) or 188 V up to 229 V AC (US models).

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功率
本系列所有产品输出功率可灵活调整，在低电流时输出更高电压，或在低电压时输出更大电流，都由最大额定输出功率来限制。因此一台该产品能涵盖大范围的应用领域。



Power
The devices are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. Therefore, a wide range of applications can already be covered by the use of just one unit.

直流输出
本系列有多款不同型号，可选择 0...40 V 和 0...1500 V 输出电压，0...40 A 和 0...510 A 输出电流，0...3.3 kW，0...5 kW，0...6.6 kW，0...10 kW 或 0...15 kW 输出功率的多个型号。输出端位于产品后板。

DC output
DC output voltages between 0...40 V and 0...1500 V, output currents between 0...40 A and 0...510 A and output power ratings of 0...3.3 kW, 0...5 kW, 0...6.6 kW, 0...10 kW or 0...15 kW are available. The output terminal is located in the rear panel.

放电电路
额定输出电压为200 V或以上的产品对其输出电容配有一放电电路。在空载或带很小负载的情况下，它能保证危险的输出电压在直流输出关闭后降至60 V DC以下。该电压值被认为是对人身安全有危险的极限电压。

Discharge circuit
Models with a nominal output voltage of 200 V or higher include a discharge circuit for the output capacities. For no load or low load situations, it ensures that the dangerous output voltage can sink to under 60 V DC after the DC output has been switched off. This value is considered as limit for voltages dangerous to human safety.

保护功能
为保护连接负载，可给产品设定一过压保护极限值(OVP)，以及过流(OCP)与过功率(OPP)保护极限值。

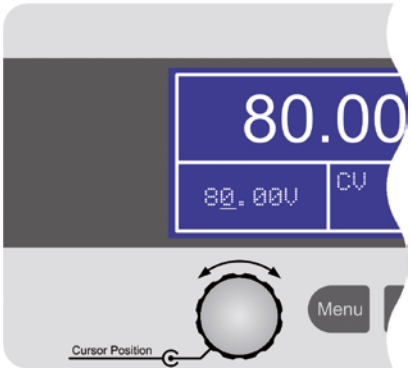
一旦因任何缘故超过了这三个极限值中的一个，直流输出会被立即切断，在显示器和接口端会发出一状态信号。

本产品还有过温保护功能，如果产品过热，它会关断直流输出。

Protective features
For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP) and overpower (OPP).
As soon as one of these thresholds is reached for any reason, the DC output will be immediately shut off and a status signal will be generated on the display and via the interfaces.
There is furthermore an overtemperature protection, which will shut off the DC output if the device overheats.

显示器和控制键
产品的所有重要信息都于一点阵显示器上清晰可见。
通过该显示器，电压与电流的实际输出值和预设值，(CV, CC, CP) 实际控制状态与其它状态，以及报警错误信息与设置菜单的设定，都清晰显示出来。

为使旋钮可以调节参数，只需按一下该旋钮，就可更换数值小数点后的光标位置。所有这些功能都归功于其方便易用的操作方式。



Display and controls
All important information is clearly visualised on a dot matrix display.
With this, information about the actual output values and set values of voltage and current, the actual control state (CV, CC, CP) and other statuses, as well as alarms and settings of the setup menu are clearly displayed.
In order to ease adjusting of values by the rotary knobs, pushing them can switch between decimal positions of a value. All these features contribute to an operator friendliness.

其面板锁定功能可以锁定整个面板，从而避免产品与连接负载出现误操作。

With a panel lock feature, the whole panel can be locked in order to protect the equipment and the loads from unintentional misuse.

扩展功能
可按需求将本系列单机产品组成各种配置，并装于高至42U的机柜内，并联后获得一个总功率高达150 kW的组合系统。也可参考第 146页。

Extensibility
The single units can be combined into various configurations upon request and in cabinets of up to 42U height, in order to build parallel systems of up to 150 kW total power. Also see page 146.

远程感测
标准远程感测输入端可直接连到负载设备，以补偿连线上的压降。如果输入端已接上负载，本电源会自动调整输出电压，以确保负载获得准确所需的电压值。

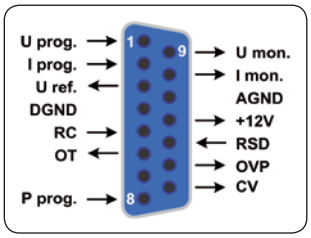
Remote sensing
The standard sensing input can be connected directly to the load in order to compensate voltage drops along the power cables. If the sensing input is connected to the load, the power supply will adjust the output voltage automatically to ensure the required voltage is available at the load.

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数字接口

本系列所有型号的后板上配有一内置USB端口，用户可以选择更换与安装不同的接口模块（IF-AB系列，见139页）。选择这个接口可以让产品跟通用工业自动系统完美地结合。

主-从总线使得用户可以并联多达16台机器，组建更大的系统，以获得更高的功率总和。



Digital interfaces

There is a built-in USB port on the rear which can be added with optionally obtainable, exchangeable and retrofittable interface modules (IF-AB series, see page 139). This choice of interfaces makes it possible to find the optimal connection of the device to common industrial automation systems.

A master-slave bus provides the option to parallel up to 16 units to a bigger system with higher power and totals formation.

模拟接口

隔离模拟接口位于产品后板。它有多个模拟输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流和功率。

模拟输出脚接上0 V...10 V或0 V...5 V电压，可监控输出电压和电流。此外，还有几个输入脚和输出脚，可用来控制和监控产品状态。

Analog interface

There is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current and power from 0...100% through control voltages of 0...10 V or 0...5 V.

To monitor output voltage and current, there are analog outputs with voltage ranges of 0...10 V or 0...5 V. There are also several inputs and outputs for the device status.

选购件

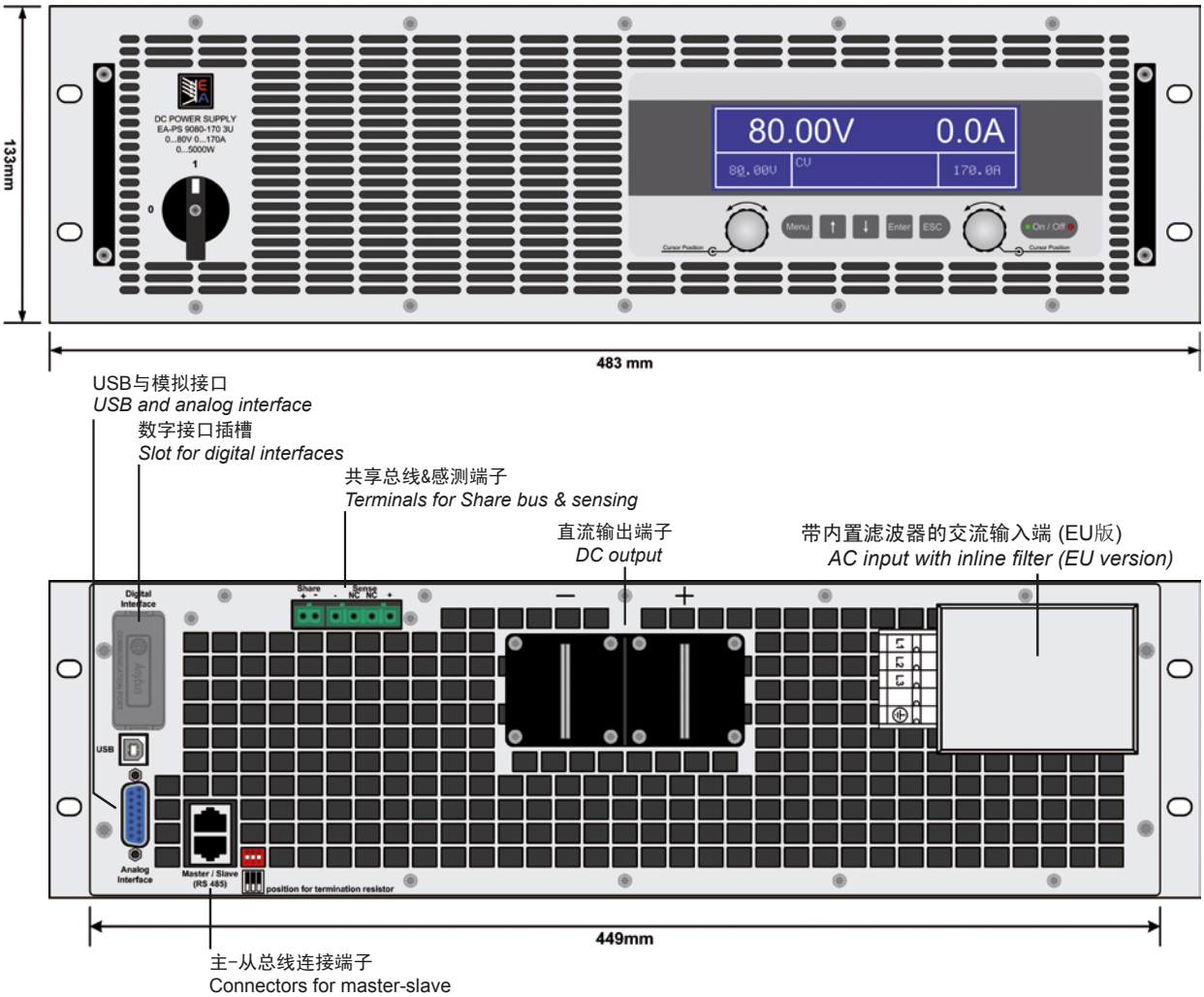
- 可供RS232, CAN, CANopen, Modbus TCP, Profibus, Profinet/IO, Devicenet 或Ethernet数字接口模块，其插槽位于产品后板（仅针对标准型号），可以轻松地插入新的接口或者更换现有的接口。本产品能自动感测接口型号，仅需很少配置或者不需配置。详情见139页。
- 高速跃变（也可见152页）*
- 水制冷（仅针对200 V以下型号）

* 并非针对所有电压--具体请咨询

Options

- Digital interface modules for RS232, CAN, CANopen, Modbus TCP, Profibus, Profinet/IO, Devicenet or Ethernet. The interface slot is located on the rear panel (standard models only), making it easy for the user to plug in a new interface or to replace an existing one. The interface will be automatically detected by the device and requires no or only little configuration. See page 139.
- High speed ramping (see page 152) *
- Water cooling (only for models up to 200 V)

* Not available for all voltages - please quote for availability



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技术参数	Technical Data	Series EA-PSE 9000 3U / 系列
AC输入	**Input AC**	
- 电压	- Voltage standard	欧版型号 / European models: 340...460 V, 2ph/3ph 美版型号 / US models: 188...229 V, 2ph/3ph
- 频率	- Frequency	45...65 Hz
- 功率因数	- Power factor	>0.99
输出：DC电压	**Output: Voltage DC**	
- 精确度	- Accuracy	<0.1%
- 0-100% 的负载调整率	- Load regulation 0-100% load	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%
- 负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms
- 负载从10-90%上升需时	- Slew rate 10-90%	最长30 ms
- 过压保护	- Overvoltage protection	可调，范围为0...110% U_{nenn} / adjustable, 0...110% U_{nom}
- 直流端关闭时空载放电需时	- No load discharge time on DC off	100% U 针对 / to <60 V; 少于10 s / less than 10 s
输出：电流	**Output: Current**	
- 精确度	- Accuracy	<0.2%
- 0-100% ΔU_{DC}时的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%
输出：功率	**Output power**	
- 精确度	- Accuracy	<1%
过压类别	**Overvoltage category**	2
保护功能	**Protection**	OTP, OVP, OPP, PF, OCP [2]
隔离耐压	**Isolation**	
- 输入对外壳	- Input to enclosure	2500 V DC
- 输入对输出	- Input to output	2500 V DC
- 输出对外壳	- Output to enclosure (PE)	根据型号不同而不同，详见后面表格 / Depending on model, see tables
污染等级	**Pollution degree**	2
保护级别	**Protection class**	1
模拟接口	**Analog interface**	内置15-针D-Sub母插，电隔离 / Built in, 15-pole D-Sub (female), galvanically isolated
- 输入范围	- Input range	0...5 V 或 / or 0...10 V (可转换 / switchable)
- U / I 的精确度	- Accuracy U / I	0...10 V: <0.2% 0...5 V: <0.4%
串联操作	**Series operation**	可实现，但取决于直流负极对PE的耐压 / Possible, but depending on the isolation of DC- against PE
- 主-从（Master-Slave）	- Master-Slave	可实现 / Possible
并联操作	**Parallel operation**	可实现，通过共享总线操作或模拟接口 / Possible, via Share Bus operation or via analog interface
- 主-从（Master-Slave）	- Master-Slave	可实现 / Possible
安全标准	**Standards**	EN 61326, IEC 1010, EN 61010
制冷方式	**Cooling**	风扇，还可选择：水冷 / Fans, optional: water
工作温度	**Operation temperature**	0...50 °C
储存温度	**Storage temperature**	-20...70 °C
相对湿度	**Relative humidity**	<80%, 无凝露 / non-condensing
使用高度	**Operation altitude**	<2000 m
产品尺寸 (宽x高x长) [1]	**Dimensions (W H D)** [1]	19“ 3 HE/3U 609 mm

[1] 仅为外壳尺寸，非整体尺寸 / Enclosure only, not overall
[2] 见153页 / See page 153

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技术参数	Technical Data	PSE 9040-170 3U	PSE 9080-170 3U	PSE 9200-70 3U	PSE 9360-40 3U
DC输出电压	Output voltage DC	0...40 V	0...80 V	0...200 V	0...360 V
- 纹波 (1	- Ripple (1	<200 mV_{PP} <16 mV_{RMS}	<200 mV_{PP} <16 mV_{RMS}	<300 mV_{PP} <40 mV_{RMS}	<320 mV_{PP} <55 mV_{RMS}
- 感测端电压补偿	-Sensing compensation	≈1 V	≈2 V	≈5 V	≈7.5 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±400 V DC	±400 V DC	±400 V DC	±400 V DC
- 输出正极对PE	- Positive output <-> PE	±400 V DC	±400 V DC	±600 V DC	±600 V DC
输出电流	Output current	0...170 A	0...170 A	0...70 A	0...40 A
- 纹波 (1	- Ripple (1	<80 mA_{RMS}	<80 mA_{RMS}	<22 mA_{RMS}	<18 mA_{RMS}
输出功率	Output power	0...3300 W	0...5000 W	0...5000 W	0...5000 W
效率	Efficiency	≈93%	≈93%	≈95%	≈93%
U的编程分辨率	Programming resolution U	≤2 mV	≤4 mV	≤9 mV	≤15 mV
I的编程分辨率	Programming resolution I	≤7 mA	≤7 mA	≤3 mA	≤2 mA
重量 (2	Weight (2	≈17 kg	≈17 kg	≈17 kg	≈17 kg
欧版订购编号 (3	Ordering number Euro (3	06230700	06230701	06230702	06230703
美版订购编号 (3	Ordering number US (3	06238700	06238701	06238702	06238703

技术参数	Technical Data	PSE 9500-30 3U	PSE 9750-20 3U	PSE 9040-340 3U	PSE 9040-510 3U
DC输出电压	Output voltage DC	0...500 V	0...750 V	0...40 V	0...40 V
- 纹波 (1	- Ripple (1	<350 mV_{PP} <70 mV_{RMS}	<800 mV_{PP} <200 mV_{RMS}	<320 mV_{PP} <25 mV_{RMS}	<320 mV_{PP} <25 mV_{RMS}
- 感测端电压补偿	-Sensing compensation	≈10 V	≈15 V	≈1 V	≈1 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±725 V DC	±725 V DC	±400 V DC	±400 V DC
- 输出正极对PE	- Positive output <-> PE	±1000 V DC	±1000 V DC	±400 V DC	±400 V DC
输出电流	Output current	0...30 A	0...20 A	0...340 A	0...510 A
- 纹波 (1	- Ripple (1	<16 mA_{RMS}	<16 mA_{RMS}	<160 mA_{RMS}	<120 mA_{RMS}
输出功率	Output power	0...5000 W	0...5000 W	0...6600 W	0...10000 W
效率	Efficiency	≈95.5%	≈94%	≈93%	≈93%
U的编程分辨率	Programming resolution U	≤21 mV	≤31 mV	≤2 mV	≤2 mV
I的编程分辨率	Programming resolution I	≤2 mA	≤1 mA	≤14 mA	≤21 mA
重量 (2	Weight (2	≈17 kg	≈17 kg	≈24 kg	≈30 kg
欧版订购编号 (3	Ordering number Euro (3	06230704	06230705	06230706	06230707
美版订购编号 (3	Ordering number US (3	06238704	06238705	06238706	06238707

技术参数	Technical Data	PSE 9080-340 3U	PSE 9200-140 3U	PSE 9360-80 3U	PSE 9500-60 3U
DC输出电压	Output voltage DC	0...80 V	0...200 V	0...360 V	0...500 V
- 纹波 (1	- Ripple (1	<320 mV_{PP} <25 mV_{RMS}	<300 mV_{PP} <40 mV_{RMS}	<320 mV_{PP} <55 mV_{RMS}	<350 mV_{PP} <70 mV_{RMS}
- 感测端电压补偿	-Sensing compensation	≈2 V	≈5 V	≈7.5 V	≈10 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±400 V DC	±400 V DC	±400 V DC	±725 V DC
- 输出正极对PE	- Positive output <-> PE	±400 V DC	±600 V DC	±600 V DC	±1000 V DC
输出电流	Output current	0...340 A	0...140 A	0...80 A	0...60 A
- 纹波 (1	- Ripple (1	<160 mA_{RMS}	<44 mA_{RMS}	<35 mA_{RMS}	<32 mA_{RMS}
输出功率	Output power	0...10000 W	0...10000 W	0...10000 W	0...10000 W
效率	Efficiency	≈93%	≈95%	≈93%	≈95%
U的编程分辨率	Programming resolution U	≤4 mV	≤9 mV	≤15 mV	≤21 mV
I的编程分辨率	Programming resolution I	≤14 mA	≤6 mA	≤4 mA	≤3 mA
重量 (2	Weight (2	≈24 kg	≈24 kg	≈24 kg	≈24 kg
欧版订购编号 (3	Ordering number Euro (3	06230708	06230709	06230710	06230711
美版订购编号 (3	Ordering number US (3	06238708	06238709	06238710	06238711

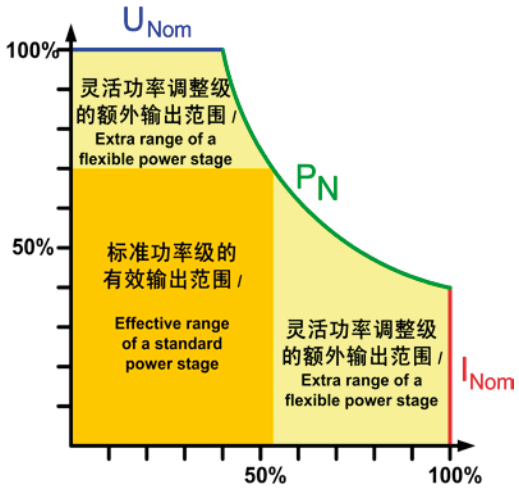
(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 针对标准型号，带可选件的重量会不同 / of standard version, models with options may vary
(3 标准型号的产品编码，带3 W选项功能的编码则会不同 / Ordering number of the standard version, models with option 3 W installed have different Ordering numbers.

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技术参数	Technical Data	PSE 9750-40 3U	PSE 91000-30 3U	PSE 9080-510 3U	PSE 9200-210 3U
DC输出电压	Output voltage DC	0...750 V	0...1000 V	0...80 V	0...200 V
- 纹波 (1	- Ripple (1	<800 mV_{PP} <200 mV_{RMS}	<1600 mV_{PP} <350 mV_{RMS}	<320 mV_{PP} <25 mV_{RMS}	<300 mV_{PP} <40 mV_{RMS}
- 感测端电压补偿	-Sensing compensation	≈15 V	≈20 V	≈2.5 V	≈6 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±725 V DC	±725 V DC	±400 V DC	±400 V DC
- 输出正极对PE	- Positive output <-> PE	±1000 V DC	±1000 V DC	±400 V DC	±600 V DC
输出电流	Output current	0...40 A	0...30 A	0...510 A	0...210 A
- 纹波 (1	- Ripple (1	<32 mA_{RMS}	<22 mA_{RMS}	<240 mA_{RMS}	<66 mA_{RMS}
输出功率	Output power	0...10000 W	0...10000 W	0...15000 W	0...15000 W
效率	Efficiency	≈94%	≈95%	≈93%	≈95%
U的编程分辨率	Programming resolution U	≤31 mV	≤41 mV	≤4 mV	≤9 mV
I的编程分辨率	Programming resolution I	≤2 mA	≤2 mA	≤21 mA	≤9 mA
重量 (2	Weight (2	≈24 kg	≈24 kg	≈30 kg	≈30 kg
欧版订购编号 (3	Ordering number Euro (3	06230712	06230713	06230714	06230715
美版订购编号 (3	Ordering number US (3	06238712	06238713	06238714	06238715

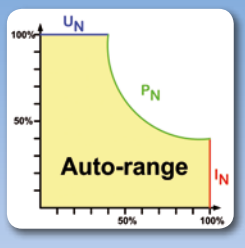
技术参数	Technical Data	PSE 9360-120 3U	PSE 9500-90 3U	PSE 9750-60 3U	PSE 91500-30 3U
DC输出电压	Output voltage DC	0...360 V	0...500 V	0...750 V	0...1500 V
- 纹波 (1	- Ripple (1	<320 mV_{PP} <55 mV_{RMS}	<350 mV_{PP} <70 mV_{RMS}	<800 mV_{PP} <200 mV_{RMS}	<2400 mV_{PP} <400 mV_{RMS}
- 感测端电压补偿	-Sensing compensation	≈7.5 V	≈10 V	≈15 V	≈30 V
隔离耐压	Isolation				
- 输出负极对PE	- Negative output <-> PE	±400 V DC	±725 V DC	±725 V DC	±725 V DC
- 输出正极对PE	- Positve output <-> PE	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC
输出电流	Output current	0...120 A	0...90 A	0...60 A	0...30 A
- 纹波 (1	- Ripple (1	<50 mA_{RMS}	<48 mA_{RMS}	<48 mA_{RMS}	<26 mA_{RMS}
输出功率	Output power	0...15000 W	0...15000 W	0...15000 W	0...15000 W
效率	Efficiency	≈93%	≈95%	≈94%	≈95%
U的编程分辨率	Programming resolution U	≤15 mV	≤21 mV	≤31 mV	≤61 mV
I的编程分辨率	Programming resolution I	≤5 mA	≤4 mA	≤3 mA	≤2 mA
重量 (2	Weight (2	≈30 kg	≈30 kg	≈30 kg	≈30 kg
欧版订购编号 (3	Ordering number Euro (3	06230716	06230717	06230718	06230719
美版订购编号 (3	Ordering number US (3	06238716	06238717	06238718	06238719

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 针对标准型号，带可选件的重量会不同 / of standard version, models with options may vary
(3 标准型号的产品编码，带3 W选项功能的编码则会不同 / Ordering number of the standard version, models with option 3 W installed have different Ordering numbers.



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U I P OVP OCP OTP USB LAN





EA-PSI 5200-10

- 宽范围输入电压90...264 V，带主动式PFC
- 效率高达92%
- 输出功率有：0...160 W至0...640 W
- 输出电压：0...40 V 至 0...200 V
- 输出电流：0...2 A 至 0...40 A
- 灵活的功率调整输出
- 各种保护功能（OVP, OCP, OTP）
- 可显示所有数值与状态的蓝屏液晶显示器
- 远程感测
- 9个预设记忆组
- 电隔离模拟接口
  - 通过0...10 V电压可对U / I / P编程
  - 通过0...10 V电压可监控U / I
- 温控风扇制冷 *
- 上下壳是一整体
- 符合SELV标准 (EN 60950)的40 V产品型号
- 配有USB与以太网端口
- EMC符合EN 55022 等级B
- 支持SCPI指令语言

- **Wide input voltage range 90...264 V with active PFC**
- **High efficiency up to 92%**
- **Output power ratings: 0...160 W up to 0...640 W**
- **Output voltages: 0...40 V up to 0...200 V**
- **Output currents: 0...2 A up to 0...40 A**
- **Flexible, power regulated output stage**
- **Various protection circuits (OVP, OCP, OTP)**
- **Blue LCD display for all value and status**
- **Remote sense**
- **Memory for 9 different presets**
- **Galvanically isolated, analog interface with**
  - **U / I / P programmable via 0...10 V**
  - **U / I monitoring via 0...10 V**
- **Temperature controlled fans for cooling ***
- **Chassis top and bottom closed**
- **40 V models according to SELV (EN 60950)**
- **USB and Ethernet port integrated**
- **EMC according to EN 55022 Class B**
- **SCPI command language supported**

概要
EA-PSI 5000系列是一款由微处理器控制的实验室电源，其标准型号配备多种功能。设定值、实际值与状态都能同一时间清晰显示于蓝光LCD屏上，让用户一览无遗。

所有输出参数的监控功能有助于测试设备的减少，且几乎不需要安装外部的监控硬件与软件。

控制面板上清晰地分布有两个旋钮，五个按钮。用户仅需用手指点触几下就能轻易地操控本产品。

若想集成到远程控制的实验室应用与小的测试系统中，本产品后板还配有一组接口（模拟与数字的都有）。

AC输入
采用主动式功率因数校正线路，使产品在90 V_{AC}至264 V_{AC}全世界宽范围输入电压下都适用。

* 320 W & 640 W 型号

General
The microprocessor controlled laboratory power supplies of series EA-PSI 5000 offer a set of useful standard features, which can facilitate operation. Set values, actual values and status are clearly displayed at the same time on the blue, illuminated LCD, in order to have them at one glance.

The implemented supervision features for all output parameters can help to reduce test equipment and make it almost unnecessary to install external supervision hardware and software. The clearly arranged control panel with its two knobs and five pushbuttons enables the user to handle the device easily with a few touches of a finger.

For the integration into remotely controlled laboratory applications and small test systems, the devices offer a set of interfaces (analog and digital) on their rear side.

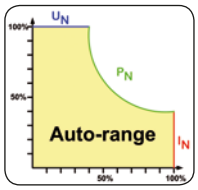
AC input
All units are provided with an active **P**ower **F**actor **C**orrection circuit and are suitable for a worldwide usage on a mains supply from 90 V up to 264 V AC.

* 320 W & 640 W models

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功率

本系列所有型号的输出功率都可灵活调整。可在低电流时输出高电压，或在低电压时输出大电流，但总是受限于最大额定输出功率范围内。本系列产品的设定功率值都可调，因此仅用一台产品却能应用于广范围的应用中。



Power

All models are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. The power set value is adjustable with these models. Therefore, a wide range of applications can already be covered by the use of just one single unit.

直流输出

本系列有多款不同型号，可选择0...40 V和0...200 V输出电压，0...2 A和0...40 A输出电流，0...160 W和0...640 W输出功率的型号。
因此不管是手动还是远程控制（模拟或数字），都可在0%与100%之间连续调节电流、电压与功率。

输出端位于产品后前板上。产品后板还有一个额外的输出端，为螺丝端子。

DC output

DC output voltages between 0...40 V and 0...200 V, output currents between 0...2 A and 0...40 A and output powers between 0...160 W and 0...640 W are available.
Current, voltage and power can be adjusted continuously between 0% and 100%, no matter if manually or remotely controlled (analog or digital).
The output terminal is located on the front panel. There is furthermore an additional output on the rear side on a screw terminal.

保护功能

为保护连接设备，可给产品设定一过压保护极限值(OVP)，以及过流(OCP)保护极限值。

一旦因任何缘故超过了这三个极限值中的一个，直流输出会被立即切断，在显示器和接口端会发出一状态信号。

本产品还有过温保护，如果产品过热，它会关断直流输出。

Protective features

For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP).
As soon as one of these thresholds is reached for any reason, the DC output will be immediately shut off and a status signal will be generated on the display and via the interfaces.
There is furthermore an overtemperature protection, which will shut off the DC output if the device overheats.

显示器和控制键

显示器清晰显示出输出电压与电流的设定与实际值。

旋钮可用来调节设定电压、电流和与功率，以及保护极限值（OCP，OVP）。

为避免误操作，可锁定旋钮。

Display and controls

Set values and actual values of output voltage and output current are clearly represented on the display.
Set values of voltage, current and power, as well as the protection thresholds (OCP, OVP) can be adjusted using the rotary knobs.
To prevent unintentional operations, the knobs can be locked.

输出值的预设

在不影响输出状态的条件下设置输出值，显示器上可显示预设值，即实际值的下方。

这样用户可预设所需输出电压、电流和功率，通过旋钮即可完成。

Presetting of output values

To set output values without a direct reaction to the output condition, the set values are also shown on the display, positioned below the actual values.
With this, the user can preset required values for voltage, current and power. This is done by using the rotary knobs.

回读功能

本产品存有9组不同的预设电压、电流、功率、OVP(可调过压保护极限）与OCP（可调过流保护极限）。只需按一下按钮就可回读，这可避免频繁调节输出值。

Recall feature

The device can store 9 different sets of preset values for voltage, current, power, OVP (adjustable overvoltage protection) and OCP (adjustable overcurrent protection). These can be recalled easily by the push of a button and help to avoid constant adjustment of the output values.

三路接口

该接口位于PSI 5000系列产品的后板上，它有三个连接头：一个模拟接头，两个数字接头。

所有这三个连接头都能用于远程监控与控制本产品。
模拟接头上的输入引脚接上0 V...10 V电压可控制0...100% 的设定电压、电流与功率。

其输出引脚接上0 V...10 V电压可控制0...100% 的输出电压与电流。还有几个输入与输出引脚可用来控制与监控产品状态。

Three-way interface

This interface, which is located on the rear side of all models of PSI 5000 series, offers three connectors: one analog and two digital ones. All three can be used to remotely monitor and control the device.
The analog connector offers inputs to set voltage, current and power in the range of 0...100% through control voltages of 0V...10 V.
To monitor the output voltage and current, there are analog outputs with voltage ranges of 0 V...10 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

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数字接口为**USB**与**Ethernet**端口。可选择性使用，能远程控制产品，或者仅用于数据记录。

远程控制状态会显示在显示器上，此时所有按钮与旋钮，除本地按钮外，都被锁定。

USB端口无需设置，如果产品的IP地址上提供有以太网连接的网络参数，可在网站上设定它。

The digital interfaces are **USB** and **Ethernet**. They can be used alternatively to completely control the device remotely or just record data.
Remote control state is indicated in the display, while all buttons and knobs, except Local button, are locked.

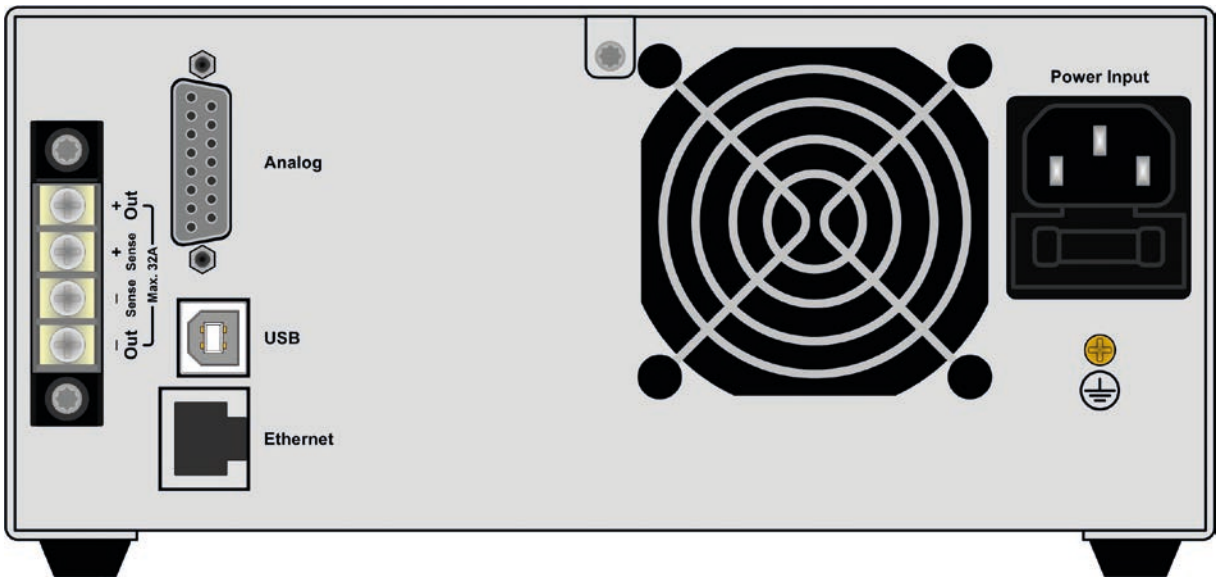
For USB there is no setup required and the network parameters for Ethernet connection can be comfortably configured on a website, that if offered on the device's IP address.

可选配件
• 安全插头一套（可通过电流最大32 A，2个，红/黑），可安装在直流输出螺丝端上。可当非接触安全插座用。适合4 mm的插头。



Options
• Safety adapter set (max. 32 A, 2 pcs. red/black), mounted on top of the DC output screw-clamp terminal, used to achieve a non-contact safety socket. For 4 mm Büschel plug.





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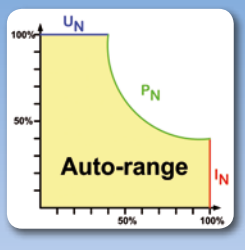
技术参数	Technical Data	PSI 5040-10 A	PSI 5080-05 A	PSI 5200-02 A	PSI 5040-20 A	PSI 5080-10 A
AC输入电压	Input voltage AC	90...264 V	90...264 V	90...264 V	90...264 V	90...264 V
- 频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
- 功率因数	- Power factor	>0.95	>0.95	>0.95	>0.97	>0.97
DC输出电压	Output voltage DC	0...40 V	0...80 V	0...200 V	0...40 V	0...80 V
- 0-100% 的负载调整率	- Load regulation 0-100% load	<0.08%	<0.08%	<0.08%	<0.08%	<0.08%
-±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
- 纹波 (1	- Ripple (1	<80 mV_{PP} <10 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}	<150 mV_{PP} <30 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}
- 负载从10%-100%调整需时	- Regulation 10-100% load	<1 ms	<1 ms	<1.5 ms	<1 ms	<1 ms
- 精确度 (2	- Accuracy (2	≤0.2%	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出电流	Output current	0...10 A	0...5 A	0...2 A	0...20 A	0...10 A
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
- 纹波 (1	- Ripple (1	<40 mA_{PP}	<20 mA_{PP}	<8 mA_{PP}	<80 mA_{PP}	<40 mA_{PP}
- 精确度 (2	- Accuracy (2	≤0.2%	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出功率	Output power	0...160 W	0...160 W	0...160 W	0...320 W	0...320 W
- 精确度 (2	- Accuracy (2	≤1%	≤1%	≤1%	≤1%	≤1%
制冷方式	Cooling	自然对流 / Convection			风扇 / Fan	风扇 / Fan
保护等级	Protection class	1				
工作温度	Operation temperature	0...50°C				
储存温度	Storage temperature	-20...70°C				
产品尺寸 (宽x高x长) (3	Dimensions (3 (WxHxD)	200x87x301 mm	200x87x301 mm	200x87x301 mm	200x87x301 mm	200x87x301 mm
重量	Weight	3 kg	3 kg	3 kg	3 kg	3 kg
订购编号	Ordering number	05100400	05100401	05100402	05100403	05100404

技术参数	Technical Data	PSI 5200-04 A	PSI 5040-40 A	PSI 5080-20 A	PSI 5200-10 A
AC输入电压	Input voltage AC	90...264 V	90...264 V	90...264 V	90...264 V
- 频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
- 功率因数	- Power factor	>0.97	>0.99	>0.99	>0.99
DC输出电压	Output voltage DC	0...200 V	0...40 V	0...80 V	0...200 V
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% load	<0.08%	<0.08%	<0.08%	<0.08%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%
- 纹波 (1	- Ripple (1	<150 mV_{PP} <30 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}	<150 mV_{PP} <30 mV_{RMS}
- 负载从10%-100%调整需时	- Regulation 10-100% load	<1.5 ms	<1 ms	<1 ms	<1.5 ms
- 精确度 (2	- Accuracy (2	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出电流	Output current	0...4 A	0...40 A	0...20 A	0...10 A
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%
- 纹波 (1	- Ripple (1	<16 mA_{PP}	<160 mA_{PP}	<80 mA_{PP}	<32 mA_{PP}
- 精确度 (2	- Accuracy (2	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出功率	Output power	0...320 W	0...640 W	0...640 W	0...640 W
- 精确度 (2	- Accuracy (2	≤1%	≤1%	≤1%	≤1%
制冷方式	Cooling	风扇 / Fan			
保护等级	Protection class	1			
工作温度	Operation temperature	0...50°C			
储存温度	Storage temperature	-20...70°C			
产品尺寸 (宽x高x长) (3	Dimensions (3 (WxHxD)	200x87x301 mm	200x87x331 mm	200x87x331 mm	200x87x331 mm
重量	Weight	3 kg	3.3 kg	3.3 kg	3.3 kg
订购编号	Ordering number	05100405	05100406	05100407	05100408

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 在/ at 23°C ±5°C
(3 仅为外壳尺寸，非产品整体尺寸 / Enclosure only, not overall

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EA-PS 5200-10

- 宽范围输入电压90...264 V，带主动式PFC
- 效率高达92%
- 输出功率有：0...160 W至0...640 W
- 输出电压：0...40 V 至 0...200 V
- 输出电流：0...2 A 至 0...40 A
- 灵活的功率调整输出
- 各种保护功能（OVP, OCP, OTP）
- 可显示所有数值与状态的蓝屏液晶显示器
- 9个预设记忆组
- 温控风扇制冷
- 上下壳是一整体
- 符合SELV标准 (EN 60950)的40 V产品型号
- 配有USB与以太网端口
- EMC符合EN 55022 等级B

- **Wide input voltage range 90...264 V with active PFC**
- **High efficiency up to 92%**
- **Output power ratings: 0...160 W up to 0...640 W**
- **Output voltages: 0...40 V up to 0...200 V**
- **Output currents: 0...2 A up to 0...40 A**
- **Flexible, power regulated output stage**
- **Various protection circuits (OVP, OCP, OTP)**
- **Blue LCD display for all value and status**
- **Memory for 9 different presets**
- **Temperature controlled fans for cooling**
- **Chassis top and bottom closed**
- **40 V models according to SELV (EN 60950)**
- **USB port integrated**
- **EMC according to EN 55022 Class B**

概要
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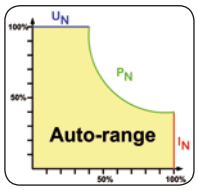
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The output terminal is located in the front panel. An additional screw terminal (max. 20 A) is located on the rear.

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为保护连接设备，可给产品设定一过压保护极限值(OVP)，以及过流(OCP)保护极限值。

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显示器和控制键
显示器清晰显示出输出电压与电流的设定与实际值。

旋钮可用来调节设定电压、电流和与功率，以及保护极限值（OCP，OVP）。

为避免误操作，可锁定旋钮。

Display and controls
Set values and actual values of output voltage and output current are clearly represented on the display.
Set values of voltage, current and power, as well as the protection thresholds (OCP, OVP) can be adjusted using the rotary knobs.
To prevent unintentional operations, the knobs can be locked.

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在不影响输出状态的条件下设置输出值，显示器上可显示预设值，即实际值的下方。

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To set output values without a direct reaction to the output condition, the set values are also shown on the display, positioned below the actual values.
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本产品存有9组不同的预设电压、电流、功率、OVP(可调过压保护极限）与OCP（可调过流保护极限）。只需按一下按钮就可回读，这个可避免输出值频繁地调节。

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The device can store 9 different sets of preset values for voltage, current, power, OVP (adjustable overvoltage protection) and OCP (adjustable overcurrent protection). These can be recalled easily by the push of a button and help to avoid constant adjustment of the output values.

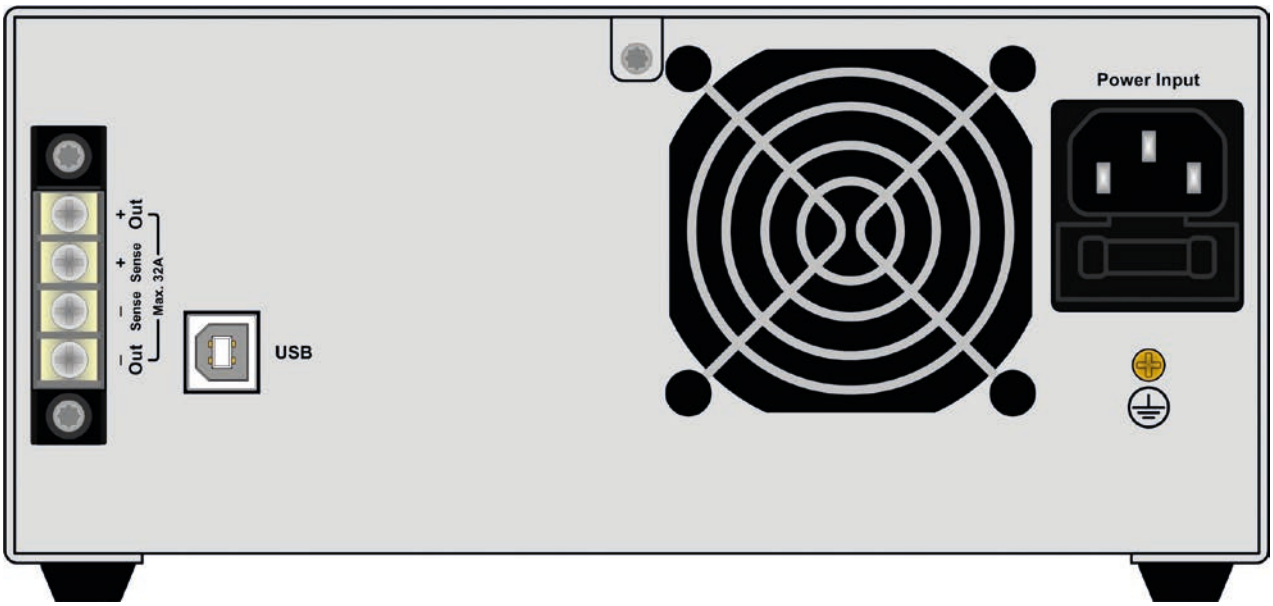
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Options
• Safety adapter set (max. 32 A, 2 pcs. red/black), mounted on top of the DC output screw-clamp terminal, used to achieve a non-contact safety socket. For 4 mm Büschel plug.

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技术参数	Technical Data	PS 5040-10 A	PS 5080-05 A	PS 5200-02 A	PS 5040-20 A	PS 5080-10 A
AC输入电压	Input voltage AC	90...264 V	90...264 V	90...264 V	90...264 V	90...264 V
- 频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
- 功率因数	- Power factor	>0.95	>0.95	>0.95	>0.97	>0.97
DC输出电压	Output voltage DC	0...40 V	0...80 V	0...200 V	0...40 V	0...80 V
- 0-100% 的负载调整率	- Load regulation 0-100% load	<0.08%	<0.08%	<0.08%	<0.08%	<0.08%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
- 纹波 (1	- Ripple (1	<80 mV_{PP} <10 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}	<150 mV_{PP} <30 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}
- 负载从10%-100%调整需时	- Regulation 10-100% load	<1 ms	<1 ms	<1.5 ms	<1 ms	<1 ms
- 精确度 (2	- Accuracy (2	≤0.2%	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出电流	Output current	0...10 A	0...5 A	0...2 A	0...20 A	0...10 A
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
- 纹波 (1	- Ripple (1	<40 mA_{PP}	<20 mA_{PP}	<8 mA_{PP}	<80 mA_{PP}	<40 mA_{PP}
- 精确度 (2	- Accuracy (2	≤0.2%	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出功率	Output power	0...160 W	0...160 W	0...160 W	0...320 W	0...320 W
- 精确度 (2	- Accuracy (2	≤1%	≤1%	≤1%	≤1%	≤1%
制冷方式	Cooling	风扇 / Fan				
保护等级	Protection class	1				
工作温度	Operation temperature	0...50°C				
储存温度	Storage temperature	-20...70°C				
产品尺寸 (宽x高x长) (3	Dimensions (3 (WxHxD)	200x87x301 mm	200x87x301 mm	200x87x301 mm	200x87x301 mm	200x87x301 mm
重量	Weight	3 kg	3 kg	3 kg	3 kg	3 kg
订购编号	Ordering number	05100300	05100301	05100302	05100303	05100304

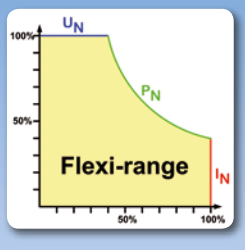
技术参数	Technical Data	PS 5200-04 A	PS 5040-40 A	PS 5080-20 A	PS 5200-10 A
AC输入电压	Input voltage AC	90...264 V	90...264 V	90...264 V	90...264 V
- 频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
- 功率因数	- Power factor	>0.97	>0.99	>0.99	>0.99
DC输出电压	Output voltage DC	0...200 V	0...40 V	0...80 V	0...200 V
- 0-100%的负载调整率	- Load regulation 0-100% load	<0.08%	<0.08%	<0.08%	<0.08%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%
- 纹波 (1	- Ripple (1	<150 mV_{PP} <30 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}	<80 mV_{PP} <10 mV_{RMS}	<150 mV_{PP} <30 mV_{RMS}
- 负载从10%-100%调整需时	- Regulation 10-100% load	<1.5 ms	<1 ms	<1 ms	<1.5 ms
- 精确度 (2	- Accuracy (2	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出电流	Output current	0...4 A	0...40 A	0...20 A	0...10 A
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%
- 纹波 (1	- Ripple (1	<16 mA_{PP}	<160 mA_{PP}	<80 mA_{PP}	<32 mA_{PP}
- 精确度 (2	- Accuracy (2	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出功率	Output power	0...320 W	0...640 W	0...640 W	0...640 W
- 精确度 (2	- Accuracy (2	≤1%	≤1%	≤1%	≤1%
制冷方式	Cooling	风扇 / Fan			
保护等级	Protection class	1			
工作温度	Operation temperature	0...50°C			
储存温度	Storage temperature	-20...70°C			
产品尺寸 (宽x高x长) (3	Dimensions (3 (WxHxD)	200x87x301 mm	200x87x331 mm	200x87x331 mm	200x87x331 mm
重量	Weight	3 kg	3.3 kg	3.3 kg	3.3 kg
订购编号	Ordering number	05100305	05100306	05100307	05100308

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz
(2 在/ at 23°C ±5°C
(3 仅为外壳尺寸，非产品整体尺寸 / Enclosure only, not overall

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U
I
OVP
OTP
USB







EA-PS 2084-05 B

- 微处理器控制
- 专为下列应用而设计
  - 学校，大学与实验室
  - 工业与系统应用
  - 工作间与研发部
  - 实验室与测试机构
- 输出功率分别有：100 W, 160 W 或 320 W*
- 输出电压：0...42 V 与 0...84 V
- 输出电流：高达0...20 A
- 带过温保护 (OT)
- 四位数显示屏指示电压和电流
- 自然对流冷却
- 密封式上盖与底座
- 安全输出插座
- 符合EN 60950安规标准

- **Microprocessor controlled**
- **Designed for**
  - **Schools,university and laboratories**
  - **Industry and system applications**
  - **Workshop and development**
  - **Laboratories and test institutes**
- **Output power ratings: 100 W, 160 W or 320 W**
- **Output voltages: 0...42 V and 0...84 V**
- **Output currents: up to 0...20 A**
- **Overtemperature protection (OT)**
- **Four-digit display for voltage and current**
- **Convection or fan cooling**
- **Chassis top and bottom closed**
- **Safety output sockets**
- **Safety EN60950**

概要

EA-PS 2000 B系列实验室电源有三种额定输出功率，100 W、160 W和320 W。本系列的优点为结构紧凑，外壳实用，输出参数优越。其上下盖完全封闭，无外置散热片。故特别适用于学校和培训机构。

产品前板装有安全输出插座。可从零至所需电压和电流之间自由调节。该系列允许多个并联或串联。灵活的功率管理系统保证在满载时操作稳定可靠。

保护功能

本系列除了具有标准保护功能如过压保护(OVP)外，还可阻止峰值电压或高电压输送给用户应用设备。并带可调极限（0...110%额定电流）的过流保护特性，过流时它会即刻切断输出，从而避免损坏应用设备。

电脑接口

通过产品前板的标准USB端口，可监控和远程控制本系列产品。用户可选择给特定应用编程（LabView VIs），或者用另外的Windows软件，这个则需购买一许可证。

General

The laboratory power supplies of the EA-PS 2000 B series are available in three power ratings of 100 W, 160 W or 320 W. The series demonstrates compact design, practical enclosure and excellent value. The units are closed at top and bottom and have no external heatsinks. Thus they are especially suitable for use in schools and other educational establishments. The safety output sockets are located on the front of the unit. Voltage and current can be adjusted from zero to the required value. The units can be connected in parallel or in series. A flexible power management ensures reliable operation at full load.

Protective features

Besides standard features, such as overvoltage protection (OVP), which is intended to protect sensitive user applications against unwanted voltage peaks or high voltage, the series now features an overcurrent protection with an adjustable threshold of 0...110% nominal current. It will protect a malfunctioning application from overcurrent by immediate output shutdown.

PC interface

The unit can be monitored and remotely controlled via the front USB port, which is equipped as standard. The user can choose between programming of a custom application (LabView VIs are available) or using a separately available Windows software for which a licence can be purchased.

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灵活可选的功率范围

设定电压和电流值可相互调整，根据P = U * I公式，保证这些输出值维持在最大输出功率范围内。这样用户可选择输出高电压或大电流。

控制和监控软件

EasyPS2000软件以CD方式供应，该软件能完全远程控制或监控本产品。所有功能都显示于图形用户界面上。为了解锁软件操作时的远程控制功能，需为每一台产品购买一个许可证代码。

主要特征：

- 事件日志
- 许可证解锁对话框
- 通过CSV表格进行半自动控制（排序）
- CSV格式的数据记录
- 兼容Windows操作系统
- 使用简便的图形用户界面
- 一台PS 2000 B产品一个实例

选项功能

- EasyPS2000软件的产品许可证

Flexible power ranging

The set values of voltage and current adjust each other in order to maintain the max. output power according to P = U * I. This allows working with either high output voltage or with high output current.

Control and monitoring software

The software EasyPS2000, which is contained on an optionally available CD, allows complete remote control or monitoring of one PS 2000 B unit. All functions of the device are available on a graphical user interface. In order to unlock the remote control features in the software, a separate licence code for every unit is required.

The main features:

- Event log
- Unlocking dialogue for device licence
- Semi-automatic control by CSV tables (sequencing)
- Data logging to CSV
- Windows compatible
- Easy to use GUI
- One PS 2000 B per instance

Options

- Device licence for EasyPS2000 control software

技术参数	Technical Data	PS 2042-06B	PS 2042-10B	PS 2042-20B	PS 2084-03B	PS 2084-05B	PS 2084-10B
AC输入电压	Input voltage AC	90...264 V	90...264 V	90...264 V	90...264 V	90...264 V	90...264 V
-频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
-功率因数	- Power factor	>0.99	>0.99	>0.99	>0.99	>0.99	>0.99
DC输出电压	Output voltage DC	0...42 V	0...42 V	0...42 V	0...84 V	0...84 V	0...84 V
- 0-100% 的负载调整率	- Load regulation 0-100%	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
-纹波(1	- Ripple (1	<100 mV_{PP} <4 mV_{RMS}	<63 mV_{PP} <5 mV_{RMS}	<150 mV_{PP} <2 mV_{RMS}	<48 mV_{PP} <4 mV_{RMS}	<96 mV_{PP} <24 mV_{RMS}	<150 mV_{PP} <2 mV_{RMS}
-负载从10%-100%调整需时	- Regulation 10-100% load	<1 ms	<2 ms	<2 ms	<2 ms	<1 ms	<1 ms
-OVP过压保护调节范围	- OVP adjustment	0...46.2 V	0...46.2 V	0...46.2 V	0...92.4 V	0...92.4 V	0...92.4 V
-精确度	- Accuracy	≤0.2%	≤0.2%	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出电流	Output current	0...6 A	0...10 A	0...20 A	0...3 A	0...5 A	0...10 A
-0-100% Δ U_{OUT}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
-在±10% Δ U_{IN}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%
-纹波(1	- Ripple (1	<10 mA_{PP} <4 mA_{RMS}	<13 mA_{PP} <5 mA_{RMS}	<15 mA_{PP} <6 mA_{RMS}	<6 mA_{PP} <2 mA_{RMS}	<9 mA_{PP} <3 mA_{RMS}	<3.8 mA_{PP} <1.4 mA_{RMS}
-精确度	- Accuracy	≤0.2%	≤0.2%	≤0.2%	≤0.2%	≤0.2%	≤0.2%
效率	Efficiency	85%	85%	85%	85%	85%	85%
输出功率	Output power	100 W	160 W	320 W	100 W	160 W	320 W
制冷方式	Cooling	自然冷却 / natural convection		风扇 / Fan	自然冷却 / natural convection		风扇 / Fan
保护级别	Protection class	1					
工作温度	Operation temperature	0...50°C					
储存温度	Storage temperature	-20...70°C					
尺寸 (宽x高x长)	Dimensions (WxHxD)	174x82x240mm	174x82x240mm	174x82x320mm	174x82x240mm	174x82x240mm	174x82x320mm
重量	Weight	1.9 kg	2 kg	2.3 kg	1.9 kg	2 kg	2.3 kg
订购编号	Ordering number	39200112	39200113	39200114	39200116	39200117	39200118

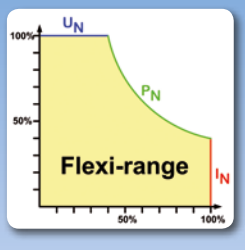
(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

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EA-PS 2000 B TRIPLE 212 W & 332 W

三路输出实验室直流电源 / TRIPLE LABORATORY DC POWER SUPPLIES







EA-PS 2342-10B

- 专为下列应用而设计
  - 学校，大学与实验室
  - 工业与系统应用
  - 工作间与研发部
  - 实验室与测试机构
- 输出电压: 2x 0...42 V 或 2x 0...84 V
- 输出电流: 0...3 A, 0...5 A, 0...6 A 或 0...10 A
- 辅助输出: 3...6 V, 12 W
- 带过温保护 (OT)
- 四位数显示屏指示电压和电流
- 自然对流冷却
- 密封式上盖与底座
- 安全输出插座

- **Designed for**
  - **Schools,university and laboratories**
  - **Industry and system applications**
  - **Workshop and development**
  - **Laboratories and test institutes**
- **Output voltages: 2x 0...42 V or 2x 0...84 V**
- **Output currents: 0...3 A, 0...5 A, 0...6 A or 0...10 A**
- **Auxiliary output: 3...6 V, 12 W**
- **Overtemperature protection (OT)**
- **Four-digit display for voltage and current**
- **Convectional cooling**
- **Chassis top and bottom closed**
- **Safety output sockets**

概要

EA-PS 2000 B Triple系列实验室电源输出两组主输出，功率可为100 W或160 W，另外还有一组3...6 V与12 W的辅助输出。

新的“追踪”功能，让用户通过控制面板左边的旋钮可同时控制这两组输出。它们之间相互隔离，可以串联或并联。结合该追踪特征，用户可以设置另外一不同的输出，如±15 V。

安全输出插座位于产品前板。能从零到最大值之间调节电压和电流。

保护功能

本系列除了具有标准保护功能如过压保护(OVP)外，还可阻止峰值电压或高电压输送给用户应用设备。并带可调极限（0...110%额定电流）的过流保护特性，过流时它会即刻切断输出，从而避免损坏应用设备。

电脑接口

通过产品前板的标准USB端口，可监控和远程控制本系列产品。用户可选择给特定应用编程（LabView VIs），或者用另外的Windows软件，这个则需购买一许可证。

General

The power supplies of the EA-PS 2000 B Triple series have two main outputs of 100 W or 160 W each and an auxiliary output with 3...6 V and 12 W.
The new „Tracking“ feature provides simultaneous control of both main outputs with the adjustment knobs of the leftside control panel. The outputs are galvanically isolated from each other and can be connected in series or parallel. In combination with the tracking feature, the user can, for example, set up a variable ±15 V output.
The safety output sockets are located on the front panel of the unit. Voltage and current can be adjusted from zero to maximum.

Protective features

Besides standard features, such as overvoltage protection (OVP), which is intended to protect sensitive user applications against unwanted voltage peaks or high voltage, the series now features an overcurrent protection with an adjustable threshold of 0...110% nominal current. It will protect a malfunctioning application from overcurrent by immediate output shutdown.

PC interface

The unit can be monitored and remotely controlled via the front USB port, which is equipped as standard. The user can choose between programming of a custom application (LabView VIs are available) or using a separately available Windows software for which a licence can be purchased.

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灵活可选的功率范围

设定电压和电流值可相互调整，根据P = U * I公式，保证这些输出值维持在最大输出功率范围内。这样用户可选择输出高电压或大电流。

Flexible power ranging

The set values of voltage and current adjust each other in order to maintain the max. output power according to P = U * I. This allows working with either high output voltage or with high output current.

控制和监控软件

EasyPS2000软件以CD方式供应，该软件能完全远程控制或监控本产品。所有功能都显示于图形用户界面上。为了解锁软件操作时的远程控制功能，需为每一台产品购买一个许可证代码。

Control and monitoring software

The software EasyPS2000, which is contained on an optionally available CD, allows complete remote control or monitoring of one PS 2000 B unit. All functions of the device are available on a graphical user interface. In order to unlock the remote control features in the software, a separate licence code for every unit is required.

主要特征：
- 事件日志
- 许可证解锁对话框
- 通过CSV表格进行半自动控制（排序）
- CSV格式的数据记录
- 兼容Windows操作系统
- 使用简便的图形用户界面
- 一台PS 2000 B产品一个实例

The main features:
- Event log
- Unlocking dialogue for device licences
- Semi-automatic control by CSV tables (sequencing)
- Data logging to CSV
- Windows compatible
- Easy to use GUI
- One PS 2000 B per instance

选项功能

- EasyPS2000软件的产品许可证

Options

- Device licence for EasyPS2000 control software

技术参数	Technical Data	EA-PS 2342-06 B	EA-PS 2342-10 B	EA-PS 2384-03 B	EA-PS 2384-05 B
AC输入电压	Input voltage AC	90...264 V	90...264 V	90...264 V	90...264 V
-频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
-功率因数	- Power factor	>0.99	>0.99	>0.99	>0.99
DC输出电压	Output voltage DC	1+2路输出: 0...42 V 3路输出: 3...6 V	1+2路输出: 0...42 V 3路输出: 3...6 V	1+2路输出: 0...84 V 3路输出: 3...6 V	1+2路输出: 0...84 V 3路输出: 3...6 V
-0-100% 的负载调整率	- Load regulation 0-100% load	<0.15%	<0.15%	<0.15%	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%
-1+2 路输出端纹波	- Ripple output 1+2 (1	<100 mV_{PP} / <4 mV_{RMS}	<63 mV_{PP} / <5 mV_{RMS}	<48 mV_{PP} / <4 mV_{RMS}	<96 mV_{PP} / <24 mV_{RMS}
-负载从10%-90%调整需时	- Regulation 10-90% load	<2 ms	<2 ms	<2 ms	<2 ms
-OVP过压保护调节范围	- Overvoltage protection	0...46.2 V	0...46.2 V	0...92.4 V	0...92.4 V
-精确度	- Accuracy	≤0.2%	≤0.2%	≤0.2%	≤0.2%
输出电流	Output current	1+2路输出: 0...6 A 3路输出: max. 4 A	1+2路输出: 0...10 A 3路输出: max. 4 A	1+2路输出: 0...3 A 3路输出: max. 4 A	1+2路输出: 0...5 A 3路输出: max. 4 A
-0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%	<0.15%
-1+2 路输出端纹波	- Ripple output 1+2 (1	<25 mA_{PP} / <9 mA_{RMS}	<40 mA_{PP} / <15 mA_{RMS}	<6 mA_{PP} / <2 mA_{RMS}	<9 mA_{PP} / <3 mA_{RMS}
- 精确度	- Accuracy	≤0.2%	≤0.2%	≤0.2%	≤0.2%
效率	Efficiency	85%	85%	85%	85%
输出功率	Output power	2x 100 W + 1x 12 W	2x 160 W + 1x 12 W	2x 100 W + 1x 12 W	2x 160 W + 1x 12 W
保护级别	Protection class	1			
制冷方式	Cooling	无风扇， 自然对流冷却 / fanless, natural convection			
工作温度	Operation temperature	0...50°C			
储存温度	Storage temperature	-20...70°C			
尺寸(宽x高x长)	Dimensions (WxHxD)	外壳尺寸 / Enclosure: 282x82x243 mm 整体尺寸 / Overall: 282x90x260 mm			
重量	Weight	3.8 kg	4 kg	3.8 kg	4 kg
订购编号	Ordering number	39200120	39200121	39200125	39200126

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

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EA-PS 3032-10 B

- 输入电压可选 115 V / 230 V (160 W/320 W)
- 宽范围输入电压90...264 V带PFC (650 W)
- 输出功率：160 W 至 650 W
- 输出电压：0...16 V 至 0...150 V
- 输出电流：0...2.5 A 至 0...40 A
- 电压和电流可粗调和精调
- 有过压保护 (OVP)
- 有过温保护 (OT)
- 三位数显示器读显电压和电流
- LED指示状态
- 远程感测功能
- 模拟接口
  通过 0...10 V电压可对U / I 编程
  通过 0...10 V电压可监控U / I
- 温控风扇制冷
- 可选USB适配器EA-UTA12（外置）

- **Mains supply: 115 V / 230 V (160 W/320 W models)**
- **Wide input voltage range: 90...264 V (650 W models)**
- **Output power ratings: 160 W up to 650 W**
- **Output voltages: 0...16 V up to 0...150 V**
- **Output currents: 0...2.5 A up to 0...40 A**
- **Voltage and current adjustable coarse and fine**
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Three-digit displays for voltage and current**
- **Status indication via LEDs**
- **Remote sensing**
- **Analog interface with**
  - **U / I programmable via 0...10 V**
  - **U / I monitoring via 0...10 V**
- **Temperature controlled fan for cooling**
- **Optional USB adapter EA-UTA12 (external)**

概要
EA-PS 3000 B系列电源具备多种多样的功能，包括：可预设电流和OVP的LED显示器，外接模拟接口，还有状态指示灯。

160 W和320 W产品基于线性技术，而650 W基于开关性技术和功率因数校正线路。

上下盖无任何通风槽，也无外部散热器。这种安全与保护方式使产品成为学校和大学，以及测试和研发实验室与工业领域的理想选择。

交流输入
640/650 W型号采用主动式**功率因数**校正线路，输入电压为90 V至264 V AC。160 W或320 W可在115 V和230 V AC间转换，使之能在全世界范围内使用。

DC输出
本系列有多款不同型号，可选择0...16 V和0...150 V输出电压，0...4 A和0...40 A输出电流，160 W和650 W输出功率的型号。
输出端位于产品前面板。

远程感测
远程感测输入端可直接连到负载设备，以补偿连线上的压降。一般只有使用了大功率电源线时才会出现压降。

General
The power supply series EA-PS 3000 B offers versatile functionality: LED displays with preset functions for current and OVP, an extensive analog interface and status indicators via LEDs.

Along with the linear technology power classes of 160 W and 320 W, there is a 650 W power class with switching technology and PFC.
There are no ventilation slots in either the top or base of the units, also no external heat sinks. This attention to safety and protection makes it ideal for schools and universities as well as test and development laboratories and industry.

AC input
The 640/650 W models feature an active **P**ower **F**actor **C**orrection and a mains input range of 90 V up to 264 V AC. Models with 160 W or 320 W are switchable between 115 V and 230 V AC supply. This enables the series for worldwide use.

DC output
A selection of DC output voltages between 0...16 V and 0...150 V, output currents between 0...4 A and 0...40 A and output power ratings between 160 W and 650 W is available.
The output terminal is located in the front panel.

Remote sensing
The sensing input can be connected directly to the load to compensate for voltage drops up to a certain level, which usually occur along high power cables.

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过压保护(OVP)
为保护连接负载，可调节一过压保护极限值(OVP)。

若输出电压超过调节极限值，输出被切断，LED灯和模拟接口端口发出状态信号。

显示器和控制件
输出电压和电流清晰显示于两个3位数显示器上。通过LED灯指示产品和按钮的功能状态，使用户操作起来更简便。

用电位器可调节输出电压、电流和OVP(过压保护)值。

输出值的预设
要设置输出值，但不影响输出状态，可采用预设功能。

通过此功能用户可预设输出电压、电流和过压保护值(OVP)。

模拟接口
模拟接口连接点位于产品前板。此处有模拟接口输入脚，接上0 V...10 V电压，可设置0...100%的输出电压、电流。
此外，还有数个输入脚和输出脚，用来控制和监控产品状态。

选购件
• USB适配器EA-UTA12（见142页）

Overvoltage protection (OVP)
Intended to protect connected loads, it is possible to adjust an overvoltage protection threshold (OVP).
If the output voltage exceeds the defined limit, the output is shut off and a status message signal by LED and via the analog interface will be generated.

Display and controls
Output voltage and output current are clearly represented on two three-digit displays. The operation states of the equipment and the pushbuttons will be indicated by LEDs, that makes the operation essentially simpler for the user.
The adjustment for voltage, current and OVP is done with potentiometers.

Presetting of output values
To set output values without a direct effect to the output condition, a preset function is implemented.
With this function the user can preset values for the output voltage, output current and overvoltage protection (OVP).

Analog Interface
The connection for the analog interface is located on the front of the device. Analog inputs and outputs are available here, for a voltage range of 0 V...10 V to set and monitor voltage and current from 0...100%. Furthermore, several inputs and outputs are available for controlling and monitoring the equipment status.

Options
• USB adapter EA-UTA12 (see page 142)

技术参数	Technical Data	EA-PS 3016-10B	EA-PS 3032-05B	EA-PS 3065-03B	EA-PS 3016-20B	EA-PS 3032-10B
输入电压	Input voltage AC	115/230 V	115/230 V	115/230 V	115/230 V	115/230 V
-频率	- Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
输出电压 (DC)	Output voltage DC	0...16 V	0...32 V	0...65 V	0...16 V	0...32 V
-0-100% 的负载调整率	- Load regulation 0-100%	<10 mV	<10 mV	<10 mV	<10 mV	<8 mV
-在±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<1 mV_{RMS}	<1 mV_{RMS}	<1 mV_{RMS}	<5 mV_{RMS}	<5 mV_{RMS}
-纹波	- Ripple LF	<2 mV_{RMS}	<2 mV_{RMS}	<2 mV_{RMS}	<2 mV_{RMS}	<2 mV_{RMS}
-负载从10%-100%调整需时	- Regulation 10-100% load	<1 ms	<1 ms	<1 ms	<1 ms	<1 ms
-OVP过压保护调节范围	- OVP adjustment	0...17.6 V	0...35.2 V	0...71.5 V	0...17.6 V	0...35.2 V
输出电流	Output current	0...10 A	0...5 A	0...2.5 A	0...20 A	0...10 A
-0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<4 mA	<4 mA	<4 mA	<4 mA	<4 mA
输出功率	Output power	160 W	160 W	160 W	320 W	320 W
安规标准	Safety	EN60950	EN60950	EN60950	EN60950	EN60950
尺寸(宽x高x长) *	Dimensions (WxHxD) *	240x120x285 mm	240x120x285 mm	240x120x285 mm	240x120x285 mm	240x120x285 mm
重量	Weight	6.5 kg	6.5 kg	6.5 kg	10 kg	10 kg
订购编号	Ordering number	35320170	35320171	35320172	35320173	35320174

技术参数	Technical Data	EA-PS 3065-05B	EA-PS 3016-40B	EA-PS 3032-20B	EA-PS 3065-10B	EA-PS 3150-04B
输入电压	Input voltage AC	115/230 V	90...264 V	90...264 V	90...264 V	90...264 V
-频率	- Frequency	50/60 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
输出电压 (DC)	Output voltage DC	0...65 V	0...16 V	0...32 V	0...65 V	0...150 V
-0-100% 的负载调整率	- Load regulation 0-100%	<10 mV	<10 mV	<20 mV	<30 mV	<40 mV
-在±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<5 mV_{RMS}	<2 mV_{RMS}	<2 mV_{RMS}	<2 mV_{RMS}	<30 mV_{RMS}
-纹波	- Ripple LF	<2 mV_{RMS}	<10 mV_{RMS}	<10 mV_{RMS}	<10 mV_{RMS}	<5 mV_{RMS}
-负载从10%-100%调整需时	- Regulation 10-100% load	<1 ms	<3 ms	<3 ms	<3 ms	<3 ms
-OVP过压保护调节范围	- OVP adjustment	0...71.5 V	0...17.6 V	0...35.2 V	0...71.5 V	0...165 V
输出电流	Output current	0...5 A	0...40 A	0...20 A	0...10 A	0...4 A
-0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<4 mA	<50 mA	<50 mA	<50 mA	<10 mA
输出功率	Output power	325 W	640 W	640 W	650 W	640 W
安规标准	Safety	EN60950	EN60950	EN60950	EN60950	EN60950
尺寸 (宽x高x长)*	Dimensions (WxHxD) *	240x120x285 mm	240x120x285 mm	240x120x285 mm	240x120x285 mm	240x120x285 mm
重量	Weight	10 kg	5.5 kg	5.5 kg	5.5 kg	5.5 kg
订购编号	Ordering number	35320175	35320176	35320177	35320178	35320179

*产品外壳尺寸，非整体安装尺寸 / Enclosure dimensions, not total installation dimensions

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EA-HV 9000-6K-2000

- 宽范围输入电压90...264 V，带主动式PFC
- 效率高达 91%
- 输出功率：2000 W
- 输出电压：1200 V 至 0...12 kV
- 输出电流：170 mA 至 0...1.67 A
- 谐振转换器
- 高调整精度，低纹波
- 有过压保护（OVP）
- 有过温保护（OT）
- 3½位数显示显示电压和电流
- LED指示状态提示
- 有闪络和短路保护功能
- 多功能模拟接口
  - 通过 0...10 V电压可对U / I 编程
  - 通过 0...10 V电压可监控U / I
- 温控风扇制冷
- 有桌面与和19“类型一体（3U）
- 可选数字接口：
  - GPIB / IEEE（带内置RS232端口）
  - Ethernet / LAN（带内置RS232端口）
  - USB EA-UTA12(外置)

- **Wide input voltage range 90...264 V with active PFC**
- **High efficiency up to 91%**
- **Output power: 2000 W**
- **Output voltages: 1200 V up to 12 kV**
- **Output currents: 170 mA up to 1.67 A**
- **Resonance converter**
- **High regulation accuracy, low ripple**
- **Voltage and current adjustable**
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **3½ digit displays for voltage and current**
- **Status indication signal via LEDs**
- **Flashover & short circuit proof**
- **Analog interface with many functions**
  - **U / I programmable via 0...10 V**
  - **U / I monitoring via 0...10 V**
- **Temperature controlled fans for cooling**
- **Desktop unit and 19“ in one (3U)**
- **Optional, digital interfaces**
  - **GPIB (IEEE) with RS232 (built-in)**
  - **Ethernet/LAN with RS232 (built-in)**
  - **USB EA-UTA12 (external)**

概要
EA-HV 9000系列是一款高压调频谐振变换器，已无数次验证其配备的性能。

产品配有一易用型10圈电位器，3½数字背光显示器，具有电压、电流和过压保护预设功能。

还有一模拟接口，可通过编程、记录电压和电流。

通过一连锁回路（安全关闭）也可从外部编程。

DC输出
本系列有多款不同类型，可选择1200 V和12 kV输出电压，170 mA和1.67 A输出电流，2000 W输出功率的型号。输出端位于产品后面板。

为保护连接负载，可设定一过压保护极限值(OVP)。

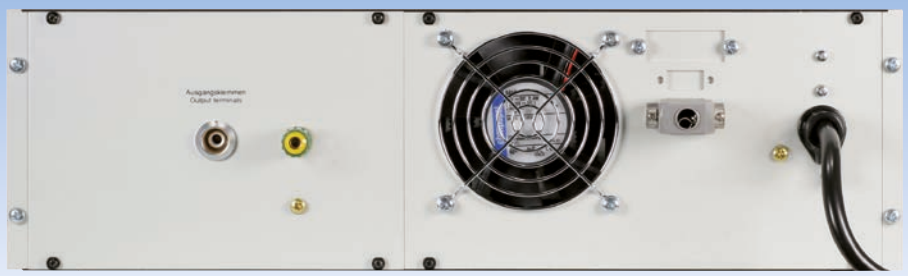
按需还可其它电压与功率级别的型号。

DC−输出端默认是与PE相连的（地，外壳）。按客户需求，所有型号也可做成相反极别（DC+连到PE），或由用户现场自己修改。

General
The high voltage power supplies of the EA-HV 9000 series are frequency modulated resonance converters and have proved themselves thousandfold.
The units are provided with easy-to-use 10-turn potentiometers, 3½ digit illuminated displays and preset functions for voltage, current and OVP.
An analog interface is provided to program and record voltage and current with 0...10 V.
The external programming connection is also equipped with an interlock loop (safety cutout).

DC output
A selection of DC output voltages between 1200 V and 12 kV and output currents between 170 mA and 1.67 A at an output power of 2000 W is available. The output terminal is located in the rear panel.
Intended to protect connected loads, it is possible to define an overvoltage protection limit (OVP).
Other voltages and powers on request.
The DC- output is by default connected to PE (ground, enclosure). Upon request, all models can also delivered with reversed polarity (DC+ connected to PE) or modified by the user on location.

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后板 / **Rear panel EA-HV 9000-6K-2000**

技术参数	Technical Data	HV 9000-1K2-2000	HV 9000-2K-2000	HV 9000-4K-2000	HV 9000-6K-2000	HV 9000-12K-2000
AC输入电压	**Input voltage AC**	90...264V, 1ph+N (1	90...264V, 1ph+N (1	90...264V, 1ph+N (1	90...264V, 1ph+N (1	90...264V, 1ph+N (1
-频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
-功率因数	- Power factor	>0,99	>0,99	>0,99	>0,99	>0,99
-230 V时的输入电流	- Input current at 230 V	~10 A (1	~10 A (1	~10 A (1	~10 A (1	~10 A (1
DC输出电压	**Output voltage DC**	0...1200 V	0...2000 V	0...4000 V	0...6000 V	0...12000 V
-0-100% 的负载调整率	- Load regulation 0-100% load	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
-纹波 BWL 20MHz	- Ripple BWL 20MHz	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
-负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms	<2 ms	<2 ms	<2 ms	<2 ms
-温度稳定度	- Temperature stability	<50ppm/°C	<50ppm/°C	<50ppm/°C	<50ppm/°C	<50ppm/°C
-OVP过压保护调节范围	- OVP adjustment	0...1212 V	0...2020 V	0...4040 V	0...6060 V	0...12120 V
输出电流	**Output current**	0...1,67 A	0...1 A	0...500 mA	0...350 mA	0...170 mA
-0-100% 的负载调整率	- Load regulation 0-100% load	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
-纹波 BWL 20MHz	- Ripple BWL 20MHz	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
-温度稳定度	- Temperature stability	<500ppm/°C	<500ppm/°C	<500ppm/°C	<500ppm/°C	<500ppm/°C
输出功率	**Output power**	2000 W	2000 W	2000 W	2000 W	2000 W
模拟编程	**Analog programming**	U / I, 0...10 V				
制冷方式	**Cooling**	风扇 / Fan				
工作温度	**Operation temperature**	0...50°C				
储存温度	**Storage temperature**	-20°C...70°C				
尺寸(宽x高x长)	**Dimensions (W H D)**	19“ 3 HE/U 460 mm				
工作高度	**Operation altitude**	max. 2000 m				
订购编号	**Ordering number**	26100103	26100104	26100114	26100105	26100106

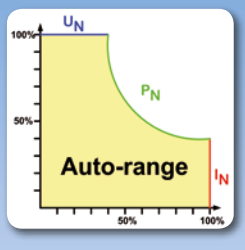
(1 当输入电流>16 A时功率将自动受限 / Automatic power limitting on input currents > 16 A

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U
I
OVP
OTP
USB
RS232
LAN
CAN
WC







EA-PSI 865-10 R

- 宽范围输入电压90...264 V（1.5 kW以下型号）
- 两相输入电压340...460 V（5 kW型号）
- 效率高达 95.5%
- 输出功率：320 W 至 0...5000 W
- 输出电压：0...16 V 至 0...500 V
- 输出电流：0...4 A 至 0...170 A
- 灵活的功率调整输出级**
- 有过压保护(OVP)
- 有过温保护(OT)
- 图形显示器显示所有值和功能
- 自动检测远程感测
- 0...10 V或0...5 V模拟接口
- 报警管理器
- 自然风冷*
- 温控风扇制冷**
- 其它选项

- **Wide range input 90...264 V (up to 1.5 kW models)**
- **Two-phase input 340...460 V (5 kW models)**
- **High efficiency up to 95.5%**
- **Output power ratings: 320 W up to 0...5000 W**
- **Output voltages: 0...16 V up to 0...500 V**
- **Output currents: 0...4 A up to 0...170 A**
- **Auto-ranging output stage ****
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Graphic display for all values and functions**
- **Remote sense with automatic detection**
- **Analog interface for 0...10 V or 0...5 V**
- **Alarm management**
- **Natural convection for cooling ***
- **Temperature controlled fans for cooling ****
- **Various options**

概要
EA-PSI 800 R系列是一款由微处理器控制的、底盘安装式实验室电源。它配备多种功能和特征，让用户使用起来更方便、有效。

输入
1.5 kW以下型号采用主动式功率因数，适合90 V至264 V AC的输入电压，而5 kW型号则需在340 V...460 V AC两相输入电压下操作。

功率
1 kW以上型号输出功率可灵活变化，在低电流时输出更高的电压，或在低电压时输出更大的电流，都由最大额定输出功率来限制。

输出
本系列有多款不同型号，可选择0...16 V和0...500 V输出电压，0...4 A和0...170 A输出电流，320 W和0...5 kW输出功率的型号。输出电压、电流、功率、OVP等都能通过菜单设定，并显示于显示器上。

General
The microprocessor controlled chassis mounting power-supplies from series EA-PSI 800 R have a multitude of functions and features making the use of this equipment easier and more effective.

Input
The equipment uses an active PFC. Models up to 1.5 kW are suitable for worldwide operation on mains supply of 90...264 V, the 5 kW models require a supply with 340...460 V AC.

Power
Models with 1 kW or higher are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power.

Output
Different units with output voltages from 0...16 V to 0...500 V, output currents from 0...4 A to 0...170 A and an output power ratings of 320 W up to 0...5 kW are available. Output voltage, current, power, OVP etc. can be set via a menu and are shown on the integrated LCD.

* 650 W以下型号
** 1000 W以上型号

* Models up to 650 W
** Models from 1 kW

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保护功能
为保护连接负载，可设定一过压保护极限值(OVP)。若输出电压超过调节极限值，输出被关断，显示器和模拟接口都发出一状态信号。

由于可调限流功能的存在，本产品也有短路和过载保护功能。

Protective features
Intended to protect connected loads, it is possible to define an overvoltage protection threshold (OVP). If the output voltage exceeds the defined limit, the output is shut off. Also a status signal on the display and via the analog interface will be generated. Due to the adjustable current limitation, the devices are also short-circuit- and overload-proof.

远程感测
远程感测输入端可直接连到负载设备，以补偿连线上的压降。如果输入端已接上负载，本电源会自动调整输出电压，以确保负载获得准确所需的电压值。

Remote sensing
The sense input can be connected directly to the load to compensate voltage drops along the power cables. If the sense input is connected to the load, the power supply will adjust the output voltage to ensure that the accurate required voltage is available on the load.

模拟接口
模拟接口输入引脚接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流。
模拟接口输出脚接上0 V...10 V或0 V...5 V电压，还可监控输出电压、电流和功率。此外，还有几个输入脚和输出脚，用来控制和监控产品状态。

Analog interface
Analog inputs with voltage ranges from 0 V...10 V or 0 V...5 V to set output voltage and current from 0...100% are available. To monitor the output voltage and current, analog outputs are provided with voltage ranges of 0 V...10 V or 0 V...5 V. Several digital inputs and outputs can be used to control and monitor the status.

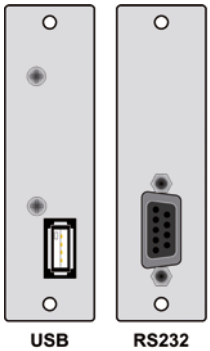
并联
5 kW型号有一个共享总线端子，可轻易地将10台产品并联起来，从而获得均匀的电流分布。其它型号通过模拟接口相互连接，可形成一个并联的主-从系统。

Parallel connection
The 5 kW models feature a „Share bus“ connector, which makes it easy to connect up to 10 units in parallel operation and in order to gain symmetric current distribution. Other models can be wired by their analog interfaces in order to have a parallel master-slave system.

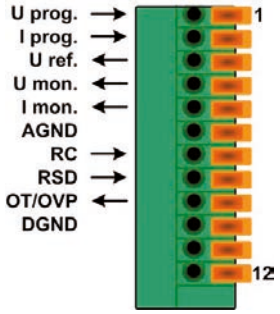
选购件
- 通过RS232、CAN、USB或以太网隔离数字接口卡，用电脑可控制本产品。接口卡插槽位于产品后板，方便用户插上新接口或替换当前接口。本产品会自动检测接口卡，并只需少许的配置或不用配置。随接口卡附有免费Windows软件，配合RS232与USB接口卡，可用来控制和监控，记录数据和排序。可参考137和143页。

Options
- Isolated digital interface cards for RS232, CAN, USB or Ethernet to control the device by PC. The interface slot is located on the rear panel, making it easy for the user to plug in a new interface or to replace an existing one. The interface will be automatically detected by the device and requires no or only little configuration. Included with the interface cards is a free Windows software for the RS232 and USB interfaces which provides control and monitoring, data logging and semi-automatic sequences. See pages 137 and 143.

数字接口 / **Digital interfaces**



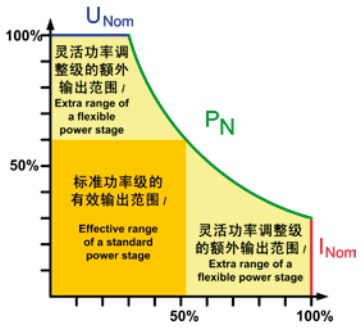
模拟接口 / **Analog interface**



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EA-PSI 800 R 1.5 kW







图形显示器 / **Graphics display**

EA-PSI 800 R 5 kW



技术参数	Technical Data	EA-PSI 816-20 R	EA-PSI 832-10 R	EA-PSI 865-05 R	EA-PSI 832-20 R	EA-PSI 865-10 R
AC输入电压	**Input voltage AC**	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N
-频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hzy
-功率因数	- Power factor	>0.99	>0.99	>0.99	>0.99	>0.99
DC输出电压	**Output voltage DC**	0...16 V	0...32 V	0...65 V	0...32 V	0...65 V
-0-100% 的负载调整率	- Load regulation 0-100%	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
-纹波 (1	- Ripple (1	<40 mV_{PP} <4 mV_{RMS}	<100 mV_{PP} <10 mV_{RMS}	<150 mV_{PP} <20 mV_{RMS}	<100 mV_{PP} <8 mV_{RMS}	<150 mV_{PP} <10 mV_{RMS}
-负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms	<2 ms	<2 ms	<2 ms	<2 ms
-感测端调整电压	- Sensing regulation	最大2 V	最大2 V	最大2 V	最大2 V	最大2 V
-10-90% 的转换速率	- Slew rate 10-90%	最长30 ms	最长30 ms	最长30 ms	最长30 ms	最长30 ms
输出电流	**Output current**	0...20 A	0...10 A	0...5 A	0...20 A	0...10 A
-0-100%ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%
-±10% ΔU_{AC}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
-纹波 (1	- Ripple (1	<60 mA_{PP} <10 mA_{RMS}	<35 mA_{PP} <7 mA_{RMS}	<12 mA_{PP} <3 mA_{RMS}	<65 mA_{PP} <10 mA_{RMS}	<25 mA_{PP} <3 mA_{RMS}
输出功率	**Output power**	320 W	320 W	325 W	640 W	650 W
效率	**Efficiency**	90.5%	89%	92%	90.5%	91%
过压类别	**Overvoltage category**	2				
污染等级	**Pollution degree**	2				
保护等级	**Protection class**	1				
模拟编程	**Analog programming**	0...10 V 或 0...5 V, 可选 / 0...10 V or 0...5 V, selectable				
制冷方式	**Cooling**	自然冷却，通风槽在产品顶部与底部/ Convectional, ventilation slots at top & bottom				
工作温度	**Operation temperature**	0...50°C				
尺寸 (宽x高x长)	**Dimensions (WxHxD)**	218x163x83 mm	218x163x83 mm	218x163x83 mm	218x163x83 mm	218x163x83 mm
安装尺寸(宽x高x长)	**Installation dim. (WxHxD)**	218x190x85 mm	218x190x85 mm	218x190x85 mm	218x190x85 mm	218x190x85 mm
重量	**Weight**	2.2 kg	2.2 kg	2.2 kg	2.2 kg	2.2 kg
订购编号	**Ordering number**	21540401	21540402	21540403	21540404	21540405

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

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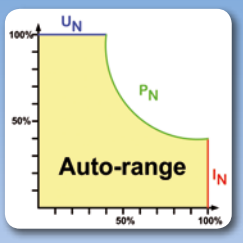
技术参数	Technical Data	EA-PSI 8160-04 R	EA-PSI 880-40 R	EA-PSI 8360-10 R	EA-PSI 880-60 R	EA-PSI 8360-15 R
AC输入电压	Input voltage AC	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N
-频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
-功率因数	- Power factor	>0.99	>0.99	>0.99	>0.99	>0.99
输出电压 (DC)	Output voltage DC	0...160 V	0...80 V	0...360 V	0...80 V	0...360 V
-0-100% 的负载调整率	- Load regulation 0-100%	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
-纹波 (1	- Ripple (1	<120 mV_{PP} <20 mV_{RMS}	<10 mV_{PP} <5 mV_{RMS}	<30 mV_{PP} <12 mV_{RMS}	<10 mV_{PP} <5 mV_{RMS}	<30 mV_{PP} <12 mV_{RMS}
-负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms	<2 ms	<2 ms	<2 ms	<2 ms
-感测端调整电压	- Sensing regulation	最大2 V	最大2 V	最大8 V	最大2 V	最大8 V
-10-90% 的转换速率	- Slew rate 10-90%	最长30 ms	最长30 ms	最长30 ms	最长30 ms	最长30 ms
输出电流	Output current	0...4 A	0...40 A	0...10 A	0...60 A	0...15 A
-0-100% ΔU_{DC} 的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%
-±10% ΔU_{AC}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
-纹波 (1	- Ripple (1	<3 mA_{PP} <1 mA_{RMS}	<19 mA_{PP} <7 mA_{RMS}	<1.2 mA_{PP} <0.45 mA_{RMS}	<19 mA_{PP} <7 mA_{RMS}	<1.2 mA_{PP} <0.45 mA_{RMS}
输出功率	Output power	640 W	1000 W	1000 W	1500 W	1500 W
效率	Efficiency	92%	93%	93%	93%	93%
过压类别	Overvoltage category	2				
污染等级	Pollution degree	2				
保护等级	Protection class	1				
模拟编程	Analog programming	0...10 V 或 0...5 V, 可选 / 0...10 V or 0...5 V, selectable				
制冷方式	Cooling	自然冷却 Convectional	风扇制冷，通风槽在产品顶部与底部 / Fan, holes at top & bottom			
工作温度	Operation temperature	0...50°C				
尺寸 (宽x高x长)	Dimensions (WxHxD)	218x163x83 mm	90x360x240 mm	90x360x240 mm	90x360x240 mm	90x360x240 mm
安装尺寸 (宽x高x长)	Installation dim. (WxHxD)	218x190x85 mm	90x370x295 mm	90x370x295 mm	90x370x295 mm	90x370x295 mm
重量	Weight	2.2 kg	6.4 kg	6.4 kg	6.6 kg	6.6 kg
订购编号	Ordering number	21540406	21540407	21540409	21540408	21540410

技术参数	Technical Data	EA-PSI 880-170 R	EA-PSI 8200-70 R	EA-PSI 8500-30 R
AC输入电压	Input voltage AC	340...460 V, 2ph	340...460 V, 2ph	340...460 V, 2ph
-频率	- Frequency	50/60 Hz	50/60 Hz	50/60 Hz
-功率因数	- Power factor	>0.99	>0.99	>0.99
输出电压 (DC)	Output voltage DC	0...80 V	0...200 V	0...500 V
-0-100% 的负载调整率	- Load regulation 0-100%	<0.05%	<0.05%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%
-纹波 (1	- Ripple (1	<150 mV_{PP} / <10 mV_{RMS}	<200 mV_{PP} / <25 mV_{RMS}	<250 mV_{PP} / <70 mV_{RMS}
-负载从10%-100%调整需时	- Regulation 10-100% load	<1 ms	<2 ms	<2 ms
-感测端调整电压	- Sensing regulation	最大2.5 V	最大6 V	最大10 V
-10-90% 的转换速率	- Slew rate 10-90%	17 ms	17 ms	17 ms
输出电流	Output current	0...170 A	0...70 A	0...30 A
-0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%
-±10% ΔU_{AC}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	<0.05%	<0.05%
-纹波 (1	- Ripple (1	<300 mA_{PP} / <40 mA_{RMS}	<44 mA_{PP} / <11 mA_{RMS}	<14 mA_{PP} / <8 mA_{RMS}
输出功率	Output power	5000 W	5000 W	5000 W
效率	Efficiency	93%	95.2%	95.5%
过压类别	Overvoltage category	2		
污染等级	Pollution degree	2		
保护等级	Protection class	1		
模拟编程	Analog programming	0...10 V 或 0...5 V, 可选 / 0...10 V or 0...5 V, selectable		
制冷方式	Cooling	风扇制冷，通风槽在产品顶部与底部/ Fan, vents at top & bottom		
工作温度	Operation temperature	0...50°C		
尺寸 (宽x高x长)	Dimensions (WxHxD)	180x530x171 mm	180x530x171 mm	180x530x171 mm
安装尺寸 (宽x高x长)	Installation dim. (WxHxD)	180x595x175 mm	180x595x175 mm	180x595x175 mm
重量	Weight	12 kg	12 kg	12 kg
订购编号	Ordering number	21540411	21540413	21540412

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

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1 kW/1.5 kW结构

320 W/640 W结构

- 宽范围输入电压90...264 V（1.5 kW以下型号）
- 两相输入电压340...460 V（5 kW型号）
- 效率高达 93.5%
- 输出功率：320 W 至 5000 W
- 输出电压：0...16 V 至 0...500 V
- 输出电流：4 A 至 170 A
- 灵活的功率调整输出**
- 有过压保护(OVP)
- 有过温保护(OT)
- LED灯指示状态
- 自动检测远程感测
- 0...10 V模拟接口
- 自然风冷却*
- 温控风扇制冷**

- **Wide range input 90...264 V (up to 1.5 kW models)**
- **Two-phase input 340...460 V (5 kW models)**
- **High efficiency up to 93.5%**
- **Output power ratings: 320 W up to 5000 W**
- **Output voltages: 0...16 V up to 0...500 V**
- **Output currents: 4 A up to 170 A**
- **Auto-ranging output stage ****
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Status indication via LEDs**
- **Remote sense with automatic detection**
- **Analog interface for 0...10 V**
- **Natural convection ***
- **Temperature controlled fans for cooling ****

概要
EA-PS 800 R系列是一款由微处理器控制，采用最新技术设计的实验室电源。它配备多种功能，是用户使用非常方便和极其有效的工具。

其外壳专门设计成强挂或机柜安装式结构。产品概念是专门针对永久性且全自动操作。一旦出现市电停电或给产品通电后，他们会立即像之前一样工作。

输入
本系列采用主动式功率因数，1.5 kW以下型号适合90 V至264 V AC的输入电压，而5 kW型号则需在340 V...460 V AC三相输入电压下操作。

DC输出
本系列有多款不同型号，可选择0...16 V和0...500 V输出电压，0...4 A和0...170 A输出电流，320 W、640 W、1000 W、1500 W和5 kW输出功率的型号。每个型号的输出电压都可分成三个可调范围。输出电流与功率则不可调，受限于其额定值。

* 650 W以下型号
** 1 kW以上型号

General
The microprocessor controlled wall mount power supplies of the series EA-PS 800 R offer useful integrated functions, turning them into an extremely effective and highly comfortable tool for the user.
The enclosure is designed for wall mount or installation inside cabinets. The concept of the device is made for permanent and unattended operation. In case of a mains supply blackout or after powering up the devices, they immediately continue to work as before.

Input
The equipment uses an active PFC. Models up to 1.5 kW are suitable for worldwide operation on mains supply of 90...264 V, 5 kW models or require a three-phase connection with two phases and 340...460 V AC.

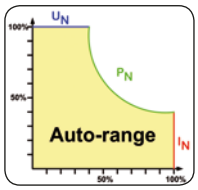
DC output
Different units with DC output voltages from 0...16 V to 0...500 V, currents from 4 A to 170 A and power ratings of 320 W, 640 W, 1000 W, 1500 W and 5 kW are available. The output voltage of each model is divided into three selectable adjustment ranges. Current and power are not adjustable and thus limited to their nominal values.

* Models up to 650 W
** Models from 1 kW

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功率

1 kW以上型号的输出功率灵活变化，在低电流时输出更高的电压，或在低电压时输出更大的电流，都由最大额定输出功率来限制。这些型号的设定功率都可调。因此仅用一台产品就可涵盖广范围的应用。



Power

Models with 1 kW or higher output power are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. The power set value is adjustable with these models. Therefore, a wide range of applications can already be covered by the use of just one single unit.

过压保护（OVP）

为保护连接负载免受过压，可设定一过压保护极限值(OVP)。它能根据输出电压自动调节。意思是，它允许输出电压出现一个固定的偏差。一旦出现过压，会自动切断输出，前板与模拟接口都会发出报警信号。

Overvoltage protection (OVP)

To protect equipment connected against excess of voltage, an overvoltage protection (OVP) is implemented, which will automatically adjust according to the output voltage. It means, it will follow the adjusted output voltage with a fixed offset. In case of overvoltage, the output will disconnect automatically and an alarm will be generated both on the front panel and the analog interface.

远程感测

远程感测输入端可直接连到负载设备，以补偿连线上的压降。如果输入端已接上负载，本电源会自动纠正输出电压，以确保负载获得准确所需的电压值。

Remote sensing

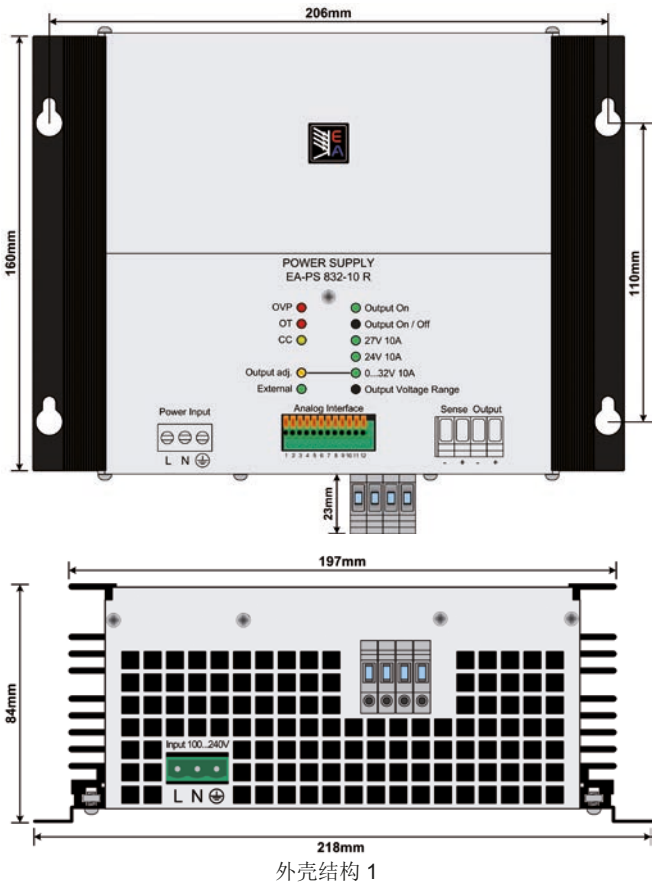
The sense input can be connected directly to the load to compensate voltage drops along the power cables. If the sense input is connected to the load, the power supply will correct the output voltage automatically in order to ensure that the accurate required voltage is available on the load.

模拟接口

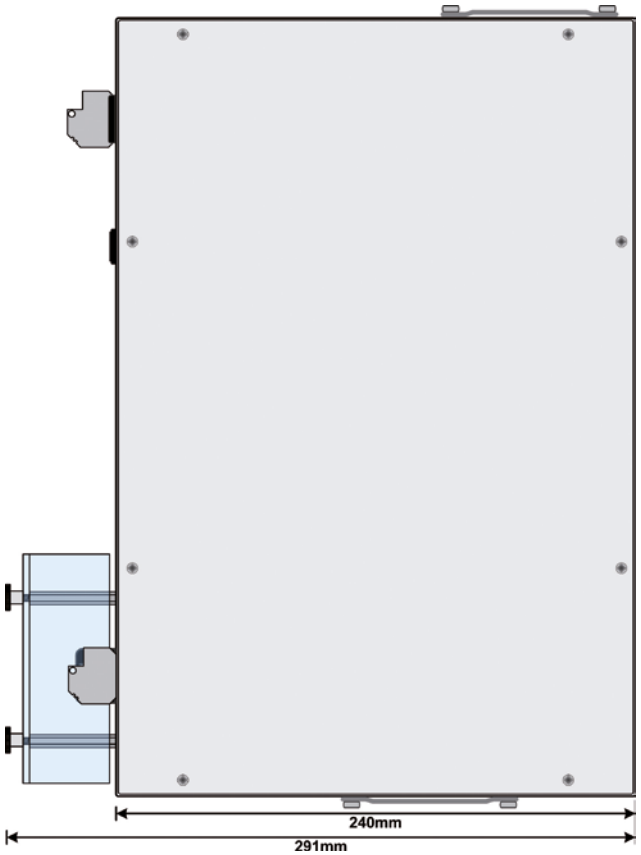
模拟接口输入引脚接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压与电流。模拟接口输出脚接上0 V...10 V或0 V...5 V电压，则可监控输出电压与电流。此外，还有几个输入脚和输出脚，用来控制和监控产品状态。

Analog interface

Analog inputs for voltages from 0...10 V for setting voltage and current from 0...100% are available. For monitoring the output voltage and current, analog outputs are realised with voltages from 0...10 V. Several digital inputs and outputs are available for controlling and monitoring the status.



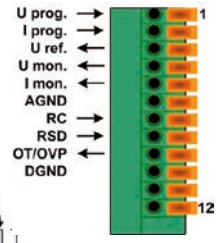
外壳结构 1
Enclosure type 1

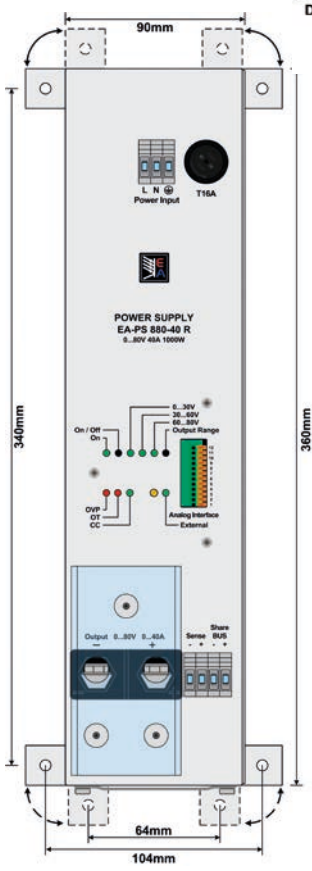


外壳结构 2
Enclosure type 2

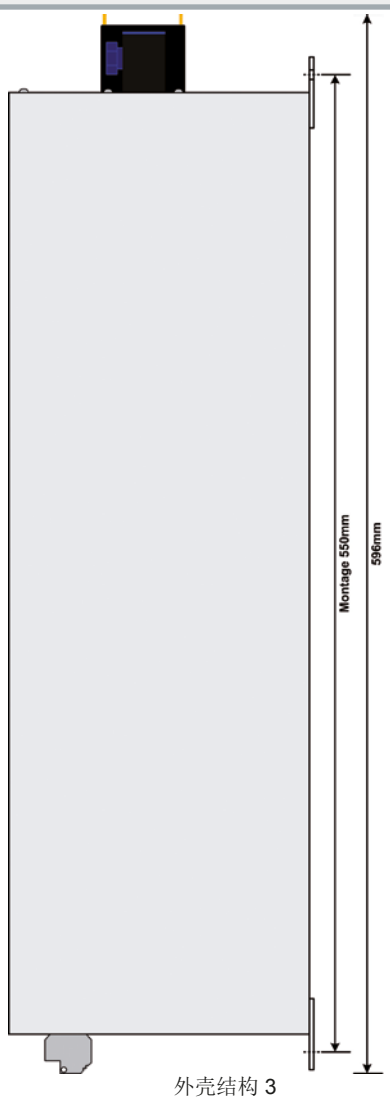
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模拟接口 / Analog interface

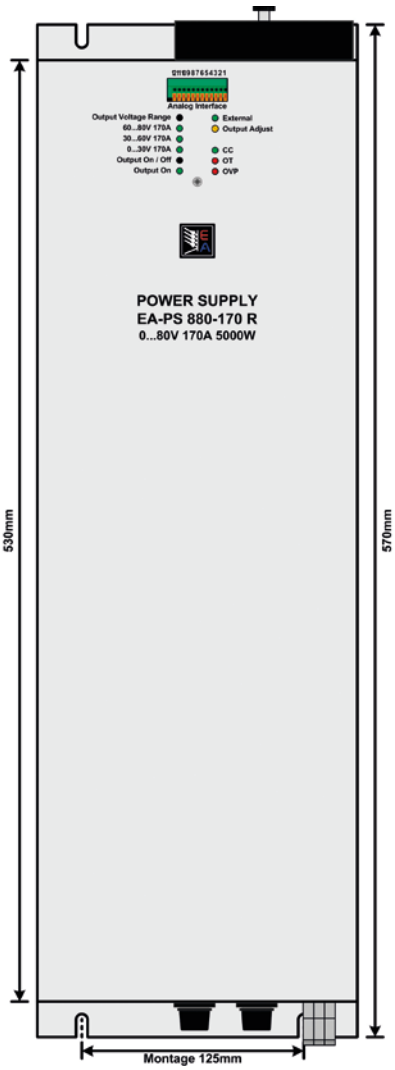




外壳结构 2
Enclosure type 2



外壳结构 3
Enclosure type 3



技术参数	Technical Data	EA-PS 816-20 R	EA-PS 832-10 R	EA-PS 865-05 R	EA-PS 832-20 R	EA-PS 865-10 R
输入电压	**Input voltage AC**	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N
-频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
-功率因数	- Power factor	>0.99	>0.99	>0.99	>0.99	>0.99
输出电压 (DC)	**Output voltage DC**	0...16 V	0...32 V	0...65 V	0...32 V	0...65 V
- 0-100% 的负载调整率	- Load regulation 0-100%	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
-纹波 (1	- Ripple (1	<40 mV_{PP} <4 mV_{RMS}	<100 mV_{PP} <10 mV_{RMS}	<150 mV_{PP} <20 mV_{RMS}	<100 mV_{PP} <8 mV_{RMS}	<150 mV_{PP} <10 mV_{RMS}
-负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms	<2 ms	<2 ms	<2 ms	<2 ms
-感测端调整电压	- Sensing regulation	最大2 V	最大2 V	最大2 V	最大2 V	最大2 V
-10-90% 的转换速率	- Slew rate 10-90%	最长30 ms	最长30 ms	最长30 ms	最长30 ms	最长30 ms
输出电流	**Output current**	0...20 A	0...10 A	0...5 A	0...20 A	0...10 A
-0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%
-±10% ΔU_{AC}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
-纹波(1	- Ripple (1	<60 mA_{PP} <10 mA_{RMS}	<35 mA_{PP} <7 mA_{RMS}	<12 mA_{PP} <3 mA_{RMS}	<65 mA_{PP} <10 mA_{RMS}	<25 mA_{PP} <3 mA_{RMS}
输出功率	**Output power**	320 W	320 W	325 W	640 W	650 W
效率	**Efficiency**	90.5%	89%	92%	90.5%	91%
过压类别	**Overvoltage category**	2				
污染等级	**Pollution degree**	2				
保护等级	**Protection class**	1				
模拟编程	**Analog programming**	0...10 V				
制冷方式	**Cooling**	自然冷却，通风槽在产品顶部与底部 / Convectional, ventilation slots at top & bottom				
工作温度	**Operation temperature**	0...50°C				
尺寸(宽x高x长)	**Dimensions (WxHxD)**	218x163x83 mm	218x163x83 mm	218x163x83 mm	218x163x83 mm	218x163x83 mm
安装尺寸 (宽x高x长)	**Installation dim. (WxHxD)**	218x190x85 mm	218x190x85 mm	218x190x85 mm	218x190x85 mm	218x190x85 mm
重量	**Weight**	2.2 kg	2.2 kg	2.2 kg	2.2 kg	2.2 kg
订购编号	**Ordering number**	21540101	21540102	21540103	21540104	21540105

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

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技术参数	Technical Data	EA-PS 8160-04 R	EA-PS 880-40 R	EA-PS 8360-10 R	EA-PS 880-60 R	EA-PS 8360-15 R
输入电压	**Input voltage AC**	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N
-频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
-功率因数	- Power factor	>0.99	>0.99	>0.99	>0.99	>0.99
输出电压 (DC)	**Output voltage DC**	0...160 V	0...80 V	0...360 V	0...80 V	0...360 V
-0-100% 的负载调整率	- Load regulation 0-100%	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
- ±10% Δ U_{IN}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
-纹波 (1	- Ripple (1	<120 mV_{PP} <20 mV_{RMS}	<10 mV_{PP} <5 mV_{RMS}	<30 mV_{PP} <12 mV_{RMS}	<10 mV_{PP} <5 mV_{RMS}	<30 mV_{PP} <12 mV_{RMS}
-负载从10%-100%调整需时	- Regulation 10-100% load	<2 ms	<2 ms	<2 ms	<2 ms	<2 ms
-感测端调整电压	- Sensing regulation	最大 2 V	最大2 V	最大8 V	最大2 V	最大8 V
-10-90% 的转换速率	- Slew rate 10-90%	最长30 ms	最长30 ms	最长30 ms	最长30 ms	最长30 ms
输出电流	**Output current**	0...4 A	0...40 A	0...10 A	0...60 A	0...15 A
-0-100%ΔU_{OUT} 的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%	<0.15%	<0.15%
-±10% Δ U_{IN}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
-纹波(1	- Ripple (1	<3 mA_{PP} <1 mA_{RMS}	<19 mA_{PP} <7 mA_{RMS}	<1.2 mA_{PP} <0.45 mA_{RMS}	<19 mA_{PP} <7 mA_{RMS}	<1.2 mA_{PP} <0.45 mA_{RMS}
输出功率	**Output power**	640 W	1000 W	1000 W	1500 W	1500 W
效率	**Efficiency**	92%	93%	93%	93%	93%
过压类别	**Overvoltage category**	2				
污染等级	**Pollution degree**	2				
保护等级	**Protection class**	1				
模拟编程	**Analog programming**	0...10 V				
制冷方式	**Cooling**	自然风冷 / Conventional	风扇，通风孔在外壳顶部与底部 / Fan, holes at top & bottom			
工作温度	**Operation temperature**	0...50°C				
尺寸 (宽x高x长)	**Dimensions (WxHxD)**	218x163x83 mm	90x360x240 mm	90x360x240 mm	90x360x240 mm	90x360x240 mm
安装尺寸 (宽x高x长)	**Installation dim. (WxHxD)**	218x190x85 mm	90x370x295 mm	90x370x295 mm	90x370x295 mm	90x370x295 mm
重量	**Weight**	2.2 kg	6.4 kg	6.4 kg	6.6 kg	6.6 kg
订购编号	**Ordering number**	21540106	215401107	21540109	21540108	21540110

技术参数	Technical Data	EA-PS 880-170 R	EA-PS 8200-70 R	EA-PS 8500-30 R
输入电压	**Input voltage AC**	340...460 V, 2ph	340...460 V, 2ph	340...460 V, 2ph
-频率	- Frequency	50/60 Hz	50/60 Hz	50/60 Hz
-功率因数	- Power factor	>0.99	>0.99	>0.99
输出电压 (DC)	**Output voltage DC**	0...80 V	0...200 V	0...500 V
-0-100% 的负载调整率	- Load regulation 0-100%	<0.05%	<0.05%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%	<0.02%	<0.02%
-纹波 (1	- Ripple (1	<150 mV_{PP} / <10 mV_{RMS}	<200 mV_{PP} / <25 mV_{RMS}	<250 mV_{PP} / <70 mV_{RMS}
-负载从10%-100%调整需时	- Regulation 10-100% load	<1 ms	<2 ms	<2 ms
-感测端调整电压	- Sensing regulation	max. 2.5 V	max. 6 V	max. 10 V
-10-90% 的转换速率	- Slew rate 10-90%	17 ms	17 ms	17 ms
输出电流	**Output current**	0...170 A	0...70 A	0...30 A
-0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%	<0.15%	<0.15%
-±10% ΔU_{AC}时的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	<0.05%	<0.05%
-纹波(1	- Ripple (1	<300 mA_{PP} / <40 mA_{RMS}	<44 mA_{PP} / <11 mA_{RMS}	<14 mA_{PP} / <8 mA_{RMS}
输出功率	**Output power**	5000 W	5000 W	5000 W
效率	**Efficiency**	93%	95.2%	95.5%
过压类别	**Overvoltage category**	2		
污染等级	**Pollution degree**	2		
保护等级	**Protection class**	1		
模拟编程	**Analog programming**	0...10 V		
制冷方式	**Cooling**	风扇，通风孔在外壳顶部与底部 / Fan, holes at top & bottom		
工作温度	**Operation temperature**	0...50°C		
尺寸 (宽x高x长)	**Dimensions (WxHxD)**	180x530x171 mm	180x530x171 mm	180x530x171 mm
安装尺寸 (宽x高x长)	**Installation dim. (WxHxD)**	180x595x175 mm	180x595x175 mm	180x595x175 mm
重量	**Weight**	12 kg	12 kg	12 kg
订购编号	**Ordering number**	21540122	21540124	21540123

(1 RMS值：在BWL 300KHz时测量的LF值, PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

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EA-PS 524-11R　　EA-PS 512-21T　　EA-PS 1501 T

- EA-PS 500
  - 宽范围输入电压90...264 V， 带主动式PFC
  - 输出功率：150 W 至 300 W
  - 输出电压：12 V, 24 V, 42 V 与 48 V
  - 输出电流：5.2 A 至 21 A
  - 输出电压可调
  - 远程感测输入
  - 过载与短路保护
  - 过温保护(OT)
  - 有桌面式与墙挂式结构：
    - 桌面式外壳配插座（T型插座）
    - 墙挂式式外壳配螺丝插座（R型插座）

- **EA-PS 500**
  - **Wide input voltage range 90...264 V with active PFC**
  - **Output powers: 150 W up to 300 W**
  - **Output voltages: 12 V, 24 V, 42 V and 48 V**
  - **Output currents: 5.2 A up to 21 A**
  - **Output voltage adjustable**
  - **Remote sense input**
  - **Overload- and short-circuit-proof**
  - **Overtemperature protection (OT)**
  - **Desk and wall mounting versions**
    - **Desk units with 4 mm sockets (type T)**
    - **Wall units with screw terminals (type R)**

EA-PS 500
EA-PS 500固定输出电源系列专为要求稳定直流电环境而设计。随附的挂条可拆卸。温控风扇保证产品恰当地制冷。

限流功能按照U-I特性运行，使产品更适合并联操作。

通过螺丝刀可调节输出电压（+15/-8%）。

远程感测线路可以对直流输出线上的压降进行一定的补偿。

宽范围的输入电压90...264 V_{AC} 适合全世界范围内使用。

EA-PS 1501 T
该通用电源为小功率电源，用可调电位器可调节直流输出电压和电流。出厂产品附有带EU插头电源线为市电连接线。本产品小巧，是业余爱好者、实验室、学校和教育培训机构的理想之选。

EA-PS 500
These fixed output power supplies series EA-PS 500 are designed for operation of equipment requiring a stable DC supply. The mounting brackets are detachable. A temperature controlled fan ensures appropriate cooling.
The output current limitation works according to an U-I characteristic and enables the units to be used also for parallel standby operation.
The output voltage can be adjusted with a screw driver (+15/-8%).
A remote sensing circuit can compensate a typical voltage drops along the DC output cables up to a certain level.
The wide input voltage range of 90...264 V_{AC} allow flexible, worldwide usage.

EA-PS 1501 T
This universal power supply is a stabilised small power unit which allows to adjust DC output voltage and current with separate potentiometers. A mains cord with Euro plug is installed for AC input. The device is very handy and ideal for the use in hobby, laboratory, school and education.

技术参数	Technical Data	PS 512-11R/T	PS 524-05R/T	PS 512-21R/T	PS 524-11R/T	PS 536-07R/T	PS 548-05R/T	PS 1501 T
AC输入电压	Input voltage AC	90...264 V	90...264 V	90...264 V	90...264 V	90...264 V	90...264 V	100...253 V
-频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	50/60 Hz
DC输出电压	Output voltage DC	11...14 V	22...29 V	11...14 V	22...29 V	32...43 V	43...58 V	2.7...15 V
- 0-100% 时的负载调整率	- Load reg. 0-100% load	≤100 mV	≤50 mV	≤100 mV	≤100 mV	≤100 mV	≤70 mV	≤20 mV
-纹波 LF	- Ripple LF	≤25 mV_{RMS}	≤20 mV_{RMS}	≤40 mV_{RMS}	≤25 mV_{RMS_f}	≤20 mV_{RMS}	≤20 mV_{RMS}	≤30 mV_{RMS}
输出电流	Output current	10.5 A	5.2 A	21 A	10.5 A	6 A	5.2 A	0.2...1 A
输出功率	Output power	150 W	150 W	300 W	300 W	300 W	300 W	15 W
尺寸 (宽x高x长)	Dim. (WxHxD) mm	110x58x226	110x58x226	110x58x226	110x58x226	110x58x226	110x58x226	77x66x112
工作温度	Operation temperature	0...40°C	0...40°C	0...40°C	0...40°C	0...40°C	0...40°C	0...45°C
重量	Weight	1.65 kg	1.65 kg	1.75 kg	1.75 kg	1.75 kg	1.75 kg	0.9 kg
订购编号	Ordering number	35320124 (R)	35320125 (R)	35320132 (R)	35320133 (R)	35320202 (R)	35320135 (R)	38917204
		35320112 (T)	35320113 (T)	35320120 (T)	35320121 (T)	35320199 (T)	35320123 (T)	

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FET开关 / FET Switch

概述
本产品安装于19“外壳内，是基于场效应三极管设计的大电流FET开关。可在极低功耗的情况下转换大电流。此类开关适用于测试或生产车间，产生极快的方形跃变。

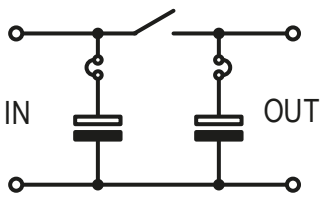
另外还可集成带电解电容的容量库到本产品上，开关的输入端装一个，输出端装一个。这些容量库可通过连接桥连到产品的后面。并能随意使用，比如当FET转为连至恒久脉冲电流设备时来保护电源。

General
This device, designed in a 19“ enclosure, is a high-current FET switch based upon field-effect transistors. It is able to switch up high current with extremely low power dissipation. Such a FET switch is used in testing or production environment, where it is required to generate ultrafast and rectangular ramping.

There are furthermore integrated banks with electrolytic capacitors, one on the input and one on the output of the switch. These banks can be connected to the switch with bridges on the rear of the unit. They can be used arbitrarily, for example to protect the source to which the FET switch it connected to from permanent pulse currents

技术参数	Technical Data	FET Switch 1
输入电压	Input voltage	230 V AC
-频率	- Frequency	50 Hz
可转换电压	Switchable voltage	最大60 V DC
可转换电流	Switchable current	最大80 A(1 / 150 A(2 DC
转换频率	Switching frequency	最大3 kHz
开关次数	Number of switches	1
集成电容大小	Attachable capacity	2x 103.5 mF
控制输入端	Control input	1x Sub-D 9针/9pole
工作温度	Operation temperature	0...50°C
储存温度	Storage temperature	-20...70°C
尺寸 (宽x高x长)	Dimensions (WxHxD)	19“ x 4 HE/4U x 460 mm
直流连接端	DC connection	M8螺丝端 / Screw terminal M8
订购编号	Ordering number	33903179

(1 连续电流 / continuous
(2 脉冲电流 / pulsed



FET-开关原理图 /
Principle schematic of the FET switch

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OTP



- AC输入电压：90...264 V
- DC输入电压：120...370 V
- 输出功率级别：10 W, 30 W, 60 W, 78 W, 100 W
- 输出电压：12 V 或 24 V
- 输出电流：0.42 A 至 6.5 A
- 过载和短路保护
- 过温保护
- 过压保护
- 自然冷却
- 保护等级为IP20
- 绝缘级别为II
- 符合EN 60950安全标准
- EMC EAN 61204 (EN 55022 等级B)

- **Input voltage AC: 90...264 V**
- **Input voltage DC: 120...370 V**
- **Output power ratings: 10 W, 30 W, 60 W, 78 W, 100 W**
- **Output voltages: 12 V and 24 V**
- **Output currents: 0.42 A up to 6.5 A**
- **Overload- and short-circuit-proof**
- **Overtemperature protection**
- **Overvoltage protection**
- **Natural cooling**
- **Protection degree IP20**
- **Isolation class II**
- **Safety EN 60950**
- **EMC EN 61204 (EN 55022 class B)**

概要

这类开关模式电源专为DIN TS35/7.5 or DIN TS35/15类的导轨安装而设计。它们建于坚固的塑胶外壳内，符合IP20保护等级。

所有型号都为90 V至260 V AC，或120 V至370 V DC宽范围输入电压。故不需进行输入电压的选择，便可在世界各地使用。

本产品有短路保护、过载保护、过温保护和过压保护。

输出端与市电（浮动）是隔离的。输出电压可在12...15 V DC 或24...28 V DC之间调节。本产品还具有输出电流限定功能，限定在110%-130%（过载时）或150%（短路时）之间。

温度>55°C，直至70°C时都可接受，但会有2.5%/°C的功率降额。

General

These switching mode power supplies are designed for DIN rail mounting on DIN TS35/7.5 or DIN TS35/15 rails. They are housed in a rugged plastic case with protection degree IP20.

All models have a wide input range for 90 V to 264 V AC or 120 V to 370 V DC for worldwide usage without the need of selecting the input.

The units are protected against short-circuit, overload, overtemperature and overvoltage.

The output is isolated against the mains supply (floating potential). The output voltage is adjustable within 12...15 V DC or 24...28 V DC. The units are provided with output current limiting to 110%-130% (overload) or 150% (short-circuit).

A derating of 2.5%/°C for temperatures of >55°C up to 70°C is required.

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技术参数	Technical Data	Series EA-PS 800 KSM / 系列
输入	**Input**	
-AC电压范围	- Voltage range AC	90...264 V
-DC电压范围	- Voltage range DC	120...370 V
-频率范围	- Frequency range	47...63 Hz
效率	**Efficiency**	>83% @ 230 V
转换频率	**Converter frequency**	50...65KHz
输出	**Output**	
-过流保护极限值	- Overcurrent protection	10-150%
-过压保护极限值	- Overvoltage protection	120-140%
-过热保护极限值	- Thermal protection	有 / yes
-滞留时间	- Hold-up time	~100 ms @ 230 V
-降额	- Derating	2.5%/°C @ 55°C...70°C
指示灯	**Indicators**	DC OK LED (绿灯/green), DC Low LED (红灯/red)
安规标准	**Standards**	EN 61204 (EMC), EN 60950-1 (Safety-安规)
制冷方式	**Cooling**	自然冷却 / Natural cooling
工作温度	**Operation temperature**	0...+55°C (0...+70°C 有功率降额 / with derating)
储存温度	**Storage temperature**	-20...+70°C

技术参数	Technical Data	EA-PS 812-010 KSM	EA-PS 812-022 KSM	EA-PS 812-045 KSM	EA-PS 812-070 KSM
输出	**Output**				
-电压	- Voltage	12...15 V DC	12...15 V DC	12...15 V DC	12...15 V DC
- 0-100%的负载调整率	- Load regulation 0-100%	≤350 mV	≤350 mV	≤300 mV	≤300 mV
-LF纹波	- Ripple LF	≤40 mV_{pp}	≤40 mV_{pp}	≤40 mV_{pp}	≤40 mV_{pp}
-额定电流	- Nominal current	0.83 A	2.5 A	5 A	6.5 A
-额定功率	- Nominal power	10 W	30 W	60 W	78 W
尺寸(宽x高x长)	**Dimensions (WxHxD)**	23x91x57 mm	53x91x57 mm	71x91x57 mm	90x91x57 mm
重量	**Weight**	0.07 kg	0.19 kg	0.25 kg	0.37 kg
订购编号	**Ordering number**	38917154	38917155	38917156	38917157

技术参数	Technical Data	EA-PS 824-004 KSM	EA-PS 824-012 KSM	EA-PS 824-025 KSM	EA-PS 824-040 KSM
输出	**Output**				
-电压	- Voltage	24...28 V DC	24...28 V DC	24...28 V DC	24...28 V DC
- 0-100%的负载调整率	- Load regulation 0-100%	≤350 mV	≤350 mV	≤300 mV	≤320 mV
-LF纹波	- Ripple LF	≤20 mV_{pp}	≤20 mV_{pp}	≤20 mV_{pp}	≤90 mV_{pp}
-额定电流	- Nominal current	0.42 A	1.25 A	2.5 A	4.2 A
-额定功率	- Nominal power	10 W	30 W	60 W	100 W
尺寸 (宽x高x长)	**Dimensions (WxHxD)**	23x91x57 mm	53x91x57 mm	71x91x57 mm	90x91x57 mm
重量	**Weight**	0.07 kg	0.19 kg	0.25 kg	0.37 kg
订购编号	**Ordering number**	38917150	38917151	38917152	38917153

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OTP



EA-PS 824-10 SM

- 宽范围输入电压90...264 V，带主动式PFC
- 效率：高达 93%
- 输出功率：120 W 至 480 W
- 输出电压：12 V, 24 V 和 48 V
- 输出电流：10 A 至 20 A
- 可持续8秒过载50%
- 导轨式安装
- 有过压保护(OVP)
- 有过温保护(OT)
- 状态LED指示灯
- 自由电位信号接点表示"输出OK"
- 自然风冷式冷却方式
- 符合EN 60950安规标准
- 符合EMI EN 61000-6-1, EN 61000-6-3标准

- **Wide input voltage range 90...264 V with active PFC**
- **High efficiency up to 93%**
- **Output powers: 120 W up to 480 W**
- **Output voltages: 12 V, 24 V and 48 V**
- **Output currents: 10 A up to 20 A**
- **50% overload for 8 seconds**
- **DIN rail mounting**
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Status indication via LEDs**
- **Potential-free signal contact for output OK**
- **Natural convection for cooling**
- **Safety EN 60950**
- **EMI EN 61000-6-1, EN 61000-6-3**

概要

EA-PS 800 SM 这一代DIN导轨安装式电源系列，已经发展成重型工业领域应用之产品。其效率高达93%，体积小巧，全因使用了创新的开关技术。本产品的功率因数值(PFC) >99%。

本产品在8秒钟内可输出超过额定功率50%的峰值功率。

电源断电时能持续供电时间 >20 ms。

调节前板电位器可调节输出电压。

所有型号都有一干式继电器接点（直流电源失效），可用来监控输出电压，还有两个状态LED灯指示输出和错误。

本产品还有过载和短路保护功能，以及浪涌电流限制。过压和过温保护电路还可保护连接负载以及电源。

以自然对流作为冷却方式，工作温度为0...70°C，60°C以上每升高一度降额2%的功率。（480 W型号则从50°C开始）

安装于DIN导轨上时，仅需弹簧夹即可，不需其它工具协助。

输入

本产品采用主动式**PFC**校正线路，从而产品能应用于世界范围内，输入电压为90 V至264 V AC，还可当150 V DC至370 V DC的隔离DC/DC转换器用。

General

This generation of DIN-Rail mounting power supplies series EA-PS 800 SM has been developed for heavy-duty industrial applications. An outstanding efficiency up to 93%, smallest dimensions are a result of the use of an innovative switching technology. The units have a power factor correction (PFC) of >99%.
They are able to supply an additional peak power of 50 % of the nominal rating for up to 8 seconds.

The hold-up time upon mains power failure is >20 ms.

The output voltage can be adjusted via trimmer on the front panel.
All models have a dry relay contact (DC power fail) to monitor the output voltage and they have two status LED's for output and error.
The units are provided with overload and short-circuit protection as well as inrush current limiting. An overvoltage and an overtemperature feature protect the connected load and also the power supply.
Cooling is arranged via natural convection, operating temperature is 0...70°C with a 2%/°C derating above 60°C (50°C at the 480 W models).
Mounting on a DIN-rail uses spring clips, eliminating the need for tools.

Input

The equipment uses an active **P**ower **F**actor **C**orrection to enable using it worldwide on a mains input from 90 V up to 264 V AC and for a usage as isolated DC/DC converters for 150 V DC up to 370 V DC as well.

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输出

本系列有多款不同型号，可选择12 V、24 V和48 V输出电压，10 A 至20 A输出电流，120 W至480 W输出功率的类型。输出电压可调。输出端为螺丝端。

保护功能

为保护连接负载，可将过压保护极限值(OVP)设定为输出电压的110%。超过该值，则关断输出。

为保护产品和连接设备，本产品内部配有过温（OT）保护功能。一旦达到关键温度，如：在高温环境下或在有限空气环流条件下工作，输出被关断，当温度下降后又自动重启。

选项

- 配上合适的电池组可当多功能直流UPS用。

DC output

Different units with DC voltage output ranges from 12 V, 24 V and 48 V, current output ranges from 10 A to 20 A and power output ranges from 120 W to 480 W, are available. The output voltage is adjustable and is provided at screw terminals.

Protective features

To protect connected equipment an overvoltage protection (OVP) of 110% of the currently adjusted output voltage is set. Exceeding this value shuts the output off.
To protect the unit from overheating, the units come with a built-in overtemperature protection (OT). On reaching critical temperature, e.g. high ambient temperature or operating with limited air circulation, the output is shut off and is automatically restarted when the temperature has reduced.

Options

- This series can also be supplied as DC-USV units with many functions, together with suitable battery units.

技术参数	Technical Data	PS 812-10 SM	PS 812-16 SM	PS 824-10 SM	PS 824-20 SM	PS 848-10 SM
AC输入电压	Input voltage AC	90...264 V	90...264 V	90...264 V	90...264 V	90...264 V
-频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
-功率因数	- Power factor	>0.99	>0.99	>0.99	>0.99	>0.99
DC输入电压	Input voltage DC	150...360 V	150...360 V	150...360 V	150...360 V	150...360 V
DC输出电压	Output voltage DC	12...15 V	12...15 V	24...28 V	24...28 V	48...56 V
- 0-100% 时的负载调整率	- Load regulation 0-100%	<1%	<1%	<1%	<1%	<1%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
-纹波LF	- Ripple LF	<50 mV_{pp}	<50 mV_{pp}	<50 mV_{pp}	<120 mV_{pp}	<180 mV_{pp}
-调整需时	- Regulation	<2 ms	<2 ms	<2 ms	<2 ms	<2 ms
-过压保护	- Overvoltage protection	16 V ±1 V	16 V ±1 V	30 V ±1 V	30 V ±1 V	58 V ±1 V
输出电流	Output current	10.0 A	16.0 A	10.0 A	20.0 A	10.0 A
输出功率	Output power	120 W	240 W	240 W	480 W	480 W
尺寸(宽x高x长)	Dimensions (WxHxD)	48x126x112 mm	60x126x112 mm	60x126x112 mm	78x126x125 mm	78x126x125 mm
重量	Weight	0.9 kg	1 kg	1 kg	1.3 kg	1.3 kg
订购编号	Ordering number	35320190	35320193	35320194	35320197	35320198

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OTP



EA-PS 800 19“

- 宽范围输入电压90...264 V，带主动式PFC
- 效率：高达 92%
- 输出功率：58 W 至240 W
- 输出电压：3.3 V 至 24 V
- 输出电流：2.5 A 至 30 A
- 单路，双路和三路输出
- 功率受限，所有输出端可输出全功率
- 所有输出端可分开调节和调整
- 有过压保护 (OVP)
- 有过温保护 (OT)
- 远程开/关，电源断电提示信号
- 远程感测功能
- 可选项
  - 电源输出端之间功率共享*
  - 无前面板

- **Wide input voltage range 90...264 V with active PFC**
- **High efficiency up to 92%**
- **Output power ratings: 58 W up to 240 W**
- **Output voltages: 3.3 V up to 24 V**
- **Output currents: 2.5 A up to 30 A**
- **Single, double or triple output**
- **Power limited, all outputs for full power**
- **All outputs separately adjustable and regulated**
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Remote on/off and power fail signal**
- **Remote sensing**
- **Options**
  - **Power sharing* between mains outputs**
  - **Without front plate**

概要

EA-PS 800 19“系列有单组，两组和三组输出的不同类型产品。结合同步整流二极管和半谐振变换器，使得其效率高达92%，是极其高效且稳定可靠的产品。

输出

本系列有不同型号，可选择3.3 V, 5 V, 12 V和24 V输出电压，80 W, 150 W和240 W输出功率的类型。所有输出端，不管是主输出还是辅助输出，都有静态限流和限功率电路，并能单独稳定，实现真正零负载兼容，具有完全的短路保护和超载保护。通过前板可调电位器可在特定范围内调节所有输出电压，以适应敏感性负载，并经LED灯指示出来。内置OVP保护电流可保护连接负载不因直流过压而受损。

输入

主动式功率因数校正与宽范围的输入电压90 V...264 V AC（120...360 V DC），使产品在全世界范围内都适用，或者当隔离DC/DC转换器用。

远程感测

远程感测输入电路为一H15端子，可直接连到负载的输入端，以补偿市电输出线上的压降，确保给敏感性设备供应稳定又精确的电压。

General

The models of series EA-PS 800 19” are available as single, dual or triple output power supplies. By combining the synchronised rectifier and semi-resonant converter principle, an efficiency of up to 92% is achieved, making them highly efficient and extremely reliable.

DC output

A selection of output voltages between 3.3 V, 5 V, 12-15 V and 24 V at power levels of 80 W, 150 W and 240 W are available. All outputs, main and auxiliary, are provided with a static current limit and a power limit circuit and are stabilised independently, making them truly zero-load compatible, fully short-circuit- and overload-proof. All output voltages can be trimmed within a specific range by potentiometers located in the front panel to accommodate sensitive loads, and are visualised via LEDs. The integrated OVP protects the equipment connected from DC overvoltage damage.

Input

A wide input range of 90 V...264 V AC (120 V…360 V DC) with active PFC (power factor correction) makes them suitable for a worldwide usage or as isolated DC/DC converters as well.

Remote sense

The remote sensing circuit located at the H15 connector can be connected to the input terminals of the load in order to compensate the voltage loss across the main output wires, ensuring a stable and precise voltage to sensitive equipment.

*„Power-Sharing-功率共享“功能是当两台或两台以上的产品并联时，通过将输出电压调整至相同值，使带载电流均衡送出。

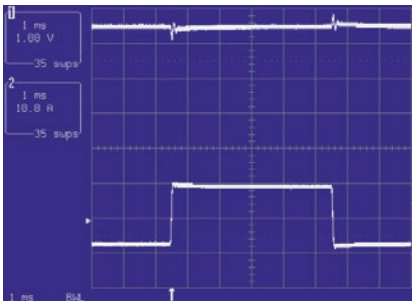
* Power sharing is a feature that makes the load current distribute equally when connecting two or multiple units in parallel, by regulating the output voltages to identical values

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图1：PS805-150 19“ 输出从2.5 A至18 A的带载变化图。

图2：主输出的带载台阶描述了它能单独稳定，且不影响辅助输出。

主输出 /
Main output



输出电流 /
Output current

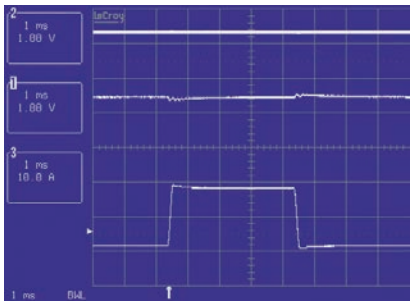
图1 / Figure 1

Figure 1: Load step from 2.5 A to 18 A at PS805-150 19“

Figure 2: The load step on the main output illustrates the separated stabilisation for the main output which does not affect auxiliary output.

辅助输出 /
Aux. output

主输出 /
Main output



输出电流 /
Output current

图2 / Figure 2

远距离开/关
此外，还有一个抑制输入功能，可以远距离启动或关闭输出，使产品可应用于如：自动化系统和/或为了安全目的的领域。

可选项
- ASF：功率共享引脚，仅针对单路输出产品。利用它可以便建立冗余电源系统。
- 按照客户需求可将多个模块并联组合到一完整的19”机架式系统内，还能组成客户指定的输出版本。

Remote on/off
The inhibit input allows to remotely enable or disable the output, in order to use the device, for example, for automated systems and/or just for safety purposes.

Options
- ASF: additional power sharing pin, only for single output models. It provides the possibility to build up a redundant power system.
- Complete 19” rack systems with parallel redundant modules and custom specific output versions are available upon request.

技术参数	Technical Data	EA-PS 800 19“ 80 W	EA-PS 800 19“ 150 W	EA-PS 800 19“ 240 W
AC输入电压	Input voltage AC	90...264 V, 1ph+N	90...264 V, 1ph+N	90...264 V, 1ph+N
- 频率	- Frequency	45...65 Hz	45...65 Hz	45...65 Hz
DC输入电压	Input voltage DC	90...360 V	90...360 V	90...360 V
功率因数	Power factor	>0.99	>0.99	>0.99
效率	Efficiency	高达 / up to 89%	高达 / up to 91%	高达 / up to 92%
输入浪涌电流限制值	Input surge current limitation	<23 A 通过 / by NTC	<23 A 通过 / by NTC	<23 A 通过 / by NTC
输入尖峰电压限制值	Input voltage spike suppression	通过 / by VDR	通过 / by VDR	通过 / by VDR
滞留时间	Hold-up time	>20 ms	>20 ms	>20 ms
输出功率	Output power	58 W ... 96 W	87 ... 150 W	108 ... 240 W
工作温度	Operation temperature	0...70°C	0...70°C	0...70°C
温度 / 输出功率降额	Temperature / Derating			
- 自然对流	- with natural convection	>45 °C 2.1 W/°C	>45 °C 4 W/°C	>45 °C 6.4 W/°C
- 强制风冷 1 m/s	- with forced cooling 1 m/s	>60 °C 4 W/°C	>60 °C 7.5 W/°C	>60 °C 12 W/°C
储存温度	Storage temperature	-40°C ... +85°C	-40°C ... +85°C	-40°C ... +85°C
相对湿度	Relative humidity	<90%, n.c..	<90%, n.c..	<90%, n.c..
安全标准	Safety	EN 60950, IEC 950	EN 60950, IEC 950	EN 60950, IEC 950
EMI辐射	EMI emission	EN 61000-6-3	EN 61000-6-3	EN 61000-6-3
EMI抗扰度	EMI noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
尺寸(宽x高x长)	Dimensions (WxHxD)	8 HP x 3U x 162 mm	10 HP x 3U x 162 mm	12 HP x 3U x 162 mm
重量	Weight	640g	780g	930g

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技术参数	Technical Data	PS 803-80 Single	PS 805-80 Single	PS 812-80 Single	PS 824-80 Single
DC输出电压	Output voltage DC	3.3 V (3.0...3.6 V)	5 V (4.8...5.5 V)	12 V (11.8...15.2 V)	24 V (23.5...28.5 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.05%	<0.05%	<0.05%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.05%	<0.05%	<0.05%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	3.8...4.5 V	6.0...6.7 V	16.5...18.0 V	29.0...33.0 V
输出电流 / 功率	Output current / power	16 A / 58 W	16 A / 80 W	7.5 A / 90 W	4 A / 96 W
输出电流极限	Output current limit	<19 A	<19 A	<8.5 A	<4.8 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.			
电源故障信号	Power fail signal	after >5 ms / 后指示			
控制输入	Control input	外部开-关 / external on-off			
带ASF信号的均流	Power share with ASF signal	optional / 可选			
订购编号	Ordering number	08130300	08130301	08130302	08130303

技术参数	Technical Data	PS 805-12-80 Double		PS 805-24-80 Double	
DC输出电压	Output voltage DC	5 V (4.8...5.5 V)	12 V (11.8...15.2 V)	5 V (4.8...5.5 V)	24 V (23.8...27.2 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	6.0...6.7 V	16.5...18.0 V	6.0...6.7 V	33.0...36.0 V
输出电流 / 功率	Output current / power	16 A / 80 W	2.5 A	16 A / 80 W	2.5 A
输出电流极限	Output current limit	<19 A	<3.0 A	<19 A	<3.0 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.		0.5 V max.	
电源故障信号	Power fail signal	after >5 ms / 后指示		after >5 ms / 后指示	
控制输入	Control input	外部开-关 / external on-off		外部开-关 / external on-off	
带ASF信号的均流	Power share with ASF signal	optional / 可选		optional / 可选	
订购编号	Ordering number	08130304		08130305	

技术参数	Technical Data	PS 812-12-80 Double		PS 812-24-80 Double	
DC输出电压	Output voltage DC	12 V (11.8...15.2 V)	12 V (11.8...15.2 V)	12 V (11.8...15.2 V)	24 V (23.8...27.2 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	16.5...18.0 V	16.5...18.0 V	16.5...18.0 V	33.0...36.0 V
输出电流 / 功率	Output current / power	7.5 A / 90 W	2.5 A	7.5 A / 90 W	2.5 A
输出电流极限	Output current limit	<8.5 A	<3.0 A	<8.5 A	<3.0 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.		0.5 V max.	
电源故障信号	Power fail signal	after >5 ms / 后指示		after >5 ms / 后指示	
控制输入	Control input	外部开-关 / external on-off		外部开-关 / external on-off	
带ASF信号的均流	Power share with ASF signal	optional / 可选		optional / 可选	
订购编号	Ordering number	08130306		08130307	

技术参数	Technical Data	PS 805-12-12-80 Triple		
DC输出电压	Output voltage DC	5 V (4.8...5.5 V)	+12 V (11.8...15.2 V)	-12 V (11.8...15.2 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.2%	<0.2%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.2%	<0.2%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	6.0...6.7 V	16.5...18.0 V	16.5...18.0 V
输出电流 / 功率	Output current / power	16 A / 80 W	2.5 A	2.5 A
输出电流极限	Output current limit	<19 A	<3.0 A	<3.0 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.		
电源故障信号	Power fail signal	after >5 ms / 后指示		
控制输入	Control input	外部开-关 / external on-off		
带ASF信号的均流	Power share with ASF signal	optional / 可选		
订购编号	Ordering number	08130308		

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技术参数	Technical Data	PS 803-150 Single	PS 805-150 Single	PS 812-150 Single	PS 824-150 Single
DC输出电压	Output voltage DC	3.3 V (3.0...3.6 V)	5 V (4.8...5.5 V)	12 V (11.8...15.2 V)	24 V (23.5...28.5 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.05%	<0.05%	<0.05%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.05%	<0.05%	<0.05%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	3.8...4.5 V	6.0...6.7 V	16.5...18.0 V	29.0...33.0 V
输出电流 / 功率	Output current / power	24 A / 87 W	24 A / 132 W	10.7 A / 150 W	6.3 A / 150 W
输出电流极限	Output current limit	<28 A	<28 A	<12.8 A	<7.5 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.			
电源故障信号	Power fail signal	after >5 ms / 后指示			
控制输入	Control input	外部开-关 / external on-off			
带ASF信号的均流	Power share with ASF signal	optional / 可选			
订购编号	Ordering number	08130309	08130310	08130311	08130312

技术参数	Technical Data	PS 805-12-150 Double		PS 805-24-150 Double	
DC输出电压	Output voltage DC	5 V (4.8...5.5 V)	12 V (11.8...15.2 V)	5 V (4.8...5.5 V)	24 V (23.8...27.2 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	6.0...6.7 V	16.5...18.0 V	6.0...6.7 V	33.0...36.0 V
输出电流 / 功率	Output current / power	24 A / 150 W	2.5 A	24 A / 150 W	2.5 A
输出电流极限	Output current limit	<28 A	<3.0 A	<28 A	<3.0 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.		0.5 V max.	
电源故障信号	Power fail signal	after >5 ms / 后指示		after >5 ms / 后指示	
控制输入	Control input	外部开-关 / external on-off		外部开-关 / external on-off	
带ASF信号的均流	Power share with ASF signal	optional / 可选		optional / 可选	
订购编号	Ordering number	08130313		08130314	

技术参数	Technical Data	PS 812-12-150 Double		PS 812-24-150 Double	
DC输出电压	Output voltage DC	12 V (11.8...15.2 V)	12 V (11.8...15.2 V)	12 V (11.8...15.2 V)	24 V (23.8...27.2 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	16.5...18.0 V	16.5...18.0 V	16.5...18.0 V	33.0...36.0 V
输出电流 / 功率	Output current / power	10.7 A / 150 W	2.5 A	10.7 A / 150 W	2.5 A
输出电流极限	Output current limit	<12.8 A	<3.0 A	<12.8 A	<3.0 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.		0.5 V max.	
电源故障信号	Power fail signal	after >5 ms / 后指示		after >5 ms / 后指示	
控制输入	Control input	外部开-关 / external on-off		外部开-关 / external on-off	
带ASF信号的均流	Power share with ASF signal	optional / 可选		optional / 可选	
订购编号	Ordering number	08130315		08130316	

技术参数	Technical Data	PS 805-12-12-150 Triple		
DC输出电压	Output voltage DC	5 V (4.8...5.5 V)	+12 V (11.8...15.2 V)	-12 V (11.8...15.2 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.2%	<0.2%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.2%	<0.2%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	6.0...6.7 V	16.5...18.0 V	16.5...18.0 V
输出电流 / 功率	Output current / power	24 A / 150 W	2.5 A	2.5 A
输出电流极限	Output current limit	<28 A	<3.0 A	<3.0 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.		
电源故障信号	Power fail signal	after >5 ms / 后指示		
控制输入	Control input	外部开-关 / external on-off		
带ASF信号的均流	Power share with ASF signal	optional / 可选		
订购编号	Ordering number	08130317		

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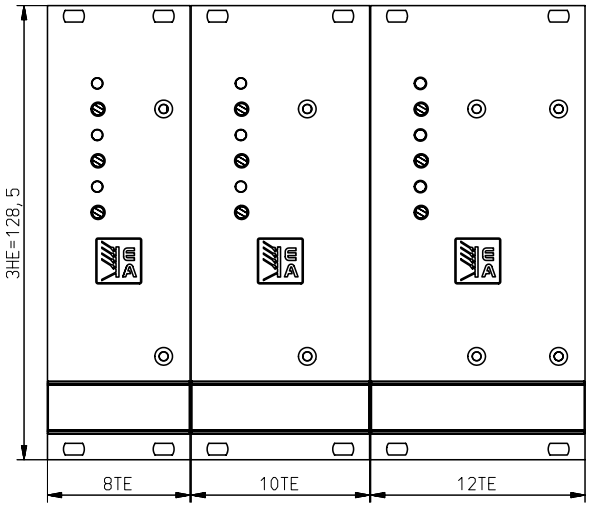
技术参数	Technical Data	PS 803-240 Single	PS 805-240 Single	PS 812-240 Single	PS 824-240 Single
DC输出电压	Output voltage DC	3.3 V (3.0...3.6 V)	5 V (4.8...5.5 V)	12 V (11.8...15.2 V)	24 V (23.5...28.5 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.05%	<0.05%	<0.05%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.05%	<0.05%	<0.05%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	3.8...4.5 V	6.0...6.7 V	16.5...18.0 V	29.0...33.0 V
输出电流 / 功率	Output current / power	30 A / 108 W	30 A / 165 W	16 A / 240 W	10 A / 240 W
输出电流极限	Output current limit	<36 A	<36 A	<19.2 A	<19.2 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.			
电源故障信号	Power fail signal	after >5 ms / 后指示			
控制输入	Control input	外部开-关 / external on-off			
带ASF信号的均流	Power share with ASF signal	optional / 可选			
订购编号	Ordering number	08130318	08130319	08130320	08130321

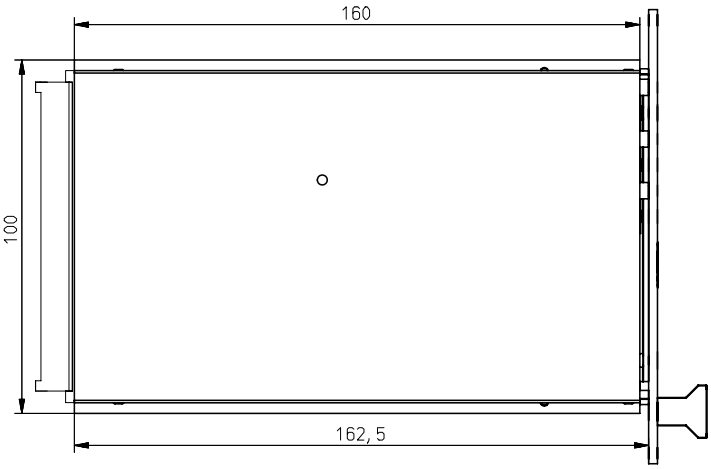
技术参数	Technical Data	PS 805-12-240 Double		PS 805-24-240 Double	
DC输出电压	Output voltage DC	5 V (4.8...5.5 V)	12 V (11.8...15.2 V)	5 V (4.8...5.5 V)	24 V (23.8...27.2 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	6.0...6.7 V	16.5...18.0 V	6.0...6.7 V	33.0...36.0 V
输出电流 / 功率	Output current / power	30 A / 195 W	2.5 A	34 A / 225 W	2.5 A
输出电流极限	Output current limit	<36 A	<3.0 A	<36 A	<3.0 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.		0.5 V max.	
电源故障信号	Power fail signal	after >5 ms / 后指示		after >5 ms / 后指示	
控制输入	Control input	外部开-关 / external on-off		外部开-关 / external on-off	
带ASF信号的均流	Power share with ASF signal	optional / 可选		optional / 可选	
订购编号	Ordering number	08130322		08130323	

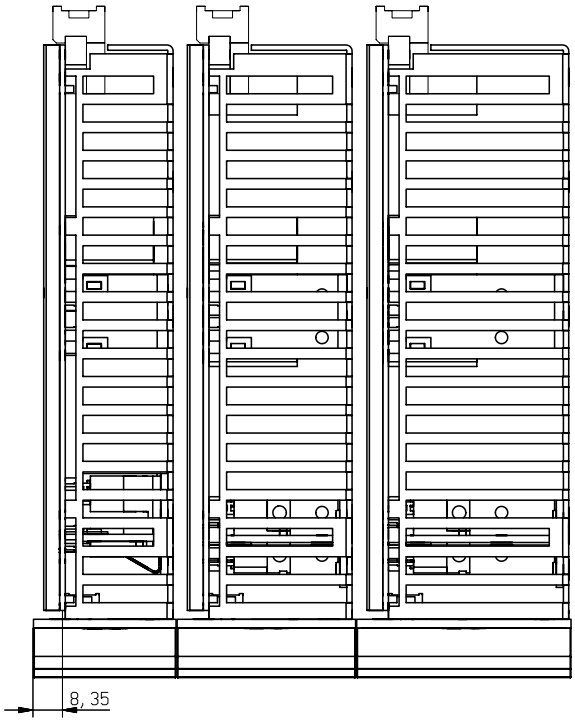
技术参数	Technical Data	PS 812-12-240 Double		PS 812-24-240 Double	
DC输出电压	Output voltage DC	12 V (11.8...15.2 V)	12 V (11.8...15.2 V)	12 V (11.8...15.2 V)	24 V (23.8...27.2 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.2%	<0.05%	<0.2%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	16.5...18.0 V	16.5...18.0 V	16.5...18.0 V	33.0...36.0 V
输出电流 / 功率	Output current / power	16 A / 240 W	2.5 A	16 A / 240 W	2.5 A
输出电流极限	Output current limit	<19.2 A	<3.0 A	<19.2 A	<3.0 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.		0.5 V max.	
电源故障信号	Power fail signal	after >5 ms / 后指示		after >5 ms / 后指示	
控制输入	Control input	外部开-关 / external on-off		外部开-关 / external on-off	
带ASF信号的均流	Power share with ASF signal	optional / 可选		optional / 可选	
订购编号	Ordering number	08130324		08130325	

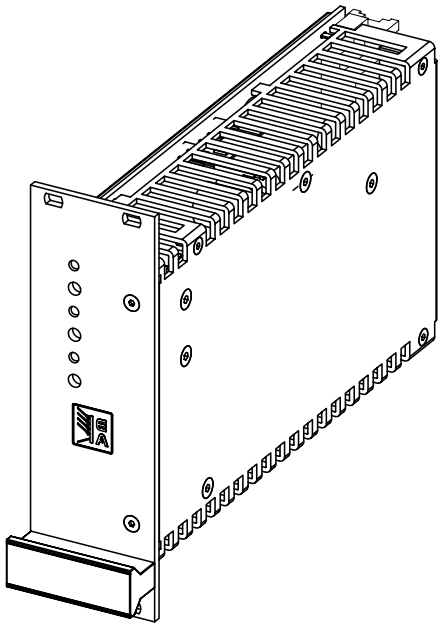
技术参数	Technical Data	PS 805-12-12-240 Triple		
DC输出电压	Output voltage DC	5 V (4.8...5.5 V)	+12 V (11.8...15.2 V)	-12 V (11.8...15.2 V)
0...100% I_{out} 负载调整率	Load regulation 0...100% I_{out}	<0.05%	<0.2%	<0.2%
100% I_{out} 线性调整率	Line regulation 100% I_{out}	<0.05%	<0.2%	<0.2%
纹波NF	Ripple LF	<40 mV_{pp}	<40 mV_{pp}	<40 mV_{pp}
负载从10-100% 调整需时	Regulation time 10-100% load	<0.5 ms	<0.5 ms	<0.5 ms
OVP 过压保护调节范围	OVP adjustment	6.0...6.7 V	16.5...18.0 V	16.5...18.0 V
输出电流 / 功率	Output current / power	30 A / 225 W	2.5 A	2.5 A
输出电流极限	Output current limit	<36 A	<3.0 A	<3.0 A
感测端的电压调整	Voltage regulation with sense	0.5 V max.		
电源故障信号	Power fail signal	after >5 ms / 后指示		
控制输入	Control input	外部开-关 / external on-off		
带ASF信号的均流	Power share with ASF signal	optional / 可选		
订购编号	Ordering number	08130326		

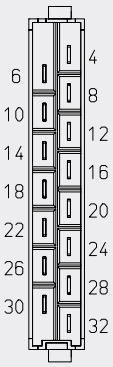
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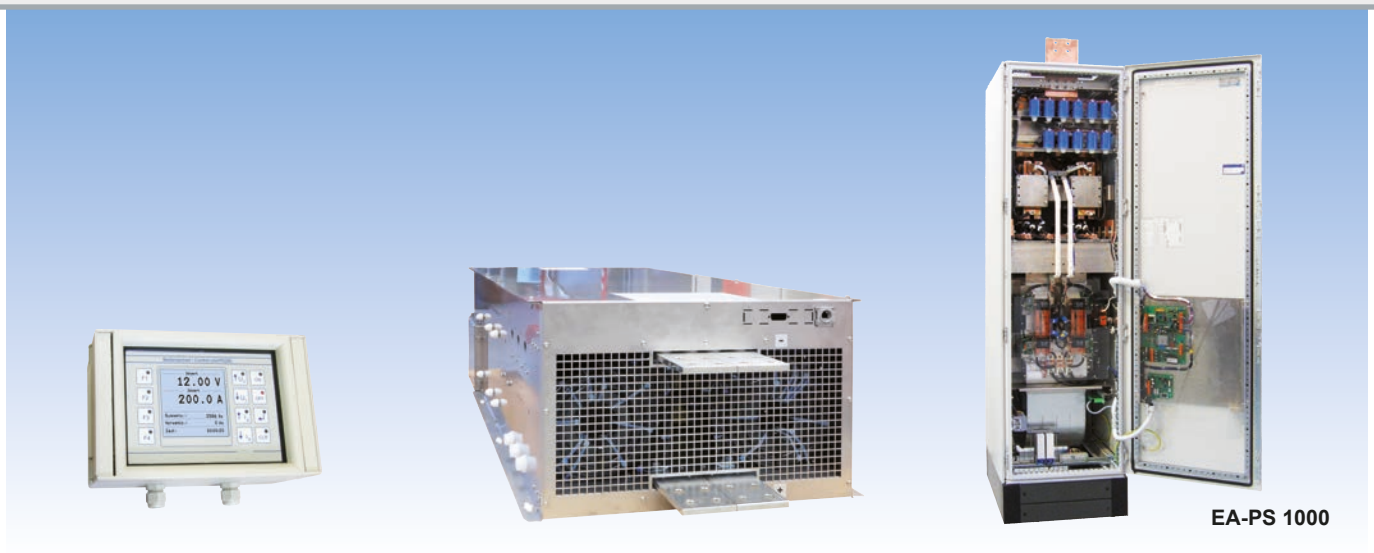


H15连接器	引脚	H15连接器脚位分布说明 / Connector H15 pin layout		
Connector H15	Pin	PS 800 19“ Single	PS 800 19“ Double	PS 800 19“ Triple
	4	+V1	+V1	+V1
	6	+V1	+V1	+V1
	8	GND V1	GND V1	GND V1
	10	GND V1	GND V1	GND V1
	12	+Sense	+Sense	+Sense
	14	-Sense	-Sense	-Sense
	16	Power fail	Power fail	Power fail
	18	---	+V2	+V2
	20	--- (optional ASF*)	GND V2	GND V2 / V3
	22	---	---	-V3
	24	Extern On/Off	Extern On/Off / ASF*	Extern On/Off / ASF*
	26	---	---	---
	28	N	N	N
	30	L	L	L
	32	PE	PE	PE

* ASF = 可选功率均衡特征 / optional power sharing feature

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U
I
RS485
LAN
Profi-bus



EA-PS 1000

- 高效 >85%
- 输出功率：1250 W 至 240 kW
- 输出电压：0...5 V 至 0...60 V
- 输出电流：0...250 A 至 0...4000 A
- 精确度：U <0.5%，I <1%
- 纹波 (300 Hz) <1%
- 恒压和恒流调整
- 电压和电流0...100%可调
- 市电电压为230 V AC或3 x 400 V AC
- PFC值 >0.95
- 浪涌电流限制
- 用铜条当直流输出端
- 可选项：
  - 数字接口 (RS485，LAN，Profibus等)
  - 模块化，可接外部控制键EA-PS 280
  - 模拟接口（0...10 V）
  - 模拟接口用隔离放大器
  - 远程感测

- **High efficiency >85%**
- **Output power ratings: 1250 W up to 240 kW**
- **Output voltages: 0...5 V up to 0...60 V**
- **Output currents: 0...250 A up to 0...4000 A**
- **Accuracy: U <0.5%, I <1%**
- **Ripple (at 300 Hz): <1%**
- **Constant voltage and current regulation**
- **Voltage and current adjustable 0...100%**
- **Mains supply 230 V AC or 3x 400 V AC**
- **Power factor >0.95**
- **Inrush current limit**
- **DC output connector via copper bars**
- **Options**
  - **Digital interface (RS485, LAN, Profibus a. o.)**
  - **Modular, external control unit EA-PS 280**
  - **Analog interface (0...10 V)**
  - **Isolation amplifier for analog interface**
  - **Remote sensing**

概要

EA-PS 1000系列为可调、风冷、重载型开关电源。其型号的输出电压高达60 V，电流达4000 A，输出功率至240 kW。

本产品主要用于如电镀、表面处理、硬化类的大功率环境；以及各种工业应用，如给电动引擎启动器、直流马达供电等；还用于自动终端检测系统的测试，如接触片、继电器、开关、断路器以及一般重型直流元件的测试。

所有型号都有一内置数字控制总线，可配合不同的数字接口模块（RS485，Ethernet，Profibus，Profinet）或模块控制器来控制本产品。与任何其他数字接口不听，还有一内置模拟接口（可供0...10 V电压）。它能代替数字控制总线。若无任意一可选接口或控制件，本产品不能被控制。因此建议用户在购买本产品的同时，也购买至少一个接口模块。数字接口模块以后将被其他类型接口代替。

其内部控制与调整电路由微处理控制芯片供电，因此与本系列之前的型号相比，它提高了本产品的精确度，改善了其反应速度与设定时间。

General

The EA-PS 1000 series is a range of adjustable, air cooled, heavy-duty, switched-mode power supplies. There are models with output voltages of up to 60 V, output currents of up to 4000 A and output power ratings of up to 240 kW available.

This series is used in high-power environments, such as electro-plating, surface treatment, hardening or industrial applications such as powering of electric engine starters, DC motors etc. and is used in automatic end-of-line test systems for the testing of contactors, relays, switches, breakers and heavy duty DC components in general

All models feature a built-in digital control bus to which various, optionally available digital interface modules (RS485, Ethernet, Profibus, Profinet) or a modular control unit can be connected in order to control the device. Alternatively to any digital interface, an optional, built-in analog interface (0...10 V) is available. It replaces the digital control bus. Without any of the optional interfaces or the control unit, the device can not be controlled. Thus it is recommended to purchase the device always together with at least one optional interface. The digital interface modules can be replaced later on by other interface types.

The internal control and regulation circuit is powered by a fast microcontroller unit, resulting in higher accuracy and improved response and settling times, compared to former models of this series.

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Option/可选件 **EA-PS 280**



1500 W / 2500 W / 5000 W



3000 W / 5000 W / 10000 W

- 高效 >85%
- 输出功率：1500 W 至 10000 W
- 输出电压：0...6 V，0...10 V至 0...20 V
- 输出电流：0...250 A 至 0...500 A
- 恒压和恒流调整
- 工作温度0-35°C（按需也可做40°C）
- 浪涌电流限制
- 风扇制冷，最大风量有100或200 m^3/h
- 19“不锈钢机柜系统
- 用铜条当直流输出端
- 可选项：
  - 用电脑编程 (RS485 / LAN / Profibus等)
  - 模块化，可接外部控制键EA-PS 280
  - 模拟接口（0...10 V）
  - 模拟接口用隔离放大器
  - 远程感测

- **High efficiency >85%**
- **Output power ratings: 1500 W up to 10000 W**
- **Output voltages: 0...6 V, 0...10 V or 0...20 V**
- **Output currents: 0...250 A up to 0...500 A**
- **Constant voltage and current regulation**
- **Operation temp range 0-35°C (40°C upon request)**
- **Inrush current limit**
- **Air cooling by fan, air volume max. 100 or 200 m^3/h**
- **Stainless steel enclosure, for 19“ rack systems**
- **DC output connector via copper bars**
- **Options**
  - **Programming via PC (RS485/Profibus/LAN etc.)**
  - **Modular, mobile control unit EA-PS 280**
  - **Analog interface (0...10 V)**
  - **Isolation amplifier for analog interface**
  - **Remote sensing**

技术参数	Technical Data		PS 1006-250	PS 1006-500	PS 1010-250
AC输入电压	Input voltage AC		400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph
- 频率	- Frequency		50...60 Hz	50...60 Hz	50...60 Hz
- 功率因素	- Power factor		>0.95	>0.95	>0.95
DC输出电压	Output voltage DC		0...6 V	0...6 V	0...10 V
- 精确度	- Accuracy		<0,5%	<0,5%	<0,5%
- 纹波	- Ripple		<1%	<1%	<1%
输出电流	Output current		0...250 A	0...500 A	0...250 A
- 精确度	- Accuracy		<1%	<1%	<1%
输出功率	Output power		1500 W	3000 W	2500 W
尺寸 * 宽 高 长	Dimensions *	W H D	21TE / 21 HP 6 HE / 6U 400 mm	42TE / 42 HP 6 HE / 6U 400 mm	21TE / 21 HP 6 HE / 6U 400 mm
重量	Weight		~12 kg	~20 kg	~12 kg

技术参数	Technical Data		PS 1010-500	PS 1020-250	PS 1020-500
AC输入电压	Input voltage AC		400 V +/- 10%, 3ph	400 V +/- 10%, 3ph	400 V +/- 10%, 3ph
- 频率	- Frequency		50...60 Hz	50...60 Hz	50...60 Hz
- 功率因素	- Power factor		>0.95	>0.95	>0.95
DC输出电压	Output voltage DC		0...10 V	0...20 V	0...20 V
- 精确度	- Accuracy		<0,5%	<0,5%	<0,5%
- 纹波	- Ripple		<1%	<1%	<1%
输出电流	Output current		0...500 A	0...250 A	0...500 A
- 精确度	- Accuracy		<1%	<1%	<1%
输出功率	Output power		5000 W	5000 W	10000 W
尺寸 * 宽 高 长	Dimensions *	W H D	42TE / 42 HP 6 HE / 6U 400 mm	21TE / 21 HP 6 HE / 6U 400 mm	42TE / 42 HP 6 HE / 6U 400 mm
重量	Weight		~20 kg	~12 kg	~20 kg

* 仅为外壳尺寸，非产品整体尺寸 / Enclosure only, not over all

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U
I
RS485
LAN
Profi-bus



Option/可选件 **EA-PS 280**



EA-PS 1020-2000

- 高效 >85%
- 输出功率：15 kW 至 40 kW
- 输出电压：0...10 V，0...20 V至 0...40 V
- 输出电流：0...750 A 至 0...2000 A
- 恒压和恒流调整
- 工作温度0-35°C（按需也可做40°C）
- 浪涌电流限制
- 风扇制冷，最大风量有540-1000 m^3/h
- 强挂式或地面安装式不锈钢外壳
- 用铜条当直流输出端
- 可选项：
  - 用电脑编程 (RS485 / LAN / Profibus等)
  - 模块化，可接外部控制键EA-PS 280
  - 模拟接口（0...10 V）
  - 模拟接口用隔离放大器
  - 远程感测

- **High efficiency >85%**
- **Output power ratings: 15 kW up to 40 kW**
- **Output voltages: 0...10 V, 0...20 V or 0...40 V**
- **Output currents: 0...750 A up to 0...2000 A**
- **Constant voltage and current regulation**
- **Operation temp range 0-35°C (40°C upon request)**
- **Inrush current limit**
- **Air cooling by fan, air volume max. 540-1000 m^3/h**
- **Stainless steel enclosure for wall or ground install**
- **DC output connection via copper bars**
- **Options**
  - **Programming via PC (RS485/Profibus/LAN etc.)**
  - **Modular, mobile control unit EA-PS 280**
  - **Analog interface (0...10 V)**
  - **Isolated amplifiers for analog interface**
  - **Remote sensing**

技术参数	Technical Data	PS 1006-800	PS 1006-1000	PS 1006-1500	PS 1006-2000	PS 1010-800	PS 1010-1000
AC输入电压	Input voltage AC	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph
- 频率	- Frequency	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz
- 功率因素	- Power factor	>0.95	>0.95	>0.95	>0.95	>0.95	>0.95
DC输出电压	Output voltage DC	0...6 V	0...6 V	0...6 V	0...6 V	0...10 V	0...10 V
- 精确度	- Accuracy	<0,5%	<0,5%	<0,5%	<0,5%	<0,5%	<0,5%
- 纹波	- Ripple	<1%	<1%	<1%	<1%	<1%	<1%
输出电流	Output current	0...800 A	0...1000 A	0...1500 A	0...2000 A	0...800 A	0...1000 A
- 精确度	- Accuracy	<1%	<1%	<1%	<1%	<1%	<1%
输出功率	Output power	4.8 kW	6 kW	9 kW	12 kW	8 kW	10 kW
尺寸 * B	Dimensions * W	343 mm	343 mm	509 mm	509 mm	343 mm	343 mm
尺寸 * H	Dimensions * H	265 mm	265 mm	275 mm	275 mm	265 mm	265 mm
尺寸 * T	Dimensions * D	415 mm	415 mm	470 mm	470 mm	415 mm	415 mm
重量	Weight	~32 kg	~32 kg	~45 kg	~45 kg	~32 kg	~32 kg

技术参数	Technical Data	PS 1010-1500	PS 1010-2000	PS 1020-750	PS 1020-1000	PS 1020-1500	PS 1020-2000	PS 1040-1000
AC输入电压	Input voltage AC	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph
- 频率	- Frequency	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz
- 功率因素	- Power factor	>0.95	>0.95	>0.95	>0.95	>0.95	>0.95	>0.95
DC输出电压	Output voltage DC	0...10 V	0...10 V	0...20 V	0...20 V	0...20 V	0...20 V	0...40 V
- 精确度	- Accuracy	<0,5%	<0,5%	<0,5%	<0,5%	<0,5%	<0,5%	<0,5%
- 纹波	- Ripple	<1%	<1%	<1%	<1%	<1%	<1%	<1%
输出电流	Output current	0...1500 A	0...2000 A	0...750 A	0...1000 A	0...1500 A	0...2000 A	0...1000 A
- 精确度	- Accuracy	<1%	<1%	<1%	<1%	<1%	<1%	<1%
输出功率	Output power	15 kW	20 W	15 kW	20 kW	30 kW	40 kW	40 kW
尺寸 * B	Dimensions * W	509 mm	509 mm	509 mm	509 mm	564 mm	564 mm	564 mm
尺寸 * H	Dimensions * H	275 mm	355 mm	355 mm	355 mm	332 mm	332 mm	332 mm
尺寸 * T	Dimensions * D	470 mm	492 mm	492 mm	492 mm	817 mm	1027 mm	1027 mm
重量	Weight	~45 kg	~70 kg	~45 kg	~70 kg	~90 kg	~125 kg	~125 kg

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Option/可选件 EA-PS 280



EA-PS 1060-4000



EA-PS 1060-4000

- 高效 >85%
- 输出功率：45 kW 至 240 kW
- 输出电压：0...40 V或 0...60 V
- 输出电流：0...750 A 至 0...4000 A
- 恒压和恒流调整
- 工作温度0-35°C（按需也可做40°C）
- 浪涌电流限制
- 风扇制冷，最大风量有1080-3240 m^3/h
- 机柜式外壳（1-3个）
- 用铜条当直流输出端
- 可选项：
  - 用电脑编程 (RS485 / LAN / Profibus等)
  - 模块化，可接外部控制键EA-PS 280
  - 模拟接口（0...10 V）
  - 模拟接口用隔离放大器
  - 远程感测

- **High efficiency >85%**
- **Output power ratings: 45 kW up to 240 kW**
- **Output voltages: 0...40 V or 0...60 V**
- **Output currents: 0...750 A up to 0...4000 A**
- **Constant voltage and current regulation**
- **Operation temp range 0-35°C (40°C upon request)**
- **Inrush current limit**
- **Air cooling by fan, air volume max. 1080-3240 m^3/h**
- **Delivered as cabinet (1-3 pcs)**
- **DC output connection via copper bars**
- **Options**
  - **Programming via PC (RS485/Profibus/LAN etc.)**
  - **Modular, mobile control unit EA-PS 280**
  - **Analog interface (0...10 V)**
  - **Isolated analog amplifiers**
  - **Remote sensing**

技术参数	Technical Data	PS 1040-1500	PS 1040-2000	PS 1040-3000	PS 1040-4000	PS 1060-800
AC输入电压	Input voltage AC	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph
- 频率	- Frequency	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz
- 功率因素	- Power factor	>0.95	>0.95	>0.95	>0.95	>0.95
DC输出电压	Output voltage DC	0...40 V	0...40 V	0...40 V	0...40 V	0...60 V
- 精确度	- Accuracy	<0,5%	<0,5%	<0,5%	<0,5%	<0,5%
- 纹波	- Ripple	<1%	<1%	<1%	<1%	<1%
输出电流	Output current	0...1500 A	0...2000 A	0...3000 A	0...4000 A	0...800 A
- 精确度	- Accuracy	<1%	<1%	<1%	<1%	<1%
输出功率	Output power	60 kW	80 kW	120 kW	160 kW	48 kW
尺寸（宽x高x长） *	Dimensions (WxHxD)*	600x2200x600 mm	600x2200x600 mm	1200x2200x600 mm	1200x2200x600 mm	600x2200x600 mm
机柜数量	Number of cabinets	1x 42 HE/U	1x 42 HE/U	2x 42 HE/U	2x 42 HE/U	1x 42 HE/U
重量	Weight	~380 kg	~380 kg	~760 kg	~760 kg	~380 kg

技术参数	Technical Data	PS 1060-1000	PS 1060-1800	PS 1060-2000	PS 1060-3000	PS 1060-4000
AC输入电压	Input voltage AC	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph	400 V +/- 10% 3ph
- 频率	- Frequency	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz	50...60 Hz
- 功率因素	- Power factor	>0.95	>0.95	>0.95	>0.95	>0.95
DC输出电压	Output voltage DC	0...60 V	0...60 V	0...60 V	0...60 V	0...60 V
- 精确度	- Accuracy	<0,5%	<0,5%	<0,5%	<0,5%	<0,5%
- 纹波	- Ripple	<1%	<1%	<1%	<1%	<1%
输出电流	Output current	0...1000 A	0...1800 A	0...2000 A	0...3000 A	0...4000 A
- 精确度	- Accuracy	<1%	<1%	<1%	<1%	<1%
输出功率	Output power	60 kW	108 kW	120 kW	180 kW	240 kW
尺寸（宽x高x长） *	Dimensions (WxHxD)*	600x2200x600 mm	1200x2200x600 mm	1200x2200x600 mm	1800x2200x600 mm	1800x2200x600 mm
机柜数量	Number of cabinets	1x 42 HE/U	2x 42 HE/U	2x 42 HE/U	3x 42 HE/U	3x 42 HE/U
重量	Weight	~380 kg	~760 kg	~760 kg	~1140 kg	~1520 kg

* 仅为机柜外壳尺寸，非整体尺寸 / Only outer cabinet dimensions, not over all

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EA-EL 3160-60

- 功率级别：0...400 W
- 输入电压：0...160 V或0...400 V
- 输入电流：0...60 A或0...25 A
- 过温保护(OT)
- 带可调占空比与可调升/降时间的脉动操作
- 操作模式
  - 恒流（CC）
  - 恒压（CV）
  - 恒功率（CP）
  - 恒阻（CR）
- 远程感测，触发输入，触发输出*
- 电池测试模式，带时间和容量计算器
- 选购件，数字接口
  - RS232, CAN, USB, GPIB (IEEE), Ethernet

- **Power rating: 0...400 W**
- **Input voltages: 0...160 V or 0...400 V**
- **Input currents: 0...60 A or 0...25 A**
- **Overtemperature protection (OT)**
- **Pulsed operation with adjustable duty cycle and variable rise/fall time**
- **Operation modes**
  - **Constant current (CC)**
  - **Constant voltage (CV)**
  - **Constant power (CP)**
  - **Constant resistance (CR)**
- **Remote sense, trigger input, trigger output**
- **Battery test mode with time and capacity counter**
- **Optional, digital interface cards**
  - **RS232, CAN, USB, GPIB (IEEE), Ethernet**

概述
EA-EL 3000系列是一款由微处理器控制的电子负载，它能满足现代化实验室和工业的各种需求。

操作模式
本负载提供下列几种典型的操作模式：恒流（CC），恒功率(CP)，恒阻(CR)和恒压（CV）。

用一开关可预选上述操作模式。其它设定则对保护测试设备有效。举例：恒流模式下可设定一个最大功率，而恒压、恒功率或恒阻模式则可设定一最大电流。

静态操作
在静态操作模式下，可通过调节旋钮设定A、B两组数据。用户手动地在这两组数间转换。

经数字或模拟接口执行的远程控制下，通过合适的机械操纵也能实现很复杂的曲线特性。

动态操作
在动态操作模式下，产品可以在A和B两数值间转换。这两个数能应用到U，I，P或R四组参数上。这两个值的脉宽能分别在50µs与100 s之间调节，达到可变占空比。此外，可设置30µs 至 200 ms的上跃和下降时间。模拟接口上还有一外部触发输入脚，用来给外部设备供电，从而从外部转换A和B数值。

General
The microprocessor controlled electronic loads of the EA-EL 3000 series satisfy practically every need of modern laboratories and industry.

Operation modes
The loads provide the typical operation modes Constant Current (CC), Constant Power (CP), Constant Resistance (CR) and Constant Voltage (CV).
The mode is preselected by a switch. Other settings are additionally effective to protect the test equipment. For example, constant current can have a maximum power setting while constant voltage, power or resistance can have a maximum current setting.

Static operation
In static operation two values, A and B, can be set using an adjustment knob. The user can manually switch between these two values in order to achieve steps.
In remote control via digital or analog interface, even complex characteristics can be realised by using proper control mechanisms.

Dynamic Operation
In dynamic operation, the device switches between two values A and B, which can be applied to all four physical units U, I, P or R. For both values, the pulse width can be adjusted separately between 50µs and 100 s, achieving a variable duty cycle. In addition, rise and fall can be adjusted between 30µs and 200 ms. There is also an external trigger input on the analog interface to feed an external source in order to control the alternation from A to B externally.

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电池测试模式
在电池测试模式下，电池以恒流、恒功率或恒阻放电，直至电池电压达到可调极限，然后测试自动终止。放电时间与消耗容量会被测量并显示出来。

显示器
所有重要信息都直接显示于屏幕上。
因此关于U,I, P, R的实际输出值或预设值、实际调整模式(CV,CC,CP,CR)、错误信息与设置菜单的设定，在屏幕上都清晰可见。同样地，可选数字接口的设定也会显示出来。

模拟接口
此接口提供有电压、电流、功率和阻值设定值输入脚，电压和电流监控用输出脚，控制输入脚，信号输出脚和触发输入脚。

触发输出
在动态操作模式下，A和B数值转换用的内部触发信号可用来控制或同步操作其它设备。

数字接口
在产品后板有一个接口插槽，用户可在此装上一个接口卡或者替换原有的接口卡。产品会自动检测接口，无需或只需几步配置。
随接口卡附有一免费Windows软件，适合RS232，USB或Ethernet卡，该软件可用来控制与监控，数据记录与半自动序列也可见137与143页。

可选项
- 经RS232，CAN，USB和GPIB (IEEE)，Ethernet/LAN绝缘数字接口卡，可用个人电脑控制。

Battery test mode
In the battery test mode, a battery can be discharged with a constant current, constant power or constant resistance until the battery voltage reaches an adjustable threshold, where the test automatically stops. The discharge time and consumed charge (Ah) are measured and displayed.

Display
All important information is directly represented on the display. Thus, information about the actual output values or set values for U, I, P, R, the actual regulation mode (CV,CC,CP,CR), error messages and settings in the setup menu are clearly available. Similarly, settings of the optionally available digital interfaces will be shown.

Analog interface
Inputs for voltage, current, power and resistance set values, outputs for voltage and current monitoring, control inputs, signal outputs and a trigger input are available.

Trigger output
In dynamic operation, the internal trigger signal, which is generated for switching between A and B values, can be used to control or synchronise other applications.

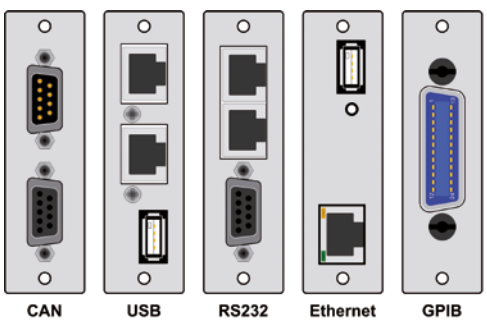
Digital interfaces
There is an interface slot located on the rear panel, making it easy for the user to retrofit an interface or to replace an existing one. The interface will be automatically detected by the device and requires no or only little configuration.
Included with the interface cards is a free Windows software for RS232, USB or Ethernet connection, which provides control and monitoring, data logging and semi-automatic sequences.
Also see pages 137 and 143.

Options
- Isolated, digital interface cards for RS232, CAN, USB, GPIB (IEEE), Ethernet/LAN to control the device by PC.

Software EasyLoad Lite软件



数字接口卡 / **Digital interfaces**



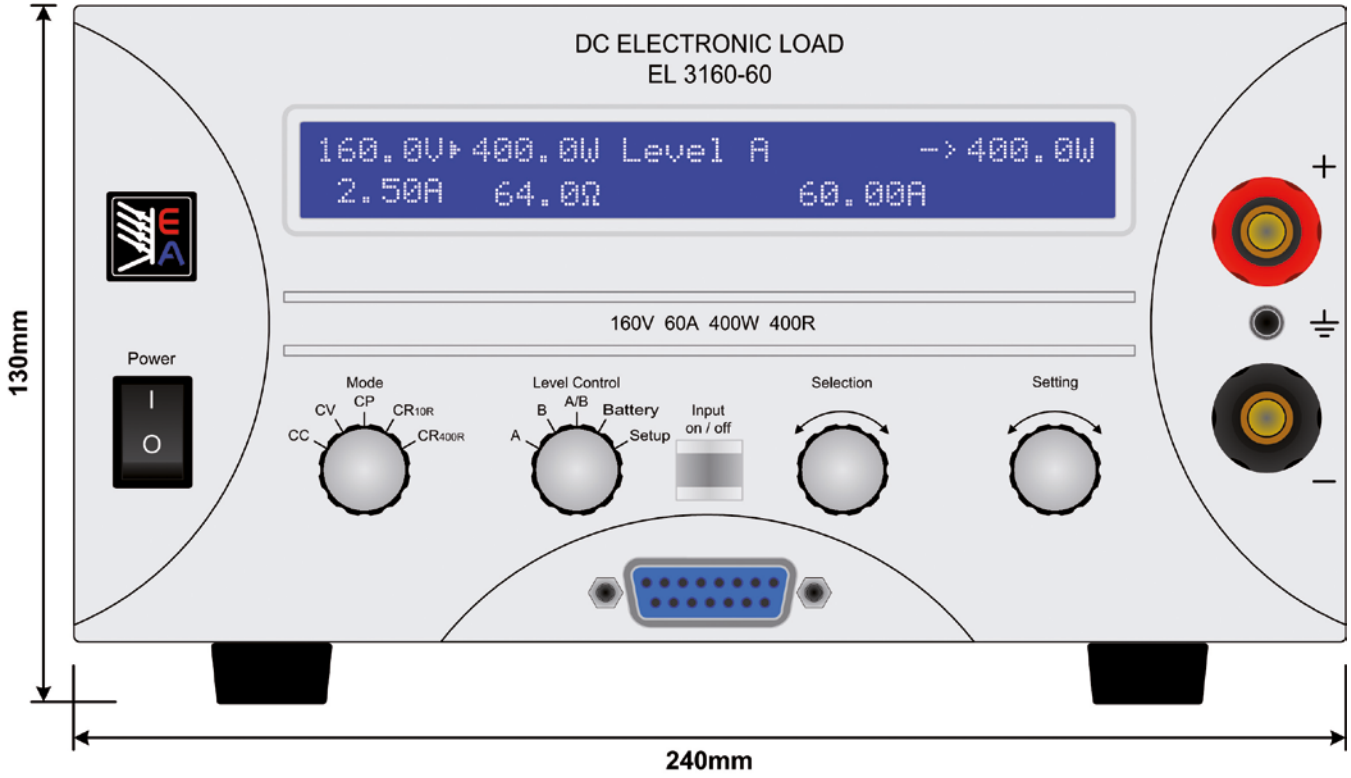
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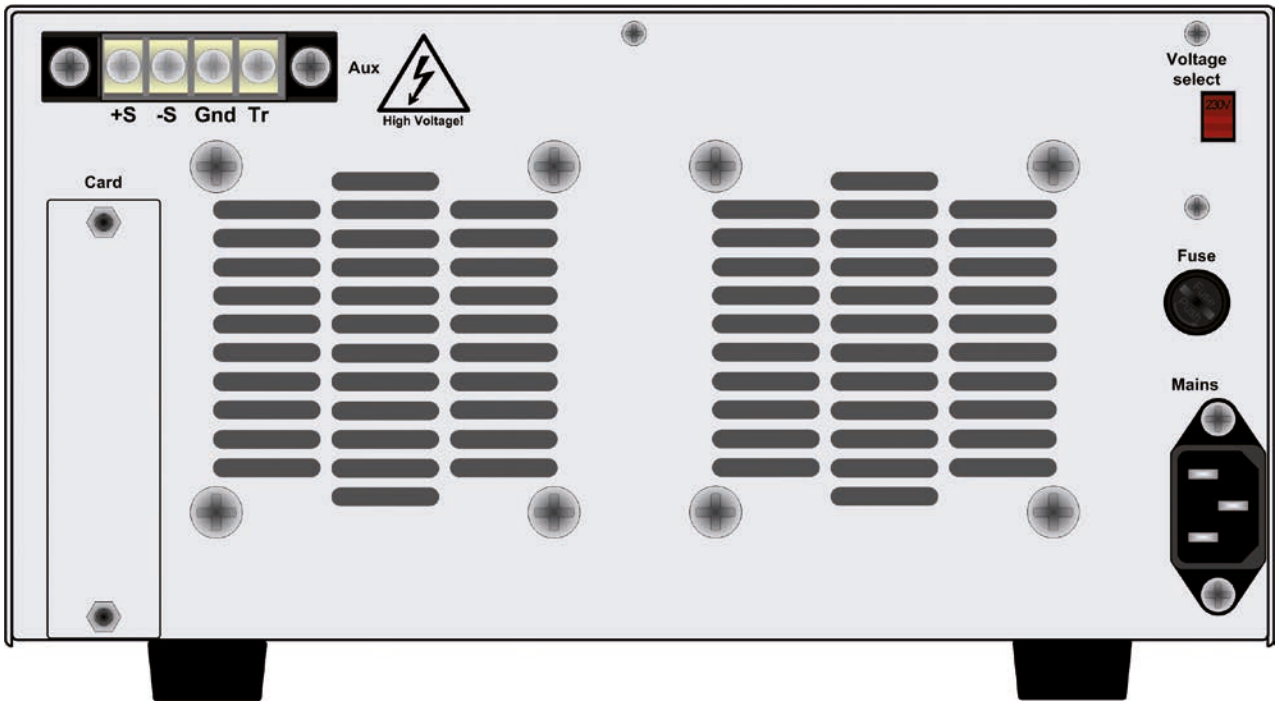
基本规格参数 General specifications

技术参数	Technical Data	Series EA-EL 3000 / 系列
电源输入电压	Power input voltage	115 V/230 V @ 50/60 Hz
显示器	Display	Display 2x40个字符 / 2x40 characters
电池测试	Batterie testing	
- 关断电压	- Cut off voltage	自由调节 / Freely adjustable
- 显示器显示数值	- Read out at display	放电时间 / Duration of discharge
		放电容量 / Capacity of discharge
模拟接口	Analog interface	
- U / I / P / R设定输入脚	- Setting inputs U / I / P / R	0...10 V
- U / I监控输出脚	- Monitoring outputs U / I	0...10 V
- 控制信号	- Control signals	Intern / Extern, 内/外，输入开/关 / Input on/
		off/关, R-模式 / R mode
- 状态信号	- Status signals	过压 / Overvoltage
		过温 / Overtemperature
- 参考电压	- Reference voltage	10 V
制冷方式	Cooling	温控风扇 / Temperature controlled fan
连接端子	Terminals	前板 / Front panel
- 负载输入	- Load input	安全插座 / Safety sockets
- 感测/触发输出	- Sense / Trigger output	4脚螺丝端子 / 4-pin screw terminal
- 模拟接口	- Analog interface	Sub-D连接器 / Sub-D connector 15 Pin

技术参数	Technical Data	EA-EL 3160-60	EA-EL 3400-25
20°C时恒定输入功率	Steady power input at 20°C	400 W	400 W
DC输入电压	Input voltage DC		
- 调节范围	- Adjustment range	0...160 V	0...400 V
- 显示器分辨率	- Resolution of display	100 mV	100 mV
- 精确度	- Accuracy	≤0.1% von U_{Nenn} / of U_{Nom}	≤0.1% von U_{Nenn} / of U_{Nom}
- 最大电流时的最小电压	- Min. voltage at max. current	约 / approx. 1.4 V	约 / approx. 1.0 V
输入电流	Input current		
- 调节范围	- Adjustment range	0...60 A	0...25 A
- 显示器分辨率	- Resolution of display	10 mA	10 mA
- 精确度	- Accuracy	≤I_{Nenn} 的0.2% / of I_{Nom}	≤I_{Nenn} 的0.2% / of I_{Nom}
输入功率	Input power		
- 调节范围	- Adjustment range	0...400 W	0...400 W
- 显示器分辨率	- Resolution of display	100 mW	100 mW
- 精确度	- Accuracy	≤P_{Nenn} 的2% / of P_{Nom}	≤P_{Nenn} 的2% / of P_{Nomm}
内阻	Resistance		
- 调节范围 1	- Adjustment range 1	0...10Ω	0...40Ω
- 显示器分辨率	- Resolution of display	10 mΩ	10 mΩ
- 调节范围 2	- Adjustment range 2	0...400Ω	0...800Ω
- 显示器分辨率	- Resolution of display	100 mΩ	1Ω
- 精确度	- Accuracy	≤R_{Nenn} 的2%/ of R_{Nom} + ≤I_{Nenn} 的0.3%/ of I_{Nom}	≤R_{Nenn} 的2%/ of R_{Nom} + ≤I_{Nenn} 的0.3%/ of I_{Nom}
动态函数	Dynamic function	2 Pegel / 2 levels	2 Pegel / 2 levels
- A / B占空比级别	- Pulse width Level A / B	50µs...100 s	50µs...100 s
- 升/降时间	- Rise/fall time	30µs...200 ms	30µs...200 ms
尺寸 (宽x高x长)	Dimensions (WxHxD)	240 x 120 x 300 mm	240 x 120 x 300 mm
重量	Weight	6 kg	6 kg
订购编号	Ordering number	35320200	35320201

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U I P R OVP OCP OPP OTP USB LAN



EA-EL 9080-60 DT

- 输入功率级别：0...300 W至0...1200 W
- 输入电压：0...80 V至0...750 V
- 输入电流：0...5 A至0...60 A
- 多语言彩色触摸屏
- 用户配置文档，真实函数发生器
- 多个可调保护功能：OVP, OCP, OPP
- 操作模式：CV, CC, CP, CR
- 内置以太网接口，模拟接口以及USB接口
- 配提拉手柄与倾斜支撑架
- 支持SCPI & ModBus
- 带控制软件(Windows)
- LabView VIs

- **Input power ratings: 0...300 W up to 0...1200 W**
- **Input voltages: 0...80 V up to 0...750 V**
- **Input currents: 0...5 A up to 0...60 A**
- **Multilingual colour touch panel**
- **User profiles, true function generator**
- **Adjustable protections: OVP, OCP, OPP**
- **Operation modes: CV, CC, CP, CR**
- **Ethernet, analog interface and USB interface built-in**
- **Carrying handle and tilt stand**
- **SCPI & ModBus supported**
- **Control software (Windows)**
- **LabView VIs**

概述

EA-EL 9000 DT系列是一款新的电子负载，它由10台EA-EL 9000 B产品组合而成。从而输出新的电压、电流与功率级别，适用于实验鼠、学校或工作间日常的众多应用。

所有型号都有四种操作模式：恒压（CV)，恒流（CC)，恒功率(CP)和恒阻(CR)。控制电路的核心部件是一个微处理器，它具有很多有趣的特征，比如：带有通用函数的真实函数发生器，像正弦波，方波或三角波，还有一个任意函数。

大的彩色TFT触摸屏可以让用户直观地进行手动操作，就像现在流行的智能手机或者平板电脑那样操作。

跟旧系列电子负载相比，经模拟或数字接口控制产品时的响应时间已大大提高，全归因于ARM处理器控制的硬件。

本系列标配的数字接口有USB与以太网，以及一个模拟接口。所有接口都电隔离。

要远程控制产品并应用到客户指定应用都被SCPI与ModBus通用协议简化，还有即时使用的LabView。

General

The new series of compact electronic DC loads, called EA-EL 9000 DT, extend series EA-EL 9000 B by 10 models to round up the portfolio. It offers new voltage, current and power ratings for a multitude of applications for daily use in laboratories, schools or workshops.

All models support the four regulation modes constant voltage (CV), constant current (CC), constant power (CP) and constant resistance (CR). The core of the control circuit is a fast microprocessor which provides interesting features, such as a true function generator with common functions like sine wave, rectangle or triangle, but also an arbitrary function.

The large colour TFT touch panel offers an intuitive kind of manual operation, like it is prolific nowadays with smartphones or tablet computers.

Response times during the control of the devices via analog or digital interface have been improved by an ARM processor controlled hardware, compared to older electronic load series.

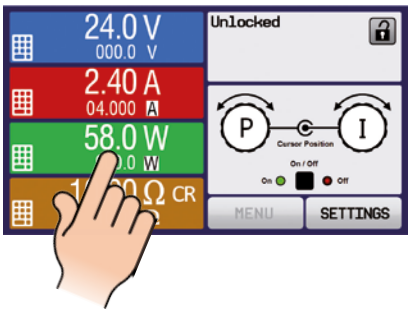
Digital interfaces, such as USB and Ethernet, are standard with this series, as well as an analog one. All interfaces are galvanically isolated.
Remote control and implementation into custom applications for every purpose is simplified by the common protocols SCPI and ModBus, as well as by ready-to-use LabView components.

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功率等级、电压和电流
本本系列有0...80 V DC至0...750 V DC，0...5A至0...60A输出电流的产品型号。输出功率级别有600W或1200W。

Power ratings, voltages, currents
The voltage range portfolio goes from models with 0...80 V DC up to models with 0...750 V DC. Input currents with 0...5 A up to 0...60 A per unit are available. The series offers two power classes with 600 W or 1200 W peak power.

操作面板（HMI）
手动操作通过TFT触摸屏、两个旋钮与一个按钮来完成。大的彩色显示器一次性显示所有设定与实际值。通过人机界面可完成整个设置，包括函数（方形，三角形，正弦形）的配置等。
还提供多语言显示（德文，英文，俄文，中文）。



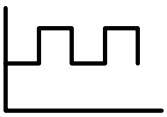
Handling (HMI)
Manual operation is done with a TFT touch panel, two rotary knobs and a pushbutton. The large colour display shows all relevant set values and actual values at a glance. The whole setup is also done with the human-machine interface, as well the configuration of functions (square, triangle, sine) etc.
The display is multilingual (German, English, Russian, Chinese).

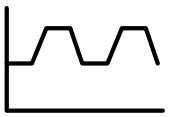
函数发生器
本系列所有型号都配有函数发生器。它能形成多种典型函数，如下所示，并应用到输出电压或输出电流上。发生器可通过前面板的触摸屏或经其中一数字接口完全可控与配置。

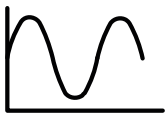
预设的函数为用户提供一切需要的参数，比如Y偏移值，时间/频率或幅度，形成整套配置。.

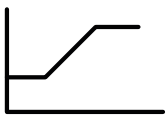
Function generator
All models within this series include a true function generator which can generate typical functions, as displayed in the figures below, and apply them to either the output voltage or the output current. The generator can be completely configured and controlled by using the touch panel on the front of the device, or by remote control via one of the digital interfaces.
The predefined functions offer all necessary parameters to the user, such as Y offset, time / frequency or amplitude, for full configuration ability.


三角形
Triangle


矩形
Rectangle


梯形
Trapezoid


正弦
Sine


阶跃式
Ramp


DIN 40839

除了基于任意发生器形成的标准函数外，还可访问该基础发生器，创建并执行一套复杂的函数，将其分开在多达100个序列内。在研发与生产过程中可用它来做测试。

通过产品前板的USB端口可以从标准的U盘上传序列或者存储序列，从而可在不同的测试序列间变换。

此外还有一个XY发生器，可用来形成其它函数，比如UI或IU，用户可在（CSV文档）表格格式内定义，或者用USB软件上传。

对于光伏方面的测试，可使用用户可调关键参数形成一个PV曲线。还可应用固件升级，安装更多的特性参数供用户选择。

Additionally to the standard functions, which are all based upon a so-called arbitrary generator, this base generator is accessible for the creation and execution of complex sets of functions, separated into up to 100 sequences. Those can be used for testing purposes in development and production.
The sequences can be loaded from and saved to a standard USB flash drive via the USB port on the front panel, making it easy to change between different test sequences.
There is furthermore a XY generator, which is used to generate other functions, such as UI or IU, which are defined by the user in the form of tables (CSV file) and then loaded from a USB flash drive.
For photovoltaics related tests, a PV curve can be generated and used from user-adjustable key parameters.

远程控制 & 连接
进行远程控制时，可使用产品后板默认配置的三个接口卡端口（1x analog, 1x USB, 1x Ethernet/LAN）。

产品前方还有一个USB端口，用来插U盘，方便上传与保存函数和用户配置文档。

Windows系统操作用户可以使用“EA Power Control”软件。它具有“Sequencing”特性，能通过CSV格式的半自动表格控制产品。该表格就是简单的测试程序，且可在MS Excel表格或其它CSV编辑器下创建和编辑，然后导入我们的软件工具。

Remote control & connectivity
For remote control, there are by default three interface ports (1x analog, 1x USB, 1x Ethernet/LAN) available on the rear of the devices.
Another USB port, located on the front side, is intended for USB flash drives in order to load and save functions and user profiles.

Windows users can profit from the included software “EA Power Control”. It offers a feature called “Sequencing”, where the device is controlled through a semi-automatic table in CSV format. This table represents a simple test procedure and can be created and edited in MS Excel or other CSV editors and then imported in our software tool.

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功率降额
EA-EL 9000 DT系列产品具有热降额功能，当产品在最大功率级别下运行时避免过热。

环境温度越低，冷却状况越好，负载可吸收的功率就越大。功率降额后可持续吸收的功率是在25°C室温条件下定义的，并当温度上升时会快速减少。

电池测试模式
本产品还有一电池测试模式，可以通过恒流或恒阻放电来测试各类电池。它会显示累计的测试时间与消耗的容量 (Ah)。

如果用EA Power Control进行测试，数据会记录在电脑上，然后以CSV格式导出数据表。后续可在MS Exce或类似工具下进行分析，甚至能创建可视化的放电图。

关于更详细的设置，可以设定一可调极限值，以便停止低电压电池的测试，或者停止可调最大测试期。

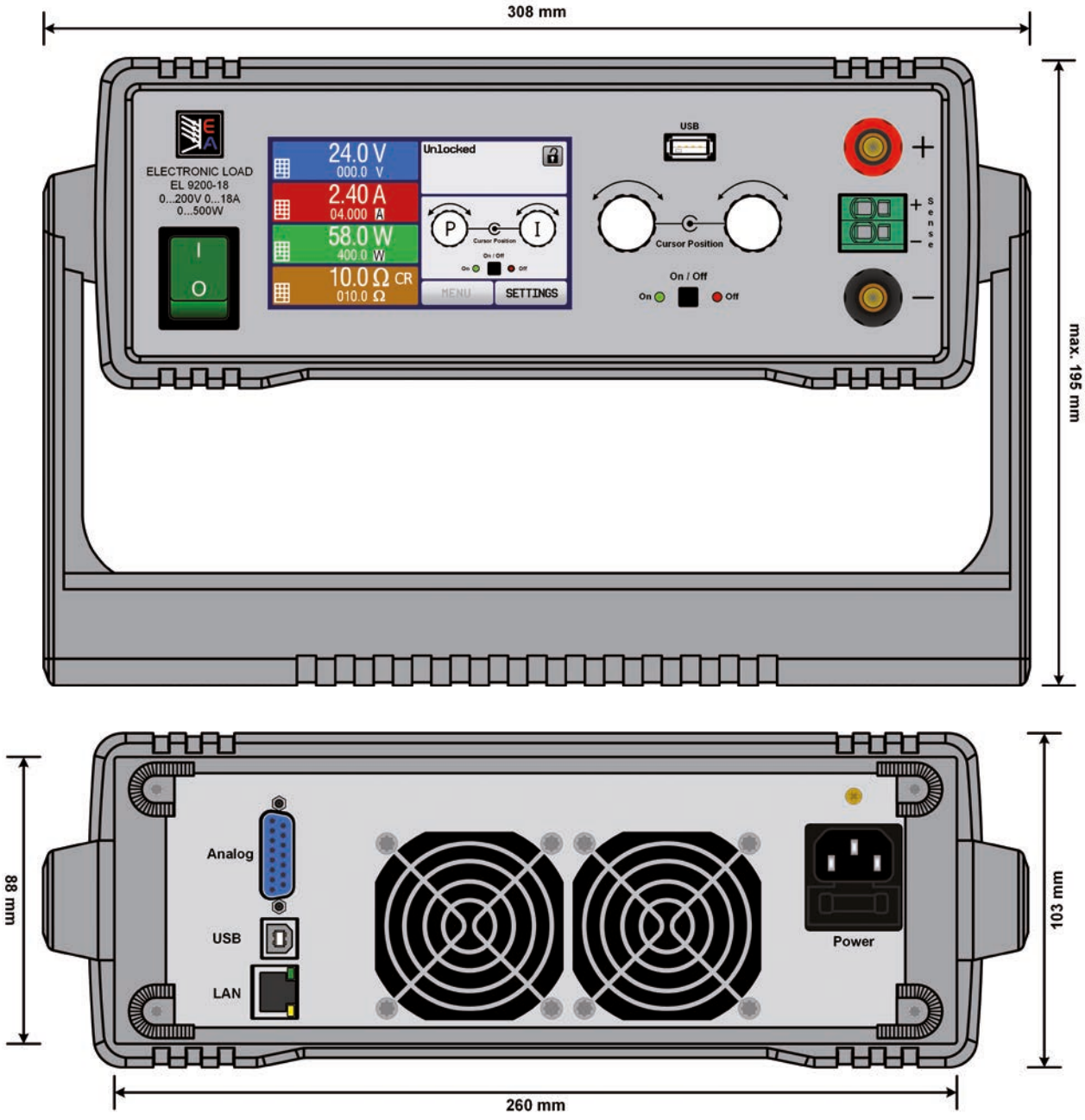
Power derating
The devices of the EA-EL 9000 DT series are equipped with thermal derating in order to avoid overheating when operating in the maximum power range.

The lower the ambient temperature and the better the cooling, the higher the power that the load can take. The continuous intake power after derating is defined at 25°C ambient temperature and will show and insignificant reduction with rising temperatures.

Battery test
For purposes of testing all kinds of batteries, such as for example constant current or constant resistance discharging, the devices offer a battery test mode. This show extra values for elapsed testing time and consumed capacity (Ah).

Data recorded by the PC during tests with, for example, EA Power Control can be exported as Excel table in CSV format and analysed later in MS Excel or similar tools and even visualised as a discharge diagram.

For more detailed setup, there is also an adjustable threshold to stop the battery test on low battery voltage, as well an adjustable maximum test period.



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技术参数	Technical Data	Series EA-EL 9000 DT / 系列	
AC输入电压	**AC input**		
- 电压 / 频率	- Voltage / Frequency	90...264 V, 45...66 Hz	
- 功率因素校正(PFC)	- Power factor correction (PFC)	>0.99	
- 功率损耗	- Power consumption	最大 40 W	
DC输入：电流	**DC input: Current**		
- 精确度	- Accuracy	<0.2%	
- 5-100% ΔU_{DC}负载调整率	- Load regulation 5-100% ΔU_{DC}	<0.1%	
- 10-90% 负载上升时间	- Rise time 10-90% load step	<50 µs	
DC输入：电压	**DC input: Voltage**		
- 精确度	- Accuracy	<0.1%	
- 0-100% ΔI_{DC}负载调整率	- Load regulation 0-100% ΔI_{DC}	<0.05%	
DC输入：功率	**DC input: Power**		
- 精确度	- Accuracy	<0.5%	
DC输入：内阻	**DC input: Resistance**		
- 精确度	- Accuracy	≤额定电流的1% + 0,3% / ≤1% + 0.3% of nominal current	
显示器与面板	**Display and panel**	带TFT控制面板的彩显屏 / Graphics display with TFT touch panel	
数字接口	**Digital interfaces**		
- 内置	- Built-in	1x B型USB (通讯用) / 1x USB type B (for communication) 1x A型USB (存储设备用) / 1x USB type A (for storage device) 1x Ethernet	
模拟接口	**Analog interface**	内置15-针D-Sub母插，电隔离 / Built in, 15-pole D-Sub (female), galvanically isolated	
- U / I / P / R设定输入脚	- Setting inputs U / I / P / R	0...10 V / 0...5 V	
- U / I监控输出脚	- Monitoring outputs U / I	0...10 V / 0...5 V	
- 控制信号	- Control signals	远程开-关，直流输入开-关，内阻模式开-关 / Remote on-off, DC input on-off, resistance mode on-off	
- 状态信号	- Status signals	过压保护，过温保护 / Overvoltage, Overtemperature	
- 参考电压	- Reference voltage	10 V / 5 V	
制冷	**Cooling**	温控风扇 / Temperature controlled fans	
- 操作温度	- Operation temperature	0...50 °C	
- 储存温度	- Storage temperature	-20...70 °C	
前板端子	**Terminals on front**		
- 负载输入	- Load input	前板，插拔式 & 螺丝端子 / Frontside, plug & screw terminal	
- 远程感测	- Remote sensing	夹式端子 / Clamp terminal	
后板端子	**Terminals on rear**		
- 模拟接口	- Analog interface	15-针Sub-D连接器/ Sub-D connector 15 pole	
- 数字接口	- Digital interfaces	USB (Type B), RJ45	
机械特性	**Mechanics**		
- 尺寸 (宽x 高 x 深) (1	- Dimensions (W x H x D) (1	276 x 103 x 415 mm	
- 重量	- Weight	600W: ≈ 6.5 kg	1200 W: ≈ 7.5 kg

(1 仅为外壳尺寸 / Body only

型号	功率 / Power		电压	电流	内阻	I最大时的最小电压(2	订购编号
Model	**峰值 / Peak**	**恒定值 (1/ Cont. (1**	**Voltage**	**Current**	**Resistance**	**U_{Min} for I_{Max} (2**	**Ordering number**
EL 9080-40 DT	600 W	300 W	0...80 V	0...40 A	0.1...30 Ω	≈ 2.2 V	33210501
EL 9200-18 DT	500 W	300 W	0...200 V	0...18 A	0.6...170 Ω	≈ 2 V	33210502
EL 9360-10 DT	450 W	300 W	0...360 V	0...10 A	1.6...540 Ω	≈ 2 V	33210503
EL 9500-08 DT	300 W	300 W	0...500 V	0...8 A	4...1000 Ω	≈ 6.5 V	33210504
EL 9750-05 DT	300 W	300 W	0...750 V	0...5 A	8...2200 Ω	≈ 5.5 V	33210505
EL 9080-60 DT	1200 W	600 W	0...80 V	0...60 A	0.12...30 Ω	≈ 2.2 V	33210506
EL 9200-36 DT	1000 W	600 W	0...200 V	0...36 A	0.8...172 Ω	≈ 2 V	33210507
EL 9360-20 DT	900 W	600 W	0...360 V	0...20 A	1.6...440 Ω	≈ 2 V	33210508
EL 9500-16 DT	600 W	600 W	0...500 V	0...16 A	3.2...1000 Ω	≈ 6.5 V	33210509
EL 9750-10 DT	600 W	600 W	0...750 V	0...10 A	4...2200 Ω	≈ 5.5 V	33210510

(1 室温为 25°C 时的参数 / At 25°C ambient temperature
(2 给负载提供最小的直流输入电压，以获得最大的输入电流 / Minimum DC input voltage to supply for the load to achieve the max. input current

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EA-EL 9080-510 3U

- 输入功率等级: 1,2 kW...7,2 kW
  还可扩展至 72 kW
- 输入电压: 0...80 V 至 0...750 V
- 输入电流：单机每台可达510 A
- 基于FPGA/DSP控制
- 多语言彩色触摸屏
- 用户配置文档，真实函数发生器
- 多个可调保护功能：OVP, OCP, OPP
- 操作模式：CV, CC, CP, CR
- 电隔离接口（模拟接口与USB接口）
- 并联用主-从总线
- 远程感测
- 可选接口有：
  - 即插即用型数字接口
- 支持SCPI & ModBus

- **Input power ratings: 1.2 kW...7.2 kW**
  Expandable in cabinets up to 72 kW
- **Input voltages: 0...80 V up to 0...750 V**
- **Input currents: up to 510 A per unit**
- **FPGA/DSP based control**
- **Multilingual colour touch panel**
- **User profiles, true function generator**
- **Adjustable protections: OVP, OCP, OPP**
- **Operation modes: CV, CC, CP, CR**
- **Galvanically isolated interfaces (analog and USB)**
- **Master-slave bus for parallel connection**
- **Remote sensing**
- **Optional:**
  - **Digital, plug & play interfaces**
- **SCPI & ModBus supported**

概述

EA-EL 9000 B系列是一款新的电子负载，它将代替之前的EA-EL 9000 系列，供应新的电压、电流与功率级别，适用于众多应用。

所有型号都有四种操作模式：恒压（CV)，恒流（CC)，恒功率(CP)和恒阻(CR)。基于FPGA的控制电路具有很多有趣的特征，比如：真实函数发生器，它可使用表格做成的函数模拟非线性内阻。

其功率损耗与高度之间的联系得到很大地提升。所有型号都只为3U高，而每台产品的直流功率的消耗能力可达7.2 kW，这个高度跟旧系列EA-EL 9000相比，降低了一半。

大的彩色TFT触摸屏可以让用户直观地进行手动操作，就像现在流行的智能手机或者平板电脑那样操作。

经模拟或数字接口控制产品时的响应时间也有很大提高，全归因于DSP处理器控制的硬件。

多台产品并联时，可以使用主从总线，将这些产品连接起来，组成更大的系统，从而实际输出值会被汇总，而设定值则分布输出。

General

The new series of compact electronic DC loads, called EA-EL 9000 B, replaces the former series EA-EL 9000 and offers new voltage, current and power ratings for a multitude of applications.
All models support the four common regulation modes constant voltage (CV), constant current (CC), constant power (CP) and constant resistance (CR). The FPGA based control circuit provides interesting features, such as a function generator with a table based function for the simulation of nonlinear internal resistances.

The relation between power consumption and height of the devices has been significantly increased. With only 3U height for all models and the capability of consuming DC power of up to 7.2 kW per unit the height has been reduced to half, compared to the former series EA-EL 9000.
The large colour TFT touch panel offers an intuitive kind of manual operation, such as it is prolific nowadays with smartphones or tablet computers.
Response times for the control via analog or digital interfaces have been improved by the DSP controlled hardware.

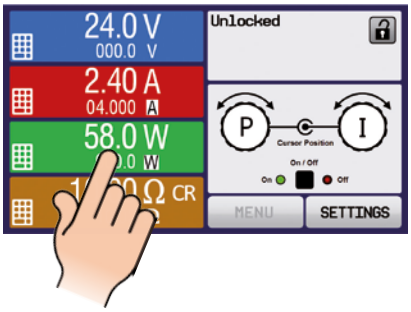
In parallel operation of multiple devices, a master-slave bus is used to link the units to a bigger system where the actual values are totalled and the set values distributed.

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功率等级、电压和电流
本本系列有0...80 V DC至0...750 V DC输出电压的多个型号，单台机器的输入电流高达510A。单个型号的功率级别有很多，因此多台装入机柜内可扩展至72 kW（见146页），从而获得更大的总电流。

结构
本系列所有型号都组装在一个19“宽，3U高，460 mm深的柜式外壳内，可以很简便地配进不同尺寸的19“机柜，比如42U。，以组成更高的功率。还可将不同的设备安装到机柜系统，比如：电子负载与电源一起，这样可以组成一个大功率的供电-吸收电的系统。

操作面板（HMI）
手动操作通过TFT触摸屏、两个旋钮与一个按钮来完成。大的彩色显示器一次性显示所有设定与实际值。通过人机界面可完成整个设置，包括函数（方形，三角形，正弦形）的配置等。
还提供多语言显示（德文，英文，俄文，中文）。



函数发生器与表格控制
本产品还具有一基于FPGA的数字函数与任意发生器。它可控制和运行用户定制的负载配置文档，并产生任意顺序的正弦、方形、锯齿形以及跳跃型函数。

通过可自由编程的4096点数值表，能实时嵌入到控制电路中，然后可重现非线性内阻，就像电池或LED灯条中的内阻。

远程控制 & 连接
进行远程控制时，可使用产品后板默认配置的两个接口卡端口（1x analog, 1x USB）与一个模拟接口。这些端口还可装上插拔式数字接口模块（指定插槽）进行扩展。

另外，本系列所有型号还配有一个三位接口（3 W功率，见下面描述），它为产品提供了1x GPIB/IEEE，1X USB与1x Analog接口。

应用到LabView IDE时，我们给USB, RS232, GPIB与Ethernet常用接口提供即用版(VIs)。通过通讯协议文档还可支持其它IDE与接口。可上传和存储文档。

Share-Bus-共享总线
在产品后板有一个模拟连接端子叫“Share Bus”，可用来并联连接多台类似的产品，从而均衡输出电流，比如本系列的多台负载并联，或者与EA-ELR 9000系列并联。

同时通过此端子连接EA-PSI 9000，EA-PS 9000与EA-PSE 9000，还可组建两象限系统。该系统专门利用源-沉原理做测试用途。

Power ratings, voltages, currents
The available voltage range portfolio goes from models with 0...80 V DC up to models with 0...750 V DC. Input currents up to 510 A with only one unit are available. The series offers various power classes amongst the single models, which can be extended up to 72 kW in cabinets (see from page 146) for a significantly higher total current.

Construction
All models are built in 19“ wide rack enclosures with 3U height and 460 mm depth, which makes them ideal for use in 19“ cabinets of various sizes, for example 42U, and for the design of systems with very high power. It is furthermore possible to build cabinet systems with mixed equipment, i.e. electronic loads and power supplies, in order to achieve the source-sink principle with high power ratings.

Handling (HMI)
Manual operation is done with a TFT touch-panel, two rotary knobs and a pushbutton. The large colour display shows all relevant set values and actual values at a glance. The whole setup is also done with the human-machine interface, as well as the configuration of functions (square, triangle, sine) etc.
The display is multilingual (German, English, Russian, Chinese).

Function generator and table control
A special feature is the comfortable, FPGA based, digital function and arbitrary generator. It enables controlling and running user-customisable load profiles and can generate sine, square, saw tooth and ramp functions in arbitrary order.
With a freely programmable digital value table of 3276 effective points, which is embedded in the control circuit, the devices can reproduce non-linear internal resistances, such as those of batteries or LED chains.

Remote control & connectivity
For remote control, there are by default two interface ports (1x analog, 1x USB) available on the rear of the devices, which can also be extended by optional, pluggable and retrofittable, digital interface modules (dedicated slot).
Alternatively to the interface modules slot, all models can be equipped with a three-way interface (option 3W, see below), which then offers 1x GPIB/IEEE, 1x USB and 1x Analog on the rear side of the device.

For the implementation into the LabView IDE we offer ready-to-use components (VIs) to be used with the interface types USB, RS232, GPIB and Ethernet. Other IDEs and interfaces are supported by documentation about the communication protocol.

Share Bus
The so-called „Share Bus“ is an analog connection at the rear of the devices and is used to balance current across multiple similar units in parallel connection, such as with loads of this series and series EA-ELR 9000.
It can also be used to build a two-quadrants system in connection with power supplies of series EA-PSI 9000, EA-PS 9000 and EA-PSE 9000. This system is dedicated for testing purposes using the source-sink principle.

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功率降额
EA-EL 9000 B系列产品具有热降额功能，当产品在最大功率级别下运行时避免过热。

环境温度越低，冷却状况越好，负载可吸收的功率就越大。功率降额后可持续吸收的功率是在25°C室温条件下定义的，并当温度上升时会快速减少。

电池测试模式
本产品还有一电池测试模式，可以通过恒流或恒阻放电来测试各类电池。它会显示累计的测试时间与消耗的容量 (Ah)。

如果用EA Power Control进行测试，数据会记录在电脑上，然后以CSV格式导出数据表。后续可在MS Exce或类似工具下进行分析，甚至能创建可视化的放电图。

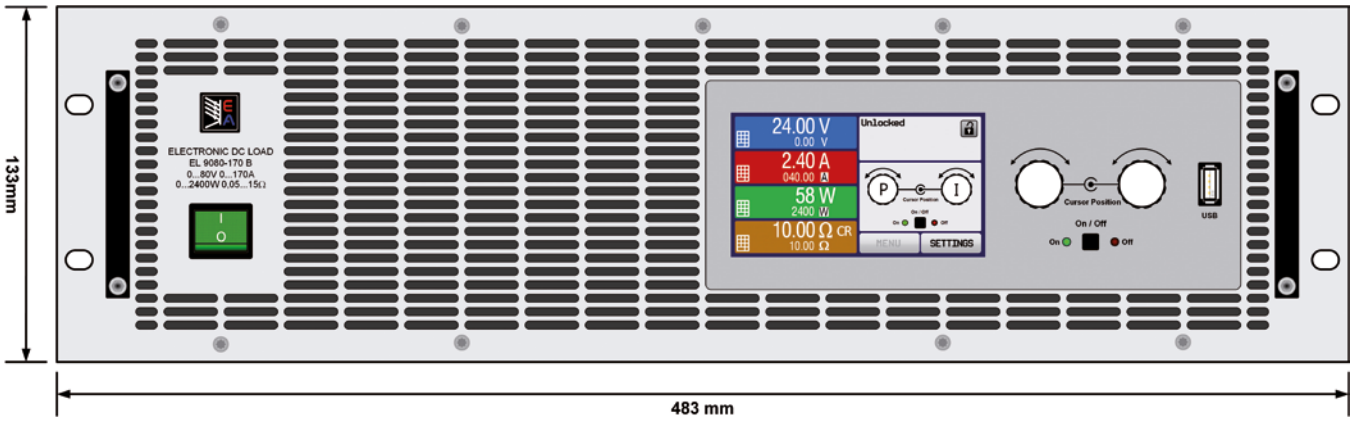
关于更详细的设置，可以设定一可调极限值，以便停止低电压电池的测试，或者停止可调最大测试期。

选项
- 可插拔式数字接口模块，如CANopen, Ethernet (1个或2个端口)，Profibus，ProfiNET (1个或2个端口)，RS232，DeviceNet与ModBus-TCP。请见139页。

Power derating
The devices of the EA-EL 9000 B series are equipped with thermal derating in order to avoid overheating when operating in the maximum power range.
The lower the ambient temperature and the better the cooling, the higher the power that the load can take. The continuous intake power after derating is stable up to 50°C ambient temperature.

Battery test
For purposes of testing all kinds of batteries, such as for example constant current or constant resistance discharging, the devices offer a battery test mode. This show extra values for elapsed testing time and consumed capacity (Ah).
Data recorded by the PC during tests with, for example, EA Power Control can be exported as Excel table in CSV format and analysed later in MS Excel or similar tools and even visualised as a discharge diagram.
For more detailed setup, there is also an adjustable threshold to stop the battery test on low battery voltage, as well an adjustable maximum test period.

Options
- Pluggable and retrofittable, digital interface modules for CANopen, Ethernet (1 or 2 ports), Profibus, ProfiNet I/O (1 or 2 ports), RS232, DeviceNet and ModBus-TCP. See page 139.



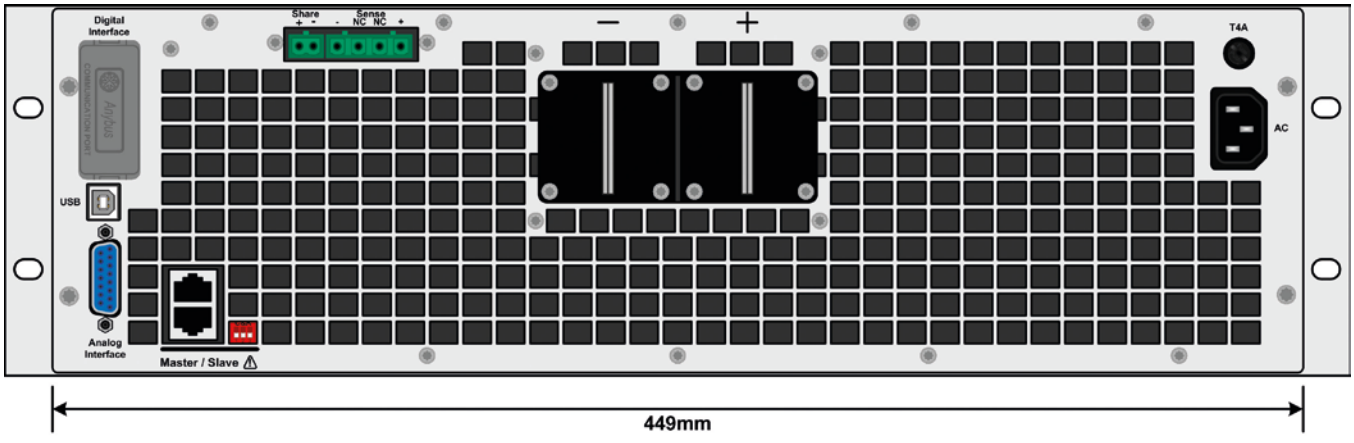
型号	功率 / Power	电压	电流	Strom	内阻	I最大时的最小电压(3	重量	订购编号 (1
Model	**峰值 / Peak**	**恒定值 (2/ Steady (2**	**Voltage**	**Current**	**Resistance**	**U_{Min} for I_{Max} (3**	**Weight**	**Ordering number (1**
EA-EL 9080-170 B	2400 W	1200 W	0...80 V	0...170 A	0.045...15 Ω	≈ 2.2 V	≈ 9 kg	33200260
EA-EL 9200-70 B	2000 W	1200 W	0...200 V	0...70 A	0.25...85 Ω	≈ 2 V	≈ 9 kg	33200261
EA-EL 9360-40 B	1800 W	1200 W	0...360 V	0...40 A	0.8...270 Ω	≈ 2 V	≈ 9 kg	33200262
EA-EL 9500-30 B	1200 W	1200 W	0...500 V	0...30 A	1.5...500 Ω	≈ 6.5 V	≈ 9 kg	33200263
EA-EL 9750-20 B	1200 W	1200 W	0...750 V	0...20 A	3.5...1100 Ω	≈ 5.5 V	≈ 9 kg	33200264
EA-EL 9080-340 B	4800 W	2400 W	0...80 V	0...340 A	0.023...7.5 Ω	≈ 2.2 V	≈ 13 kg	33200265
EA-EL 9200-140 B	4000 W	2400 W	0...200 V	0...140 A	0.13...43 Ω	≈ 2 V	≈ 13 kg	33200266
EA-EL 9360-80 B	3600 W	2400 W	0...360 V	0...80 A	0.4...135 Ω	≈ 2 V	≈ 13 kg	33200267
EA-EL 9500-60 B	2400 W	2400 W	0...500 V	0...60 A	0.75...250 Ω	≈ 6.5 V	≈ 13 kg	33200268
EA-EL 9750-40 B	2400 W	2400 W	0...750 V	0...40 A	1.75...550 Ω	≈ 5.5 V	≈ 13 kg	33200269
EA-EL 9080-510 B	7200 W	3600 W	0...80 V	0...510 A	0.015...5 Ω	≈ 2.2 V	≈ 17 kg	33200270
EA-EL 9200-210 B	6000 W	3600 W	0...200 V	0...210 A	0.08...28 Ω	≈ 2 V	≈ 17 kg	33200271
EA-EL 9360-120 B	5400 W	3600 W	0...360 V	0...120 A	0.27...90 Ω	≈ 2 V	≈ 17 kg	33200272
EA-EL 9500-90 B	3600 W	3600 W	0...500 V	0...90 A	0.5...167 Ω	≈ 6.5 V	≈ 17 kg	33200273
EA-EL 9750-60 B	3600 W	3600 W	0...750 V	0...60 A	1.2...360 Ω	≈ 5.5 V	≈ 17 kg	33200274

(1 参数此为标准版的订购编号，装3W选项的型号编号则有不同 / Ordering number of the standard version, models with option 3W installed have different ordering numbers
(2 室温为 25°C 时的参数 / At 25°C ambient temperature
(3 给负载提供最小的直流输入电压，以获得最大的输入电流 / Minimum DC input voltage to supply for the load to achieve the max. input current

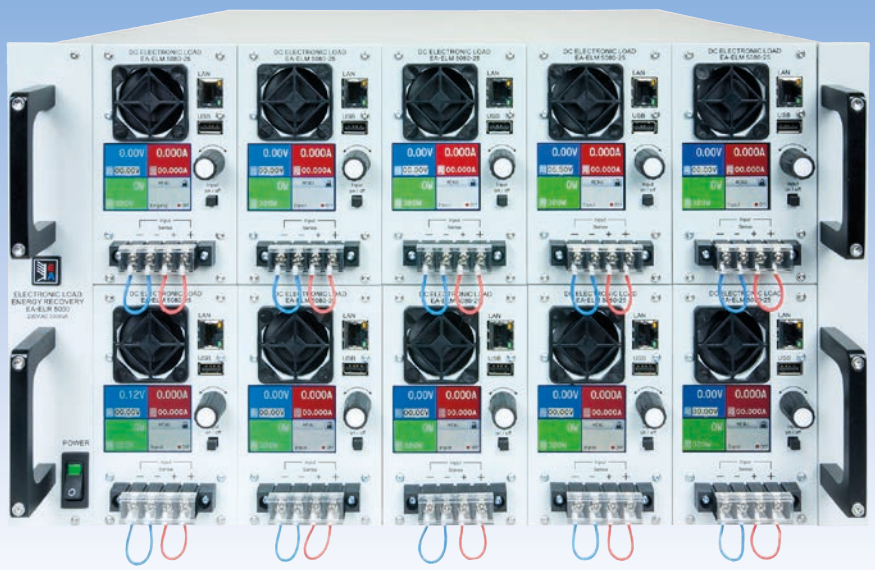
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技术参数	Technical Data	Series EA-EL 9000 B / 系列
AC输入电压	**AC input**	
- 电压 / 频率	- Voltage / Frequency	90...264 V, 45...66 Hz
- 功率因素校正	- Power factor correction (PFC)	>0.99
- 功率损耗	- Power consumption	最大40 W
DC输入：电流	**DC input: Current**	
- 精确度	- Accuracy	<0.2%
- 1-100% ΔU_{DC}负载调整率	- Load regulation 1-100% ΔU_{DC}	<0.1%
- 10-90% 负载上升时间	- Rise time 10-90% load step	<50 µs
DC输入：电压	**DC input: Voltage**	
- 精确度	- Accuracy	<0.1%
- 0-100% ΔI_{DC}负载调整率	- Load regulation 0-100% ΔI_{DC}	<0.05%
DC输入：功率	**DC input: Power**	
- 精确度	- Accuracy	<0.5%
DC输入：内阻	**DC input: Resistance**	
- 精确度	- Accuracy	≤额定电流的1% + 0,3% / ≤1% + 0.3% of nominal current
显示器与面板	**Display and panel**	TFT控制面板的彩显屏 / Graphics display with TFT touch panel
数字接口	**Digital interfaces**	
- 内置型	- Built-in	1x USB Typ B (通讯用) / 1x USB type B for communication 1x GPIB (3W通讯选项用) / 1x GPIB (optional with option 3W)
- 插槽型	- Slot	1x 可拆装内置模块用 (仅针对标准型号) / 1x for retrofittable plug-in modules (standard models only)
模拟接口	**Analog interface**	
- U / I / P / R设定输入脚	- Setting inputs U / I / P / R	0...10 V / 0...5 V
- U / I监控输出脚	- Monitoring outputs U / I	0...10 V / 0...5 V
- 控制信号	- Control signals	远程开-关，直流输入开-关，内阻模式开-关 / Remote on-off, DC input on-off, resistance mode on-off
- 状态信号	- Status signals	过压保护，过温保护 / Overvoltage, Overtemperature
- 参考电压	- Reference voltage	10 V / 5 V
制冷	**Cooling**	温控风扇 / Temperature controlled fans
- 操作温度	- Operation temperature	0...50 °C
- 储存温度	- Storage temperature	-20...70 °C
前板端子	**Terminals on rear panel**	
- 负载输入	- Load input	螺丝端子 / Screw terminal
- 共享总线 & 远程感测	- Share Bus & Sense	2 & 4针插头/ Plug connector 2 pole & 4 pole
- 模拟接口	- Analog interface	15-针Sub-D连接器 / Sub-D connector 15 pole
- 数字接口	- Digital interfaces	24针GPIB卡用模块插座 / Module socket or GPIB 24pole Master-Slave (2x RJ45), USB
尺寸 [1] (宽x 高 x 深)	- Dimensions [1] (W H D)	19“ 3 HE/U 464 mm

[1] 仅为外壳尺寸 / Enclosure only



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EA-ELR 5000 机柜

- 多通道直流负载器
- 可将获得的直流能量转化并返回本地电网
- 可供能容纳10台负载模块的19“ 6U机柜
- 输入功率级别分别有：每个模块可达0...320 W
- 输入电压有：0...80 V或0...200 V
- 输入电流由：0...10 A或0...25 A
- 基于微控制器的数字化控制
- 多语言TFT触摸屏
- 序列发生器
- 内置Ethernet/LAN接口
- 支持SCPI指令语言与ModBus

- **Multi-channel DC load**
- **Energy recovery of the supplied DC energy into the local grid**
- **19” 6U rack for up to 10 separate load modules**
- **Input power ratings: up to 0...320 W per module**
- **Input voltages: 0...80 V or 0...200 V**
- **Input currents: 0...10 A or 0...25 A**
- **µController based digital control**
- **Multilingual TFT touch panel**
- **Sequence generator**
- **Ethernet/LAN interface built-in**
- **SCPI command language and ModBus supported**

概述

新系列EA-ELR 5000是专门设计出来以配置成多通道直流电子负载的。在一个19”的机柜系统内，可以安装10台功率为320 W的直流负载。每个模块可独立操作，但是要求机柜内安装能量转换的DC-AC逆变设备。模块还可扩展，可将模块的直流输入端并联连接起来。

负载模块有两个电压选择，一个是80 V，一个是200 V。并且配有通用的调整模式：恒压(CV)，横流(CC)与恒功率(CP)。

能量返回功能可使产生的直流电同步转化成正弦波电流，然后返回给当地电网。这不仅摆脱了以前的热耗散，同时还节省了用电成本。产品上的巨大彩色TFT触摸屏提供一个不同于其他产品的手动操作。

本产品标配一个以太网端口，从而可将负载产品轻易地集成到LAN产品的网络中。通过随附的Windows软件或者在LabView或其它IDE创建的客户定制应用可以从外部控制。另外还支持SCPI通讯协议与ModBus。

General

The new series EA-ELR 5000 was designed to configure a multi-channel electronic DC load. In a rack for 19” systems, up to ten DC load units with 320 W nominal power each can be installed. The modular units operate separately from each other, but require the rack as it contains the energy recovering DC-AC inverter. The modules are also extendable. Parallel connection on the DC inputs of the module is possible.
The load modules come in two voltage variants, 80 V and 200 V, and incorporate the common regulation modes constant voltage (CV), constant current (CC) and constant power (CP).

The energy recovery function inverts the supplied DC energy into a synchronous sine current and feeds it back into the local grid. This reduces the usual heat dissipation to a minimum and saves energy costs at the same time. The colour TFT touch panel offers an intuitive kind of manual operation.

Equipped with an Ethernet port by default, the load units can be easily integrated into a network of LAN devices. External control is possible via an included Windows software or via custom applications created in LabView or other IDEs. The commonly known communication protocols SCPI and ModBus are supported.

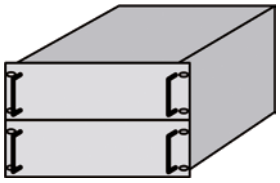
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功率、电压和电流等级

本系列有两个负载型号。一款型号的输入电压最大为80 V DC，另一款为200 V。两款型号最大功率为320 W。因此80 V型号可以吸收电流25 A，而200 V则可吸收10 A。将10台这样的负载模块装入一单独的机柜内，可以组成最大3200 W的功率。

机械结构

装负载模块的机架为6U高，19“宽，深度为480 mm。适合放入不同尺寸的19“机柜。



供电

本机架的操作电压为230 V AC (±10%)的，可匹配16 A 的墙插或类似插座。能量反馈功能要求电网上一直接有足够的设备，并且要消耗这返回的能量。



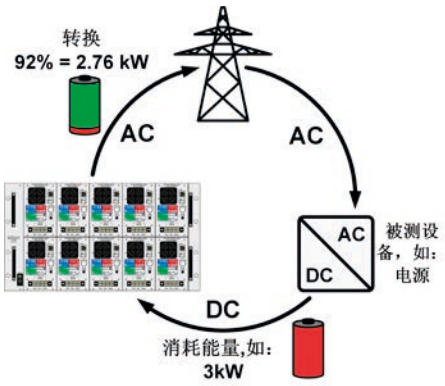
可选择给电网装一监控设备“ENS”（见141页），该设备可拆卸且为模块式。

如选择安装“ENS2”，电网将变成三相电（L1, L2, L3, N, PE）。

能量返回

本负载最主要的特点是其AC输入端，即电网连接端，它也可用作直流电返回的输出端，转换效率接近93%。这种能量转换方式有助于降低用电成本，且避免使用昂贵的制冷系统，因为普通电子负载使用过程中会将直流输入电量转化成热量，从而需要制冷系统进行冷却。

原理图如下：



此类回馈式负载不可用作发电。我们还共有另外一个监控设备（自动隔离件，ENS），能加强对人体与设备的安全，特别是在运行此类隔离操作的时候。

不管用户是否装有此类监控设备，我们产品配有一简易无冗余关闭功能，遇到电网连线突然断开时会关闭产品。本产品可监控AC电压和频率，当超过功率上限或下限时会自动关闭功率模块。

Power ratings, voltages, currents

There are two load models available. One for max. 80 V DC input voltage and one for max. 200 V. Both models have a max. power of 320 W, while the 80 V model can take up to 25 A and the 200 V can take up to 10 A. By installing up to 10 units of these load modules into a single rack it is possible to extend the power to 3200 W max.

Construction

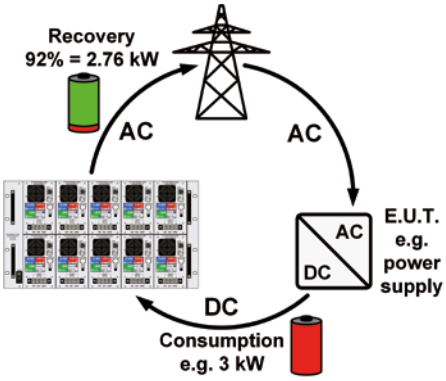
The rack, which is used to hold the load modules, is designed with 19“ width and 6U height, while having an installation depth of 480 mm. This makes it ideal for use in 19“ cabinets of various sizes.

Supply

The rack can be operated on a normal 230 V AC (±10%), 16 A wall socket or a similar supply. The recovery feature requires to always have sufficient devices on the grid to consume the backfed energy.
The grid connection can be equipped with a supervision unit “ENS2” (see page 141) which is optionally available, retrofittable and modular.
With this option installed, the grid connection will always be three-phase (L1, L2, L3, N, PE).

Energy recovery

The most important feature of these electronic loads is that the AC input, i.e. grid connection, is also used as output for the recovery of the supplied DC energy, which will be converted with an efficiency of approximately 93%. This way of energy recovery helps to lower energy costs and avoids expensive cooling systems, such as required for conventional electronic loads which convert the DC input energy into heat.
Principle view:

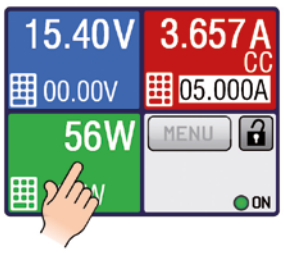


Operation of these backfeeding loads in terms of power generation is not intended. There is an additional supervision unit (automatic isolation unit, ENS) available for optional installation and to achieve additional safety of persons and equipment, especially when running the so-called isolated operation.

Regardless of whether the user has installed that supervision unit or not, the devices feature a simple and non-redundant switch-off function for the case of an interruption in the grid connection cable. They supervise AC voltage and frequency and will automatically switch off the inverter block in case upper or lower limits are exceeded.

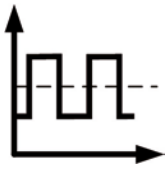
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操作面板（HMI）
手动操作通过阻性触摸屏、两个旋钮与一个按钮来完成。这个彩色显示器能一次性显示所有设定与实际值。在人机界面也可完成整个设置，包括序列发生器的配置。



Operation (HMI)
Manual operation is done with a resistive touch panel, two rotary knobs and a pushbutton. The colour display shows all relevant set values and actual values at a glance. The whole setup is also done with the human-machine interface, as well the configuration of the sequence generator.

序列发生器
本产品还有一个特别功能，就是配有数字序列发生器。利用半自动序列块（最多100）可以控制负载产品。这些序列块由可编程的设定电压、电流与功率，再加上时间组成。发生器可以针对任何或所有设定值立刻描绘出一个方形波信号。



Sequence generator
A special feature is the digital sequence generator. It enables to control the load unit by semi-automatic sequence blocks (max. 100). Those blocks consist of programmable set values for voltage, current and power, plus a time value. The generator can apply a rectangular wave signal to any or all set values at once.

远程控制 & 连接
进行远程控制时，可使用模块上面前板默认配置的Ethernet/LAN端口。通过这个连接，用户可以使用SCPI语言或协议控制模块的所有功能。

产品前方还有一个USB端口，用来插U盘，方便上传与保存序列，以便安装控制面板的固件升级文档。

应用到LabView IDE时，我们给Ethernet常用接口提供即用版(VIs)。通过通讯协议文档还可支持其它IDE与接口。可上传和存储文档。

选项
- 配有16个端口的标准以太网交换机，高度仅为1U，适合装入19“机架。

Remote control & connectivity
For remote control, there is by default an Ethernet/LAN port available on the front of the modules. Via this configurable connection users can completely control all functions of the modules either via SCPI language or ModBus protocol.

A USB port, also located on the front side, is intended for USB flash drives in order to load and save sequences and to install firmware updates for the HMI, i.e. control panel.

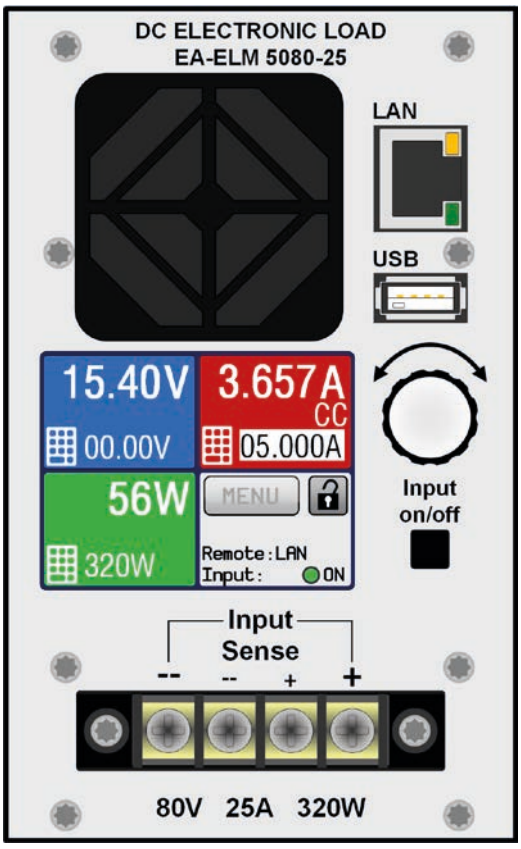
For the implementation into the LabView IDE we offer ready-to-use components (VIs) to be used with the Ethernet interface. Other IDEs and interfaces are supported by documentation about the communication protocol.

Options
- Standard Ethernet switch with 16 ports for 19” rack mount and with 1U height

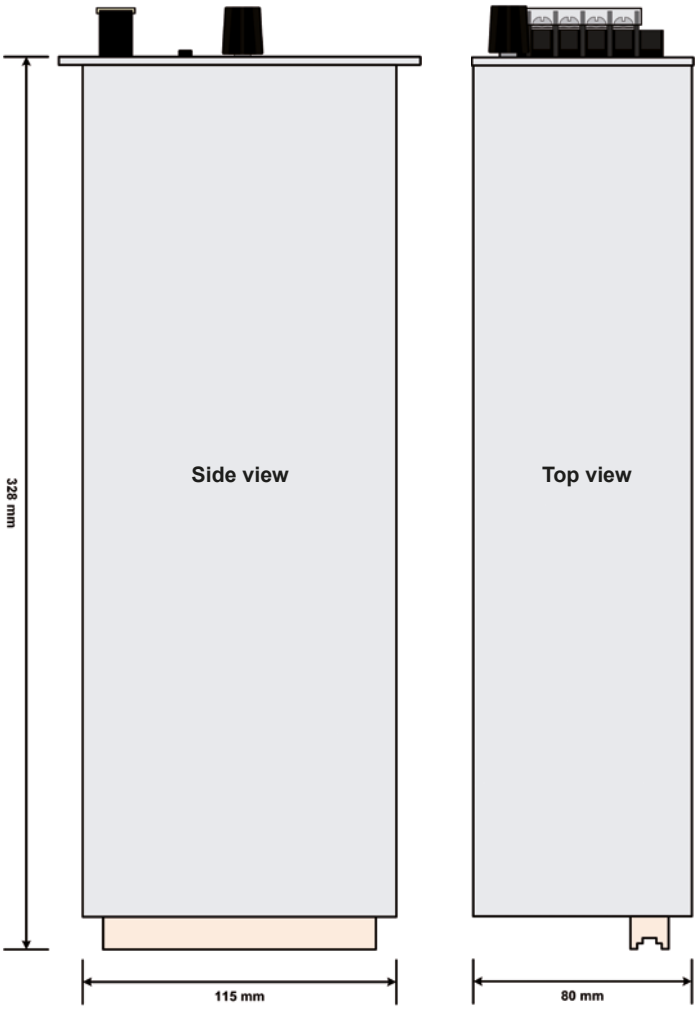
技术参数	Technical Data	EA-ELR 5000 Rack
AC输入	**AC connection**	
- 电压	- Voltage	230 V AC, ±10%, 45...65 Hz
- 功率因素校正	- Power factor correction (PFC)	>0.99
- 效率	- Efficiency	≥92%
制冷	**Cooling**	
- 类型	- Kind	温控风扇 / Temperature controlled fans
- 工作温度	- Operation temperature	0...50 °C
- 储存温度	- Storage temperature	-20...70 °C
端子	**Terminals**	
- 直流输入	- DC input	螺丝端 / Screw terminal
- 感测端	- Sense	螺丝端 / Screw terminal
- 其它	- Other	Ethernet, USB
机械特性	**Mechanics**	
- 每个机架可安装的负载模块	- Load modules per rack	最多10 / up to 10
- 机架重量	- Weight of rack	12.25 kg
- 装满后机架重量	- Weight of fully equipped rack	35.8 kg
- 机架尺寸 (宽x 高 x 深)	- Dimensions of rack (WxHxD)	19“ x 6HE / 6U x 500 mm
- 保护等级	- Protection class	1
- 污染等级	- Degree of pollution	2
订购编号	**Ordering number**	33130336

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技术参数	Technical Data	EA-ELM 5080-25	EA-ELM 5200-10
DC输入：电压	**DC input: Voltage**		
- 范围	- Range	0...80 V	0...200 V
- 精确度	- Accuracy	<0.1%	<0.1%
- 0-100% ΔU_{DC}负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.05%	<0.05%
- 10-90% 负载上升时间	- Response time 10-90% load step	<1 ms	<1 ms
DC输入：电流	**DC input: Current**		
- 范围	- Range	0...25 A	0...10 A
- 精确度	- Accuracy	<0.1%	<0.1%
- 0-100% ΔI_{DC}负载调整率	- Load regulation 0-100% ΔI_{DC}	<0.05%	<0.05%
DC输入：功率	**DC input: Power**		
- 范围	- Range	0...320 W	0...320 W
- 精确度	- Accuracy	<1%	<1%
- 0-100% $\Delta U/I_{DC}$负载调整率	- Load regulation 0-100% $\Delta U/I_{DC}$	<0.2%	<0.2%
显示器与面板	**Display and panel**	控制面板的彩显屏 / Graphics display with touch panel	
数字接口	**Digital interfaces**		
- 内置(前板)	- Built-in (front side)	1x U盘用A型USB / 1x USB type A for USB flash drives 1x Ethernet (SCPI, ModBus, HTTP, TCP, ICMP)	
制冷	**Cooling**		
- 类型	- Kind	温控风扇 / Temperature controlled fans	
- 工作温度	- Operation temperature	0...50 °C	
- 储存温度	- Storage temperature	-20...70 °C	
端子	**Terminals**		
- 直流输入	- DC input	螺丝端子 / Screw terminal	
- 感测端	- Sense	螺丝端子 / Screw terminal	
- 其它	- Other	Ethernet, USB	
机械特性	**Mechanics**		
- 重量	- Weight	2.35 kg	
- 尺寸 (1) (宽x 高 x 深)	- Dimensions (WxHxD)	81 x 132,5 x 310 mm	
订购编号	**Ordering number**	33220430	33220431



带控制面板的负载模块前视图 /
Front view of the load module with control panel



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EA-ELR 9200-210

- 可接1相，2相或3相输入电压使用（欧标和美标都有）
- 可将直流电量返回到本地电网
- 直流输入端为电隔离结构
- 每台产品的输入功率高达10.5 kW 还可扩展至105 kW或更高
- 输入电压高达1500 V
- 每台产品的输入电流能高达510 A
- 基于FPGA/DSP数字控制
- 多语言TFT触摸屏
- 用户配置文档，真实函数发生器
- 电隔离
- 并联用主-从总线
- 前板有额外的USB端口，适合使用外置U盘
- 可选数字式即插即用型接口，或安装IEEE/GPIB端口
- 支持SCPI指令语言
- 可选自动隔离设备(1

- **For 1-, 2- or 3-phase supply (European and US models available)**
- **Energy recovery of the supplied DC energy into the local grid**
- **Galvanically isolated DC input**
- **Input power ratings up to 10.5 kW per unit Expandable to 105 kW or more**
- **Input voltages up to 1500 V**
- **Input currents up to 510 A per unit**
- **FPGA/DSP based digital control**
- **Multilingual TFT touch panel**
- **User profiles, true function generator**
- **Galvanically isolated**
- **Master-slave bus for parallel connection**
- **Extra USB port on the front for USB stick**
- **Optional, digital, plug & play interfaces or alternatively installed IEEE/GPIB port**
- **SCPI command language supported**
- **Optional automatic isolation unit (1**

概述

新一系列的直流电子负载具有将能量返回市电的功能，称为EA-ELR 9000，其电压、电流与功率级别也都是新的，适用于多种用途。
这些产品具有四个常用调节模式：恒压、恒流、恒功率和恒阻。基于FPGA的控制电路带来了更多新的功能，如函数发生器，模拟非线性内阻的基于表格格式的调整电路。

能量返回功能可使产生的直流电同步转化成正弦波电流，然后返回给当地电网。这不仅摆脱了以前的热耗散，同时还节省了用电成本。产品上的巨大彩色TFT触摸屏提供一个不同于其他产品的手动操作。

经模拟或数字接口进行控制的反应时间已由DSP控制软件得到很好的改善。

多台产品并联操作时，可经主从总线将这数台产品连到一个更大的系统上，此时实际值会被累加，设定值则会被均衡分布。

1) 前德文术语名: ENS

General

The new series of electronic DC loads with energy recovery to mains, called EA-ELR 9000, offers new voltage, current and power ratings for a multitude of applications.
These devices incorporate the four common regulation modes constant voltage, constant current, constant power and constant resistance. The FPGA based control circuit provides additional features, such as a function generator, a table based regulation circuit for the simulation of non-linear internal resistances.

The energy recovery function converts the supplied DC energy into a synchronous sine current and feeds it back into the local grid. This eliminates the usual heat dissipation to a minimum and saves energy costs at the same time. The large colour TFT touch panel offers a different and intuitive kind of manual operation, compared to other devices.

Response times for the control via analog or digital interfaces have been improved by the DSP controlled hardware.

In parallel operation of multiple devices, a master-slave bus is used to connect the units to a bigger system where the actual values are totalled and the set values distributed.

1) Former german name: ENS

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功率、电压和电流等级

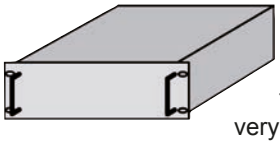
本系列有0...80 V DC至0...1500 V DC输出电压的产品型号，还有一款输入电流高达510 A的型号。本系列有三个功率级别，分别为3.5 kW，7 kW或10.5 kW（此为欧标型号，美标型号请参考规格参数表），单机外壳仅3U高。还可组合到机柜内扩展高达105 kW（或更大）的功率，并形成更大的总电流。按照客户要求能组成更大功率的系统。

Power ratings, voltages, currents

The available voltage range portfolio goes from models with 0...80 V DC up to models with 0...1500 V DC. Input currents up to 510 A with only one unit are available. The series offers three power classes with 3.5 kW, 7 kW or 10.5 kW (EU models, for US model see techn. specs) in only 3U for single devices, which can be extended up to 105 kW (or higher) in cabinets for a significantly high total current. Upon request, even higher total power can be realised.

机械结构

所有型号都安装于一个3U高，19“宽，609 mm深的机架式外壳内，适合各种尺寸的19“机柜，如42U，也适合大功率的系统设计。



Construction

All models are built in 19“ wide rack enclosures with 3U height and 609 mm depth, which makes them ideal for use in 19“ cabinets of various sizes, for example 42U, and for the design of systems with very high power.

供电

3.5 kW的欧版型号配230 V (L - N)的单相电使用，而7 kW的则需两相电，10.5 kW的则需三相电。

美国版型号统一在208 V (L-L) 下工作，可提供3.1 kW、6.2 kW或 9.3 kW不同的功率级别。

可选择给电网装一监控设备（AIU, ENS），该设备可拆卸且为模块式。

如选择安装“ENS2”，电网将变成三相电（L1, L2, L3, N, PE）。



Supply

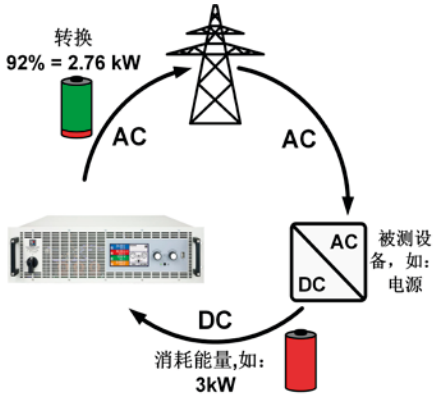
EU models with 3.5 kW are intended for use with 1-phase mains supplies of 230 V (L-N), while 7 kW models require a 2-phase and 10.5 kW models a 3-phase supply.
US models work with 208 V (L-L) and offer 3.1 kW, 6.2 kW or 9.3 kW power.

The grid connection of european models for 230 V supply can be equipped with a supervision unit (AIU, ENS) which is optionally available, retrofittable and modular.
With option „ENS2“ installed, the grid connection will become three-phase (L1, L2, L3, N, PE) for every model.

能量返回

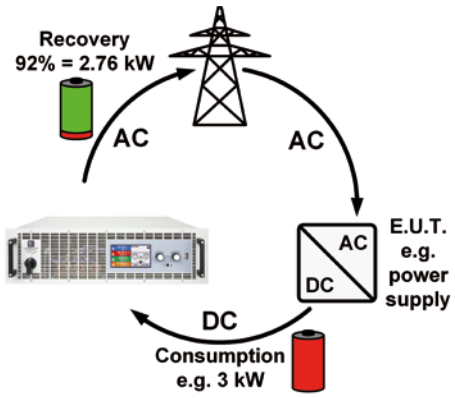
本负载最主要的特点是其AC输入端，即电网连接端，它也可用作直流电返回的输出端，转换效率接近93%。这种能量转换方式有助于降低用电成本，且避免使用昂贵的制冷系统，因为普通电子负载使用过程中会将直流输入电量转化成热量，从而需要制冷系统进行冷却。

下面为其原理示意图：



Energy recovery

The most important feature of these electronic loads is that the AC input, i.e. grid connection, is also used as output for the recovery of the supplied DC energy, which will be converted with an efficiency of approximately 93%. This way of energy recovery helps to lower energy costs and avoids expensive cooling systems, such as they are required for conventional electronic loads which convert the DC input energy into heat.
Principle view:



此类回馈式负载不可用作发电。我们还共有另外一个监控设备（自动隔离件，ENS），能加强对人体与设备的安全，特别是在运行此类隔离操作的时候。

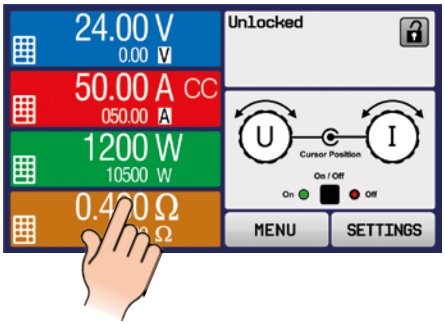
Operation of these feeding back loads in terms of power generationis notintended. There is an additional supervision unit (automatic isolation unit, ENS) available for optional installation and to achieve additional safety of persons and equipment, especilally when running the so-called isolated operation.

不管用户是否装有此类监控设备，我们产品配有一简易无冗余关闭功能，遇到电网连线突然断开时会关闭产品。本产品可监控AC电压和频率，当超过功率上限或下限时会自动关闭功率模块。

Regardless of whether the user has installed that supervision unit or not, the devices feature a simple and non-redundant switch-off function for the case of an interruption in the grid connection cable. The device supervises AC voltage and frequency and will automatically switch off the power stages in case upper or lower limits are exceeded.

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操作面板（HMI）
手动操作通过大猩猩玻璃触摸屏、两个旋钮与一个按钮来完成。大的彩色显示器一次性显示所有设定与实际值。通过人机界面可完成整个设置，包括函数（方形，三角形，正弦形）的配置等。
还提供多语言显示（德文，英文，俄文，中文）。



Operation (HMI)
Manual operation is done with a Gorilla glass touch panel, two rotary knobs and a pushbutton. The large colour display shows all relevant set values and actual values at a glance. The whole setup is also done with the human-machine interface, as well the configuration of functions (square, triangle, sine) etc.
The display is multilingual (German, English, Russian, Chinese).

函数发生器与表格控制
本产品还具有一基于FPGA的数字函数与任意发生器。它可控制和运行用户定制的负载配置文档，并产生任意顺序的正弦、方形、锯齿形以及跳跃型函数。

通过可自由编程的4096点数值表，能实时嵌入到控制电路中，然后可重现非线性内阻，就像电池或LED灯条中的内阻。

Function generator and table control
A special feature is the comfortable, FPGA based, digital function and arbitrary generator. It enables to control and run user-customisable load profiles and can generate sine, square, saw tooth and ramp functions in arbitrary order.
With a freely programmable, digital value table of 4096 points, which is embedded in the control circuit, the devices can reproduce non-linear internal resistances, such as those of batteries or LED chains.

远程控制 & 连接
进行远程控制时，可使用产品后板默认配置的两个接口卡端口（1x analog, 1x USB）与一个模拟接口。这些端口还可装上插拔式数字接口模块（指定插槽）进行扩展。

另外，本系列所有型号还配有一个三位接口（3 W功率，见下面描述），它为产品提供了1x IEEE，1X USB与1x Analog接口。

产品前方还有一个USB端口，用来插U盘，方便上传与保存函数和用户配置文档。

应用到LabView IDE时，我们给USB，RS232或Ethernet常用接口提供即用版(VIs)。通过通讯协议文档还可支持其它IDE与接口。可上传和存储文档。

Remote control & Connectivity
For remote control, there are by default two interface ports (1x analog, 1x USB) available on the rear of the devices, which can also be extended by optional, pluggable and retrofittable, digital interface modules (dedicated slot).
Alternatively, all models can be equipped with a three-way interface (option 3 W, see below), which then offers 1x GPIB/IEEE, 1X USB and 1x Analog on the rear side of the device.

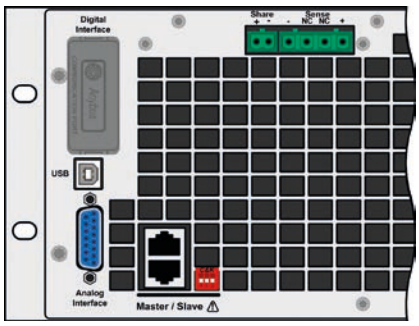
Another USB port, located on the front side, is intended for USB flash drives in order to load and save functions and user profiles.

For the implementation into the LabView IDE we offer ready-to-use components (VIs) to be used with more common interfaces like USB, RS232 or Ethernet. Other IDEs and interfaces are supported by documentation about the communication protocol.

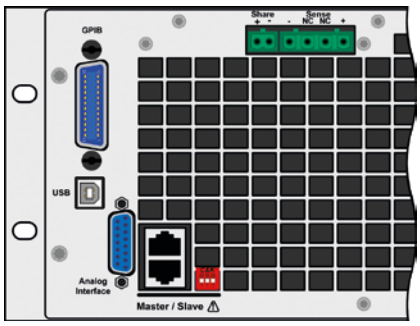
选项
- 可插拔式数字接口模块, 如CANopen, Ethernet (1个或2个端口)，Profibus，ProfiNET (1个或2个端口)，RS232，DeviceNet与ModBus-TCP。请见139页。
- 还可安装带固定GPIB端口的三位接口（3 W），而非接口模块用的默认插槽
- 自动隔离设备，三相供电 (AIU / ENS，见141页)
- 预配置的机柜（见第146页）



Options
- Pluggable and retrofittable, digital interface modules for CANopen, Ethernet (1 or 2 ports), Profibus, ProfiNet (1 or 2 ports), RS232, DeviceNet and ModBus-TCP. See page 139.
- Three-way interface (3 W) with a rigid GPIB port installed instead of the default slot for retroffitable interface modules.
- Automatic isolation unit, 3-phase (AIU / ENS, see page 141)
- Preconfigured cabinets (see page 146)



可标准型号后板所配端子 /
Rear connectors of the standard models



带选项功能型号后板所配端子 /
Rear connectors of models with option 3 W

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技术参数	Technical Data	Series EA-ELR 9000 / 系列
AC输入	**AC input**	
- 输入电压（欧版）	- Input voltage (European models)	230 V L->N, +10%/-15%, 45...66 Hz, 1ph-3ph
- 输入电压（美版）	- Input voltage (US models)	400 V L->L, +10%/-15%, 45...66 Hz, 2ph-3ph
- 功率因素校正	- Power factor correction (PFC)	>0.99
DC输入：电流	**DC input: Current**	
- 精确度	- Accuracy	<0.4%
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%
- 负载10-90%的上升时间	- Rise time 10-90% load step	<50 µs
DC输入：电压	**DC input: Voltage**	
- 精确度	- Accuracy	<0.3%
- 0-100% 电流的负载调整率	- Load regulation 0-100% current	<0.05%
DC输入：功率	**DC input: Power**	
- 精确度	- Accuracy	<1.5%
- 0-100% $\Delta U/I_{DC}$的负载调整率	- Load regulation 0-100% $\Delta U/I_{DC}$	<0.3%
DC输入：内阻	**DC input: Resistance**	
- 精确度	- Accuracy	<2%
- 0-100% $\Delta U/I_{DC}$的负载调整率	- Load regulation 0-100% $\Delta U/I_{DC}$	<0.02%
显示器与面板	**Display and panel**	带触摸屏的图形显示器 / Graphics display with touch panel
数字接口	**Digital interfaces**	
- 内置型	- Built-in	1x 通讯用A型USB / 1x USB type B for communication 1x GPIB（带3 W可选功能 / 1x GPIB (optional with option 3 W)
- 插槽型	- Slot	1x 可更换的插入式模块（仅针对标准型号） / 1x for retrofittable plug-in modules (standard models only)
模拟接口	**Analog interface**	内置15针Sub-D型母插，电隔离 / Built-in, 15-pole D-Sub (female), galvanically isolated
- U / I / P / R设定输入脚	- Input range	0...5 V 或 0...10 V (可转换) / 0...5 V or 0...10 V (switchable)
- U / I 控制输出脚	- Accuracy U / I / P / R	0...10 V: <0.1% 0...5 V: <0.2%
- 控制信号	- Control signals	远程开-关，输入开-关，内阻模式开-关 / Remote on-off, Input on-offf, resistance mode on-off
- 状态信号	- Status signals	过压 / Overvoltage, 过温 / Overtemperature
制冷	**Cooling**	温控风扇 / Temperature controlled fans
- 工作温度	- Operation temperature	0...50°C
- 储存温度	- Storage temperature	-20...70°C
后板上的连接端	**Terminals on rear panel**	
- 负载输入	- DC input	螺丝端 / Screw terminal
- 共享总线 & 感测端	- Share Bus & Sense	2针 & 4针插头连接器 / Plug connector 2 pole & 4 pole
- 模拟接口	- Analog interface	15针Sub-D型连接器 / Sub-D connector 15 pole
- 数字接口	- Digital interface	50针模块插座或24针GPIB接口，以及USB/ Module socket 50 pole or GPIB 24 pole, USB

型号	欧版功率	美版功率	电压	电流	阻值	效率	宽 / 深(1	高	重量	订购编号(2	
										欧版	美版
Model	**Power (EU)**	**Power (US)**	**Voltage**	**Current**	**Resistance**	**Efficiency**	**Width / Depth (1**	**Height**	**Weight**	**Ordering number (2**	
										EU	**US**
EA-ELR 9080-170	0...3.5 kW	0...3.1 kW	0...80 V	0...170 A	0.01...12 Ω	92.5%	19“ / 609 mm	3U	17 kg	33200401	33208401
EA-ELR 9250-70	0...3.5 kW	0...3.1 kW	0...250 V	0...70 A	0.09...120 Ω	93.5%	19“ / 609 mm	3U	17 kg	33200402	33208402
EA-ELR 9500-30	0...3.5 kW	0...3.1 kW	0...500 V	0...30 A	0.42...480 Ω	94.5%	19“ / 609 mm	3U	17 kg	33200403	33208403
EA-ELR 9750-22	0...3.5 kW	0...3.1 kW	0...750 V	0...22 A	0.8...1100 Ω	94.5%	19“ / 609 mm	3U	17 kg	33200404	33208404
EA-ELR 9080-340	0...7 kW	0...6.2 kW	0...80 V	0...340 A	0.005...6 Ω	92.5%	19“ / 609 mm	3U	24 kg	33200405	33208405
EA-ELR 9250-140	0...7 kW	0...6.2 kW	0...250 V	0...140 A	0.04...60 Ω	93.5%	19“ / 609 mm	3U	24 kg	33200406	33208406
EA-ELR 9500-60	0...7 kW	0...6.2 kW	0...500 V	0...60 A	0.21...240 Ω	94.5%	19“ / 609 mm	3U	24 kg	33200407	33208407
EA-ELR 9750-44	0...7 kW	0...6.2 kW	0...750 V	0...44 A	0.43...550 Ω	94.5%	19“ / 609 mm	3U	24 kg	33200408	33208408
EA-ELR 91000-30	0...7 kW	0...6.2 kW	0...1000 V	0...30 A	0.83...950 Ω	94.5%	19“ / 609 mm	3U	24 kg	33200409	33208409
EA-ELR 9080-510	0...10.5 kW	0...9.3 kW	0...80 V	0...510 A	0.003...4 Ω	92.5%	19“ / 609 mm	3U	31 kg	33200410	33208410
EA-ELR 9250-210	0...10.5 kW	0...9.3 kW	0...250 V	0...210 A	0.03...40 Ω	93.5%	19“ / 609 mm	3U	31 kg	33200411	33208411
EA-ELR 9500-90	0...10.5 kW	0...9.3 kW	0...500 V	0...90 A	0.14...160 Ω	94.5%	19“ / 609 mm	3U	31 kg	33200412	33208412
EA-ELR 9750-66	0...10.5 kW	0...9.3 kW	0...750 V	0...66 A	0.29...360 Ω	94.5%	19“ / 609 mm	3U	31 kg	33200413	33208413
EA-ELR 91500-30	0...10.5 kW	0...9.3 kW	0...1500 V	0...30 A	1.2...1450 Ω	94.5%	19“ / 609 mm	3U	31 kg	33200414	33208414

(1 仅为外壳尺寸 / Enclosure only
(2 参数此为标准版的订购编号，装3W选项的型号编号则有不同 / Ordering number of the standard version, models with option 3W installed have different ordering numbers

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U
I
OVP
OTP
USB
RS232
CAN



外壳类型 1 / Enclosure type 1 EA-BCI 812-20 R

- 宽范围输入电压90...264 V带PFC
- 输出功率：320 W 至 1500 W
- 输出电压有12 V，24 V与48 V
- 充电电流高达60 A
- 适合于：Li-Ion和Pb, NiCd, NiMH
- 温控充电特性
- 可编程充电特性
- 电源模式
- 图形显示器显示所有数值与状态
- 有短路保护和反接保护
- 有过压保护(OVP)
- 有过温保护(OT)
- 可自动检测的远程感测端
- 模拟接口
- 自然风冷却*或温控风扇制冷**
- 可选件数字接口卡

- **Wide range input 90...264 V**
- **Output power ratings: 320 W up to 1500 W**
- **Typical charging voltages 12 V, 24 V and 48 V**
- **Charging currents up to 60 A**
- **Suitable for: Li-Ion and Pb, NiCd, NiMH**
- **Temperature controlled charging**
- **Programmable charging profiles**
- **Power supply mode**
- **Graphic display for all values and status**
- **Short-circuit and reverse polarity protection**
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Remote sense with automatic detection**
- **Analog interface**
- **Natural convection for cooling* or temperature controlled fan ****
- **Optional, digital interface cards**

概要
EA-BCI 800 R系列是一款由单片机控制的电池充电器。它具有几乎满足所有需求的多种功能和特点。

图形显示器上的清晰菜单快速、简便地指导用户进行正确的设置。本系列通过可选数字接口可编程、遥控和监控。这样可管理、分析和评估一个或多个电池的所有相关数据。

充电曲线文档
EA-BCI 800 R系列非常适合充Li-Ion电池，也可充铅性、NiCd、NiMH电池。用户可针对特定电池类型轻易配置所需充电曲线。

输出
本系列分别有5 A至60 A充电电流，320 W至1.5 kW功率的多个型号。

远程感测输入端
内置感测输入端可直接连到电池上，以补偿连线上的压降，输出调整后的电压给负载。如果输入端已接上负载，本充电器会自动纠正输出电压，确保电池获得准确所需的电压。

General
The microprocessor controlled battery chargers of the series EA-BCI 800 R have a multitude of functions and features covering all needs.
The clear menu in the graphic display provides a fast and simple guide to correct settings. The chargers can be programmed, remotely controlled and monitored using the optional digital interface cards. Thus all the data for one or more batteries can be administered, analysed and evaluated.

Charging profiles
The chargers in the EA-BCI 800 R series are very suitable for Lithium ion batteries. But also lead, NiCd or NiMH batteries can be charged. The required charging profiles are easily configured by the user for specific batteries.

Output
Chargers with charging currents from 5 A up to 60 A and powers from 320 W up to 1.5 kW are available.

Remote sense
The built-in sensing input can be connected directly to the battery to compensate voltage drops along the power cables and put out the voltage to the load as adjusted. If the sense input is connected to the load, the battery charger will correct the voltage automatically, in order to ensure that the accurate required voltage is available on the battery.

* 600 W以下型号
** 1 kW以上型号

* Models up to 600 W
** Models from 1 kW

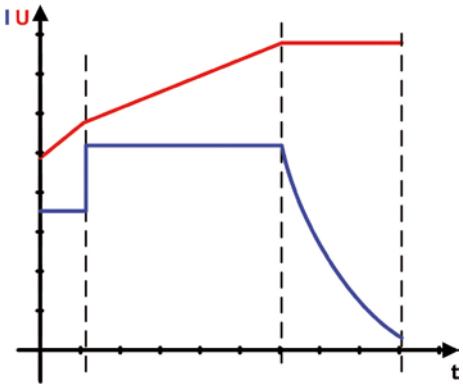
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锂离子电池的充电循环阶段

针对锂离子电池，可编程修复充电、预充、快充和峰值充电的各项参数。

可编程的参数有：比如充电电压、电流、时间、温度补偿。

按此种方式每个电池可单独充电，从而使使容量和寿命得到最大优化。



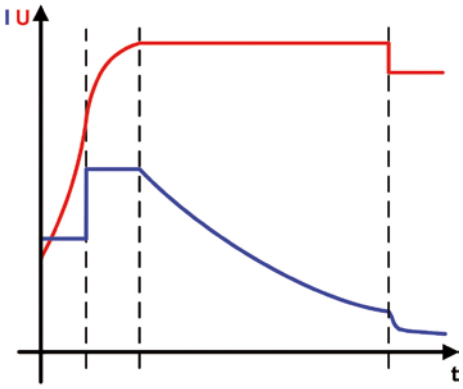
还可在允许的可调宽范围内编辑几乎任何电池参数，该项特征使得本产品成为任何类型锂电池的理想充电器。

铅酸电池的充电阶段

本产品可用4个充电循环阶段来充液态、GEL或AGM铅酸电池，或者5个循环阶段来充，包含存储和刷新模式。

铅酸电池的四个充电阶段

电池接到充电器上后，单片机检测电池极性和电压，确定是否开始充电。如果电池极性错误或完全过放(<0.2 x U_{Nom})，则不开始充电。针对过放的电池(>0.2 至 <0.9 x U_{Nom})，则以减小后的电流开始**预充循环阶段**。



然后紧接着**快充阶段**，以全电压和最大电流进行，直到充电电流下降到输出电流的80%以下。

接着进入**补充阶段**，以恒压进行，直到电流下降到额定充电电流的15%，或已完成12个小时充电时间而结束。

第四阶段是**涓充阶段**，此时一直保持给电池充电。

铅酸电池的五个充电阶段

如果电池长时间与充电器相连，且没有释放任何能量，24小时后存储的电量会减少。此时以较低电压对闲置电池进行储存充电，可以延长电池寿命。定期的维护充电可修复电池以补偿自放电释放的电量。

温度补偿充电循环

电池充电时建议装一温度感测器，它能根据电池的温度调节电压，从而限制危险气体的释放以及过充。

针对NiCd 和 NiMH电池，该温度感测器不仅可以帮助识别充满状态，还可防止危险气体的释放。

Charging cycles for Lithium ion batteries

For Lithium ion batteries the parameters for maintenance charge, precharge, fast charge and peak charge are programmable.
Charging voltage, current, time, temperature compensation are some examples of the parameters which can be programmed.
In this way every battery can be individually charged and the capacity and life are optimized.

The possibility to edit virtually any battery parameter within a wide adjustment range makes the chargers ideal for any type of Lithium batteries.

Charging profile for lead-acid batteries

The devices use either a 4-stage charging cycle for charging lead-acid batteries with liquid, gel or felt soaked (AGM) electrolyte, or a 5-stage cycle which includes a storage and refresh mode.

Four step charging for lead-acid batteries

After connecting the battery, the microprocessor checks the polarity and voltage of the battery, and determines if and when the charging process should begin. False polarity or complete discharge (<0.2 x U_{Nom}) will not be charged. Deeply discharged batteries (>0.2 to <0.9 x U_{Nom}) start with a **precharge cycle** and reduced current.

This stage is followed by a **boost charge**, using full power and maximum current until the charging current sinks below 80% of the nominal current.

There follows an **absorption charge** at constant voltage until either the current has fallen below 15% or a charging time of 12 hours is reached.

The fourth stage is a **trickle charge** in which the total charge in the battery is kept constant.

Five step charging for lead-acid batteries

If a battery remains connected to a charger for a long period without delivering any energy, the maintenance charge is reduced after 24 hours. This storage charge with reduced voltage for an unused battery leads to a longer battery life. At regular intervals the maintenance charge refreshes the battery to compensate for auto discharge.

Temperature compensated charging cycles

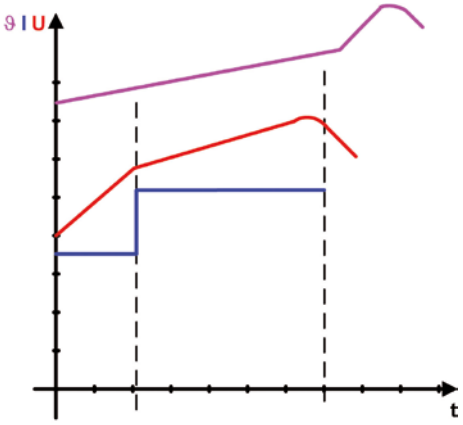
It is recommended that a temperature sensor is used for lead-acid battery charging. The charging voltage can then be adjusted to the temperature of the battery thus limiting the emissions of dangerous gases and overcharging.
For NiCd and NiMH batteries a temperature sensor can help not only with fully-charged recognition, but also as protection against dangerous gas emission.

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LNiCd和NiMH电池的充电循环阶段

针对NiCd 和 NiMH电池，可对预充、主充和后续充进行编程。另外，充满识别条件可选择ΔU 或 ΔT或两者的结合。

可编程参数有，例如：充电电压、电流、时间、温度补偿。按此种方式每个电池都可单独充电，从而使充满容量和寿命达到最优。由于对电池充电器所有参数进行编程的特点，使得产品适合所有类型的NiCd 和 NiMHH电池。



Charging cycles for NiCd and NiMH batteries

For NiCd and NiMH batteries the parameters for precharge, main charge and post charge are programmable. In addition the recognition of fully-charged can be selected as either ΔU or ΔT or as a combination of both.
Charging voltage, current, time, temperature compensation are some examples of the parameters which can be programmed. In this way every battery can be individually charged and the capacity and life optimised. The possibility of programming the battery charger for all parameters makes it suitable for all types of NiCd and NiMH batteries.

模拟接口

模拟输入脚上有温度补偿功能。想要监控充电电压和电流，需在模拟输出脚接上0 V...10 V电压。此外，还有数个数字输入脚和输出脚，可用来控制和监控产品状态。

可选项

- 经RS232，CAN或USB隔离数字接口可远程控制和监控本产品。在产品前方有一接口卡插槽。也可见137页。针对客户自己的编程，还有LabView VIs。

Analog interface

An analog input for temperature compensation is available. For monitoring the charging voltage and current, analog outputs are available with voltages of 0 V...10 V. Several digital inputs and outputs are available for controlling and monitoring the status.

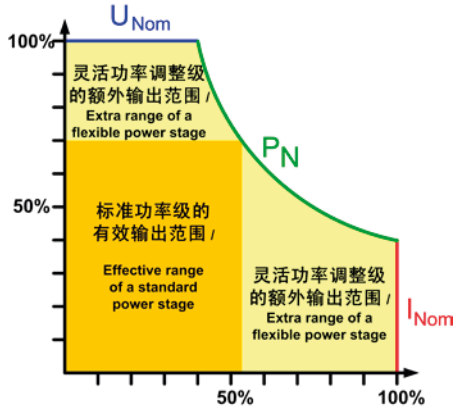
Options

- The devices are remotely controllable via isolated, digital interface cards for RS232, CAN or USB. There is an interface slot available on the devices. Also see page 137. LabView VIs are also available for custom programming.

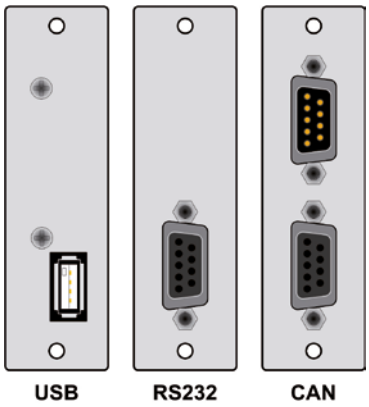
技术参数	Technical Data	Series EA-BCI 800 R / 系列
AC输入电压	Input voltage AC	90...264 V, 1ph+N
-频率	- Frequency	45...65 Hz
-功率因数	- Power factor	>0.99
输出：DC电压	Output: Voltage DC	
-精确度	- Accuracy	<0.2%
- 0-100% 的负载调整率	- Load regulation 0-100% load	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%
-负载10%-100%调整需时	- Regulation 10-100% load	<2 ms
-过压保护值	- Overvoltage protection	可调 / adjustable
输出：电流	Output: Current	
-精确度	- Accuracy	<0.2%
- 0-100% 的负载调整率	- Load regulation 0-100% load	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%
过压类别	Overvoltage category	2
污染等级	Pollution degree	2
保护级别	Protection class	1
模拟编程	Analog programming	启动，停止，温度感测 / Start, Stop, Temperature sensor
制冷方式	Cooling	320 W-640 W：自然通风；自1000 W起：风扇 / Models 320 W-640 W: Convection, models from 1000 W: Fan
安规标准	Standards	EN 60950, EN 61326, EN 55022 级别 B / Class B
工作温度	Operation temperature	0...50°C
储存温度	Storage temperature	-20...+70°C
相对湿度	Relative humidity	<80%, 无凝露 / non-condensing

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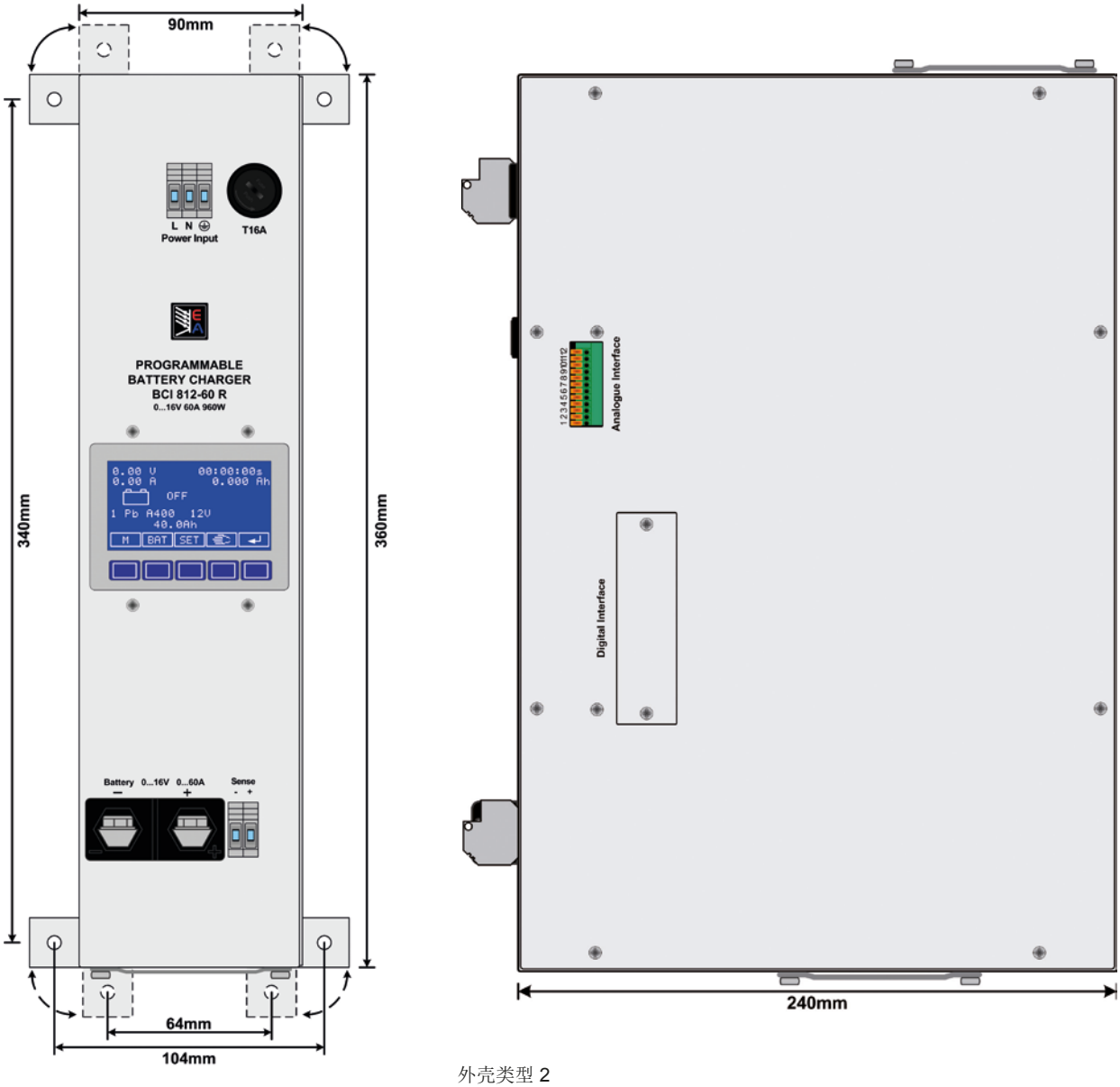
型号	充电电压	充电电流	功率	U纹波	I纹波	尺寸 WxHxD	安装尺寸 WxHxD	外壳类型	重量	订购编号
Model	**Charging voltage**	**Charging current**	**Power**	**Ripple U**	**Ripple I**	**Dimensions WxHxD**	**Installation dimensions WxHxD**	**Enclosure type**	**Weight**	**Ordering number**
BCI 812-20 R	12 V	max. 20 A	320 W	<40 mV_{PP}	<60 mA_{PP}	218x163x83 mm	218x190x85 mm	1	2.2 kg	27150401
BCI 824-10 R	24 V	max. 10 A	320 W	<100 mV_{PP}	<35 mA_{PP}	218x163x83 mm	218x190x85 mm	1	2.2 kg	27150402
BCI 848-05 R	48 V	max. 5 A	320 W	<150 mV_{PP}	<12 mA_{PP}	218x163x83 mm	218x190x85 mm	1	2.2 kg	27150403
BCI 824-20 R	24 V	max. 20 A	640 W	<100 mV_{PP}	<65 mA_{PP}	218x163x83 mm	218x190x85 mm	1	2.2 kg	27150404
BCI 848-10 R	48 V	max. 10 A	640 W	<150 mV_{PP}	<25 mA_{PP}	218x163x83 mm	218x190x85 mm	1	2.2 kg	27150405
BCI 812-40 R	12 V	max. 40 A	640 W	<10 mV_{PP}	<19 mA_{PP}	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150406
BCI 812-60 R	12 V	max. 60 A	1000 W	<10 mV_{PP}	<19 mA_{PP}	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150407
BCI 824-40 R	24 V	max. 40 A	1500 W	<10 mV_{PP}	<19 mA_{PP}	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150408
BCI 824-60 R	24 V	max. 60 A	1500 W	<10 mV_{PP}	<19 mA_{PP}	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150409
BCI 848-40 R	48 V	max. 40 A	1500 W	<10 mV_{PP}	<19 mA_{PP}	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150410



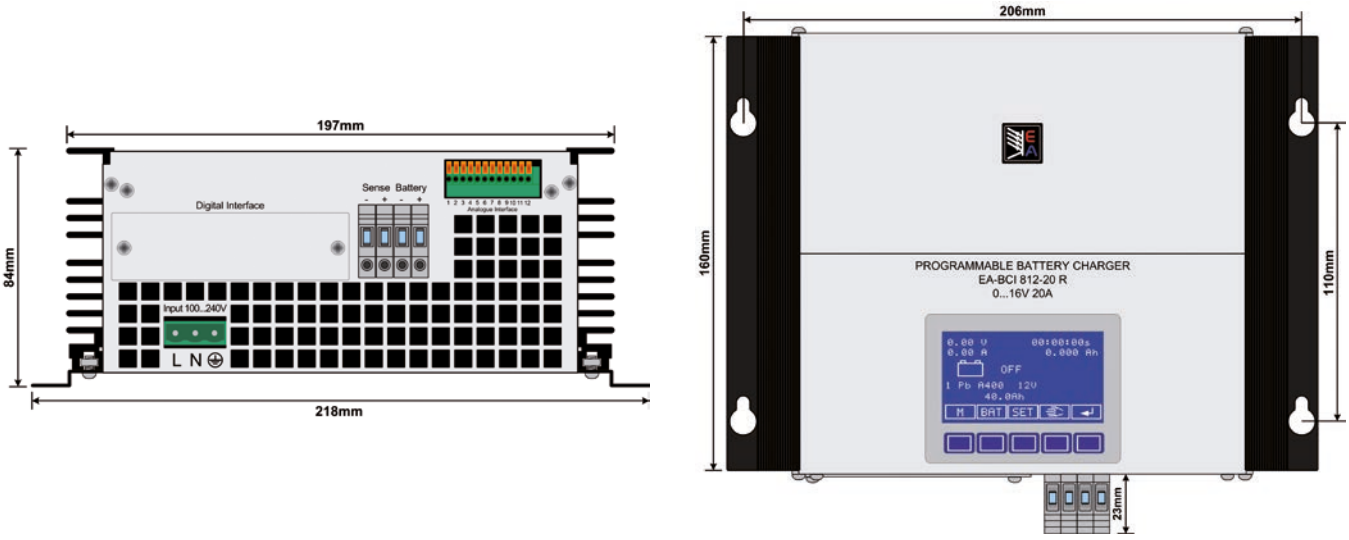
数字接口卡 / **Digital interfaces**



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外壳类型 2
Enclosure type 2



外壳类型 1
Enclosure type 1

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外壳类型 1 / Enclosure type 1 EA-BC 812-20 R

- 宽范围输入电压90...264 V
- 效率：高达 92%
- 输出功率：320 W 至 1500 W
- 电池电压：12 V，24 V 和 48 V
- 充电电流：5 A 至 60 A
- 温控充电特性
- 单片机控制充电特性
- 三种不同的铅酸电池类型可选
- 可转为可调电源模式
- 有短路保护和反接保护
- 有过压保护(OVP)
- 有过温保护(OT)
- 可自动检测的远程感测端
- 模拟接口
- 自然风冷*
- 温控风扇制冷**

- **Wide input voltage range 90...264 V**
- **High efficiency up to 92%**
- **Output powers: 320 W up to 1500 W**
- **Battery voltages: 12 V, 24 V and 48 V**
- **Charging currents: 5 A up to 60 A**
- **Temperature controlled charging characteristics**
- **Microprocessor controlled charging characteristics**
- **Three different lead-acid battery types selectable**
- **Switchable to adjustable power supply**
- **Short circuit and reverse polarity protection**
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Remote sensing with automatic detection**
- **Analog interface**
- **Natural convection for cooling***
- **Temperature controlled fans for cooling****

概要

EA-BC 800 R系列是一款由单片机控制的电池充电器。它有3个充电阶段，能快速、完整地完成充电循环，并优化电池寿命。优化的充电步骤可以极大地延长电池的寿命。

各充电循环阶段

本系列充电器可充液态、胶体(Gel 电池)、或电解液吸收在隔板内的贫液(AGM)铅酸电池。
电池接到充电器上后，微处理器会检测电池极型和电池电压，再确定是否开始充电。电池极性错误或完全过放(<0.2 x U_{Bat})时，则不开始充电。

稍微过放或深度过放的电池(>0.2 至 <0.9 x U_{Bat})，应以小电流充电的**预充循环**阶段开始。

完成上述阶段后，紧接着进行**快充循环**阶段，以全电压和最大电流进行，直到充电电流下降到输出电流的5%以下。

第三阶段就是**涓充循环**阶段，此时一直保持给电池充电，防止电池自放电。

General

The microprocessor controlled battery chargers from series EA-BC 800 R operate with a 3-stage charging process for a rapid and complete charging cycle, optimizing the life of the battery. An optimised charging result can significantly increase battery life.

Charging cycles

The chargers can be used to charge lead-acid batteries with liquid, gel (Gel Cell) or felt soaked (AGM) electrolyte.
After connecting the battery to the charger, the microprocessor checks the polarity and voltage of the battery and determines if the charging process is allowed to stOrd. At false polarity or complete discharge (<0,2 x U_{Bat}) the charging procedure can not be started.

Normally or deeply discharged batteries (>0,2 to <0,9 x U_{Bat}) start with a **precharge cycle** at reduced current.

This stage is followed by a **boost charge cycle**, using full voltage and maximum current until the charging current sinks below 5% of the nominal output current.
The third stage is a **trickle charge cycle** in which the total charge in the battery is kept constant, preventing self-discharge.

* 650 W以下型号
** 1000 W以上型号

* Models up to 600 W
** Models from 1 kW

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温度补偿充电循环阶段
电池充电时建议装一个温度感测器，它根据电池的温度调节电压，从而限制危险气体的释放，并防止过充。

输出
本系列有不同型号，可对12 V，24 V，和48 V的电池充电，充电电流有从5 A至60 A，功率从320 W至1500 W的型号。

远程感测端
远程感测输入端可直接连到负载输入端，以补偿连线上的压降。本充电器会自动调整输出电压，确保电池获得准确所需的电压。



外壳类型 2
Enclosure type 2

Temperature compensated charging cycle
It is recommended to use the included temperature sensor for battery charging. The charging voltage will then be adjusted by the temperature of the battery and thus limit the emissions of dangerous gases and prevent overcharging.

Output
Different units for batteries with 12 V, 24 V or 48 V battery voltage, for charging currents from 5 A to 60 A with power ratings from 320 W to 1500 W are available.

Remote sense
The sense input can be connected to the battery to compensate voltage drops along the power cables. The battery charger will adjust the voltage automatically in order to ensure that the correct voltage is available on the battery.

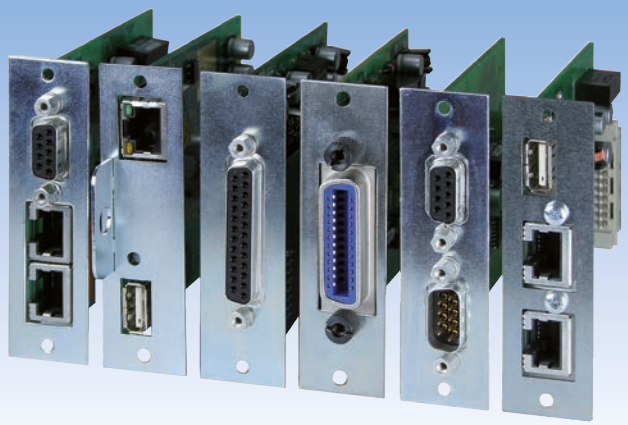
模拟接口
内置模拟接口上有一温度补偿输入端。想要监控实际充电电压和电流，可在模拟输出端接上 0 V...10 V电压。此外，还有几个数字输入端和输出端，可用来控制和监控产品状态。

Analog Interface
The built-in analog interface features an input for a temperature sensor for temperature-compensated charging. To monitor the actual charging voltage and current, analog outputs are realised with voltage ranges from 0 V...10 V. Several digital inputs and outputs are available for controlling and monitoring the status.

技术参数	**Technical Data**	**Series EA-BC 800 R / 系列**
AC输入电压	**Input voltage AC**	90...264 V, 1ph+N
-频率	- Frequency	45...65 Hz
-功率因数	- Power factor	>0.99
输出：DC电压	**Output: Voltage DC**	
-精确度	- Accuracy	<0.2%
- 0-100% 的负载调整率	- Load regulation 0-100%	<0.05%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.02%
-负载10%-100%调整需时	- Regulation 10-100% load	<2 ms
-过压保护值	- Overvoltage protection	固定，同步偏移 / fixed, concurrent offset
输出：电流	**Output: Current**	
-精确度	- Accuracy	<0.2%
- 0-100% ΔU_{DC}的负载调整率	- Load regulation 0-100% ΔU_{DC}	<0.15%
- ±10% ΔU_{AC}的线性调整率	- Line regulation ±10% ΔU_{AC}	<0.05%
安规标准	**Standards**	EN 60950, EN 61326, EN 55022 等级 B / Class B
工作温度	**Operation temperature**	0...50°C
储存温度	**Storage temperature**	-20...70°C

Model / 型号	充电电压 **Charging voltage**	电流 **Current**	功率 **Power**	U纹波 **Ripple U**	I纹波 **Ripple I**	电源模式可调范围 **Adjustment range PS mode**	尺寸 宽x高x深 **Dimensions WxHxD**	安装尺寸 宽x高x深 **Installation dimensions WxHxD**	外壳类型 **Enclosure type**	重量 **Weight**	订购编号 **Ordering number**
BC 812-20 R	12 V	20 A	300 W	<40 mV_{PP}	<60 mA_{PP}	10...15 V	218x83x163 mm	218x190x85 mm	1	2.2 kg	27150311
BC 824-10 R	24 V	10 A	300 W	<100 mV_{PP}	<35 mA_{PP}	20...30 V	218x83x163 mm	218x190x85 mm	1	2.2 kg	27150312
BC 848-05 R	48 V	5 A	300 W	<150 mV_{PP}	<12 mA_{PP}	40...60 V	218x83x163 mm	218x190x85 mm	1	2.2 kg	27150313
BC 824-20 R	24 V	20 A	600 W	<100 mV_{PP}	<65 mA_{PP}	20...30 V	218x83x163 mm	218x190x85 mm	1	2.2 kg	27150314
BC 848-10 R	48 V	10 A	600 W	<150 mV_{PP}	<25 mA_{PP}	40...60 V	218x83x163 mm	218x190x85 mm	1	2.2 kg	27150315
BC 812-40 R	12 V	40 A	600 W	<10 mV_{PP}	<19 mA_{PP}	10...15 V	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150316
BC 812-60 R	12 V	60 A	900 W	<10 mV_{PP}	<19 mA_{PP}	10...15 V	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150317
BC 824-40 R	24 V	40 A	1200 W	<10 mV_{PP}	<19 mA_{PP}	20...30 V	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150318
BC 824-60 R	24 V	60 A	1500 W	<10 mV_{PP}	<19 mA_{PP}	20...30 V	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150319
BC 848-40 R	48 V	40 A	1500 W	<10 mV_{PP}	<19 mA_{PP}	40...60 V	90x360x240 mm	90x370x265 mm	2	6.5 kg	27150320

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EA-IF Interfaces / 接口

- 可改装、可插拔、可更换
- 安装简易（即插即用）
- 通过产品上的设置菜单可简便地进行配置
- 多台不同设备可轻易联网
- 绝缘耐压高达2000 V
- 软件刻录成CD，配有工具和说明书
- 对所选接口可使用**LabView VIs**

- **Retrofittable, pluggable, replaceable**
- **Simple installation (plug 'n play)**
- **Easy configuration via a setup menu on the device**
- **Simple networking of different devices**
- **Galvanic isolation up to 2000 V**
- **Software CD with tools and documentation**
- **LabView VIs for selected interfaces**

概述
EA接口卡都是可插拔式数字或模拟卡，适用于不同系列的可编程电源、充电器或电子负载。

对于PSI 800 R 和 BCI 800 R系列墙挂式产品，有专门的短款接口卡（其型号名称结尾为 „2“ ）。

支持LabView
针对USB，RS232，GPIB与Ethernet数字接口卡，我们可供即时使用的LabView VIs，见下表。

支持其他编程语言
光碟上的文件包内有一通讯协议。因此所有接口卡都能应用于任何编程语言下。

软件和驱动程序
随同接口卡，还附有一CD，里面含有相关文件和软件。软件分为Windows软件套件*EasySoft*（也可参考143页）和LabView VIs。特定接口卡支持的软件和产品型号请参考下表。

应用
这些接口卡涵盖了很多应用领域。比如：USB接口几乎在所有电脑上都配备。RS232接口可在产品与电脑之间架起一个长达30 m的距离。Ethernet-以太网卡可将多台产品集成到标准或公司网络，也可从中间点对其控制与监控。

CAN用于直接将多台产品联网，从而为控制器（如电脑或控制件）连成一个电源或电子负载串。

General
The EA interface cards are pluggable digital or analog cards for selected series of programmable power supplies, battery charger or electronic loads.
There are special shortened versions (models with a „2“ at the end of the article name) available for wall mount series **PSI 800 R** and **BCI 800 R**. See table below.

Support for LabView
For the digital interface with USB, RS232, GPIB and Ethernet we provide ready-to-use LabView VIs. See table below.

Support for other programming languages
The communication protocol is documented and included in the package. Thus all interfaces can be integrated in virtually any programming language.

Software and drivers
The interface cards are delivered with a tools CD that includes documentation and software. The software is divided into the Windows software suite ***EasySoft*** (also see page 143) and LabView compatible VIs. For the software and device support of the particular interface cards see table below.

Applications
The interfaces cover many application areas. For example, USB is practically available everywhere with a PC. With RS232, the user can bridge distances of up to 30 m between device and PC. Using Ethernet many devices can be integrated into a standard local or company network and can be controlled and monitored from a central location.
CAN is used to network multiple devices directly, making it easier to connect a string of power supplies or electronic loads to the controlling unit, such as PC or PLC.

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型号概览

USB
- 型号：EA-IF-U1　订购编号：33100212
- 型号：EA-IF-U2　订购编号：33100220
- 带虚拟COM口（VCP）的USB驱动程序
- 传输速度：最大57600 Bd

CAN
- 型号：EA-IF-C1　订购编号：33100214
- 型号：EA-IF-C2　Ord.Nr. 33100222
- 可变数据传输速率高达1Mbit/s
- 支持规格为2.0 A的标准CAN
- 内置可选总线终端
- 兼容Vector™软件（DBC文件）

Analog
- 型号：EA-IF-A1　订购编号：33100215
- 电压范围可调（如：0...5 V, 2...7 V）
- 数字与模拟输入脚和输出脚
- 输出/输入脚可参数化

IEEE/GPIB
- 型号：EA-IF-G1　订购编号 / Ord.Nr. 33100216
- 指令执行时间典型值<30 ms
- SCPI指令集
- 总线上可连接多达15台产品

RS232
- 型号：EA-IF-R1　订购编号：33100213
- 型号：EA-IF-R2　订购编号：33100221
- 可变数据传输速率高达57600 Baud

Ethernet/LAN
- 型号：EA-IF-E1B　订购编号：33100227
- SCPI指令集
- 网络控制接口
- 一额外的USB端口可执行IF-U1卡的功能

Profibus
- 型号：EA-IF-PB1　订购编号：33100219
- 符合IEC 61158标准
- DPV0与DPV1从机
- 数据传输速率高达12MBit/s
- 一个总线段可连接多达30台设备
- 一额外的USB端口可执行IF-U1卡的功能

Model overview

USB
- Type: EA-IF-U1　Ord.No. 33100212
- Type: EA-IF-U2　Ord.No. 33100220
- USB driver with virtual COM port (VCP)
- Transfer speed: max. 57600 Bd

CAN
- Type: EA-IF-C1　Ord.No. 33100214
- Type: EA-IF-C2　Ord.No. 33100222
- Variable data transmission rates up to 1Mbit/s
- Supports standard CAN specification 2.0 A
- Integrated, selectable bus termination
- Vector™ software compatible (DBC files available)

Analog
- Type: EA-IF-A1　Ord.No.33100215
- Voltage range adjustable (e.g. 0...5 V, 2...7 V)
- Digital and analog inputs and outputs
- Outputs / inputs parameterisable

IEEE/GPIB
- Type: EA-IF-G1　Ord.No. 33100216
- Command execution time <30 ms typ.
- SCPI command set
- Up to 15 devices at the bus

RS232
- Type: EA-IF-R1　Ord.No. 33100213
- EA-IF-R2　Ord.No. 33100221
- Variable baud rates up to 57600 Baud

Ethernet/LAN
- Type: EA-IF-E1B　Ord.Nr. 33100227
- Type: EA-IF-E2B　Ord.Nr. 33100228
- SCPI command set
- Web control interface
- Integrated IF-U1 functionality by add. USB port

Profibus
- Type: EA-IF-PB1　Ord.Nr. 33100219
- According to standard IEC61158
- DPV0 and DPV1 slave
- Data transmission rate up to 12MBit/s
- Up to 30 units on a bus segment
- Integrated IF-U1 functionality by add. USB port

	IF-U1	IF-U2	IF-R1	IF-R2	IF-C1	IF-C2	IF-G1	IF-E1B	IF-PB1	IF-A1	IF-E2B
	USB	USB	RS232	RS232	CAN	CAN	GPIB	Ethernet	Profibus	Analog	Ethernet
PS 8000 T / DT / 2U	●		●		●		●	●	●		
PS 8000 3U	●		●		●		●	●	●		
PSI 8000 T / DT / 2U	●		●		●		●	●	●	●	
PSI 8000 3U	●		●		●		●	●	●	●	
PSI 800 R		●		●		●					●
BCI 800 R		●		●		●					
PSI 9000	●		●		●		●	●	●	●	
EL 3000	●		●		●		●	●			
EL 9000 (HP)	●		●		●		●	●			
EasyLoad Lite	●	●	●	●				●			●
EasyPower Lite	●	●	●	●				●			●
LabView VIs	●	●	●	●			●	●			●
Isolation DC (max.) 隔离电压（最大）	2000 V	2000 V	2000 V	2000 V	2000 V	2000 V	2000 V	1500 V	1000 V	2000 V	1500 V

[1] 仅能通过额外的USB端口完成 / only via the additional USB port

提示：表格上半部分显示哪些产品支持哪类接口卡。下半部分显示哪类接口卡具有哪些软件。意思是，带Ethernet接口卡的电子负载产品支持EasyLoad Lite软件，但是只能使用接口卡的USB端口。

Note: the upper part of the table indicates what device supports which interface cards. The lower part shows, for which interface cards there is software available. It means, for example, that an electronic load with an Ethernet card is supported by EasyLoad Lite, but only if the USB port of the card is used.

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EA-IF-AB Interfaces / 接口

- 可改装，安装简易（即插即用型）
- 通过产品上的设置菜单可简便地完成配置
- 电隔离耐压高达2500 V

基本信息
EA接口卡为可插拔式数字模块，目前适用于ELR 9000，PSI 9000与EL 9000 B系列，同样也会适用到将来的可编程电源或电子负载上。

支持LabView与其它编程语言
我们给带RS232端口，以及带Ethernet端口的所有接口卡提供的即用型LabView-VIs软件。
通讯协议是完全开放的，存储在文件内。用户可将其集成到任何一种虚拟编程语言中。

软件与驱动
随产品会附有一张光盘或者USB笔，里面存储了一些文档、驱动程序与软件。

型号概览

RS232
- 型号：EA-IF-AB-RS232　　订购编号：35400101
- 转换速度：最大115200 Bd
- D-sub型9针公座，专为调制解调器连接用
- SCPI与Modbus协议

CANopen
- 型号：EA-IF-AB-CAN　　订购编号：35400100
- 转换速度：最大1MBit/s
- 全CANopen-Slave
- 自动波特率
- 含EDS (电子数据表)文档
- 1x Sub-D型9针公座

Profibus
- 型号：EA-IF-AB-PBUS　　订购编号：35400103
- 转换速度：最大12MBit/s
- 全DPV1-Slave
- 含GSD(Generic Station Device)文档
- 1x D-Sub型9针母座

- **Retrofittable, simple installation (plug 'n play)**
- **Easy configuration via a setup menu on the device**
- **Galvanic isolation up to 2500 V**

General
The EA interfaces are pluggable, digital modules for current series ELR 9000, PSI 9000 and EL 9000 B, as well as upcoming series of programmable power supplies or electronic loads.

Support for LabView and programming languages
Ready-to-use LabView VIs for the interfaces with type RS232 and all types with Ethernet port (1 or 2) are provided.
The communication protocol is open and included in the documentation. Thus it can be integrated in virtually any programming language.

Software and drivers
The devices of the series which can host these modules are delivered with a CD or USB pen drive which includes documentation, drivers and software.

Model overview

RS232
- Type: EA-IF-AB-RS232　　Ord.No. 35400101
- Transfer speed: max. 115200 Bd
- D-sub, male, 9-pole for null modem cable
- SCPI and Modbus protocol

CANopen
- Type: EA-IF-AB-CANO　　Ord.Nr. 35400100
- Transfer speed: max. 1MBit/s
- Full CANopen slave
- Auto-baud
- EDS (Electronic Data Sheet) included
- 1x D-Sub socket, male, 9-pole

Profibus
- Type: EA-IF-AB-PBUS　　Ord.No. 35400103
- Transfer speed: max. 12MBit/s
- Full DPV1 slave
- GSD (Generic Station Device) file included
- 1x D-Sub socket, female, 9-pole

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ProfiNet 1P
- 型号：EA-IF-AB-PNET1P 订购编号：35400105
- 转换速度：100MBit/s，全双向
- PROFINET/IO通讯
- 含GSDML
- 1x RJ45 8针插座



ProfiNet 1P
- Type: EA-IF-AB-PNET1P Ord.No. 35400105
- Transfer speed: 100MBit/s, full duplex
- PROFINET/IO communication
- GSDML included
- 1x RJ45 socket, 8-pole

ProfiNet 2P
- 型号：EA-IF-AB-PNET1P 订购编号：35400110
- 转换速度：100MBit/s，全双向
- PROFINET/IO通讯
- 含GSDML
- 2x RJ45 8针插座，带以太网开关



ProfiNet 2P
- Type: EA-IF-AB-PNET2P Ord.No. 35400110
- Transfer speed: 100MBit/s, full duplex
- PROFINET/IO communication
- GSDML included
- 2x RJ45 socket 8-pole, with Ethernet switch

Ethernet 1P
- 型号：EA-IF-AB-ETH1P 订购编号：35400104
- 转换速度：10/100MBit/s
- 透明插座
- SCPI与Modbus协议
- 1x RJ45插座，8针



Ethernet 1P
- Type: EA-IF-AB-ETH1P Ord.No. 35400104
- Transfer speed: 10/100MBit/s
- Transparent socket
- SCPI and Modbus protocol
- 1x RJ45 socket, 8-pole

Ethernet 2P
- 型号：EA-IF-AB-ETH1P 订购编号：35400108
- 转换速度：10/100MBit/s
- 透明插座
- SCPI与Modbus协议
- 2x RJ45 8针插座，带以太网开关
- DLR (Device Level Ring-设备级环网技术)



Ethernet 2P
- Type: EA-IF-AB-ETH2P Ord.No. 35400108
- Transfer speed: 10/100MBit/s
- Transparent socket
- SCPI and Modbus protocol
- 2x RJ45 socket 8-pole, with Ethernet switch
- DLR (Device Level Ring)

Modbus-TCP 1P
- 型号：EA-IF-AB-MBUS1P 订购编号：35400107
- 转换速度：10/100MBit/s
- 256个字节进/出
- SCPI与Modbus协议
- 1x RJ45插座，8针



Modbus-TCP 1P
- Type: EA-IF-AB-MBUS1P Ord.No. 35400107
- Transfer speed: 10/100MBit/s
- 256 Bytes in/out
- SCPI and Modbus protocol
- 1x RJ45-Buchse, 8-pole

Modbus-TCP 2P
- 型号：EA-IF-AB-MBUS2P 订购编号：35400109
- 转换速度：最大10/100MBit/s
- 全ModBus TCP服务器（从机）
- 256个字节进/出
- SCPI与Modbus协议
- 2x RJ45插座，8针
- 内置有一个给总线拓扑或DLR(设备级环网技术)用的开关



Modbus-TCP 2P
- Type: EA-IF-AB-MBUS2P Ord.No. 35400109
- Transfer speed: 10/100MBit/s
- Full ModBus TCP server (slave)
- 256 Bytes in/out
- SCPI and Modbus protocol
- 2x RJ45-Buchse 8-pole
- Integrated switch for string bus topology or DLR (device level ring)

DeviceNet
- 型号：EA-IF-AB-DNET 订购编号：35400106
- 转换速度：125 kBd - 500 kBd
- 256个字节进/出
- DeviceNET功能：适配器（从机）
- 隐式&显式报文传送，UCMM
- 1x WAGO 5针插座



DeviceNet
- Type: EA-IF-AB-DNET Ord.No. 35400106
- Transfer speed: 125 kBd - 500 kBd
- 256 Bytes in/out
- DeviceNET function: adapter (slave)
- Implicit & Explicit Messaging, UCMM
- 1x 5pole WAGO plug

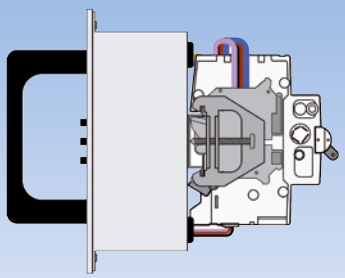
CAN
- 型号：EA-IF-AB-CAN 订购编号：35400111
- 转换速度：最快1MBit/s
- CAN标准插头2.0 A与2.0 B兼容
- 1x D-Sub 9针插座，公插



CAN
- Type: EA-IF-AB-CAN Ord.No. 35400111
- Transfer speed: max. 1MBit/s
- CAN standard 2.0 A and 2.0 B compatible
- 1x D-Sub socket, male, 9-pole

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- 可改装，安装简易
- **3U模块适合装入19“机柜或机架内**
- 可配也可不配接触器
- 符合**VDE AR 4105**德国标准
- 同时也符合**CEI 0-21**意大利标准
- 多语言用户界面（德语，英语，意大利语）

- **Retrofittable, simple installation**
- **3U module for installation in 19“ cabinets or racks**
- **With or without included contactors**
- **According to german standard VDE AR 4105**
- **Also according to italian standard CEI 0-21**
- **Multi-language user interface (GER, ENG, ITA)**

概述
按照欧洲标准或对于本土供电公司的规定，当操作电量返回设备时，如：太阳能电池板，有回馈功能的电子负载，要求安装一自动隔离器（AIU，前称：ENS）。

EA-ENS2是ELR 9000能量回馈式电子负载的一个可选配件。

此类设备的安装通常只在隔离操作下运行电子负载时才需求，因为此时返回的电量比消耗的要多。

ENS2会监控电量返回时交流电网电压、频率与相位角度的变化，如果监测到的参数不符，它会自动将回馈式设备与电网断开。

如果接上同等能量消耗设备进行正常操作，即：消耗的能量等同于或大于回馈能量，则可省略此隔离设备。

自动隔离设备一般都会检测三相电的所有相位。

2 (16 A)

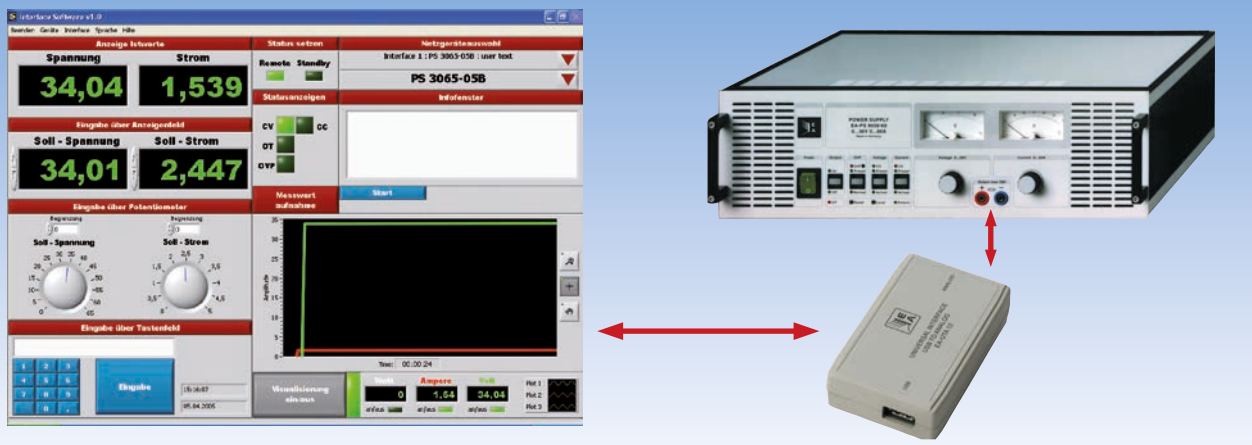
各款型号
ENS总是检测三相供电的三个相位。目前可供两个型号。EA-ENS2 10.5 kW 给10.5 kW功率的一台ELR 9000电子负载用。另外一款则适合两台或两台以上ELR系列并联操作用。与ENS模块连接所需的接触片不随货提供，因为它需定制以符合特定条件，并由当地电工安装。

General
According to european standards or provisions of local electric supply companies it can be required to install an automatic isolation unit (AIU, former name: ENS) when operating energy recovering devices, such as solar panels or electronic loads with feed back.
The EA-ENS2 is an optional accessory for the feeding back electronic loads of series ELR 9000.
Installing such a device is usually required only when running the electronic load in so-called isolated operation, where the recovered energy is higher than the consumed.
The ENS2 supervises the energy recovery regarding AC grid voltage, frequency and phase angle and automatically cuts the feeding back device from the grid, in case the supervised parameters are not met.
For normal operation with a balanced energy consumption, i.e. consumed energy is equal or bigger than the recovered energy, such an automatic isolation unit can be omitted.
The automatic isolation unit always supervises all three phases of a three-phase supply.

Variants
There are two models available. Model EA-ENS2 10.5 kW is intended for the use with one electronic load device of ELR 9000 series, with up to 10.5 kW power. The other model is for any other situation where two or more ELR units are operating in parallel. The required contactors, which have to be used in connection with the ENS module, are not included and are usually specified to meet the given situation and installed by an electrician on location.

技术参数	Technical Data	EA-ENS2	EA-ENS2 10.5 kW
电网电压	Grid voltage	230 V AC (L-N) bzw. 400 V AC (L-L)	230 V AC (L-N) bzw. 400 V AC (L-L)
电网频率	Grid frequency	50 Hz	50 Hz
电网相位	Grid phases	3	3
符合标准	Standards	VDE AR 4105, CEI 0-21	VDE AR 4105, CEI 0-21
已装接触片	Installed contactors	-	2 (16 A)
尺寸 (宽x高)	Dimensions (WxH)	19“ x 3 HE/3U	19“ x 3 HE/3U
安装深度	Installation depth	127 mm	127 mm
重量	Weight	2.3 kg	2.7 kg
订购编号	Ordering number	33200499	33200498

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EA-UTA 12 USB Interface

- USB数字–模拟的转换
- 分辨率：最小12位
- 安装简易，USB即插即用
- 无需外部供电
- 供配模拟接口的EA产品使用
- 也适用于其他生产商制造的电源
- 可监控状态信号
- 可设定控制信号
- 内含软件
- LabView-驱动（VIs）
- 针对其它电脑语言的编程指引

- **USB Digital-to-Analog conversion**
- **Resolution: min. 12 Bit**
- **Simple installation, USB plug 'n play**
- **No external supply voltage required**
- **For EA units with analog interface**
- **Also for power supplies from other manufacturer**
- **Status signals monitorable**
- **Control signals settable**
- **Software included**
- **LabView drivers (VIs)**
- **Tutorial for programming in other PC languages**

概述
利用此通用型USB转模拟适配器与电脑，可以监控带0...10 V模拟接口的任意一台电源的电流与电压，以及状态。随产品包装附有Windows软件，以及Labview VIs，可用来创建客户指定的应用。

具有下列功能
- 分开设置电流和电压
- 分开记录实际电压和电流值
- 读取状态信号
- 设置控制信号
- 数据记录，可导出Excel或类似(CSV)文档格式
- 图行化历史记录显示
- 标准型号或客制型号的产品数据库

软/硬件要求
- 配有0...10 V模拟接口的实验室电源
- 带Win2000 / XP或更新操作系统的电脑一台，至少有P4, 800MHz, 64MB RAM

该适配器可控制EA-PS 3000 B，EA-PS 9000或HV 9000系列，（按需）也可控制其它系列，或者通过模拟连接控制其它制造商的产品。

PS 3000B系列随产品还附有USB线，驱动器，软件，适配器连接线。
PS 3000B以外的系列用适配器连线需另外订购。

可从我司网站获取相关软件和文档：
www.elektroautomatik.cn

General
With this universal USB-to-Analog adapter and a PC it is possible to monitor and control current and voltage, as well as status of any power supply with an 0...10 V analog interface. A Windows software, as well as LabView VIs to create custom-designed applications are included in the package.

Features of the PC software
- Separate setting of current and voltage
- Separate reading of actual values of current and voltage
- Read status signals
- Set control signals
- Data recording with export to Excel or similar (CSV)
- Graphical history display
- Device database for standard and custom models

Hard- and software requirements
- Laboratory power supply with analog 0...10 V interface
- A PC with Windows 2000/ XP or newer, at least P4, 800MHz, 64MB RAM

This adapter is capable of controlling our power supply series PS 3000B, PS 9000 or HV 9000, as well as other series (upon request) or even devices from other manufacturers by analog connection.
USB cable, driver, software and adapter cable for devices of series PS 3000 B are included.
For series other than PS 3000B an appropriate adaptor cable can be obtained separately.

Software and documentation are available at:
www.elektroautomatik.cn

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利用基于Windows操作系统的软件工具，可以控制和监控我们的电源与电子负载。这些工具操作简单，仅需几步设置。显示界面全为英文。不过仅能与下列产品系列和接口卡兼容。也可参考137页。

EasyPower Lite （电源用）
- 一个实例控制一台产品
- 与下列系列产品兼容：
  - **PSI 8000 T**
  - **PS 8000 T**
  - **PSI 800 R**
- 数据采集（CSV文档）
- 以列表形式列出的半自动序列
- 与带USB，Ethernet或RS232端口的接口卡兼容

EasyLoad Lite （电子负载用）
- 一个实例控制一台产品
- 与**EL 3000**系列产品兼容
- 数据采集（CSV文档）
- 以列表形式列出的半自动序列
- 与带USB，Ethernet或RS232端口的接口卡兼容

EasyPS2000 （**PS 2000 B**电源用）
- 一个实例控制一台产品
- 产品固件可升级
- 数据采集（CSV文档）
- 以列表形式（CSV文档）列出的半自动序列

注意：EasyPS2000软件为免费软件，但是需要为每台产品购买一个注册码锁定产品所有功能。可将产品的采购证明与产品系列号发送到ps2000bsoft@elektroautomatik.de邮箱购买。购买后，您可申请免费的软件光盘与一条迷你USB连接线。

Windows based software tools are available to control and monitor power supplies and electronic loads. These are very easy to handle with a minimum of setup required. The GUI will be completely in english. The tools are only compatible to the device series and interface cards listed below. Also see page 137.

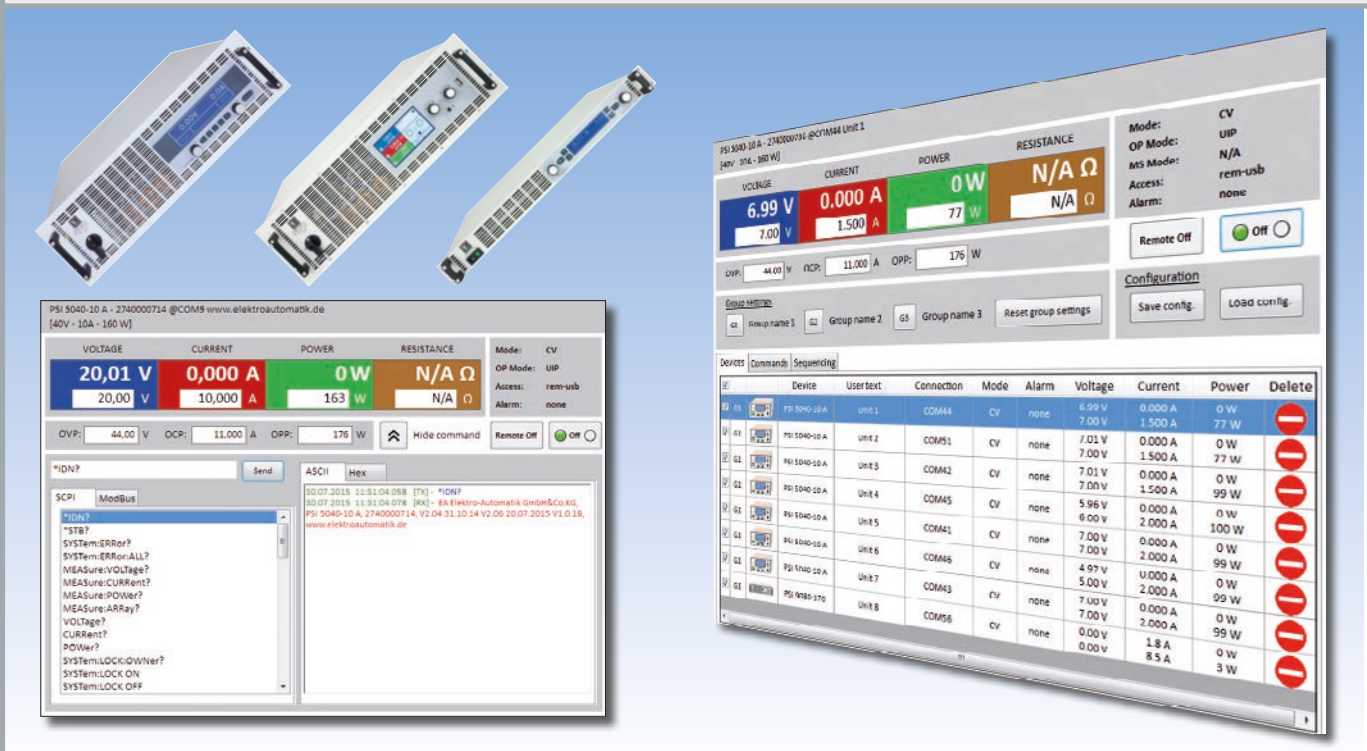
EasyPower Lite for power supplies
- One device can be controlled per instance
- Compatible to the device series:
  - **PSI 8000 T**
  - **PS 8000 T**
  - **PSI 800 R**
- Data acquisition (CSV files)
- Semi-automatic sequences by list tables (CSV)
- Compatible to interface cards with USB , Ethernet or RS232 port

EasyLoad Lite for electronic loads
- One device can be controlled per instance
- Compatible to the device series **EL 3000**
- Data acquisition (CSV files)
- Automated sequences by list tables
- Compatible to interface cards with USB , Ethernet or RS232 port

EasyPS2000 for PS 2000 B power supplies
- One device can be controlled
- Data acquisition (CSV files)
- Semi-automatic sequences by list tables (CSV)

Note: The software EasyPS2000 is free of charge, but requires a licence code per devic to unlock all features. It can be ordered by sending an e-mail with the proof of purchase and the device serial number to ps2000bsoft@elektroautomatik.de. After purchase of an licence code, a software CD with a mini USB cable can be shipped free of charge upon request.

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EA Power Control (EAPC) 是一款针对2014年新上市的产品系列用的新版Windows操作软件，这些产品都有ModBus通讯协议。它对电源与电子负载的支持方式一样，也可与USB与以太网数字接口配合操作。

EAPC支持下面的产品系列：
- ELR 5000, ELR 9000
- EL 9000 B, EL 9000 DT
- PSI 9000 DT
- PSI 5000, PS 5000
- PS 9000 1U / 2U / 3U
- PSI 9000 2U / 3U / 15U / 24U

该软件当前版本（更新日期：2015年8月）可以手动控制，监控，直接输入指令(SCPI 与 ModBus)，半自动表格控制-Sequencing，以及数据记录-称为Logging。在不同窗口下可一次性操作**多达10台机器**。

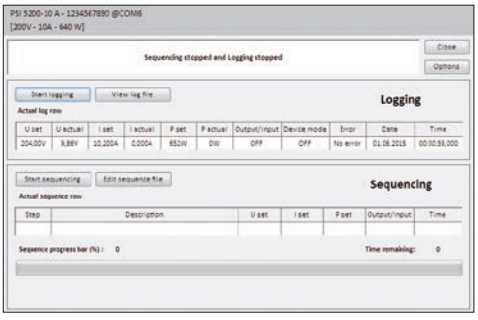
另外还可对所支持的产品系列安装固件升级选项。

EAPC是目前仍在不断的研发完善中，有计划增加如下一些特性：
- MultiControl - 在同一个窗口下同步控制20台产品，且所有数值与状态可一览无遗。
- 分开控制并可见**光伏**函数（部分产品系列），**燃料电池**函数（部分产品系列）
- Battery test-**电池测试**（针对电子负载）

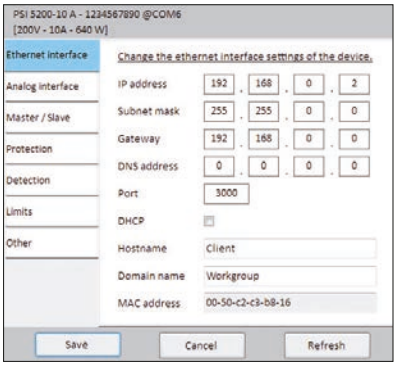
The new Windows software **EA Power Control** (EAPC) is a graphical control interface for all new device series from 2014 which feature the ModBus protocol. It supports power supply devices the same way as electronic loads and can be used with the digital interfaces USB and Ethernet.
Following device series are supported by EAPC:
- **ELR 5000, ELR 9000**
- **EL 9000 B, EL 9000 DT**
- **PSI 9000 DT**
- **PSI 5000, PS 5000**
- **PS 9000 1U / 2U / 3U**
- **PSI 9000 2U / 3U / 15U / 24U**

In the current version (date: August, 2015) the software offers manual control, monitoring, direct input of commands (**SCPI** and **ModBus**), the semi-automatic table control **Sequencing** and a data recording feature named **Logging**. It can handle **up to 10 units** at once in separate windows.
There is furthermore the option to install firmware updates for the supported device series.

EAPC is under constant development. These upcoming features are planned:
- **MultiControl** - control up to 20 devices in the same window and synchronously, with all values and status at a glance
- Separate control and visualisation of the **photovoltaics** function (certain device series) and the **fuel cell** function (certain device series)
- **Battery test** (for electronic loads)



排序&记录窗口 /
Sequencing & Logging window



与设置相关的设定窗口 /
Settings window for all device related settings

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EA-UPS 724-08 B

EA-BU 724-03

- 90...264 V 宽范围输入电压，带主动式 PFC
- 输出功率级别：150 W 至 500 W
- 输出电压：12 V, 24 V 和 48 V
- 输出电流：3.2 A 至 21 A
- 导轨式安装
- 过压保护 (OVP)
- 过温保护 (OT)
- 过放保护，电池电压低报警
- LED 灯显示状态
- 报警输出，远程开 / 关
- 安规符合 EN 60950, EN 50091-1-2 标准
- EMI 符合 EN 61000-6-1, EN 61000-6-3 标准

- **Wide input voltage range 90...264 V with active PFC**
- **Output powers: 150 W up to 500 W**
- **Output voltages: 12 V, 24 V and 48 V**
- **Output currents: 3.2 A up to 21 A**
- **DIN-rail mounting**
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Deep discharge protection, battery voltage low alarm**
- **Status indication via LEDs**
- **Alarm outputs, remote on/off**
- **Safety EN 60950, EN 50091-1-2**
- **EMI EN 61000-6-1, EN 61000-6-3**

技术参数	Technical Data	UPS 712-12B	UPS 712-21B	UPS 724-06B	UPS 748-03B	UPS 724-08B
AC输入电压	Input voltage AC	88...264 V	88...264 V	85...264 V	85...264 V	85...264 V
DC输出电压	Output voltage DC	typ. 13.5 V	typ. 13.5 V	typ. 27.0 V	typ. 54.0 V	typ. 27.0 V
- 电池模式	- Battery mode	10.5...13.5 V	10.5...13.5 V	21.0...27.0 V	42...54 V	21.0...27.0 V
-负载0-100% 时的稳定度	- Stability at 10...100% load	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
- 纹波	- Ripple	<100 mV_{PP}	<150 mV_{PP}	<100 mV_{PP}	<100 mV_{PP}	<100 mV_{PP}
输出电流寸	Output current	最大11 A	最大21 A	最大5.6 A	最大3.2 A	最大7.5 A
尺寸 (宽x高x深)	Dimensions (WxHxD)	210x105x87 mm	240x133x87 mm	210x105x87 mm	210x105x87 mm	210x105x87 mm
重量	Weight	1.6 kg	2.3 kg	1.6 kg	1.6 kg	1.7 kg
订购编号	Ordering number	18175203	18175202	18175189	18175191	18175192

技术参数	Technical Data	UPS 748-05B	UPS 724-11B	UPS 748-07 A	UPS 724-18 A	UPS 748-10 A
AC输入电压	Input voltage AC	85...264 V	85...264 V	88...264 V	88...264 V	88...264 V
DC输出电压	Output voltage DC	typ. 54.0 V	typ. 27.0 V	typ. 54.0 V	typ. 27.0 V	typ. 54.0 V
- 电池模式	- Battery mode	42...54 V	21.0...27.0 V	42...54 V	21.0...27.0 V	42...54 V
-负载0-100% 时的稳定度	- Stability at 10...100% load	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
- 纹波	- Ripple	<150 mV_{PP}	<200 mV_{PP}	<240 mV_{PP}	<200 mV_{PP}	<240 $mV_{eff.}$
输出电流寸	Output current	最大4.2 A	最大11.0 A	最大6.25 A	最大18.0 A	最大10.0 A
尺寸 (宽x高x深)	Dimensions (WxHxD)	210x105x87 mm	240x133x87 mm	240x133x87 mm	250x133x120 mm	250x133x120 mm
重量	Weight	1.6 kg	2.3 kg	2.3 kg	2.8 kg	2.8 kg
订购编号	Ordering number	18175193	18175194	18175195	18175196	18175197

技术参数	Technical Data	BU 712-13	BU 724-03	BU 724-07	BU 748-02
电池电压	Battery voltage	12 V	24 V	24 V	48 V
容量	Capacity	13 Ah	2,5 Ah	6,5 Ah	1,2 Ah
240分钟备份时间	Back up time 240 min.	输出/at 3.2 A	输出/at 0.6 A	输出/at 1.6 A	输出/at 0.3 A
50分钟备份时间	Back up time 50 min.	输出/at 8.0 A	输出/at 1.6 A	输出/at 4.5 A	输出/at 0.8 A
25分钟备份时间	Back up time 25 min.	输出/at 16 A	输出/at 3.1 A	输出/at 9.0 A	输出/at 1.8 A
9分钟备份时间	Back up time 9 min.	输出/at 32 A	输出/at 6.3 A	输出/at 16 A	输出/at 3.0 A
尺寸 (宽x高x深)	Dimensions (WxHxD)	180x133x125 mm	210x105x87 mm	180x133x125 mm	210x105x85 mm
重量	Weight	6.7 kg	3.5 kg	6.7 kg	2.9 kg
订购编号	Ordering number	10370132	10370123	10370125	10370124

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一般信息
这些机柜系统符合EN/IEC 60204-1:2006，可给下面装于19“外壳的电源和电子负载系列所用：

- PSI 9000 3U
- PS 9000 3U
- EL 9000 B
- ELR 9000

可按客户需求提供其他系列，按不同尺寸，以及混合组合的机柜系统。

配置
这些机柜通常可按客户的选择预先配置好。根据机柜类型与设置，每个机柜系统最多可装12台产品。一般是直流端并联在一起的，但是也可以基于直流输出端或直流输入端将系统配置成可以单独使用每一台机器的形式（多通道供电源或吸收源）。还可将并联组或混合系统组建在一个机柜内，形成供电-吸收系统。

一个系统基本由机柜，交流端与直流总线（一般为铜条）组成。

General
These cabinet systems, compliant to EN/IEC 60204-1:2006, are available in two sizes and for following power supply or electronic load series with 19“ enclosure:

- PSI 9000 3U
- PS 9000 3U
- EL 9000 B
- ELR 9000

Configurations for other series and sizes, as well as mixed combination of devices upon request.

Configuration
The cabinets are always preconfigured with the customer‘s selection of components. Depending on the cabinet type and setup, up to 12 units can be equipped per system. **Parallel connection** of the DC side is default, but it is also possible to configure the system to use all units separately (**multi-channel** source or sink) based on their DC output or DC input. It is furthermore possible to build groups of parallel units or mixed system to have a **source-sink** system within one cabinet.
A base system consists of the cabinet, AC terminal and DC bus (usually copper bars).

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与市电的连接
电源组机柜，回馈式电子负载机柜或者两种设备的混合机柜上供有单相或**三相**电网连接端。根据交流电的电流，也可提供带电源线与**CEE plug** (16 A, 32 A 或 63 A).插头的机柜。
标准的电子负载仅需很小的交流电流，因此一般只提供**标准的电源线**。

直流端的连接
默认情况下，机柜内所有产品的DC输出端通过铜条与高压连接线并联在一起，可供高压系统使用。直流总线可直接连接到螺丝端。

功率
根据基础系统与所选产品型号，可形成高达180 kW（电源组）或126 kW（负载组）的总功率。

安规标准与TÜV认证
可按客户要求，将所供机柜依照IEC/EN 60204-1:2006+A1+A10标准组建。甚至还可执行深度TÜV 认证测试，并提供书面测试报告，或者对完全组建好的机柜执行现场测试（技术检测与目检），并做一份证书。

安规标准
机柜能保证性能的高度安全。比如，在可能出现高压的直流总线上安装保护盖。对于其它情况与额外的安全需求，还可安装紧急关闭系统，遇到紧急情况它能将整个机柜与市电切断。既可以通过开关手动切断，或者通过门触器（内锁回路）在遇意外事故时打开机柜后门。

软件
机柜系统还支持**EA Power Control**软件（见页面144），不论它是否配置了主-从。该软件可以监控和控制多台产品，以及记录数据。

对于客户特定应用与软件项目，还有LabView VIs软件，经USB或以太网端口可以快速应用起来。

配套元件
基本上机柜系统一般由一个机柜，一至十台产品以及连线组成。但是还有其它更多选择，可见下表。可根据应用的需求选择机柜系统。所需总功率决定使用产品的数量，而产品数量决定机柜的高度。大电流会增加铜条的尺寸和重量，高电压则必须使用高压连接线，用于直流端之间的连接。

Grid connection
Cabinets for power supplies, recuperating electronic loads or mixed system of both device types feature a one-phase or **three-phase** power grid connection terminal. Depending on the resulting AC supply current, a cabinet can also be delivered with a supply cable and **CEE plug** (16 A, 32 A or 63 A).
Standard electronic loads, which only require small AC currents, are usually delivered with a **standard mains cord**.

DC connection
By default, the DC connection (or DC bus) connects all units in parallel with coppers bars resp. additional high voltage cables for high voltage systems. The DC bus is directly accessible on screw points.

Power
Depending on the base system and the selected device models, a total power of up to 180 kW (using power supplies) or 126 kW (using electronic loads) can be achieved.

Standards & TÜV approval
The cabinets can be manufactured according to IEC/EN 60204-1:2006+A1+A10 upon request. There are furthermore the options to let the TÜV perform an extensive approval test including a written test report, or to let them perform an on-location test on the fully built and equipped cabinet (technical and visual inspection), which results in a conformity certificate.

Safety
The construction of the cabinets ensures high safety for persons. This is, for example, achieved by putting protective covers on the DC bus, where high voltage can be present. For other situations and additional safety, the cabinets can be equipped with an **emergency off system** which can cut off the entire cabinet from AC supply in case of an emergency. The cut-off is either initiated manually with a **switch** or by door contacts (**interlock loop**) when accidentally opening the cabinet rear doors.

Software
The cabinet systems are supported by the software **EA Power Control** (see page 144), no matter if configured for master-slave or not. This software can monitor and control the unit(s), as well as record data.
For custom applications and software projects, there are LabView VIs available, which allow for fast implementation of the cabinet via USB or Ethernet.

Kit system
Basically, the cabinet system consists of a cabinet, one thru ten units and cabling. But there are various options are available, see tables below. The cabinet system is selected according to the requirements of the application. The required total power determines the number of units, the number of units determines the height of the cabinet. High currents will increase the size and weight of the copper bars, high voltages will force the use of high voltage cables which are combined on the DC connection terminal.

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机柜参数 / Cabinets

技术参数	Technical Data	基本机柜系统 1 / Base system 1	基本机柜系统 2 / Base system 2
型号	Type	Rittal TS8 33 HE	Rittal TS8 42 HE
机柜高度 (U)	Height cabinet (U)	33	42
机柜高度 (1	Height cabinet (1	1600 mm	2000 mm
宽度	Width	600 mm	600 mm
深度	Depth	800 mm	800 mm
3P电网连接	Supply connection 3P	三厢端子 / Three-phase terminal	三厢端子 / Three-phase terminal
3P电网电压	Supply voltage 3P	400 V AC	400 V AC
1P电网连接	Supply connection 1P	带IEC端子的电源线 / IEC mains cord	带IEC端子的电源线 / IEC mains cord
1P电网电压	Supply voltage 1P	230 V AC	230 V AC
可连接的最多产品台数	Number of max. devices	9	12
最大可获功率(2	Maximum power (2	135 kW	180 kW
订购编号	Ordering number	82010060	82010057

(1 此为不含轮子的机柜高度，根据选项不同可能会有变化 / Height without wheels, may vary depending due to options
(2 取决于单机的额定功率 / Depending on the nominal power of the single devices

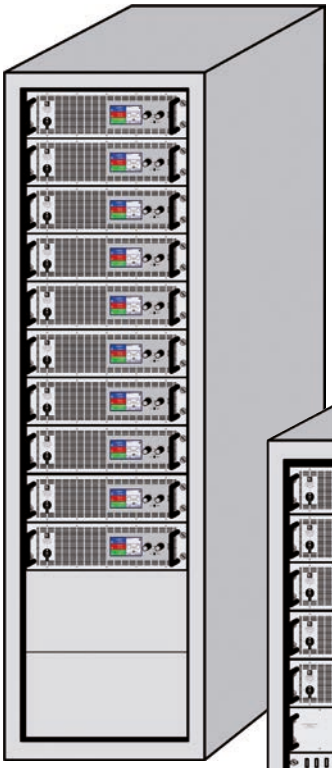
零部件 / Components

类别 / Category	描述	Description
机械件 / Mechanics	轮子套件120 mm (2个固定，2个可滑动)	Wheel set 120 mm (2x fixed, 2x steerable)
	3U或6U机柜的上盖，可当前板或后板用，有带通风槽或无通风槽的版本	Cover panel 3U or 6U, for front or rear use, with or without air ventilation slots
输入保险丝 / Input fuses	三相输入断路器，16 A/32 A/63 A，K型	Input breaker 3-phase, for 16 A/32 A/63 A, characteristic K
电网连接 / Grid connection	400 V CEE插头，16 A/32 A/63 A，三相输入用，或6个Schuko电源排插（电子负载用）	CEE plug 400 V, 16 A/32 A/63 A, for 3-phase input or 6x Schuko power strip for electronic loads
安规 / Safety	紧急开关，表面安装，带旋钮并/或外部接触器，也带16 A/32 A/63 A接触器加辅助电源	Emergency off switch, surface mount, with knob and/or ext. contact, also with contactor 16 A/32 A/63 A plus aux. power supply
直流端的连接 / DC connection	铜条或高压线	Copper bars or high voltage cables
水冷 / Water cooling	带水龙头，端口的水冷用整套套件，代替风冷系统	Complete set with tap, ports and hoses for water cooling connection instead of air cooling
远程控制 / Remote control	模拟接口用隔离放大器，1个通道	Galvanic isolation amplifier for analog interface, 1-4 channels
	模拟接口用主-从连线	Master-slave wiring for analog interface
	数字接口卡，带电线，比如CAN	Digital interface cards, installed & wired (for example CAN)

提示：按要求还可供机柜组装用其它部件，如通风系统，玻璃门等
Note: further components for cabinets, like exhaust systems, glass doors etc. are available upon request

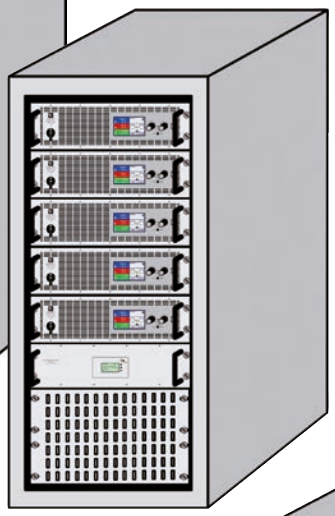
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配置举例 / **Example configurations**



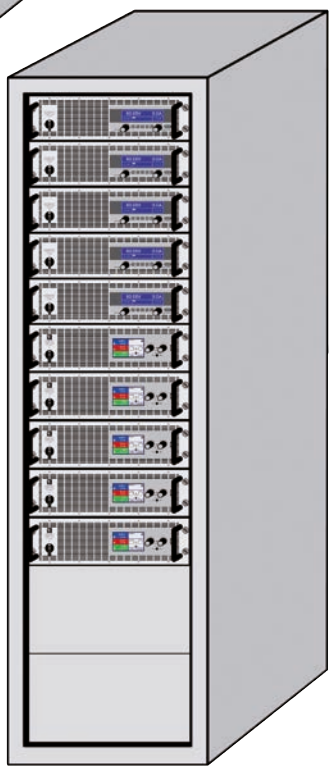
例 **1**:
这个42U机柜，由10台3U高的电源组合而成，如PS 9000 3U系列。每台机的最大功率为15 kW, 则整个机柜的总功率将可达150 kW。可获得高达5100 A的大电流，能应用于电镀或焊接领域。

Example 1:
42U cabinet, equipped with 10 units of power supplies in 3U height, for example PS 9000 3U series. With a maximum of 15 kW per unit, the cabinet has a total power of 150 kW. High currents of up to 5100 A can be used for electroplating or welding.



例 **2**:
这个24U机柜，由5台3U高的ELR 9000电子负载组合而成。每台机的最大输入功率为10.5 kW, 则整个机柜的总功率可达52.5 kW。可获得高达2050 A的大电流，能应用于大容量电池的测试或其它高性能的电源产品上。

Example 2:
24U cabinet, equipped with 5 units of electronic loads ELR 9000 in 3U height, plus an automatic isolation unit. With up to 10.5kW input power per unit, the cabinet can take a total power of max. 52.5 kW. High currents of up to 2050 A can be used to test high capacity batteries or other high performance power sources.



例 3:
这个42U机柜，由5台3U高的电源如PS 9000 3U系列，与5台3U高的ELR 9000 电子负载（有能量反馈）或EL 9000 B（无能量反馈））组合而成。这5台电源产品能提供25 kW，50 kW或75 kW的功率，而这5台电子负载则可吸收高达52.5 kW的输入功率。这种组合可应用于如两象限操作中。

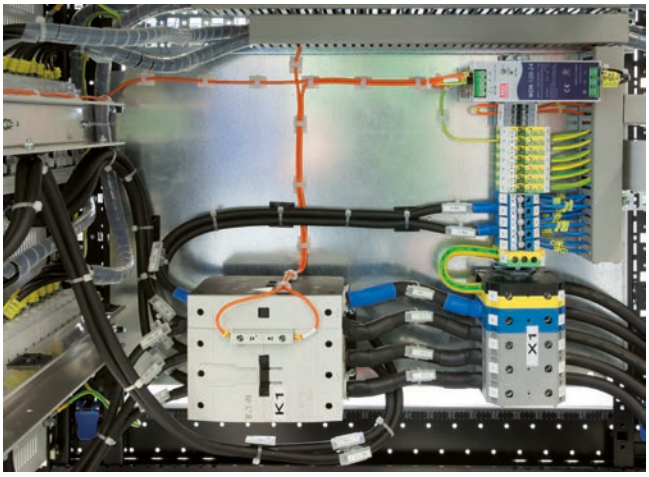
Example 3:
Mixed configuration in a 42U cabinet, equipped with 4 units of power supplies in 3U height, for example PS 9000 3U series, and 5 units of electronic loads ELR 9000 (back-feeding) or EL 9000 B (not back-feeding) with 3U each. The five power supplies can provide 25 kW, 50 kW or 75 kW power, while the five loads can take up to 52.5 kW input power. This combination can be used for two-quadrants operation, for example.

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应用举例 / **Example applications**



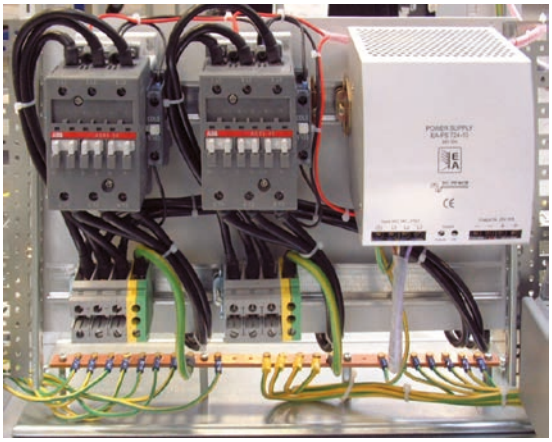
带紧急关闭装置的42U机柜，内配10x ELR 9000 /
42U cabinet with emergency off and 10x ELR 9000



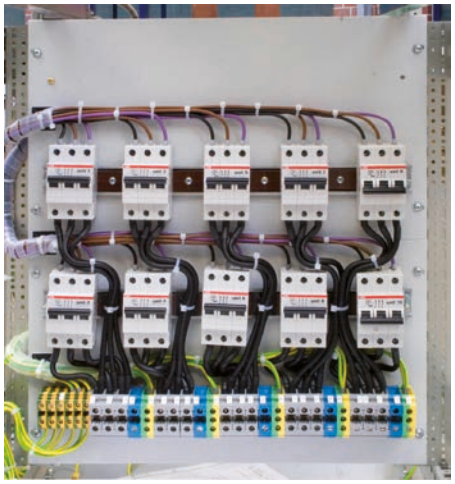
带两个紧急关闭接触器的AC输入面板 /
AC input panel with two separate emergency off contactors



带水冷装置的混合机柜系统 /
Mixed system with water cooling

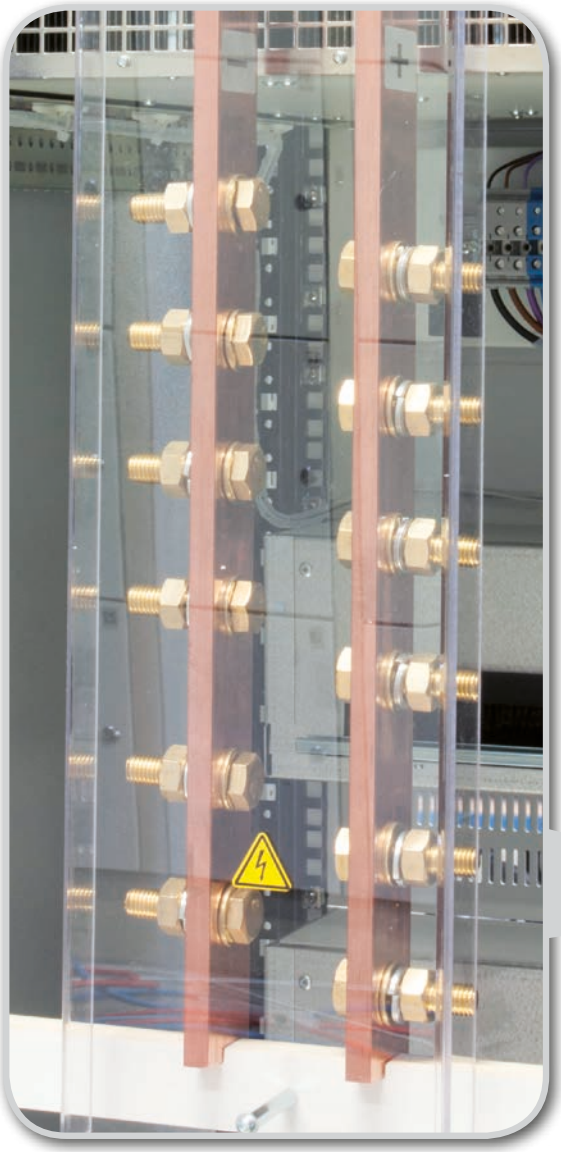


带自动隔离器接触片的交流输入面板 /
AC input panel with contactors of the automatic isolation unit

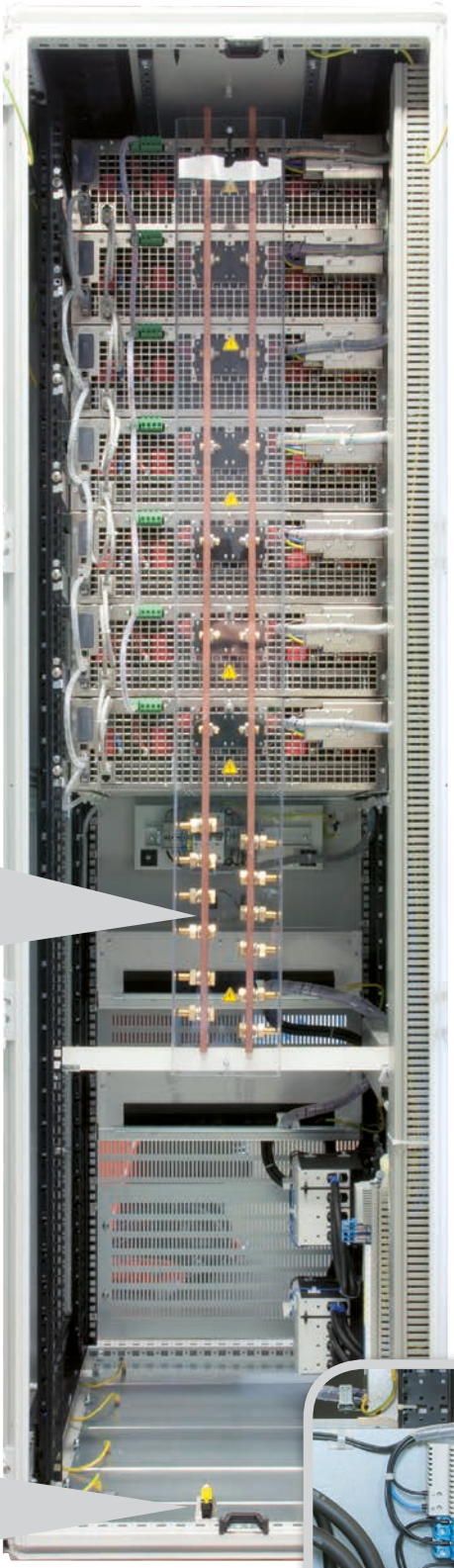


带断路器的AC输入面板 /
AC input panel with breakers

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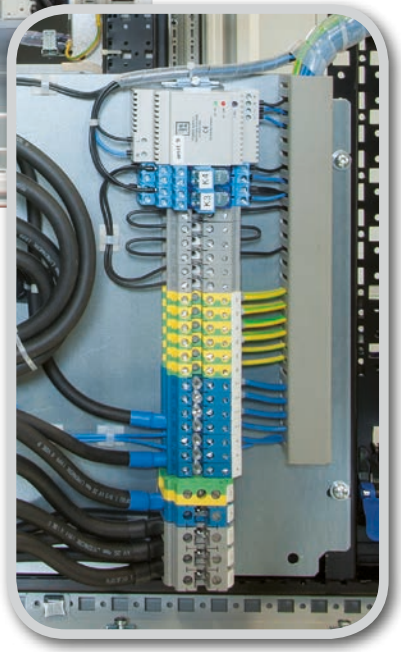


直流螺丝端 /
DC screw terminal



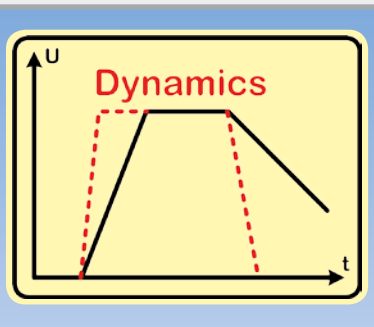


门触件（带内置锁） /
Door contact (Interlock)



交流输入螺丝端 /
AC input screw terminals

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更优化的调整速度
为了在最短上升和下降时间内达到快速电压变化，可按客户需求在生产组装的时候减小电源直流输出端的滤波电容。

滤波量的减小，加上外部电子负载，可使输出电压在不到1 ms的时间内完成从0...100%上跃，在少于2 ms的时间从100...0%下降。根据电源型号的不同，所需最小的电容容量也会不同。

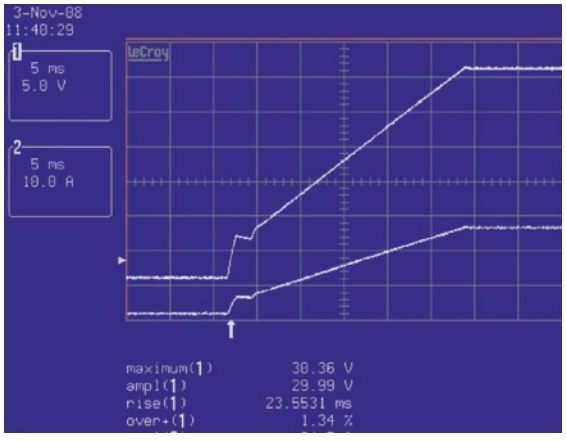
必须注意的是减小滤波量会使输出纹波升高。该选项适用于每个应用。

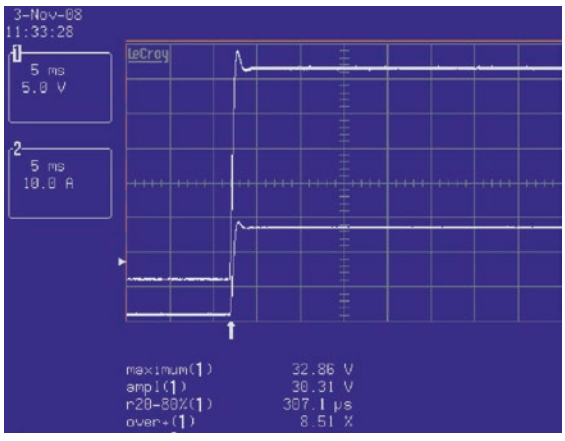
下图为正常输出滤波量（左图）和减少滤波量（右图）的跃变时间的对比。

Improved regulation speed
In order to achieve rapid voltage changes with minimal ramp up and down times, the filter capacity on the DC output of certain power supply series can be reduced during production and upon request.
This reduction, combined with an external electronic load, can result in ramp-up times for 0-100% output voltage of less than 1 ms and ramp-down times for 100-0% of less then 2 ms. It depends on the power supply model and minimum required capaity.

It has to be noted that a reduction in filter capacity results in a higher output ripple.The option is thus suitable for every kind of application.

Visualisation of the ramp time with normal (left figure) and reduced output capacity (right figure):





高速跃变选项可应用于下面系列产品上：
• PSI 9000 2U
• PSI 9000 3U
• PS 9000 2U
• PS 9000 3U
• PS 8000 T

High-Speed is available for following series:
• PSI 9000 2U
• PSI 9000 3U
• PS 9000 2U
• PS 9000 3U
• PS 8000 T

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函数管理器

某些电源与电子负载系列本机配备的函数管理器，它为直流输入或输出电压与电流提供有标准函数（正弦，方形）或特殊函数（）可选。还可调节多个参数，如：振幅，时间，频率等。

Function generator

The function generator, which is included with certain series of power supplies and electronic loads, provides an option to apply a standard function (e.g. sine, square) or special functions (DIN 40835, photovoltaics, fuel cell) to the DC input resp. DC output value of voltage or current. It also offers to adjust various parameters such as amplitude, time, frequency etc.

高速跃变

为减少输出电压和电流的动态动作，可执行产品内部永久更改，即输出容量减至最小值。该改变可使输出电压的上升和下降时间缩至最短，但同时会带来负面影响，即：电压和电流的纹波会增加。部分电源系列配备该功能。

High speed ramping

Device internal and permanent modification where the output capacities are reduced to a minimum value in order to increase the dynamics of the output regarding voltage and current. With this optional modification, the rise and fall time of the output voltage minimizes significantly while at the same time the voltage and current ripples are increased, as a negative side effect.This option is available for selected power supply series.

OT/OTP

过温的简称。这是一个报警条件，指示出产品过热。在此条件下，功率端会暂时关闭，当产品冷却后自动恢复工作（正常工作）。然后报警指示会消失。

OT/OTP

Short for overtemperature. This is an alarm condition, which indicates overheating of a device. In this condition the power stages are deactivated temporarily and will continue to work (usually) automatically after cooling down. Then the alarm indication will be erased.

OCP

过流保护的简称。指示可调电流极限被超过，它会关闭直流输出或直流输入，而恒流极限仅能将输出电流限制到可调值。

OCP

Short for overcurrent protection. A feature that indicates the exceedance of an (usually) adjustable current threshold, which switches the DC output or DC input off, contrary to the constant current limitation which only limits the output current to the adjusted value.

OVP

过压保护的简称。指示可调电压极限被超过，它会关闭直流输出或输入，以便保护应用设备免受危险电压的损坏。

OVP

Short for overvoltage protection. A feature that indicates the exceedance of an (usually) adjustable voltage threshold, which always switches the DC output or input off, in order to protect an application from dangerous voltage.

OPP

过功率保护的简称。它会将超过的（一般）功率极限值指示出来，通常会关闭直流输出或输入，以便保护应用设备被损坏。

OPP

Short for overpower protection. A feature that indicates the exceedance of an (usually) adjustable power threshold, which always switches the DC output or input off, in order to protect an application from dangerous power consumption or supply.

PF

电源故障的简称。它表示产品AC输入部分故障，或者AC供电端过压或欠压。在此状态下，功率输入与输出端会关闭。

PF

Short for power fail. A feature which signalises the defect of the AC input part of a device or the condition of over- or undervoltage of AC supply. During this condition, the power output resp. input is shut off.

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EA-Elektro-Automatik (Shanghai) Co., Ltd.
医蔼贸易(上海)有限公司

Address:
Room 611-612, No. 6, Jiahe Business Center,
Lane 358 Wengcheng Road, Songjiang District,
Shanghai, China 201620
上海市松江区文诚路358弄6号嘉和商业中心611-612室

电话： +86-21-37012050
传真： +86-21-37012010
E-mail: ea1974@elektroautomatik.cn
Web: www.elektroautomatik.cn

中国区分销商 Distributor in China

T&Y Hi-tech (suzhou)Co.Ltd
苏州天仪科创机电科技有限公司
Room: 4-1108 No. 9, Jinfeng South Road
Post Code: 215101
Tel: +86-512-6558 0519
Fax:+86-512-6632 8565
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E-mail:victormeter@163.com
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