

可编程实验室直流电源

Programmable laboratory DC Power supplies



EA-PS 9080-100 1U

U

I

P

OVP

OCP

OPP

OTP



19"



USB

LAN

- 宽范围输入电压100...264 V (1500 W型号)
- 效率高达 95%
- 输出功率: 0..1500 W 或 0..3000 W
- 输出电压: 0...80 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)
- 带按键的蓝屏控制面板, 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
- 超低的高度, 仅1 U高 (44 mm)
- 温控风扇制冷
- 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

概要

EA-PS 9000 1U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、六个按键, 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。

交流输入

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。

- 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
- Very low height of only 1 U (44 mm)
- Temperature controlled fans for cooling
- USB and Ethernet port integrated
- EMC according to EN 55022 Class B
- SCPI command language supported

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

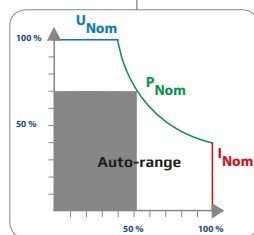
All units are provided with an active Power Factor Correction circuit and models up to 1.5 kW are even suitable for a worldwide operation on a supply from 100 V_{AC} up to 264 V_{AC}.

EA-PS 9000 1U 1500 W & 3000 W

两种功率级别的产品都会在输入电压低时自动减少输出功率，因此1.5 kW型号在输入电压为100...1150 V_{AC}时仍有1 kW。3 kW型号在输入电压为180...207 V_{AC}时仍可供应2.5 kW。

功率

所有型号的输出功率都可灵活调整。可在较低电流时输出较高电压，或在低电压时输出较高电流，但总是维持在最大额定功率范围内。它们的设定功率都可调，因此仅用一台产品就能覆盖广泛的应用。



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}.

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。因此不管是手动控制还是远程控制（模拟或数字），都可在0%与100%之间连续调节电流、电压与功率。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，其输出电容都配有一放电电路。在空载或带小负载时，它能确保危险电压在直流输出关闭后降至60 V DC以下。该电压值被认为是人体安全的最高电压。

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限值(OVP)，以及过流(OCP)与过功率(OPP)保护限值。

一旦因故超过这三个值中的一个，直流输出会被立即切断，并在显示器与接口端发出一状态信号。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

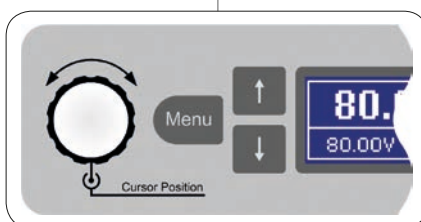
For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP) and overpower (OPP).

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.

显示器和控制键

产品所有重要信息都清晰地显示在点阵显示屏上。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置，都清晰展现出来。

为了便于旋钮能调节参数，只需按一下该旋钮，就可更换数值小数点后的光标位置。所有这些特性都有助于操作者的便利性。其面板锁定功能可锁住整个面板，从而保护产品与连接负载免受意外误用。



Display and controls

All important information is clearly visualised on a dot matrix display.

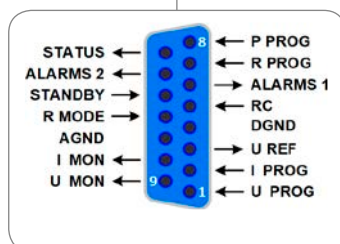
With this, information about the actual output values and set values of voltage and current, the actual control state (CV, CC, CP) and other statuses, as well as alarms and settings of the setup menu are clearly displayed.

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. 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

产品后板上装有一隔离模拟接口端子。它具有一模拟输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流与功率。要监控输出电压与电流，可给模拟输出脚接上0 V...10 V或0 V...5 V电压来完成。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.

EA-PS 9000 1U 1500 W & 3000 W



数字接口

本系列标配有两个电隔离数字接口。分别是1x USB & 1x Ethernet。可通过发送SCPI语言指令或ModBus RTU协议，经它们控制和监控产品。

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 RTU 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
交流供电	AC Supply	Models 1500 W / 型号: 100...264 V, 45...65 Hz, PF = 0.99 Models 3000 W / 型号: 180...264 V, 45...65 Hz, PF = 0.99
- 功率降额	- Derating	Models 1500 W / 型号: < 150 V AC 时降至 / to P _{out max} 1000 W Models 3000 W / 型号: < 207 V AC 时降至 / to P _{out max} 2500 W
直流: 电压	DC: Voltage	
- 精确度	- Accuracy	< 额定值的0.1% / < 0.1% of rated value
- 0-100%的负载调整率	- Load regulation 0-100%	< 额定值的0.05% / < 0.05% of rated value
- ±10% ΔU _{AC} 的线性调整率	- Line regulation ±10% ΔU _{AC}	< 额定值的0.02% / < 0.02% of rated value
- 带载10-100%调整需时	- Regulation 10-100% load	< 2.2 ms
- 带载10-90% (CV)的斜率	- Rise time 10-90% (CV)	最大 / Max. 15 ms
直流: 电流	DC: Current	
- 精确度	- Accuracy	< 额定值的0.2% / < 0.2% of rated value
- 1-100% ΔU _{DC} 的负载调整率	- Load regulation 1-100% ΔU _{DC}	< 额定值的0.15% / < 0.15% of rated value
- ±10% ΔU _{AC} 的线性调整率	- Line regulation ±10% ΔU _{AC}	< 额定值的0.05% / < 0.05% of rated value
直流: 功率	DC: Power	
- 精确度	- Accuracy	< 额定值的1% / < 1% of rated value
过压类别	Overvoltage category	2
保护功能	Protection	OTP, OVP, OCP, OPP, PF ⁽¹⁾
隔离耐压	Insulation	
- 交流输入对外壳	- AC input to enclosure	2500 V DC
- 交流输入对直流输出	- AC input to DC output	2500 V DC
- 直流输出对外壳 (PE)	- DC output to enclosure (PE)	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	Degree of pollution	2
保护等级	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
- 信号范围	- Signal range	0...5 V 或 0...10 V (可切换) / 0...5 V or 0...10 V (switchable)
- U / I / P 精确度	- Accuracy U / I / P	0...10 V: < 0.2% 0...5 V: < 0.4%
- 输入脚	- Inputs	U, I, P, 远程开-关, 直流输出开-关 / U, I, P, Remote on-off, DC output on-off
- 输出脚	- Outputs	U / I, 过压, 报警, 参考电压 / U / I, Overvoltage, alarms, reference voltage
并联操作	Parallel operation	可实现, 利用共享总线操作或模拟接口 / Possible, via Share Bus operation or via analog interface
- 主-从	- Master-Slave	无 / No
安规标准	Standards	EN 60950, EN 61326, EN 55022 等级 B / Class B
制冷方式	Cooling	温控风扇 / Temperature controlled fan(s)
工作温度	Operation temperature	0...50 °C
储存温度	Storage temperature	-20...70 °C
湿度	Humidity	< 80%, 无凝露 / non-condensing
工作高度	Operation altitude	< 2000 m
机械结构	Mechanics	1500 W 3000 W
- 重量 ⁽²⁾	- Weight ⁽²⁾	~ 10.5 kg 11 kg
- 尺寸 (宽 高 深) ⁽³⁾	- Dimensions (W H D) ⁽³⁾	19" x 1 HE/U x 500 mm 19" x 1 HE/U x 500 mm

(1) 见第146页 / See page 146

(2) 为标准版, 带选项功能的则会不同 / Standard version, models with options may vary

(3) 为标准版的外壳尺寸, 非整体尺寸, 带选项功能的则会不同 / Enclosure of the standard version and not overall size, versions with options may vary

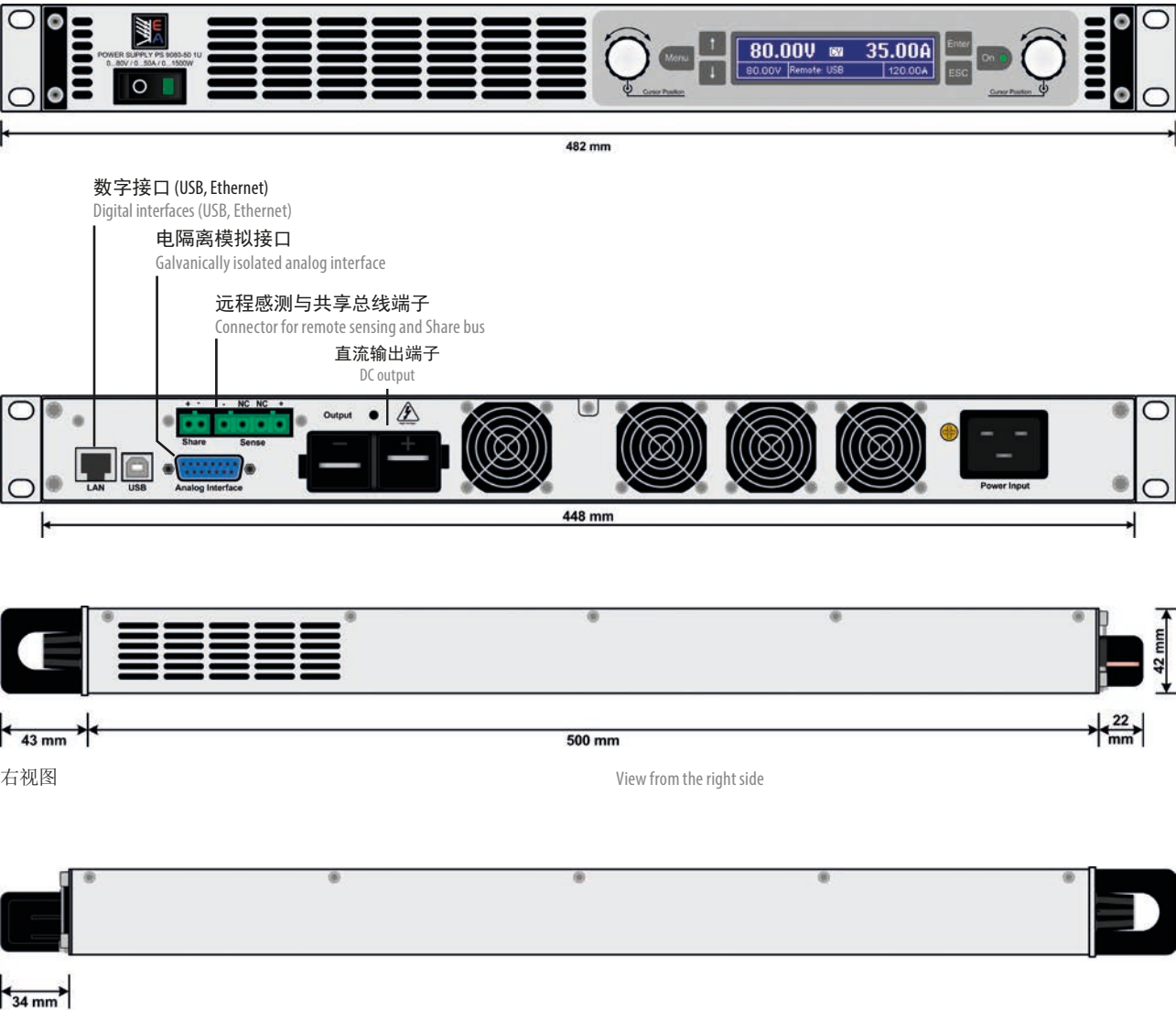
EA-PS 9000 1U 1500 W & 3000 W

型号	电压	电流	功率	效率	U的纹波 ⁽²⁾	I的纹波 ⁽²⁾	编程 ⁽¹⁾		订购编号
Model	Voltage	Current	Power	Efficiency	Ripple U ⁽²⁾	Ripple I ⁽²⁾	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) 忽略产品错误时的可编程分辨率 / Programmable resolution disregarding device errors
(2) RMS值：在BWL 300 kHz时测量的LF值，PP值：在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300kHz, PP value: measured at HF with BWL 20MHz

产品视图

Product views



右视图

View from the right side

带直流外盖的左视图 von links, mit DC-Abdeckung

View from the left side, with DC cover



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