EA-PSI 9000 T 320 W - 1500 W

桌面式可编程直流电源
Programmable desktop DC Power supplies

EA-PSI 9080-60 T

U   I   P   R   OVP   OCP   OPP   OTP   ⎍   USB

Option: LAN   ▭

- 宽范围输入电压90...264 V，带主动式PFC
- 效率高达 92%
- 输出功率：0...320 W 至0...1500 W
- 输出电压：0...40 V 至 0...500 V
- 输出电流：0...4 A 至 0...60 A
- 灵活的功率调整输出级
- 监测功能 (OVP, OCP, OPP)
- 过温保护 (OT)
- 触摸屏显示器显示数值、状态与通知
- 标配USB端口，可选以太网与模拟接口（所有接口都已电隔离）
- 内置函数发生器
- 可模拟与调整内阻
- 符合SELV标准 (EN 60950)的40 V产品型号
- 支持SCPI指令语言
- LabView VIs
- Windows操作程序下的控制软件

- 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...500 V
- Output currents: 0...4 A up to 0...60 A
- Flexible, power regulated output stage
- Supervision (OVP, OCP, OPP)
- Overtemperature protection (OT)
- Intuitive touch panel with display for values, status and notifications
- USB port as standard, Ethernet & analog optional (all interfaces galvanically isolated)
- Integrated function generator
- Internal resistance simulation and regulation
- 40 V models compliant to SELV (EN 60950)
- SCPI command language supported
- LabView VIs
- Control software for Windows

概要

EA-PSI 9000 T系列是一款由微处理器控制的实验室电源。它立足于用户友好的交互式操作概念，配备一套完整的标准功能。其输出参数、监控功能与其它设定的配置很智能且舒适。

所有输出参数的监控功能，可帮助用户减少测试设备，且几乎可不用安装外部监控硬件与软件。

General

The microprocessor controlled laboratory power supplies of series EA-PSI 9000 T 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.
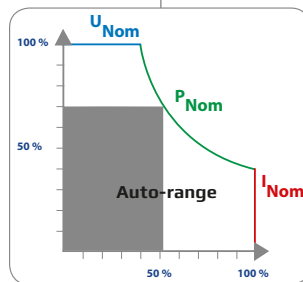
EA-PSI 9000 T   320 W - 1500 W

由两旋钮，一个按键，三个LED以及TFT彩色触摸屏组成的控制面板，显示所有关键数值与状态，用户只需轻轻一点手指，就可轻松操作本设备。

The clear control panel with its two knobs, one pushbutton, three 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.

交流输入

本系列采用主动式功率因数（简称：PFC），输入电压为90 V_{AC}至264 V_{AC}，适合全球范围内使用。1.5 kW的型号在供电电压<150 V_{AC}时，输出功率自动减少到1 kW。

AC input

The equipment uses an active **P**ower **F**actor **C**orrection (short: PFC), enabling worldwide use 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}.

功率级自动调整

本系列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。它们的最大设定功率都可调，因此仅用一台产品就能覆盖广泛的应用。

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0...40 V和0...500 V输出电压，0...4 A和0...60 A输出电流，0...320 W和0...1500 W输出功率的不同型号。

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。它还有一内阻模式，能模拟一内部在线电阻。

输出端位于产品前面板上。

DC output

DC output voltages between 0...40 V and 0...500 V, output currents between 0...4 A and 0...60 A and output power ratings between 0...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). There is furthermore the resistance mode which offers simulation of an internal in-line resistor.

The output terminals are located on the front side 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。该电压值被认为是对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极限值(OVP)，以及过流(OCP)与过功率(OPP)保护极限值。

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.

远程感测

远程感测输入端可直接连到负载设备，以补偿连线上的部分压降。如果感测输入端已接到负载上，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。远程感测端子位于产品前板。

Remote sensing

The standard sensing input can be connected directly to the load in order to compensate voltage drops along the cables. If the sensing 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. The remote sensing connector is located on the front of the device.
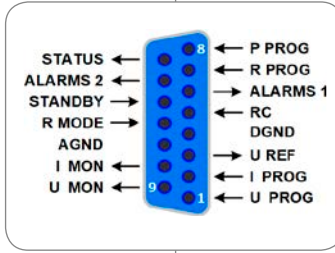
EA-PSI 9000 T   320 W - 1500 W

可选模拟接口

本系列产品后板可选择安装隔离模拟接口。该模拟接口具有一模拟输入脚，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。


Optional analog interface

A galvanically isolated analog interface can be installed optionally and subsequently, located on the rear of the device. It offers analog inputs to set voltage, current, power and resistance 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 0 V...10 V or 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

显示器与控制面板

Display and control panel

触摸屏显示器
Display with touch panel

参数调节用旋钮
Knobs for comfortable value adjustment
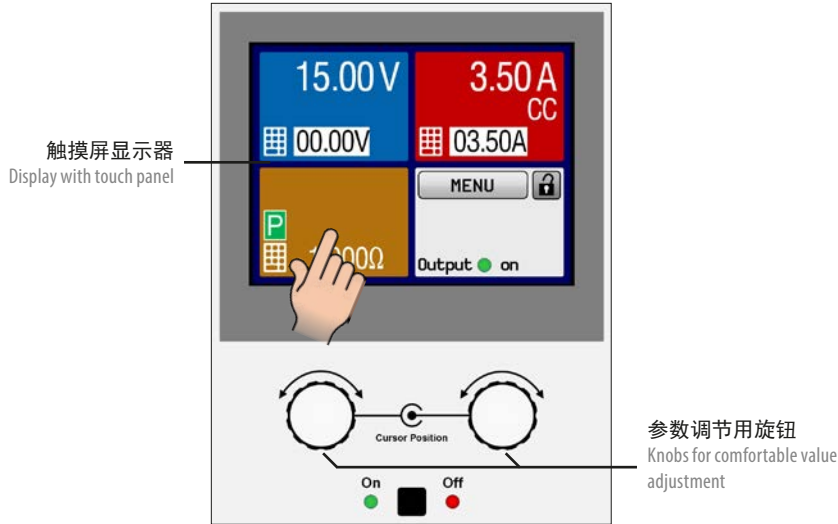
设定与实际输出电压、电流与功率都清晰显示于图形显示器上。彩色的TFT屏幕为点触式，用一个手指就能控制所有功能。

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、功率或模拟阻值。

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 the simulated, internal resistance 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

本系列所有型号都具有一可形成如下典型函数的真实函数发生器，并能将它们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，或经某一数字接口远程配置。
预设函数会为用户提供所有必须的参数，如Y偏差值，时间/频率或幅度，整套配置完成。

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.

EA-PSI 9000 T   320 W - 1500 W

| [1] 三角形 Triangle	[2] 矩形 Rectangle	[3] 梯形 Trapezoid	[4] 正弦 Sine	[5] 阶跃 Ramp
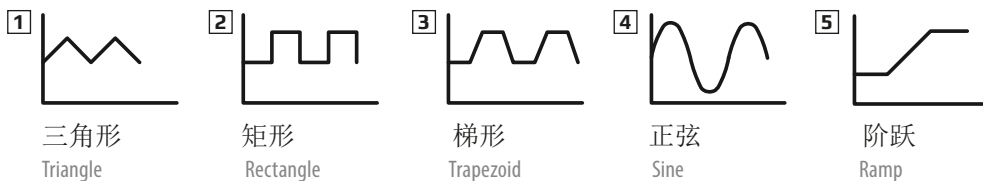
除了基于任意发生器产生的标准函数外，它还可形成某些复杂的函数，并能分成多达99组序列。这些可用于研发和生产的测试。通过前板的USB端口可将这些序列上载使用或存储于标准U盘上，这样方便更换不同的测试序列。

下图是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函数，然后上载或保存：

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 99 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:
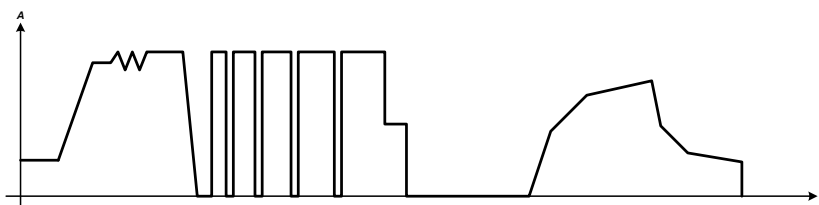
输出值的预设

设定输出值不会对输出状态有直接影响。它显示于显示器上，就在实际值下方。

利用该特性，用户可通过旋钮或触摸屏直接输入参数，预设所需的电压、电流和功率。还有5个用户配置文档，能让用户在常用设定值之间简便地转换，激活不同的配置文档即可完成。

控制软件

还可通过在Windows操作软件下运行的控制软件，对多台同型号，甚至不同型号的产品进行远程控制。它有一个显示所有设定值与实际值、直接输入SCPI与ModBus RTU指令的模式，固件更行，以及称为"排序"的半自动控制表。

产品还可用注册码解锁，用"多功能控制"应用在一个窗口下一次性监控多达20台产品。此时还能使用排序与数据记录功能。

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.

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 RTU commands, a firmware update feature and the semi-automatic table control named "Sequencing".

Optionally unlockable with a licence code, the app "Multi Control" can monitor and control up to 20 units at once and in one windows. The sequencing feature and data logging are here available as well.

可选项

▪ 带USB、以太网与模拟端口的可拆装接口模块（订购编号：33100231）
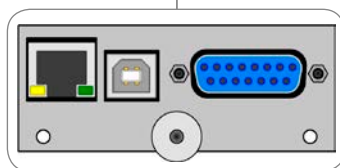
Options

▪   Retrofittable interface module with USB, Ethernet and analog ports (ordering number: 33100231)

EA-PSI 9000 T   320 W - 1500 W

技术参数	Technical Data	Series EA-PSI 9000 T / 系列	
交流：供电	AC: Supply		
- 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	型号 / Models 1500 W: < 150 V AC 降至 / to $P_{out\,max}$ 1000 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}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 ms	
- 带载10-90%上升时间	- Rise time 10-90%	最大 / Max. 30 ms	
- 过压保护	- Overvoltage protection	可调，0...110% U_{Nenn} / Adjustable, 0...110% U_{Nom}	
直流：电流	DC: Current		
- 精确度	- Accuracy	<额定值的0.1% / <0.2% of rated value	
- 1-100% ΔI_{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	OT, OVP, OCP, OPP, PF [2	
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	负极：最大400 V DC；正极：最大400 V DC+ / 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（可选）	Analog interface (optional)	可选 (15-针D-Sub母插，电隔离) / optionally available (15-pole D-Sub, 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)	
- 输入脚	- Inputs	U, I, P, R, 远程开-关，直流输出开-关，内阻模式开-关 / U, I, P, R, Remote on-off, DC output on-off, resistance mode on-off	
- 输出脚	- Outputs	U, I, 过压，报警，参考电压 / U, I, Overvoltage, alarms, reference voltage	
- U / I / P / R精确度	- Accuracy U / I / P / R	0...10 V: <0.2%	0...5 V: <0.4%
并联操作	Parallel operation	可实现 / Possible	
安规标准	Standards	EN 60950, EN 61326, EN 61010, EN 55022 等级 B / Class B	
制冷方式	Cooling	温控风扇 / Temperature controlled fan	
工作温度	Operation temperature	0...50 ℃	
储存温度	Storage temperature	-20...70 ℃	
相对湿度	Relative humidity	<80%, 无凝露 / non-condensing	
工作高度	Operation altitude	<2000 m	
机械结构	Mechanics		
- 重量	- Weight	320 W - 640 W: ~ 7 kg	1000 W - 1500 W: ~ 8 kg
- 尺寸 (宽 高 深) [1	- Dimensions (W x H x D) [1	320 W - 640 W: 92 x 239 x 352 mm	1000 W - 1500 W: 92 x 239 x 412 mm

[1 仅为机身尺寸 / Body only
[2 也可见第146页 / See page 146

EA-PSI 9000 T   320 W - 1500 W

| 型号 Model	电压 Voltage	电流 Current	功率 Power	效率 Efficiency	U最大时的纹波 [2] Ripple U [2]	I最大时的纹波 Ripple I	编程 [1] U (typ.)	 I (typ.)	 P (typ.)	订购编号 Ordering number
PSI 9040-20 T	0...40 V	0...20 A	0...320 W	≤88%	20 mV$_{PP}$ / 2 mV$_{RMS}$	1 mA$_{RMS}$	1.5 mV	0.8 mA	0.012 W	06200540
PSI 9080-10 T	0...80 V	0...10 A	0...320 W	≤89%	20 mV$_{PP}$ / 2 mV$_{RMS}$	1 mA$_{RMS}$	3.1 mV	0.4 mA	0.012 W	06200541
PSI 9200-04 T	0...200 V	0...4 A	0...320 W	≤89%	50 mV$_{PP}$ / 6 mV$_{RMS}$	1.5 mA$_{RMS}$	7.6 mV	0.2 mA	0.012 W	06200542
PSI 9040-40 T	0...40 V	0...40 A	0...640 W	≤89%	20 mV$_{PP}$ / 2 mV$_{RMS}$	1 mA$_{RMS}$	1.5 mV	1.5 mA	0.024 W	06200543
PSI 9080-20 T	0...80 V	0...20 A	0...640 W	≤91%	20 mV$_{PP}$ / 2 mV$_{RMS}$	1 mA$_{RMS}$	3.1 mV	0.8 mA	0.024 W	06200544
PSI 9200-10 T	0...200 V	0...10 A	0...640 W	≤92%	50 mV$_{PP}$ / 6 mV$_{RMS}$	1.5 mA$_{RMS}$	7.6 mV	0.4 mA	0.024 W	06200545
PSI 9040-40 T	0...40 V	0...40 A	0...1000 W	≤92%	25 mV$_{PP}$ / 4 mV$_{RMS}$	6 mA$_{RMS}$	1.5 mV	1.5 mA	0.038 W	06200546
PSI 9080-40 T	0...80 V	0...40 A	0...1000 W	≤92%	25 mV$_{PP}$ / 4 mV$_{RMS}$	6 mA$_{RMS}$	3.1 mV	1.5 mA	0.038 W	06200547
PSI 9200-15 T	0...200 V	0...15 A	0...1000 W	≤93%	150 mV$_{PP}$ / 23 mV$_{RMS}$	1.8 mA$_{RMS}$	7.6 mV	0.6 mA	0.038 W	06200548
PSI 9500-06 T	0...500 V	0...6 A	0...1000 W	≤93%	155 mV$_{PP}$ / 33 mV$_{RMS}$	8 mA$_{RMS}$	19.1 mV	0.2 mA	0.038 W	06200549
PSI 9040-60 T	0...40 V	0...60 A	0...1500 W	≤92%	25 mV$_{PP}$ / 4 mV$_{RMS}$	6 mA$_{RMS}$	1.5 mV	2.3 mA	0.057 W	06200550
PSI 9080-60 T	0...80 V	0...60 A	0...1500 W	≤92%	25 mV$_{PP}$ / 4 mV$_{RMS}$	6 mA$_{RMS}$	3.1 mV	2.3 mA	0.057 W	06200551
PSI 9200-25 T	0...200 V	0...25 A	0...1500 W	≤93%	150 mV$_{PP}$ / 23 mV$_{RMS}$	1.8 mA$_{RMS}$	7.6 mV	1 mA	0.057 W	06200552
PSI 9500-10 T	0...500 V	0...10 A	0...1500 W	≤93%	155 mV$_{PP}$ / 33 mV$_{RMS}$	8 mA$_{RMS}$	19.1 mV	0.2 mA	0.057 W	06200553

[1 可编程分辨率忽略产品误差 / 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 300 kHz, PP value: measured at HF with BWL 20MHz

A

B

C

D

E

产品图片

Product views
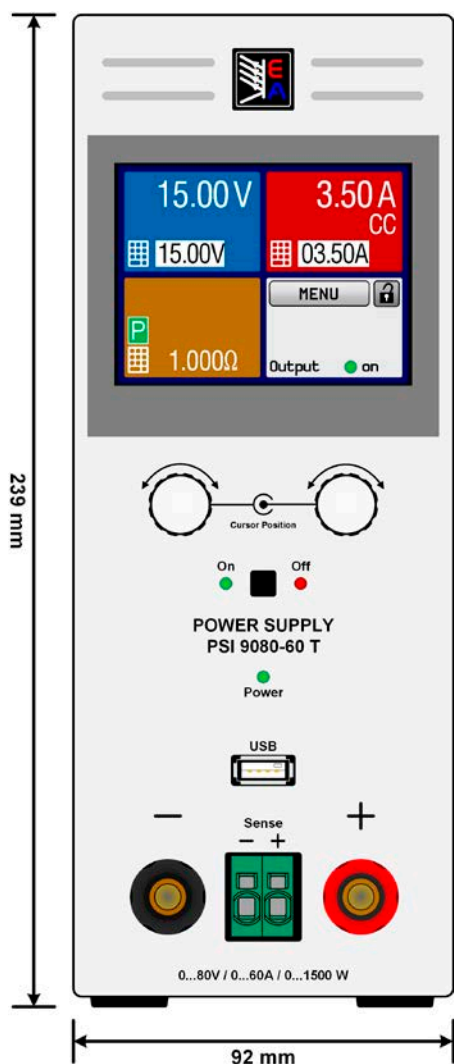
后视图 (1000 W / 1500 W) / Rear view (1000 W / 1500 W)