EA-PS 9000 T 320 W - 1500 W

Programmable desktop DC Power supplies

EA-PS 9080-60 T

U | I | P | OVP | OCP | OPP | OTP | USB

Option: LAN

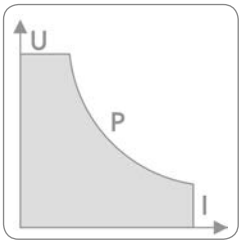
- **Wide AC supply voltage range: 90...264 V, with active PFC**
- **High efficiency: up to 92%**
- **Output power ratings: 0...320 W up to 0...1500 W**
- **Output voltages: 0...40 V up to 0...500 V**
- **Output currents: 0...4 A up to 0...60 A**
- **Flexible, power regulated output stage**
- **Supervisions and protections (OVP, OCP, OPP, OT)**
- **Intuitive touch panel with display for values, status and notifications**
- **USB port as standard, Ethernet & analog ports optional (all interfaces galvanically isolated)**
- **40 V models compliant to SELV (EN 60950)**
- **SCPI command set and ModBus RTU support**
- **LabView VIs and control software for Windows**

General

The microprocessor-controlled laboratory power supplies of series EA-PS 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.
The clear control panel with its two knobs, one pushbutton, three LEDs and the touch panel with color display for all important values and status enable the user to handle the device easily with a few touches of a finger tip.

AC supply

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 reduce their output power to 1 kW below input voltages of 150 V_{AC}.



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 adjustable power set value or the rated power. Therefore, a wide range of applications can already be covered by the use of just one unit.

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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). The output terminals are located on the front side of the devices.

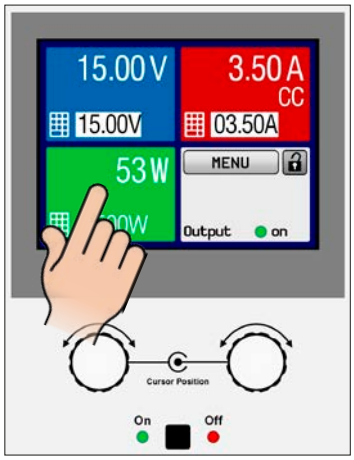
Discharge circuit
Models with a rated output voltage of 200 V or higher include a discharge circuit for the output capacities. For no load or low load situations, it ensures that the dangerous output voltage sinks under 60 V DC after the DC output has been switched off. This value is considered as limit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

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 on case the device overheats.

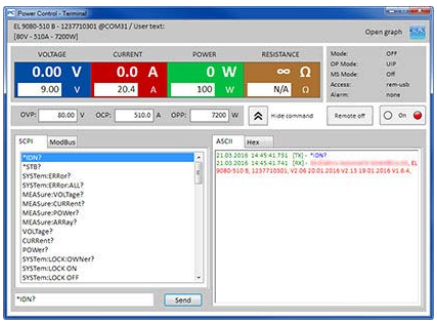
Remote sensing
The standard sensing input can be connected directly to the load in order to compensate voltage drops along the cables. If the sensing input is connected to the load, the power supply will detect this and adjust the output voltage automatically to ensure the accurate required voltage is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

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 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 0 V...10 V or 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

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 color TFT screen is touch sensitive and can be intuitively used to control all functions of the device with just a finger tip. Set values of voltage, current or power can be adjusted using the rotary knobs or entered directly via a numeric pad. To prevent unintentional operations, all operation controls can be locked. The screen language can furthermore be selected between English, Russian, Chinese and German.

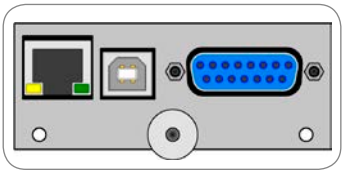


Presetting of output values
To set output values without a direct impact on the output condition, the set values are also shown on the display, positioned below the actual values. With this, the user can preset required values for voltage, current and power. It is either done by using the rotary knobs 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 unlocked with a license 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.

Options
- Retrofittable interface module with USB, Ethernet and analog ports



EA-PS 9000 T 320 W - 1500 W

Technical Data	Series EA-PS 9000 T	
AC: Supply		
- Voltage	90...264 V, 1ph+N	
- Frequency	45...65 Hz	
- Power factor	>0.99	
- Derating	Only models with 1500 W: <150 V AC to $P_{out\ max}$ 1000 W	
DC: Voltage		
- Accuracy	<0.1% of rated value	
- Load regulation 0-100%	<0.05% of rated value	
- Line regulation ±10% ΔU_{AC}	<0.02% of rated value	
- Regulation 10-100% load	<2 ms	
- Rise time 10-90%	Max. 30 ms	
- Overvoltage protection	Adjustable, 0...110% U_{Nom}	
DC: Current		
- Accuracy	<0.2% of rated value	
- Load regulation 1-100% ΔU_{DC}	<0.15% of rated value	
- Line regulation ±10% ΔU_{AC}	<0.05% of rated value	
DC: Power		
- Accuracy	<1% of rated value	
Overvoltage category	2	
Protection	OT, OVP, OCP, OPP, PF (2	
Insulation		
- Input to enclosure	2500 V DC	
- Input to output	2500 V DC	
- Output to enclosure	Negative: max. 400 V DC, positive: max. 400 V DC + output voltage	
Degree of pollution	2	
Protection class	1	
Analog interface (optional)	15 pole D-Sub, galvanically isolated	
- Signal range	0...5 V or 0...10 V (switchable)	
- Inputs	U, I, P, remote control on-off, DC output on-off	
- Outputs	U, I, overvoltage, alarms, reference voltage	
- Accuracy U / I / P	0...10 V: <0.2%	0...5 V: <0.4%
Parallel operation	Possible	
Standards	EN 60950, EN 61326, EN 61010, EN 55022 Class B	
Cooling	Temperature-controlled fan	
Operation temperature	0...50 °C	
Storage temperature	-20...70 °C	
Relative humidity	<80%, non-condensing	
Operation altitude	<2000 m (1.242 mi)	
Mechanics		
- Weight	320 W - 640 W: ≈7 kg (15.4 lb)	1000 W - 1500 W: ≈8 kg (17.6 lb)
- Dimensions (W x H x D) (1	320 W - 640 W: 92 x 239 x 352 mm (3.6" x 9.4" x 13.8")	1000 W - 1500 W: 92 x 239 x 412 mm (3.6" x 9.4" x 16.2")

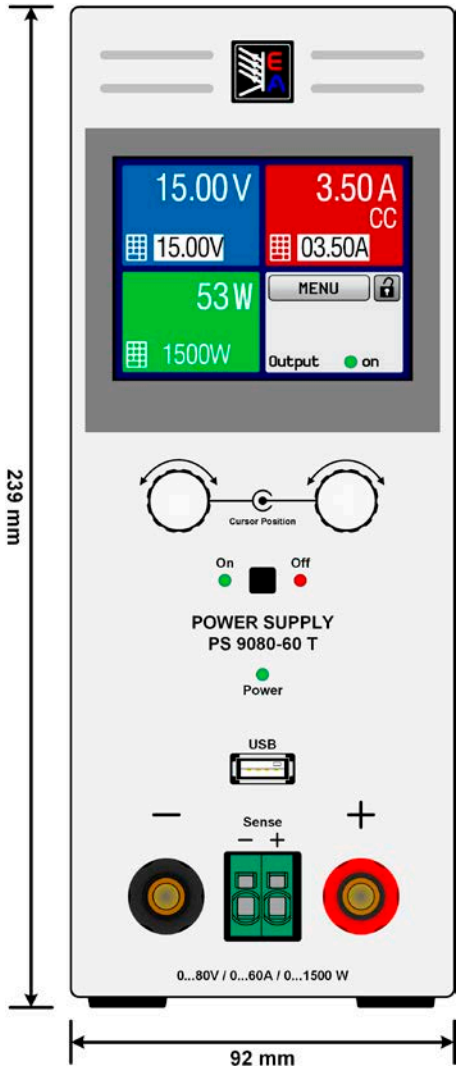
(1 Body only
(2 See page 126

EA-PS 9000 T 320 W - 1500 W

Model	Voltage	Current	Power	Efficiency	Ripple U (2	Ripple I	Programming (1			Ordering number
							U (typ.)	I (typ.)	P (typ.)	
PS 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	06200440
PS 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	06200441
PS 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	06200442
PS 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	06200443
PS 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	06200444
PS 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	06200445
PS 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	06200446
PS 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	06200447
PS 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	06200448
PS 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	06200449
PS 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	06200450
PS 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	06200451
PS 9200-25 T	0...200 V	0...25 A	0...1500 W	≤93%	155 mV_{PP} / 33 mV_{RMS}	8 mA_{RMS}	7.6 mV	1 mA	0.057 W	06200452
PS 9500-10 T	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	06200453

(1 Programmable resolution disregarding device errors
(2 RMS value: measured at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

Product views



Rear view (1000 W / 1500 W)