Programmable laboratory DC Power supplies

- Wide AC supply voltage range: 100...264 V (1500W models), with active PFC
- High efficiency: up to 95%
- Output power ratings: 0...1500 W or 0...3000 W
- Output voltages: 0...80 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 and digital (USB, Ethernet) interfaces
- Very low height of only 1U
- Temperature-controlled fans for cooling
- 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 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 (1.75") 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 supply
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<sub>ac</sub> up to 264 V<sub>ac</sub>. 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<sub>ac</sub> and the 3 kW models can still provide 2.5 kW at 180...207 V<sub>ac</sub>.

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.
EA-PS 9000 1U  1500 W & 3000 W

Power
All models are equipped with a flexible autoranging 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.

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.

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.

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.

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...5 V or 0 V...3 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

Digital interfaces
All models feature 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 (see page 118) or by a custom application, which is supported by a programming documentation, as well as LabView Virtual Instruments (VIs).

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Current</th>
<th>Power</th>
<th>Efficiency</th>
<th>Ripple U max.</th>
<th>Ripple I max.</th>
<th>Programming</th>
<th>Ordering number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 9080-50 1U</td>
<td>0...80 V</td>
<td>0...50 A</td>
<td>0...1500 W</td>
<td>≤91%</td>
<td>100 mVpp / 5.2 mVpp</td>
<td>4 mApp</td>
<td>3 mA</td>
<td>2 mA</td>
</tr>
<tr>
<td>PS 9200-25 1U</td>
<td>0...200 V</td>
<td>0...25 A</td>
<td>0...1500 W</td>
<td>≤93%</td>
<td>293 mVpp / 51 mVpp</td>
<td>8 mApp</td>
<td>8 mA</td>
<td>1 mA</td>
</tr>
<tr>
<td>PS 9360-15 1U</td>
<td>0...360 V</td>
<td>0...15 A</td>
<td>0...1500 W</td>
<td>≤94%</td>
<td>195 mVpp / 33 mVpp</td>
<td>1.6 mApp</td>
<td>14 mA</td>
<td>0.6 mA</td>
</tr>
<tr>
<td>PS 9500-10 1U</td>
<td>0...500 V</td>
<td>0...10 A</td>
<td>0...1500 W</td>
<td>≤94%</td>
<td>293 mVpp / 63 mVpp</td>
<td>1.4 mApp</td>
<td>20 mA</td>
<td>0.4 mA</td>
</tr>
<tr>
<td>PS 9750-06 1U</td>
<td>0...750 V</td>
<td>0...6 A</td>
<td>0...1500 W</td>
<td>≤95%</td>
<td>260 mVpp / 40 mVpp</td>
<td>0.6 mApp</td>
<td>30 mA</td>
<td>0.25 mA</td>
</tr>
<tr>
<td>PS 9080-100 1U</td>
<td>0...80 V</td>
<td>0...100 A</td>
<td>0...3000 W</td>
<td>≤92%</td>
<td>76 mVpp / 4.2 mVpp</td>
<td>6 mApp</td>
<td>3 mA</td>
<td>4 mA</td>
</tr>
<tr>
<td>PS 9200-50 1U</td>
<td>0...200 V</td>
<td>0...50 A</td>
<td>0...3000 W</td>
<td>≤93%</td>
<td>234 mVpp / 40 mVpp</td>
<td>10 mApp</td>
<td>8 mA</td>
<td>2 mA</td>
</tr>
<tr>
<td>PS 9360-30 1U</td>
<td>0...360 V</td>
<td>0...30 A</td>
<td>0...3000 W</td>
<td>≤93%</td>
<td>156 mVpp / 26 mVpp</td>
<td>1.9 mApp</td>
<td>14 mA</td>
<td>1.5 mA</td>
</tr>
<tr>
<td>PS 9500-20 1U</td>
<td>0...500 V</td>
<td>0...20 A</td>
<td>0...3000 W</td>
<td>≤93%</td>
<td>234 mVpp / 50 mVpp</td>
<td>1.9 mApp</td>
<td>20 mA</td>
<td>0.8 mA</td>
</tr>
<tr>
<td>PS 9750-12 1U</td>
<td>0...750 V</td>
<td>0...12 A</td>
<td>0...3000 W</td>
<td>≤93%</td>
<td>260 mVpp / 40 mVpp</td>
<td>0.7 mApp</td>
<td>30 mA</td>
<td>0.5 mA</td>
</tr>
</tbody>
</table>

(1) Programmable resolution without device error
(2) RMS value: measured at LF with BWL 300kHz, PP value: measured at HF with BWL 20MHz

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## EA-PS 9000 1U 1500 W & 3000 W

### Technical Data

<table>
<thead>
<tr>
<th>Series EA-PS 9000 1U</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AC: Supply</strong></td>
<td></td>
</tr>
</tbody>
</table>
| 1500 W models: 100...264 V, 1ph+N or 2ph, 45...65 Hz, PF = 0.99  
3000 W models: 180...264 V, 1ph+N or 2ph, 45...65 Hz, PF = 0.99 |  |
| **- Derating** |  |
| 1500 W models: < 150 V AC to P_out max 1000 W  
3000 W models: < 207 V AC to P_out max 2500 W |  |
| **DC: Voltage** |  |
| - Accuracy | <0.1% of rated value  
- Load regulation 0-100% | <0.05% of rated value  
- Line regulation ±10% ΔU_L | <0.02% of rated value  
- Regulation 10-100% load | <2.2 ms  
- Rise time 10-90% (CV) | Max. 15 ms  
| **DC Current** |  |
| - Accuracy | <0.2% of rated value  
- Load regulation 1-100% ΔU_L | <0.15% of rated value  
- Line regulation ±10% ΔU_L | <0.05% of rated value  
| **DC: Power** |  |
| - Accuracy | <1% of rated value  
Overvoltage category | 2  
Protection | OTP, OVP, OCP, OPP, PF  
Insulation |  |
| - AC input to enclosure | 2500 V DC  
- AC input to DC output | 2500 V DC  
- DC output to enclosure (PE) | Negative: max. 400 V DC, positive: max. 400 V DC + output voltage  
Degree of pollution | 2  
Protection class | 1  
Analog interface | Built in, 15 pole D-Sub (female), galvanically isolated  
- Signal range | 0...5 V or 0...10 V (switchable)  
- Accuracy U / I / P | 0...10 V: <0.2%  
0...5 V: <0.4%  
- Inputs | U, I, P, remote control on-off, DC output on-off  
- Outputs | U, I, overvoltage, alarms, reference voltage  
Parallel operation | Possible, via Share Bus operation or via analog interface  
- Master-Slave | No  
Standards | EN 60950, EN 61326, EN 55022 Class B  
Cooling | Temperature-controlled fans  
Operation temperature | 0...50 °C  
Storage temperature | -20...70 °C  
Humidity | <80%, non-condensing  
Operation altitude | <2000 m (1.242 mi)  
Mechanics | 1500 W  
- Weight (2) | 10.5 kg (23.1 lb)  
3000 W | 11 kg (24.2 lb)  
- Dimensions (W x H x D) (3) | 19" x 1U x 500 mm (19.7")  
| | 19" x 1U x 500 mm (19.7")  

(1) See page 126  
(2) Standard version, models with options may vary  
(3) Enclosure of the standard version and not overall size, versions with options may vary

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Product views

Digital interfaces (USB, Ethernet)
Galvanically isolated analog interface
Connector for remote sensing and Share bus
DC output

View from the right side

View from the left side, with DC cover