

# PS 9000 3U Series

3.3 kW - 150 kW



Heavy Duty  
Laboratory DC  
Power Supplies

**INTEPRO**  
SYSTEMS

THE POWER TEST EXPERTS

# PS 9000 3U Series

3.3 kW - 150 kW



## Product Overview

The microprocessor controlled high efficiency laboratory power supplies of series 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.



PS 9000 3U

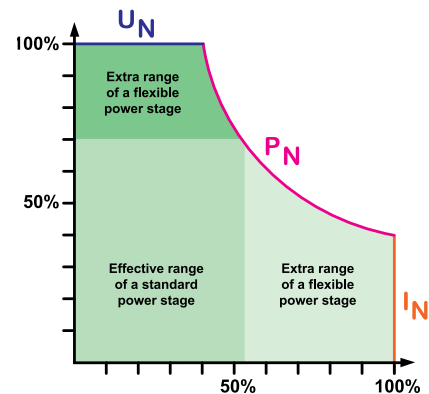
## Power

All models feature a flexible Auto-Ranging output stage which provides higher output current at reduced voltages so the source maintains maximum output power across a wide range of voltage operation.

Traditional DC sources offer a square operation curve meaning the source maintains maximum rated current at less than full scale voltage. A traditional 5kW DC source with a voltage range of 600V provides 10A. At 200V the source still offers 10A so only 2kW is actually delivered to the unit under test.

Auto-Ranging addresses this issue by automatically increasing the output current at reduced voltages. Take the PSI 9500-30 which is 5kW as an example. At 600V the source offers 10A. At 200V the source provides 25A which means the source maintains a 5kW output rating.

Auto-Range is especially useful when testing products that require varied input voltages while maintaining regulated output power. This feature often results in a single chassis solutions versus buying multiple sources to address low and high voltage / current requirements.



## 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 of 0...3,300W, 5,000W, 10,000W and 15,000W 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.

## Featured Benefits

- *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...750V*
- *Output currents: 0...30 A up to 0...510 A  
Expandable up to 0...5100 A*
- *Auto-ranging output stage*
- *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)*
- *USB and Ethernet port integrated or alternatively installed IEEE/GPIB port*
- *EMC TÜV approved for IEC 61000-6-2:2006 Class B*
- *SCPI command language supported*

## 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.

## 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. .

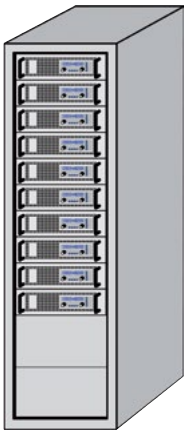
## Display & Controls

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.



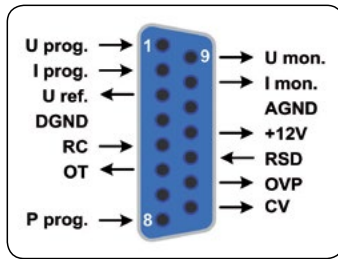
## Extensibility

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 <?>.

A so-called Share bus for the parallel connection and current balancing of up to 10 units, as well as an analog interface offer multiple possible configurations.

## Digital Interfaces

All models features two galvanically isolated, digital interfaces by default (standard: 1x USB & 1x Ethernet, with option 3W: 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.



## 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.

## Options

- *High speed ramping*
- *Water cooling (only for models up to 200 V)*
- *Three-way interface (3W) with a rigid GPIB port installed instead of the default Ethernet port*

Technical Data	Series PS 9000 3U
<b>Input AC</b>	
- Voltage standard	208VL-L; +/- 10%, 400VL-L; +/- 10%, 480VL-L; +/- 10%
- Frequency	45...66 Hz
- Power factor	>0.99
<b>Output voltage DC</b>	
- Accuracy	<0.1%
- Load regulation 0-100%	<0.05%
- Line regulation $\pm 10\% \Delta U_{AC}$	<0.02%
- Regulation 10-100% load	<2 ms
- Overvoltage protection	adjustable, 0...110% $U_{Nom}$
- No load discharge time on DC off	100% U auf / to <60 V: weniger als 10 s / less than 10 s
<b>Output current</b>	
- Accuracy	<0.2%
- Load regulation 0-100% $\Delta U_{DC}$	<0.15%
- Line regulation $\pm 10\% \Delta U_{AC}$	<0.05%
<b>Output power</b>	
- Accuracy	<1%
<b>Overvoltage category</b>	2
<b>Protection</b>	OT, OVP, OPP, PF, OCP <sup>(1)</sup>
<b>Isolation</b>	
- Input to enclosure	2500 V DC
- Input to output	2500 V DC
- Output to enclosure (PE)	Depending on model, see tables
<b>Pollution degree</b>	2
<b>Protection class</b>	1
<b>Display and panel</b>	Graphics display with touch panel
<b>Digital interfaces</b>	
- Built-in	1x USB type B for communication, 1x GPIB (optional with option 3W)
- Slot	1x for retrofittable plug-in modules (standard models only)
<b>Analog interface</b>	built-in, 15-pole D-Sub, female
- Input range	0...5 V or 0...10 V (switchable)
- Accuracy U / I	0...10 V: <0.2%      0...5 V: <0.4%
- Programming resolution	see tables below
<b>Series operation</b>	Possible, but depending on the isolation of DC- against PE
<b>Parallel operation</b>	Yes, with true master-slave, up to 10 units
<b>Standards</b>	EN 61326, IEC 1010, EN 61010 EMC TÜV approved according to IEC 61000-6-2:2005, IEC 61000-6-3:2006 Class B
<b>Cooling</b>	Fans (optional: water)
<b>Operation temperature</b>	0...50 °C
<b>Storage temperature</b>	-20...70 °C
<b>Relative humidity</b>	<80%, n.c.
<b>Operation altitude</b>	<2000 m
<b>Dimensions (W H D) <sup>(2)</sup></b>	19" 3 HE / 3U 609 mm

(1 See page 13

(2 Enclosure only, not overall

Technical Data	PS 9040-170 3U	PS 9080-170 3U	PS 9200-70 3U	PS 9360-40 3U
<b>Output voltage DC</b>	0...40 V	0...80 V	0...200 V	0...360 V
- Ripple <sup>(1)</sup>	<200 mV <sub>PP</sub> <16 mV <sub>RMS</sub>	<200 mV <sub>PP</sub> <16 mV <sub>RMS</sub>	<300 mV <sub>PP</sub> <40 mV <sub>RMS</sub>	<320 mV <sub>PP</sub> <55 mV <sub>RMS</sub>
-Sensing compensation	~ 1 V	~ 2 V	~ 5 V	~ 7.5 V
<b>Isolation</b>				
- Negative output <-> PE	±400 V DC	±400 V DC	±400 V DC	±400 V DC
- Positive output <-> PE	±400 V DC	±400 V DC	±600 V DC	±600 V DC
<b>Output current</b>	0...170 A	0...170 A	0...70 A	0...40 A
- Ripple <sup>(1)</sup>	<80 mA <sub>RMS</sub>	<80 mA <sub>RMS</sub>	<22 mA <sub>RMS</sub>	<18 mA <sub>RMS</sub>
<b>Output power</b>	0...3300 W	0...5000 W	0...5000 W	0...5000 W
<b>Efficiency</b>	~93%	~93%	~95%	~93%
<b>Programming resolution U</b>	≤2 mV	≤4 mV	≤9 mV	≤15 mV
<b>Programming accuracy U</b>	≤40 mV	≤80 mV	≤200 mV	≤360 mV
<b>Programming resolution I</b>	≤7 mA	≤7 mA	≤3 mA	≤2 mA
<b>Programming accuracy I</b>	≤340 mA	≤340 mA	≤140 mA	≤80 mA
<b>Weight <sup>(2)</sup></b>	~17 kg	~17 kg	~17 kg	~17 kg

Technical Data	PS 9500-30 3U	PS 9750-20 3U	PS 9040-340 3U	PS 9040-510 3U
<b>Output voltage DC</b>	0...500 V	0...750 V	0...40 V	0...40 V
- Ripple <sup>(1)</sup>	<350 mV <sub>PP</sub> <70 mV <sub>RMS</sub>	<800 mV <sub>PP</sub> <200 mV <sub>RMS</sub>	<320 mV <sub>PP</sub> <25 mV <sub>RMS</sub>	<320 mV <sub>PP</sub> <25 mV <sub>RMS</sub>
-Sensing compensation	~ 10 V	~ 15 V	~ 1 V	~ 1 V
<b>Isolation</b>				
- Negative output <-> PE	±725 V DC	±725 V DC	±400 V DC	±400 V DC
- Positive output <-> PE	±1000 V DC	±1000 V DC	±400 V DC	±400 V DC
<b>Output current</b>	0...30 A	0...20 A	0...340 A	0...510 A
- Ripple <sup>(1)</sup>	<16 mA <sub>RMS</sub>	<16 mA <sub>RMS</sub>	<160 mA <sub>RMS</sub>	<120 mA <sub>RMS</sub>
<b>Output power</b>	0...5000 W	0...5000 W	0...6600 W	0...10000 W
<b>Efficiency</b>	~95.5%	~94%	~93%	~93%
<b>Programming resolution U</b>	≤21 mV	≤31 mV	≤2 mV	≤2 mV
<b>Programming accuracy U</b>	≤500 mV	≤750 mV	≤40 mV	≤40 mV
<b>Programming resolution I</b>	≤2 mA	≤1 mA	≤14 mA	≤21 mA
<b>Programming accuracy I</b>	≤60 mA	≤40 mA	≤680 mA	≤1.1 A
<b>Weight <sup>(2)</sup></b>	~17 kg	~17 kg	~24 kg	~30 kg

(1) RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

(2) Weight of the standard version, models with options may vary

Technical Data	PS 9080-340 3U	PS 9200-140 3U	PS 9360-80 3U	PS 9500-60 3U
<b>Output voltage DC</b>	0...80 V	0...200 V	0...360 V	0...500 V
- Ripple <sup>(1)</sup>	<320 mV <sub>PP</sub> <25 mV <sub>RMS</sub>	<300 mV <sub>PP</sub> <40 mV <sub>RMS</sub>	<320 mV <sub>PP</sub> <55 mV <sub>RMS</sub>	<350 mV <sub>PP</sub> <70 mV <sub>RMS</sub>
-Sensing compensation	~ 2 V	~ 5 V	~ 7.5 V	~ 10 V
<b>Isolation</b>				
- Negative output <-> PE	±400 V DC	±400 V DC	±400 V DC	±725 V DC
- Positive output <-> PE	±400 V DC	±600 V DC	±600 V DC	±1000 V DC
<b>Output current</b>	0...340 A	0...140 A	0...80 A	0...60 A
- Ripple <sup>(1)</sup>	<160 mA <sub>RMS</sub>	<44 mA <sub>RMS</sub>	<35 mA <sub>RMS</sub>	<32 mA <sub>RMS</sub>
<b>Output power</b>	0...10000 W	0...10000 W	0...10000 W	0...10000 W
<b>Efficiency</b>	~93%	~95%	~93%	~95%
<b>Programming resolution U</b>	≤4 mV	≤9 mV	≤15 mV	≤21 mV
<b>Programming accuracy U</b>	≤80 mV	≤200 mV	≤350 mV	≤500 mV
<b>Programming resolution I</b>	≤14 mA	≤6 mA	≤4 mA	≤3 mA
<b>Programming accuracy I</b>	≤680 mA	≤280 mA	≤160 mA	≤120 mA
<b>Weight <sup>(2)</sup></b>	~24 kg	~24 kg	~24 kg	~24 kg
<b>Article number <sup>(3)</sup></b>	06230257	06230258	06230259	06230260

Technical Data	PS 9750-40 3U	PS 91000-30 3U	PS 9080-510 3U	PS 9200-210 3U
- Ripple <sup>(1)</sup>	<800 mV <sub>PP</sub> <200 mV <sub>RMS</sub>	<1600 mV <sub>PP</sub> <350 mV <sub>RMS</sub>	<320 mV <sub>PP</sub> <25 mV <sub>RMS</sub>	<300 mV <sub>PP</sub> <40 mV <sub>RMS</sub>
- Sensing compensation	~15 V	~20 V	~2.5 V	~6 V
<b>Isolation</b>				
- Negative output <-> PE	±725 V DC	±725 V DC	±400 V DC	±400 V DC
- Positive output <-> PE	±1000 V DC	±1000 V DC	±400 V DC	±600 V DC
<b>Output current</b>	0...40 A	0...30 A	0...510 A	0...210 A
- Ripple <sup>(1)</sup>	<32 mA <sub>RMS</sub>	<22 mA <sub>RMS</sub>	<240 mA <sub>RMS</sub>	<66 mA <sub>RMS</sub>
<b>Output power</b>	0...10000 W	0...10000 W	0...15000 W	0...15000 W
<b>Efficiency</b>	~94%	~95%	~93%	~95%
<b>Programming resolution U</b>	≤31 mV	≤41 mV	≤4 mV	≤9 mV
<b>Programming accuracy U</b>	≤750 mV	≤1 V	≤80 mV	≤200 mV
<b>Programming resolution I</b>	≤2 mA	≤2 mA	≤21 mA	≤9 mA
<b>Programming accuracy I</b>	≤80 mA	≤60 mA	≤1.1 A	≤420 mA
<b>Weight <sup>(2)</sup></b>	~24 kg~24 kg	~24 kg	~30 kg	~30 kg
<b>Article number <sup>(3)</sup></b>	06230261	06230262	06230264	06230265

(1) RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

(2) Weight of the standard version, models with options may vary

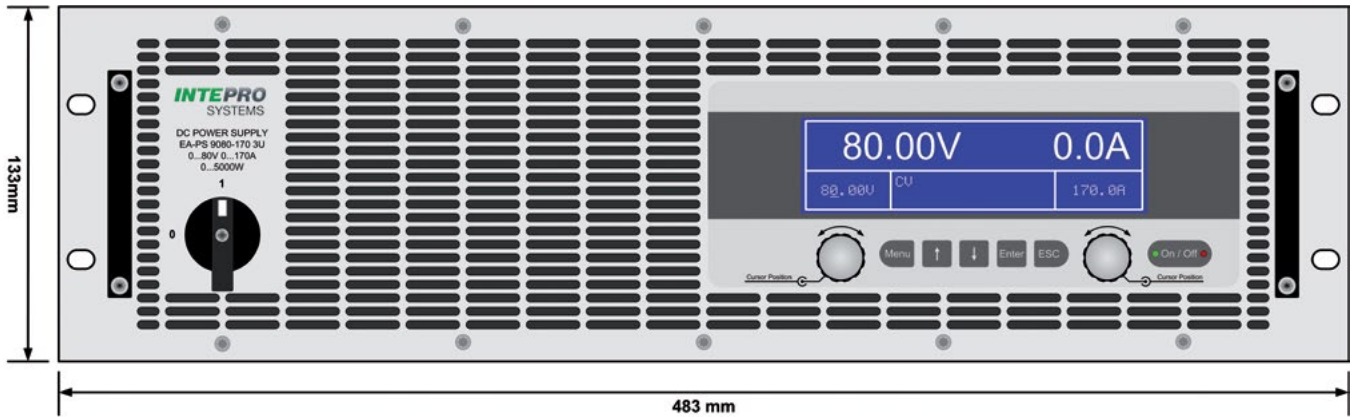
(3) Article number of the standard version, models with option 3W installed have different article numbers



Technical Data	PS 9360-120 3U	PS 9500-90 3U	PS 9750-60 3U	PS 91500-30 3U
<b>Output voltage DC</b>	0...360 V	0...500 V	0...750 V	0...1500 V
- Ripple <sup>(1)</sup>	<320 mV <sub>PP</sub> <55 mV <sub>RMS</sub>	<350 mV <sub>PP</sub> <70 mV <sub>RMS</sub>	<800 mV <sub>PP</sub> <200 mV <sub>RMS</sub>	<2400 mV <sub>PP</sub> <400 mV <sub>RMS</sub>
-Sensing compensation	~7.5 V	~10 V	~15 V	~30 V
<b>Isolation</b>				
- Negative output <-> PE	±400 V DC	±725 V DC	±725 V DC	±725 V DC
- Positive output <-> PE	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC
<b>Output current</b>	0...120 A	0...90 A	0...60 A	0...30 A
- Ripple <sup>(1)</sup>	<50 mA <sub>RMS</sub>	<48 mA <sub>RMS</sub>	<48 mA <sub>RMS</sub>	<26 mA <sub>RMS</sub>
<b>Output power</b>	0...15000 W	0...15000 W	0...15000 W	0...15000 W
<b>Efficiency</b>	~93%	~95%	~94%	~95%
<b>Programming resolution U</b>	≤15 mV	≤21 mV	≤31 mV	≤61 mV
<b>Programming accuracy U</b>	≤350 mV	≤500 mV	≤750 mV	≤1.5 V
<b>Programming resolution I</b>	≤5 mA	≤4 mA	≤3 mA	≤2 mA
<b>Programming accuracy I</b>	≤240 mA	≤180 mA	≤120 mA	≤60 mA
<b>Weight <sup>(2)</sup></b>	~30 kg	~30 kg	~30 kg	~30 kg

(1) RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

(2) Weight of the standard version, models with options may vary

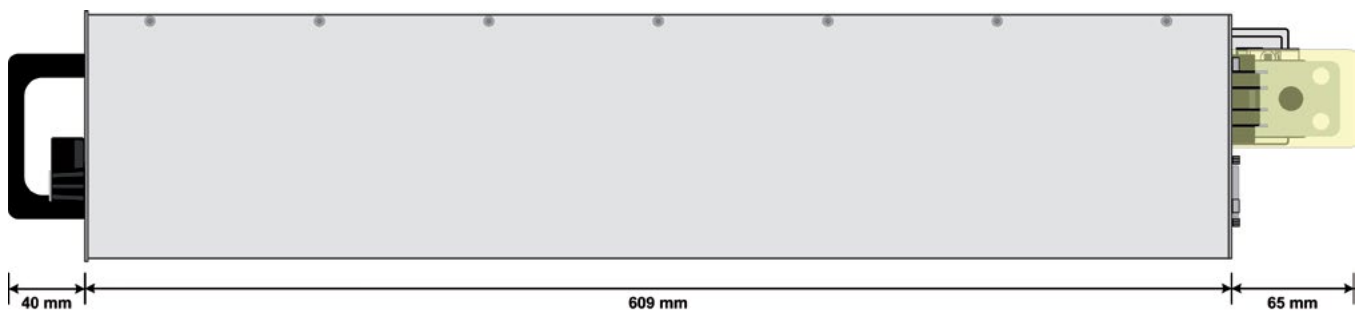
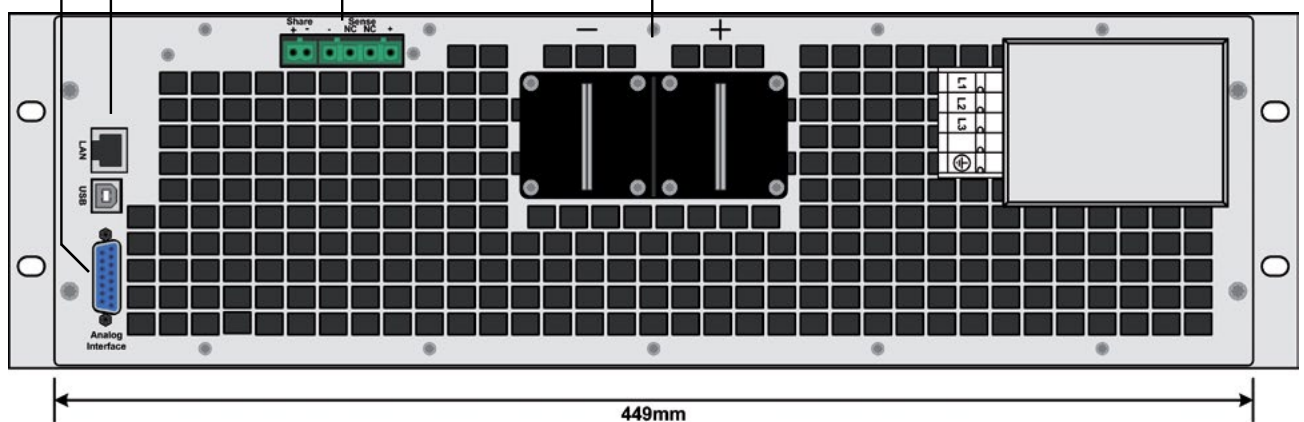


Analog interface

Digital interfaces (USB, LAN or GPIB)

Connector for remote sensing and Share bus

DC output



## Contact Us

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