

PSB 9000 3U Series

5 kW to 15 kW



Programmable
Bi-Directional DC
Power Supply

INTEPRO
SYSTEMS

THE POWER TEST EXPERTS

PSB 9000 3U Series

5 kW to 15 kW



Product Overview

The PSB 9000 Series is a microprocessor controlled bi-directional supply that features two devices in one: an electronic DC load with energy recovery and an auto-ranging DC power supply. This allows for two-quadrant operation out of a powerful instrument that is efficient and easy to use. Combining the features of the ELR 9000 Series (DC Load) and the PSI 9000 Series (DC Supply) into one chassis can free up extra cabinet space and reduce generated heat all while recovering loaded energy back to your local mains. If you are looking at solutions for charge & discharge testing, the PSB 9000 Series can provide you with a quick ROI and can be easily integrated into existing test environments.



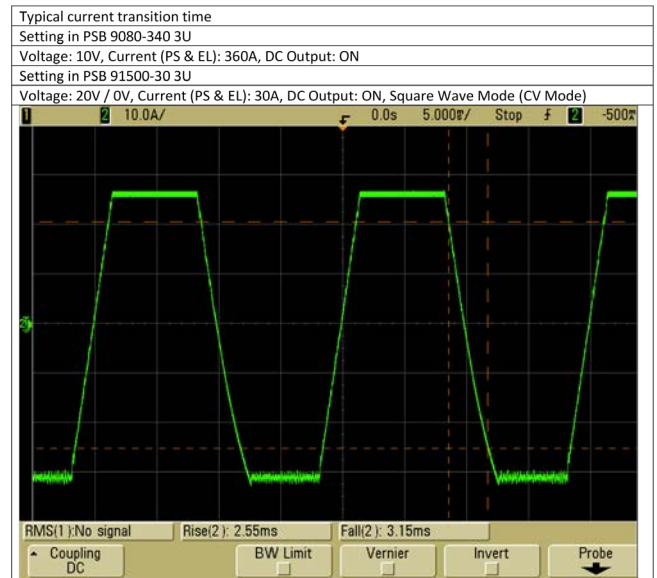
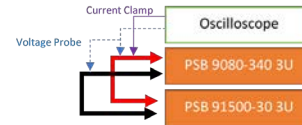
PSB 9000 3U

Source or Sink - it's a smooth transition

All PSBs act as a DC power source as well as a DC recycling load. They can be programmed to seamlessly switch between source and sink with no "off" time. When operating as the load, the device synchronizes with the 342 to 528 VAC 3-phase mains to recover upwards of 94% of the energy. When operating as a source, the unit has an efficiency up to 93% generating less heat in both modes. This provides further energy savings by reducing the cooling costs in the test environment.

DC voltages range from 0-60 V and 0-2000 V with sink and source DC currents ranging from 0-40 A and 0-1000 A. Output power ranges from 5 kW expandable up to 1.08MW. All connections are located on the rear panel.

Test Diagram

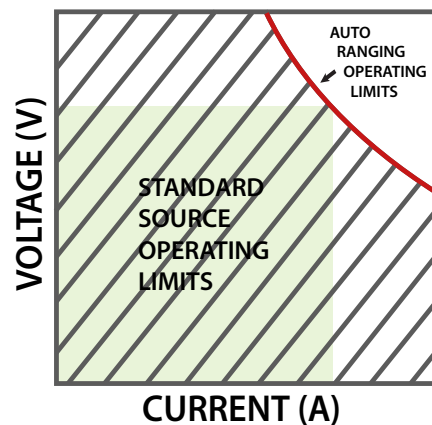


Featured Benefits

- AC connection: 360-528 VAC
- No derating in sink mode
- Energy recovery with high efficiency
- Power ratings: 5 kW, 10 kW or 15 kW, expandable up to 1.08 kW
- Voltage ratings: 60 V up to 1500 V
- Current ratings: 30 A up to 360 A
- Flexible, power regulated DC/AC stage
- Various protection circuits (OVP, OCP, OPP, OTP)
- Intuitive TFT touch panel with display for values, status and notifications
- Galvanically isolated, analog interface
- Integrated function generator
- Battery Test
- Photovoltaic array simulation
- MPP tracking simulation
- Two-quadrants operation mode
- USB port integrated
- Optional, digital interface modules
- LabView support by VI package
- Supports SCPI command language and ModBus RTU

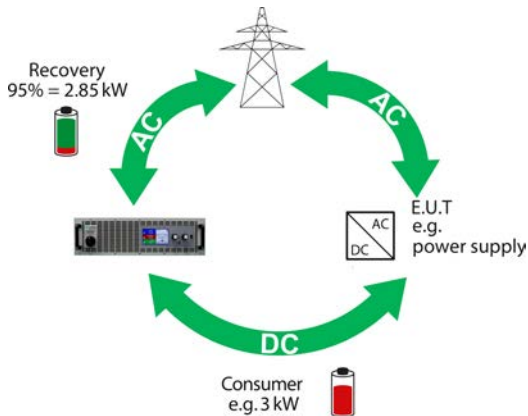
Auto-ranging Power Stage

All models are equipped with a flexible auto-ranging, bi-directional power stage. As a result, each model can achieve higher output voltage at lower output current and vice versa, with the max output power being the limiting factor.



Protective Features

For protection of connected equipment, user-defined thresholds for OVP, OCP and OPP are available. As soon as one of the thresholds is reached, the DC output is shut off and a status signal is generated on the display and sent via any connected interfaces. The device also features OTT, which will shut off the DC output if it overheats.



Energy Recovery

The most innovative feature of the electronic load is that the AC input, i.e. grid connection, is also used to recover loaded DC energy at an efficiency of 93%. This method of energy recovery helps to lower operational costs and avoids the necessity for expensive cooling systems. Conventional electronic loads dissipate loaded DC energy into heat which needs to be accounted for in facilities management.

AC Input/Output

All PSB 9000's are equipped with an active Power Factor Correction circuit and are designed for use on 2 or 3 Phase Inputs ranging from 400 to 480 VAC. When operating as a load, the device synchronizes with the mains and regenerates loaded energy back to the local power network. Since the unit generates less heat than a traditional load, further energy savings are realized by reduced cooling costs in the test environment.

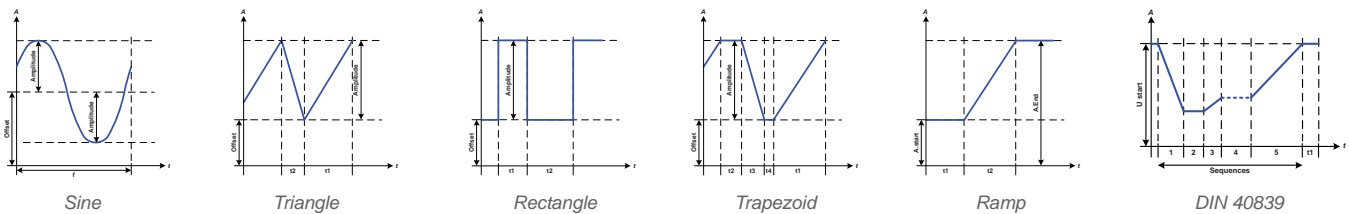
DC Terminal

DC voltages range from 0-60 V and 0-1500 V and DC currents range from 0-30 A and 0-360 A. Output power ranges from 5 to 15kW. The DC Output is located on the rear panel.

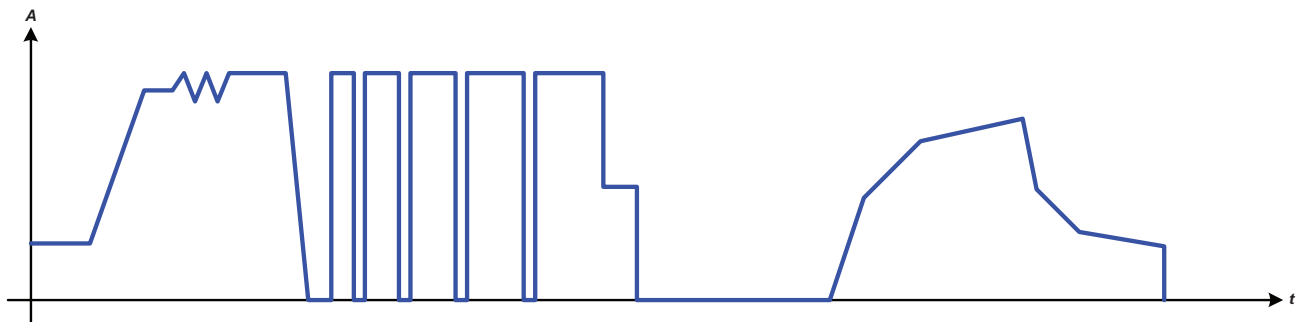
Function Generator

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.

In addition to the standard functions, which are all based upon an arbitrary generator, this base generator is accessible for the creation and execution of complex sets of functions, separated into up to 99 sequence points. Those can be used for testing purposes in development and production. The sequence points can be loaded from and saved to a standard USB flash drive via the USB port on the frontal panel, making it easy to change between different test sequences.

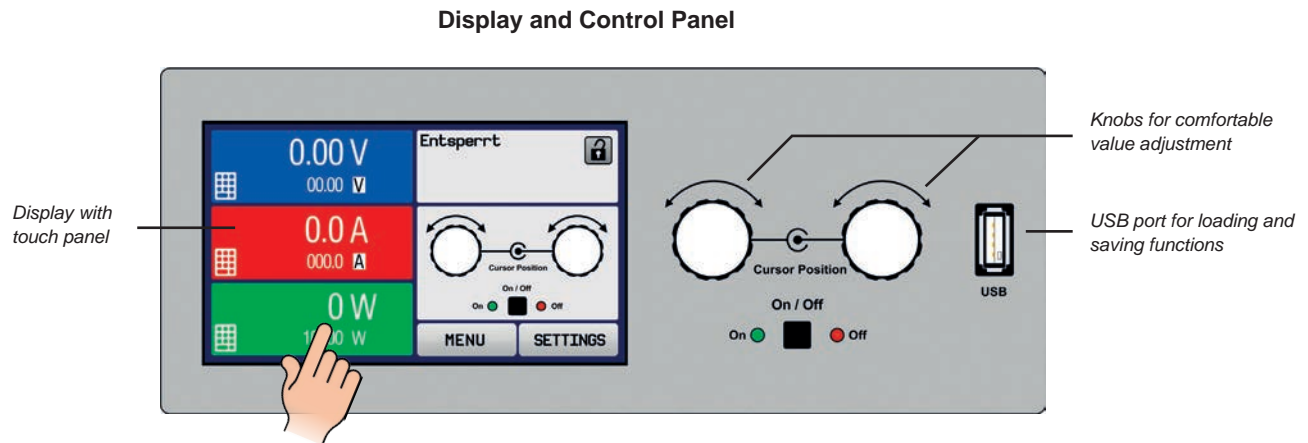


The figure below shows a fictional example of a complex function of 40 sequences, as it can be realized with the arbitrary generator. The function can be created on the device or externally and then loaded or saved:



Display and Control Panel

Set values and actual values of input & output voltage / current / 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. Set values of voltage, current, power or 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.



Master-Slave

All models feature a digital master-slave bus by default. It can be used to connect up to 32 units of identical models in parallel operation to a bigger system with total formation of the actual value of voltage, current, and power. The configuration of the master-slave system is either completely done on the control panels of the units or is possible by manual or remote control (any interface).

Analog Interface

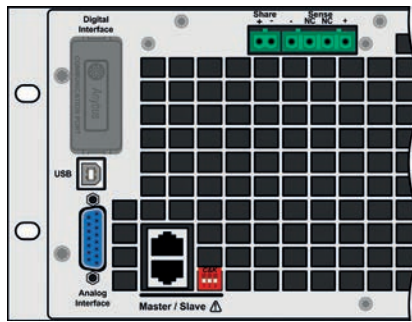
There is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current, power and resistance from 0-100% through control voltages of 0V-10V or 0V-5V. Several inputs and outputs are available for controlling and monitoring the device status.

Control Software

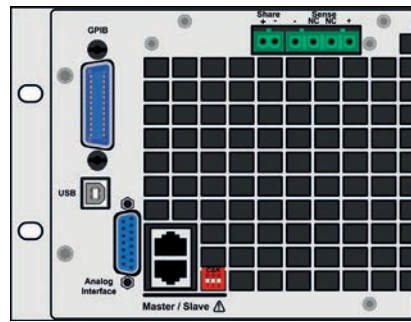
Included with the device is a control software for Windows PC, which allows for the remote control of multiple identical or even different types of devices. It has a clear interface for all set and actual values, a direct input mode for SCPI and ModBus RTU commands, a firmware update feature and the semi-automatic table control named "Sequencing".

Options

- Digital interface modules for RS232, CANopen, Modbus TCP, Profibus, Profinet/IO, Devicenet or Ethernet. The interface slot is located on the rear panel (standard models only), making it easy for the user to plug in a new interface or to replace an existing one. The interface will be automatically detected by the device and requires no or only little configuration.
- Three-way interface (3W) with a rigid GPIB port installed instead of the default slot for retrofittable interface modules.



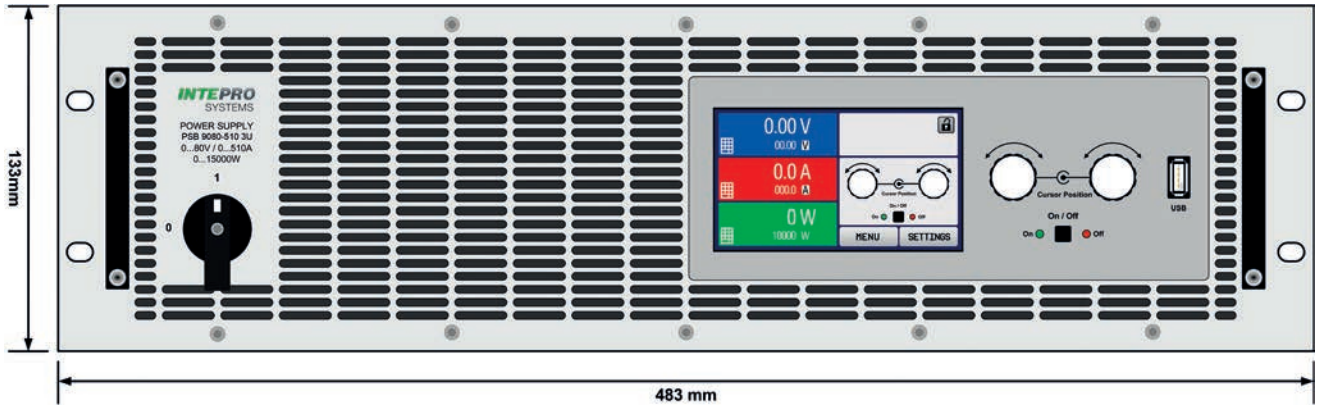
Rear connectors of the standard models



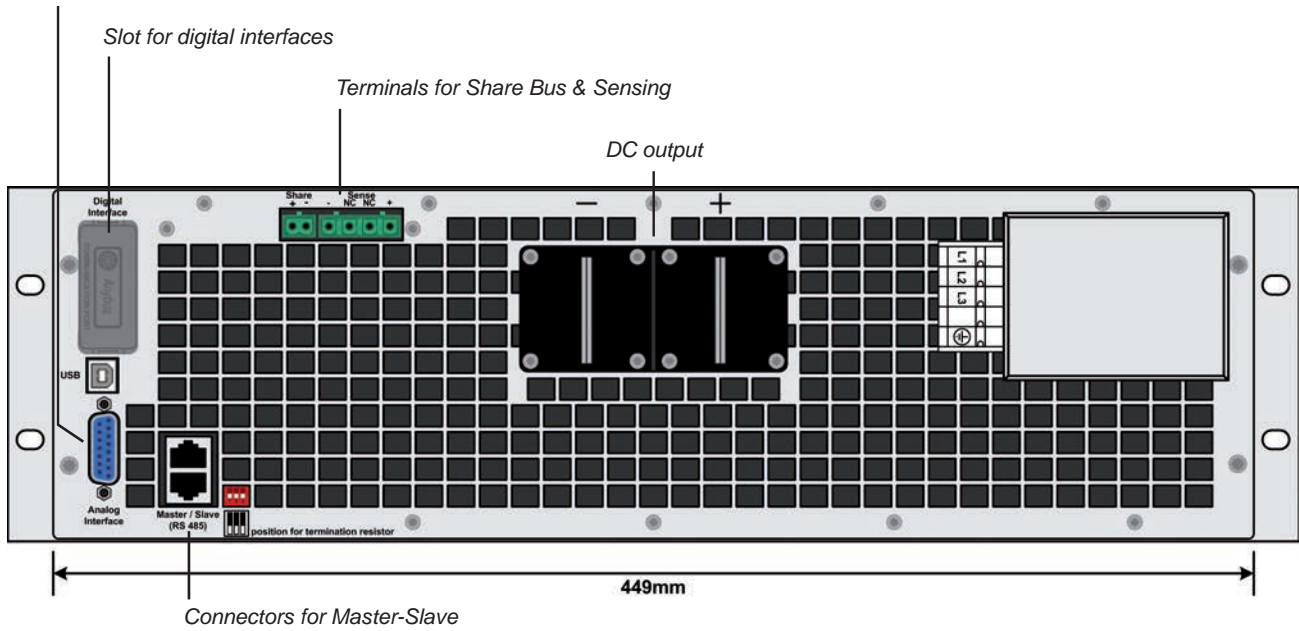
Rear connectors of models with option 3W

* Not available for all voltages - please quote for availability

** Generally available for models up to 200 V, for other models upon request

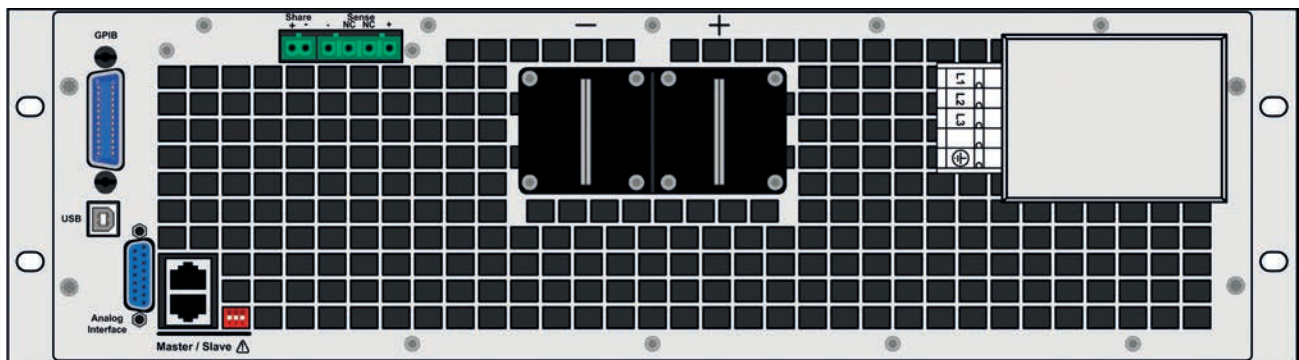


USB and analog interface

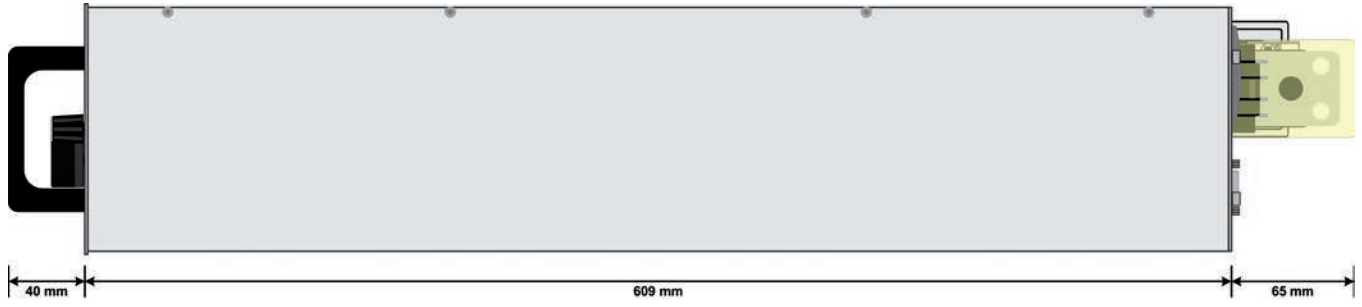


Connectors for Master-Slave

Rear view of base model



Rear view with option 3W



Technical Data

5 kW	Model 400 V / 480 V				
	PSB 9060-120	PSB 9080-120	PSB 9200-70	PSB 9360-40	PSB 9500-30
AC supply					
Voltage range (L-L), frequency	342...528 V AC, 45 - 66 Hz				
Connection	2ph, PE				
Leak current	< 3.5 mA				
Phase current	max. 16 A				
Power factor	≈ 0.99				
Efficiency of energy recovery	≤ 92.5%	≤ 92.5%	≤ 93.5%	≤ 93.5%	≤ 94.5%
DC terminal					
Max. voltage U_{Max}	60 V	80 V	200 V	360 V	500 V
Max. current I_{Max}	120 A	120 A	70 A	40 A	30 A
Max. power P_{Max}	5000 W	5000 W	5000 W	5000 W	5000 W
Overvoltage protection range	0...66 V	0...88 V	0...220 V	0...396 V	0...550 V
Overcurrent protection range	0...132 A	0...132 A	0...77 A	0...44 A	0...33 A
Overpower protection range	0...5500 W	0...5500 W	0...5500 W	0...5500 W	0...5500 W
Temperature coefficient for set values Δ/K	Voltage / current: 100 ppm				
Capacitance (approx.)	7990 μ F	7990 μ F	2520 μ F	390 μ F	180 μ F
Voltage regulation (general)					
Adjustment range	0...61.2 V	0...81.6 V	0...204 V	0...367.2 V	0...510 V
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy ⁽³⁾	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}
Remote sensing compensation	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}
Voltage regulation (power supply)					
Load regulation at 0...100% ΔI_{OUT}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Rise time 10...90% ΔU_{OUT}	Max. 30 ms	Max. 30 ms	Max. 30 ms	Max. 30 ms	Max. 30 ms
Transient time after ΔI_{OUT}	< 1.5 ms	< 1.5 ms	< 1.5 ms	< 1.5 ms	< 1.5 ms
Ripple ⁽²⁾	< 200 mV _{PP} < 16 mV _{RMS}	< 200 mV _{PP} < 16 mV _{RMS}	< 300 mV _{PP} < 40 mV _{RMS}	< 320 mV _{PP} < 55 mV _{RMS}	< 350 mV _{PP} < 70 mV _{RMS}
Fall time at no load after switching DC output off	Down from 100% to <60 V: less than 10 s				
Voltage regulation (el. load)					
Load regulation at 0...100% ΔU	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Current regulation (general)					
Adjustment range	0...122.4 A	0...122.4 A	0...71.4 A	0...40.8 A	0...30.6 A
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy ⁽³⁾	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}
Current regulation (power supply)					
Load regulation at 0...100% ΔU_{OUT}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Current regulation (el. load)					
Load regulation at 0...100% ΔU_{IN}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Ripple ⁽²⁾	< 80 mA _{RMS}	< 80 mA _{RMS}	< 22 mA _{RMS}	< 18 mA _{RMS}	< 16 mA _{RMS}

(1) Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.

Example: an 80 V model has min. 0.1% voltage accuracy, that is 80 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 80 mV, which means it might be between 4.92 V and 5.08 V.

(2) RMS value: LF 0...300 kHz, PP value: HF 0...20MHz

(3) The display error adds to the error of the related actual value on the DC terminal

5 kW	Model 400 V / 480 V				
	PSB 9060-120	PSB 9080-120	PSB 9200-70	PSB 9360-40	PSB 9500-30
Power regulation					
Adjustment range	0...5100 W	0...5100 W	0...5100 W	0...5100 W	0...5100 W
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}
Line regulation at ±10% ΔU _{AC}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}
Load reg. at 10-90% ΔU _{DC} * ΔI _{DC}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy ⁽²⁾	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}
Efficiency ⁽⁵⁾	≈ 93%	≈ 93%	≈ 95%	≈ 95%	≈ 95,5%
Resistance regulation					
Adjustment range	0.02...25 Ω	0.02...25 Ω	0.1...150 Ω	0.3...520 Ω	0.5...1000 Ω
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	≤1% of max. resistance ± 0.3% of maximum current				
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“				
Analog interface ⁽³⁾					
Signals	See „3.6.4.4. Analog interface specification“				
Galvanic isolation to the device	Max. 1500 V DC				
Sample rate of inputs & outputs	500 Hz				
Insulation					
Allowed potential shift (floating voltage) on the DC terminal:					
Negative DC to PE	Max. ±400 V DC	±400 V DC	±725 V DC	±725 V DC	±1500 V DC
Positive DC to PE	Max. ±400 V DC	±400 V DC	±1000 V DC	±1000 V DC	±1800 V DC
AC input <-> PE	2.5 kV DC				
AC input <-> DC terminal	2.5 kV DC				
Miscellaneous					
Cooling	Temperature controlled fans, front inlet, rear exhaust				
Ambient temperature	0...50 °C (32...133 °F)				
Storage temperature	-20...70 °C (-4...158 °F)				
Humidity	< 80%, not condensing				
Standards	EN 61010-1:2007-11, EN 50160:2011-02 EN 61000-6-2:2016-05, EN 61000-6-3:2011-09				
Overvoltage category	2				
Protection class	1				
Pollution degree	2				
Operational altitude	< 2000 m (1.242 mi)				
Digital interfaces					
Featured	1x USB-B for communication, 1x USB-A for functions, 1x GPIB (optional)				
Slot (standard version)	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, Ether-CAT				
Galvanic isolation from device	Max. 1500 V DC				
Terminals					
Rear side	Share Bus, DC terminal, AC supply, remote sensing, analog interface, USB, master-slave bus, interface module slot (standard version) or GPIB (optional)				
Front side	USB for sticks				
Dimensions					
Enclosure (W x H x D)	19" x 3U x 670 mm (26.4")				
Total (W x H x D)	483 x 133 x 775 mm (19" x 5.2" x 30.5")				
Weight	≈18 kg (39.7 lb)	≈18 kg (39.7 lb)	≈18 kg (39.7 lb)	≈18 kg (39.7 lb)	≈18 kg (39.7 lb)

(1) Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value. With the resistance, the accuracy rating already includes the error of the actual resistance display.

(2) The display error adds to the error of the related actual value on the DC terminal

(3) For technical specifications of the analog interface see „3.6.4.4 Analog interface specification“ on page 60 of the user manual

(4) Article number of the standard version, devices with options will have a different number

(5) Typical value at 100% voltage and 100% power

5 kW / 10 kW	Model 400 V / 480 V				
	PSB 9750-20	PSB 9060-240	PSB 9080-240	PSB 9200-140	PSB 9360-80
AC supply					
Voltage range (L-L), frequency	342...528 V AC, 45 - 66 Hz				
Connection	2ph, PE	3ph, PE	3ph, PE	3ph, PE	3ph, PE
Leak current	< 3.5 mA	< 3.5 mA	< 3.5 mA	< 3.5 mA	< 3.5 mA
Phase current	max. 16 A	max. 28 A	max. 28 A	max. 28 A	max. 28 A
Power factor	≈ 0.99				
Efficiency of energy recovery	≤ 94.5%	≤ 92.5%	≤ 92.5%	≤ 93.5%	≤ 93.5%
DC terminal					
Max. voltage U_{Max}	750 V	60 V	80 V	200 V	360 V
Max. current I_{Max}	20 A	240 A	240 A	140 A	80 A
Max. power P_{Max}	5000 W	10000 W	10000 W	10000 W	10000 W
Overvoltage protection range	0...825 V	0...66 V	0...88 V	0...220 V	0...396 V
Overcurrent protection range	0...22 A	0...264 A	0...264 A	0...154 A	0...88 A
Overpower protection range	0...5500 W	0...11000 W	0...11000 W	0...11000 W	0...11000 W
Temperature coefficient for set values Δ/K	Voltage / current: 100 ppm				
Capacitance (approx.)	180 μ F	15980 μ F	15980 μ F	5040 μ F	780 μ F
Voltage regulation (general)					
Adjustment range	0...765 V	0...61.2 V	0...81.6 V	0...204 V	0...367.2 V
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy ⁽³⁾	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}
Remote sensing compensation	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}
Voltage regulation (power supply)					
Load regulation at 0...100% ΔI_{OUT}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Rise time 10...90% ΔU_{OUT}	Max. 30 ms	Max. 30 ms	Max. 30 ms	Max. 30 ms	Max. 30 ms
Transient time after ΔI_{OUT}	< 1.5 ms	< 1.5 ms	< 1.5 ms	< 1.5 ms	< 1.5 ms
Ripple ⁽²⁾	< 800 mV _{PP} < 200 mV _{RMS}	< 320 mV _{PP} < 25 mV _{RMS}	< 320 mV _{PP} < 25 mV _{RMS}	< 300 mV _{PP} < 40 mV _{RMS}	< 320 mV _{PP} < 55 mV _{RMS}
Fall time at no load after switching DC output off	Down from 100% to <60 V: less than 10 s				
Voltage regulation (el. load)					
Load regulation at 0...100% ΔU	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Current regulation (general)					
Adjustment range	0...20.4 A	0...244.8 A	0...244.8 A	0...142.8 A	0...81.6 A
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy ⁽³⁾	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}
Current regulation (power supply)					
Load regulation at 0...100% ΔU_{OUT}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Current regulation (el. load)					
Load regulation at 0...100% ΔU_{IN}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Ripple ⁽²⁾	< 16 mA _{RMS}	< 160 mA _{RMS}	< 160 mA _{RMS}	< 44 mA _{RMS}	< 35 mA _{RMS}

(1) Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.

Example: an 80 V model has min. 0.1% voltage accuracy, that is 80 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 80 mV, which means it might be between 4.92 V and 5.08 V.

(2) RMS value: LF 0...300 kHz, PP value: HF 0...20MHz

(3) The display error adds to the error of the related actual value on the DC terminal

5 kW / 10 kW	Model 400 V / 480 V				
	PSB 9750-20	PSB 9060-240	PSB 9080-240	PSB 9200-140	PSB 9360-80
Power regulation					
Adjustment range	0...5100 W	0...10200 W	0...10200 W	0...10200 W	0...10200 W
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}
Line regulation at ±10% ΔU _{AC}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}
Load reg. at 10-90% ΔU _{DC} * ΔI _{DC}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy ⁽²⁾	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}
Efficiency ⁽⁵⁾	≈ 94%	≈ 93%	≈ 93%	≈ 95%	≈ 93%
Resistance regulation					
Adjustment range	1.2...2200 Ω	0.01...13 Ω	0.01...13 Ω	0.05...75 Ω	0.15...260 Ω
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	≤1% of max. resistance ± 0.3% of maximum current				
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“				
Analog interface ⁽³⁾					
Signals	See „3.6.4.4. Analog interface specification“				
Galvanic isolation to the device	Max. 1500 V DC				
Sample rate of inputs & outputs	500 Hz				
Insulation					
Allowed potential shift (floating voltage) on the DC terminal:					
Negative DC to PE	Max. ±1500 V DC	±400 V DC	±400 V DC	±725 V DC	±725 V DC
Positive DC to PE	Max. ±1800 V DC	±400 V DC	±600 V DC	±1000 V DC	±1000 V DC
AC input <-> PE	2.5 kV DC				
AC input <-> DC terminal	2.5 kV DC				
Miscellaneous					
Cooling	Temperature controlled fans, front inlet, rear exhaust				
Ambient temperature	0...50 °C (32...133 °F)				
Storage temperature	-20...70 °C (-4...158 °F)				
Humidity	< 80%, not condensing				
Standards	EN 61010-1:2007-11, EN 50160:2011-02 EN 61000-6-2:2016-05, EN 61000-6-3:2011-09				
Overvoltage category	2				
Protection class	1				
Pollution degree	2				
Operational altitude	< 2000 m (1.242 mi)				
Digital interfaces					
Featured	1x USB-B for communication, 1x USB-A for functions, 1x GPIB (optional)				
Slot (standard version)	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, Ether-CAT				
Galvanic isolation from device	Max. 1500 V DC				
Terminals					
Rear side	Share Bus, DC terminal, AC supply, remote sensing, analog interface, USB, master-slave bus, interface module slot (standard version) or GPIB (optional)				
Front side	USB for sticks				
Dimensions					
Enclosure (W x H x D)	19" x 3U x 670 mm (26.4")				
Total (W x H x D)	483 x 133 x 775 mm (19" x 5.2" x 30.5")				
Weight	≈18 kg (39.7 lb)	≈25 kg (55.1 lb)	≈25 kg (55.1 lb)	≈25 kg (55.1 lb)	≈25 kg (55.1 lb)

(1) Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value. With the resistance, the accuracy rating already includes the error of the actual resistance display.

(2) The display error adds to the error of the related actual value on the DC terminal

(3) For technical specifications of the analog interface see „3.6.4.4 Analog interface specification“ on page 60 of user manual

(4) Article number of the standard version, devices with options will have a different number

(5) Typical value at 100% voltage and 100% power

10 kW / 15 kW	Model 400 V / 480 V			
	PSB 9500-60	PSB 9750-40	PSB 9060-360	PSB 9080-360
AC supply				
Voltage range (L-L), frequency	342...528 V AC, 45 - 66 Hz			
Connection	3ph, PE	3ph, PE	3ph, PE	3ph, PE
Leak current	< 3.5 mA	< 3.5 mA	< 3.5 mA	< 3.5 mA
Phase current	max. 28 A	max. 28 A	max. 28 A	max. 28 A
Power factor	≈ 0.99			
Efficiency of energy recovery	≤ 94.5%	≤ 94.5%	≤ 92.5%	≤ 92.5%
DC terminal				
Max. voltage U_{Max}	500 V	750 V	60 V	80 V
Max. current I_{Max}	60 A	40 A	360 A	360 A
Max. power P_{Max}	10000 W	10000 W	15000 W	15000 W
Overvoltage protection range	0...550 V	0...825 V	0...66 V	0...88 V
Overcurrent protection range	0...66 A	0...44 A	0...396 A	0...396 A
Overpower protection range	0...11000 W	0...11000 W	0...16500 W	0...16500 W
Temperature coefficient for set values Δ/K	Voltage / current: 100 ppm			
Capacitance (approx.)	360 μ F	360 μ F	23970 μ F	23970 μ F
Voltage regulation (general)				
Adjustment range	0...510 V	0...765 V	0...61.2 V	0...81.6 V
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“			
Display: Accuracy ⁽³⁾	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}
Remote sensing compensation	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}
Voltage regulation (power supply)				
Load regulation at 0...100% ΔI_{OUT}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Rise time 10...90% ΔU_{OUT}	Max. 30 ms	Max. 30 ms	Max. 30 ms	Max. 30 ms
Transient time after ΔI_{OUT}	< 1.5 ms	< 1.5 ms	< 1.5 ms	< 1.5 ms
Ripple ⁽²⁾	< 350 mV _{PP} < 70 mV _{RMS}	< 800 mV _{PP} < 200 mV _{RMS}	< 320 mV _{PP} < 25 mV _{RMS}	< 320 mV _{PP} < 25 mV _{RMS}
Fall time at no load after switching DC output off	Down from 100% to <60 V: less than 10 s			
Voltage regulation (el. load)				
Load regulation at 0...100% ΔU	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Current regulation (general)				
Adjustment range	0...61.2 A	0...40.8 A	0...367.2 A	0...367.2 A
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“			
Display: Accuracy ⁽³⁾	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}
Current regulation (power supply)				
Load regulation at 0...100% ΔU_{OUT}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Current regulation (el. load)				
Load regulation at 0...100% ΔU_{IN}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Ripple ⁽²⁾	< 32 mA _{RMS}	< 32 mA _{RMS}	< 240 mA _{RMS}	< 240 mA _{RMS}

(1 Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.

Example: an 80 V model has min. 0.1% voltage accuracy, that is 80 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 80 mV, which means it might be between 4.92 V and 5.08 V.

(2 RMS value: LF 0...300 kHz, PP value: HF 0...20MHz

(3 The display error adds to the error of the related actual value on the DC terminal

10 kW / 15 kW	Model 400 V / 480 V			
	PSB 9500-60	PSB 9750-40	PSB 9060-360	PSB 9080-360
Power regulation				
Adjustment range	0...10200 W	0...10200 W	0...15300 W	0...15300 W
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}
Line regulation at ±10% ΔU _{AC}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}
Load reg. at 10-90% ΔU _{DC} * ΔI _{DC}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“			
Display: Accuracy ⁽²⁾	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}
Efficiency ⁽⁵⁾	≈ 95%	≈ 94%	≈ 93%	≈ 93%
Resistance regulation				
Adjustment range	0.25...500 Ω	0.6...1100 Ω	0.006...10 Ω	0.006...10 Ω
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	≤1% of max. resistance ± 0.3% of maximum current			
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“			
Analog interface ⁽³⁾				
Signals	See „3.6.4.4. Analog interface specification“			
Galvanic isolation to the device	Max. 1500 V DC			
Sample rate of inputs & outputs	500 Hz			
Insulation				
Allowed potential shift (floating voltage) on the DC terminal:				
Negative DC to PE	Max. ±1500 V DC	±1500 V DC	±400 V DC	±400 V DC
Positive DC to PE	Max. ±1800 V DC	±1800 V DC	±400 V DC	±400 V DC
AC input <-> PE	2.5 kV DC			
AC input <-> DC terminal	2.5 kV DC			
Miscellaneous				
Cooling	Temperature controlled fans, front inlet, rear exhaust			
Ambient temperature	0...50 °C (32...133 °F)			
Storage temperature	-20...70 °C (-4...158 °F)			
Humidity	< 80%, not condensing			
Standards	EN 61010-1:2007-11, EN 50160:2011-02 EN 61000-6-2:2016-05, EN 61000-6-3:2011-09			
Overvoltage category	2			
Protection class	1			
Pollution degree	2			
Operational altitude	< 2000 m (1.242 mi)			
Digital interfaces				
Featured	1x USB-B for communication, 1x USB-A for functions, 1x GPIB (optional)			
Slot (standard version)	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, Ether-CAT			
Galvanic isolation from device	Max. 1500 V DC			
Terminals				
Rear side	Share Bus, DC terminal, AC supply, remote sensing, analog interface, USB, master-slave bus, interface module slot (standard version) or GPIB (optional)			
Front side	USB for sticks			
Dimensions				
Enclosure (W x H x D)	19" x 3U x 670 mm (26.4")			
Total (W x H x D)	483 x 133 x 775 mm (19" x 5.2" x 30.5")			
Weight	≈25 kg (55.1 lb)	≈25 kg (55.1 lb)	≈ 32 kg (70.5 lb)	≈ 32 kg (70.5 lb)

(1) Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value. With the resistance, the accuracy rating already includes the error of the actual resistance display.

(2) The display error adds to the error of the related actual value on the DC terminal

(3) For technical specifications of the analog interface see „3.6.4.4 Analog interface specification“ on page 60 of user manual

(4) Article number of the standard version, devices with options will have a different number

(5) Typical value at 100% voltage and 100% power

15 kW	Model 400 V / 480 V		
	PSB 9200-210	PSB 9360-120	PSB 9500-90
AC supply			
Voltage range (L-L), frequency	342...528 V AC, 45 - 66 Hz		
Connection	3ph, PE	3ph, PE	3ph, PE
Leak current	< 3.5 mA	< 3.5 mA	< 3.5 mA
Phase current	max. 28 A	max. 28 A	max. 28 A
Power factor	≈ 0.99		
Efficiency of energy recovery	≤ 93.5%	≤ 93.5%	≤ 94.5%
DC terminal			
Max. voltage U_{Max}	200 V	360 V	500 V
Max. current I_{Max}	210 A	120 A	90 A
Max. power P_{Max}	15000 W	15000 W	15000 W
Overvoltage protection range	0...220 V	0...396 V	0...550 V
Overcurrent protection range	0...231 A	0...132 A	0...99 A
Overpower protection range	0...16500 W	0...16500 W	0...16500 W
Temperature coefficient for set values Δ/K	Voltage / current: 100 ppm		
Capacitance (approx.)	7560 μ F	1170 μ F	540 μ F
Voltage regulation (general)			
Adjustment range	0...204 V	0...367.2 V	0...510 V
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“		
Display: Accuracy ⁽³⁾	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}
Remote sensing compensation	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}
Voltage regulation (power supply)			
Load regulation at 0...100% ΔI_{OUT}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Rise time 10...90% ΔU_{OUT}	Max. 30 ms	Max. 30 ms	Max. 30 ms
Transient time after ΔI_{OUT}	< 1.5 ms	< 1.5 ms	< 1.5 ms
Ripple ⁽²⁾	< 300 mV _{PP} < 40 mV _{RMS}	< 320 mV _{PP} < 55 mV _{RMS}	< 350 mV _{PP} < 70 mV _{RMS}
Fall time at no load after switching DC output off	Down from 100% to <60 V: less than 10 s		
Voltage regulation (el. load)			
Load regulation at 0...100% ΔU	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Current regulation (general)			
Adjustment range	0...214.2 A	0...122.4 A	0...91.8 A
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“		
Display: Accuracy ⁽³⁾	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}
Current regulation (power supply)			
Load regulation at 0...100% ΔU_{OUT}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Current regulation (el. load)			
Load regulation at 0...100% ΔU_{IN}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Ripple ⁽²⁾	< 66 mA _{RMS}	< 50 mA _{RMS}	< 48 mA _{RMS}

(1 Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.
Example: an 80 V model has min. 0.1% voltage accuracy, that is 80 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 80 mV, which means it might be between 4.92 V and 5.08 V.

(2 RMS value: LF 0...300 kHz, PP value: HF 0...20MHz

(3 The display error adds to the error of the related actual value on the DC terminal

15 kW	Model 400 V / 480 V		
	PSB 9200-210	PSB 9360-120	PSB 9500-90
Power regulation			
Adjustment range	0...15300 W	0...15300 W	0...15300 W
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}
Line regulation at ±10% ΔU _{AC}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}
Load reg. at 10-90% ΔU _{DC} * ΔI _{DC}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“		
Display: Accuracy ⁽²⁾	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}
Efficiency ⁽⁵⁾	≈ 95%	≈ 94%	≈ 95%
Resistance regulation			
Adjustment range	0.033...50 Ω	0.1...180 Ω	0.16...340 Ω
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	≤1% of max. resistance ± 0.3% of maximum current		
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“		
Analog interface ⁽³⁾			
Signals	See „3.6.4.4. Analog interface specification“		
Galvanic isolation to the device	Max. 1500 V DC		
Sample rate of inputs & outputs	500 Hz		
Insulation			
Allowed potential shift (floating voltage) on the DC terminal:			
Negative DC to PE	Max. ±725 V DC	±725 V DC	±1500 V DC
Positive DC to PE	Max. ±1000 V DC	±1000 V DC	±1800 V DC
AC input <-> PE	2.5 kV DC		
AC input <-> DC terminal	2.5 kV DC		
Miscellaneous			
Cooling	Temperature controlled fans, front inlet, rear exhaust		
Ambient temperature	0...50 °C (32...133 °F)		
Storage temperature	-20...70 °C (-4...158 °F)		
Humidity	< 80%, not condensing		
Standards	EN 61010-1:2007-11, EN 50160:2011-02 EN 61000-6-2:2016-05, EN 61000-6-3:2011-09		
Overvoltage category	2		
Protection class	1		
Pollution degree	2		
Operational altitude	< 2000 m (1.242 mi)		
Digital interfaces			
Featured	1x USB-B for communication, 1x USB-A for functions, 1x GPIB (optional)		
Slot (standard version)	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, Ether-CAT		
Galvanic isolation from device	Max. 1500 V DC		
Terminals			
Rear side	Share Bus, DC terminal, AC supply, remote sensing, analog interface, USB, master-slave bus, interface module slot (standard version) or GPIB (optional)		
Front side	USB for sticks		
Dimensions			
Enclosure (W x H x D)	19" x 3U x 670 mm (26.4")		
Total (W x H x D)	483 x 133 x 775 mm (19" x 5.2" x 30.5")		
Weight	≈ 32 kg (70.5 lb)	≈ 32 kg (70.5 lb)	≈ 32 kg (70.5 lb)

(1) Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value. With the resistance, the accuracy rating already includes the error of the actual resistance display.

(2) The display error adds to the error of the related actual value on the DC terminal

(3) For technical specifications of the analog interface see „3.6.4.4 Analog interface specification“ on page 60 of the user manual

(4) Article number of the standard version, devices with options will have a different number

(5) Typical value at 100% voltage and 100% power

15 kW	Model 400 V / 480 V		
	PSB 9750-60	PSB 91000-40	PSB 91500-30
AC supply			
Voltage range (L-L), frequency	342...528 V AC, 45 - 66 Hz		
Connection	3ph, PE	3ph, PE	3ph, PE
Leak current	< 3.5 mA	< 3.5 mA	< 3.5 mA
Phase current	max. 28 A	max. 28 A	max. 28 A
Power factor	≈ 0.99		
Efficiency of energy recovery	≤ 94.5%	≤ 93.5%	≤ 94.5%
DC terminal			
Max. voltage U_{Max}	750 V	1000 V	1500 V
Max. current I_{Max}	60 A	40 A	30 A
Max. power P_{Max}	15000 W	15000 W	15000 W
Overvoltage protection range	0...825 V	0...1100 V	0...1650 V
Overcurrent protection range	0...66 A	0...44 A	0...33 A
Overpower protection range	0...16500 W	0...16500 W	0...16500 W
Temperature coefficient for set values Δ/K	Voltage / current: 100 ppm		
Capacitance (approx.)	540 μ F	130 μ F	60 μ F
Voltage regulation (general)			
Adjustment range	0...765 V	0...1020 V	0...1530 V
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.1% U_{Max}	< 0.1% U_{Max}	< 0.1% U_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.02% U_{Max}	< 0.02% U_{Max}	< 0.02% U_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“		
Display: Accuracy ⁽³⁾	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}	≤ 0.1% U_{Max}
Remote sensing compensation	Max. 5% U_{Max}	Max. 5% U_{Max}	Max. 5% U_{Max}
Voltage regulation (power supply)			
Load regulation at 0...100% ΔI_{OUT}	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Rise time 10...90% ΔU_{OUT}	Max. 30 ms	Max. 30 ms	Max. 30 ms
Transient time after ΔI_{OUT}	< 1.5 ms	< 1.5 ms	< 1.5 ms
Ripple ⁽²⁾	< 800 mV _{PP} < 200 mV _{RMS}	< 1600 mV _{PP} < 300 mV _{RMS}	< 2400 mV _{PP} < 400 mV _{RMS}
Fall time at no load after switching DC output off	Down from 100% to <60 V: less than 10 s		
Voltage regulation (el. load)			
Load regulation at 0...100% ΔU	< 0.05% U_{Max}	< 0.05% U_{Max}	< 0.05% U_{Max}
Current regulation (general)			
Adjustment range	0...61.2 A	0...40.8 A	0...30.6 A
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 0.2% I_{Max}	< 0.2% I_{Max}	< 0.2% I_{Max}
Line regulation at ±10% ΔU_{AC}	< 0.05% I_{Max}	< 0.05% I_{Max}	< 0.05% I_{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“		
Display: Accuracy ⁽³⁾	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}	≤ 0.1% I_{Max}
Current regulation (power supply)			
Load regulation at 0...100% ΔU_{OUT}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Current regulation (el. load)			
Load regulation at 0...100% ΔU_{IN}	< 0.15% I_{Max}	< 0.15% I_{Max}	< 0.15% I_{Max}
Ripple ⁽²⁾	< 48 mA _{RMS}	< 16 mA _{RMS}	< 26 mA _{RMS}

(1) Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.

Example: an 80 V model has min. 0.1% voltage accuracy, that is 80 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 80 mV, which means it might be between 4.92 V and 5.08 V.

(2) RMS value: LF 0...300 kHz, PP value: HF 0...20MHz

(3) The display error adds to the error of the related actual value on the DC terminal

15 kW	Model 400 V / 480 V		
	PSB 9750-60	PSB 91000-40	PSB 91500-30
Power regulation			
Adjustment range	0...15300 W	0...15300 W	0...15300 W
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	< 1% P _{Max}	< 1% P _{Max}	< 1% P _{Max}
Line regulation at ±10% ΔU _{AC}	< 0.05% P _{Max}	< 0.05% P _{Max}	< 0.05% P _{Max}
Load reg. at 10-90% ΔU _{DC} * ΔI _{DC}	< 0.75% P _{Max}	< 0.75% P _{Max}	< 0.75% P _{Max}
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“		
Display: Accuracy ⁽²⁾	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}	≤ 0.3% P _{Max}
Efficiency ⁽⁵⁾	≈ 94%	≈ 94%	≈ 95%
Resistance regulation			
Adjustment range	0.4...740 Ω	0.8...1300 Ω	2.5...3000 Ω
Accuracy ⁽¹⁾ (at 23 ± 5 °C / 73±9 °F)	≤1% of max. resistance ± 0.3% of maximum current		
Display: Resolution	See section „1.9.6.4. Resolution of the displayed values“		
Analog interface ⁽³⁾			
Signals	See „3.6.4.4. Analog interface specification“		
Galvanic isolation to the device	Max. 1500 V DC		
Sample rate of inputs & outputs	500 Hz		
Insulation			
Allowed potential shift (floating voltage) on the DC terminal:			
Negative DC to PE	Max. ±1500 V DC	±1500 V DC	±1500 V DC
Positive DC to PE	Max. ±1800 V DC	±1800 V DC	±1800 V DC
AC input <-> PE	2.5 kV DC		
AC input <-> DC terminal	2.5 kV DC		
Miscellaneous			
Cooling	Temperature controlled fans, front inlet, rear exhaust		
Ambient temperature	0...50 °C (32...133 °F)		
Storage temperature	-20...70 °C (-4...158 °F)		
Humidity	< 80%, not condensing		
Standards	EN 61010-1:2007-11, EN 50160:2011-02 EN 61000-6-2:2016-05, EN 61000-6-3:2011-09		
Overvoltage category	2		
Protection class	1		
Pollution degree	2		
Operational altitude	< 2000 m (1.242 mi)		
Digital interfaces			
Featured	1x USB-B for communication, 1x USB-A for functions, 1x GPIB (optional)		
Slot (standard version)	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, Ether-CAT		
Galvanic isolation from device	Max. 1500 V DC		
Terminals			
Rear side	Share Bus, DC terminal, AC supply, remote sensing, analog interface, USB, master-slave bus, interface module slot (standard version) or GPIB (optional)		
Front side	USB for sticks		
Dimensions			
Enclosure (W x H x D)	19" x 3U x 670 mm (26.4")		
Total (W x H x D)	483 x 133 x 775 mm (19" x 5.2" x 30.5")		
Weight	≈ 32 kg (70.5 lb)	≈ 32 kg (70.5 lb)	≈ 32 kg (70.5 lb)

(1) Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value. With the resistance, the accuracy rating already includes the error of the actual resistance display.

(2) The display error adds to the error of the related actual value on the DC terminal

(3) For technical specifications of the analog interface see „3.6.4.4 Analog interface specification“ on page 60 on user manual

(4) Article number of the standard version, devices with options will have a different number

(5) Typical value at 100% voltage and 100% power

Technical Data

The 208 V models are derivations from the standard 400 V models, intended to be sold on the US or Japan market or places where 208 V three-phase supply is typical. They only differ in a few technical specifications, which are listed below. The remaining specifications are listed in 1.8.3. in the user manual. The differences basically lie in the AC supply and DC power rating.

2.5 kW / 5 kW	Model 208 V					
	PSB 9060-120	PSB 9080-120	PSB 9360-40	PSB 9750-20	PSB 9060-240	PSB 9080-240
AC supply						
Voltage range (L-L),	187...228 V AC					
Connection	2ph, PE	2ph, PE	2ph, PE	2ph, PE	3ph, PE	3ph, PE
DC terminal						
Max. power P_{Max}	2500 W	2500 W	2500 W	2500 W	5000 W	5000 W
Overpower protection	0...2750 W	0...2750 W	0...2750 W	0...2750 W	0...5500 W	0...5500 W
Power regulation						
Adjustment range	0...2550 W	0...2550 W	0...2550 W	0...2550 W	0...5100 W	0...5100 W

5 kW / 7.5 kW	Model 208 V					
	PSB 9360-80	PSB 9500-60	PSB 9060-360	PSB 9080-360	PSB 9200-210	PSB 9360-120
AC supply						
Voltage range (L-L),	187...228 V AC					
Connection	3ph, PE					
DC terminal						
Max. power P_{Max}	5000 W	5000 W	7500 W	7500 W	7500 W	7500 W
Overpower protection	0...5500 W	0...5500 W	0...8250 W	0...8250 W	0...8250 W	0...8250 W
Power regulation						
Adjustment range	0...5100 W	0...5100 W	0...7650 W	0...7650 W	0...7650 W	0...7650 W

7.5 kW	Model 208 V					
	PSB 9500-90	PSB 9750-60	PSB 91000-40	PSB 91500-30		
AC supply						
Voltage range (L-L),	187...228 V AC					
Connection	3ph, PE					
DC terminal						
Max. power P_{Max}	7500 W	7500 W	7500 W	7500 W		
Overpower protection	0...8250 W	0...8250 W	0...8250 W	0...8250 W		
Power regulation						
Adjustment range	0...7650 W	0...7650 W	0...7650 W	0...7650 W		

Contact Us

sales@inteproate.com

Americas

Intepro Systems America, LP
14662-E Franklin Ave
Tustin, CA 92780
Tel: 1 714 953 2686
sales@inteproate.com
www.inteproate.com

service@inteproate.com

Europe & Africa

Intepro UK Ltd.
9 Lakeside Business Park
Swan Lane, Sandhurst Berkshire
GU47 9DN / UK
Tel: 44 012 5287 5600

www.inteproate.com

Asia & Oceania

Intepro Power Electronics
(Shenzhen) Co., Ltd
No. 828, Block 7,
Fourth Industrial Area
Nanyou, Nashan District
Shenzhen, China 518052
Tel: 0086 755 86500020

www.InteproATE.com

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