

EA-PSBE 10000 30 kW



Programmable bidirectional DC power supplies



EA-PSBE 10750-120



- Wide range 342...528 V AC supply for operation on 380 V, 400 V or 480 V grids
- US 208 V models available
- Bidirectional device - power supply and electronic load in one
- Energy recovery with high efficiency
- Power rating: 30 kW (15 kW*) per device, expandable up to 1920 kW
- Voltage ratings: 60 V up to 2000 V
- Current ratings: 40 A up to 1000 A
- Flexible, power regulated DC<->AC stage
- Various protection circuits (OVP, OCP, OPP, OTP)
- 5" TFT touch panel with display for values, status and notifications
- Remote sensing with automatic detection
- Galvanically isolated interfaces (USB, Ethernet, analog, slot)
- Optional, digital interface modules
- SCPI and ModBus command set
- LabView VIs and control software for Windows

General

The bidirectional power supplies of series EA-PSBE 10000 are the economy variants of series EA-PSB 10000 and offer the same power of 30 kW in only 4U, the same connectivity with all interfaces, but save costs due to reduced software features.

All models incorporate two devices in one: a power supply (source) and an electronic load (sink) with energy recovery. Based on these two features the devices offer the functionality of two-quadrants operation as standard. The internal electronic load achieves a high voltage dynamics by discharging unavoidable capacities on the DC terminal. For a connected source, the devices are full electronic loads with energy recovery, also ideal for bigger systems.

In source operation mode the device becomes a flexible, autoranging power supply like those of series EA-PSI 10000 4U. It incorporates the advantages of both device types into one and at the same time it eliminates the disadvantages of separate units regarding weight, space requirement, costs and effort to implement them into custom test software.

*) US208V models

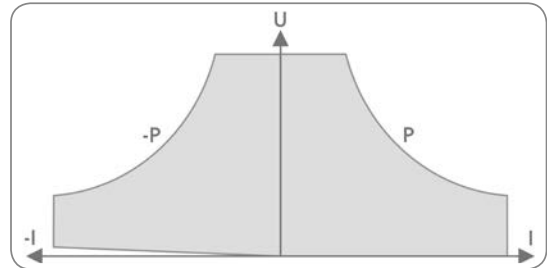
EA-PSBE 10000 30 kW

AC supply

All models are provided with an active Power Factor Correction (PFC) circuit and are designed for operation on a three-phase supply with typical worldwide ratings between 380 V and 480 V AC. But also regions where only 208 V three-phase is available are covered by the US 208 V models. During load operation, the device recovers the consumed DC energy and feeds it back into the local power network. This helps saving a lot of energy costs.

Autorangeing power stage

All models are equipped with a flexible autorangeing bidirectional power 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. rated output power. The same applies for sink mode operation. The 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.



DC output/input

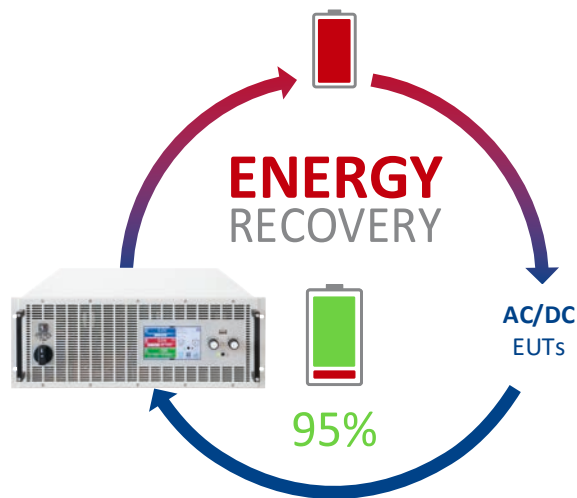
DC voltages between 0...60 V and 0 ...**2000 V**, current ratings between 0...40 A and 0...**1000 A** are available, all along with a power rating of 0...30kW for all standard models, while the US 208 V models are rated with 0...15 kW. The DC terminal is located on the rear panel.

Source-sink operation

One salient feature of these devices is the coalescence of an electronic load, also called sink, and a power supply, also called source, into one unit. It means, the device cannot only arbitrarily operate as sink or source, the switchover between these two operating modes occurs without interruption and time loss. This is also called two-quadrants operation.

Energy recovery

The most important feature of these devices is that the AC input while connected to the grid is also used as output for the recovery of the supplied DC energy during load operation, which is converted with an efficiency of up to 95.5%. This way of energy recovery helps to lower costs and can avoid expensive cooling systems, such as they are required for conventional electronic loads which only convert energy into heat. Principle view.



Master-slave

All models feature a digital master-slave bus by default. It can be used to connect up to 64 units of identical models in parallel operation to a bigger system with total formation of the actual value of voltage, current and power. This allows for a total power of up to **1920 kilowatts**.

The configuration of the master-slave system is either completely done on the control panels of the units or by remote control via any of digital communication interfaces. Handling of the master unit is possibly by manual or remote control (any interface).



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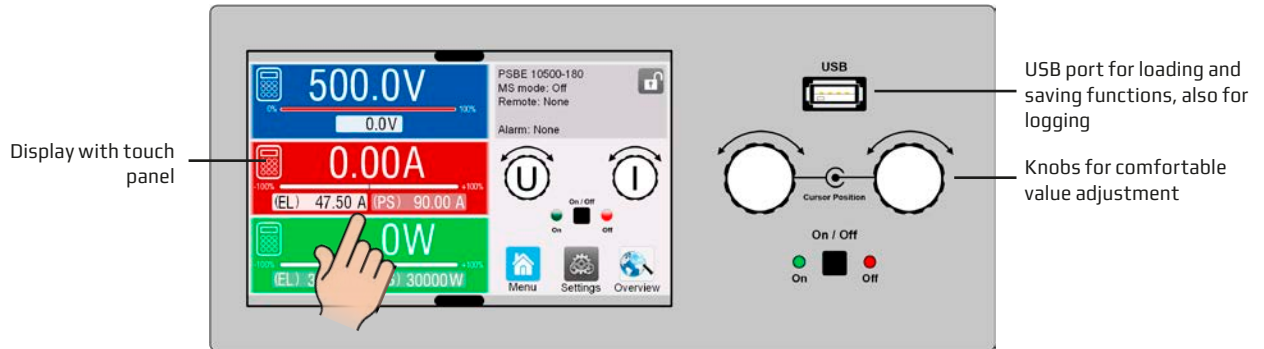


Display and control panel

Set values and actual values of input & output voltage / current / power are clearly represented on the 5" 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, 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.



Multilingual screen



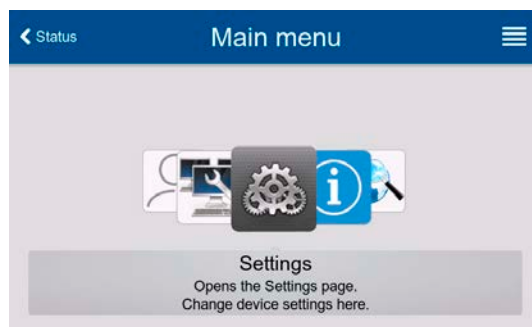
German



Chinese



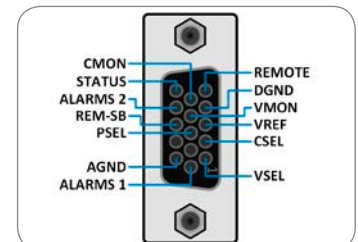
Russian



English

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 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.

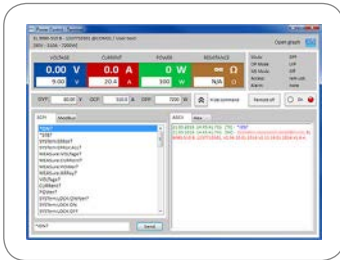


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Control software

Included with the devices is a control software for Windows PCs, called **EA Power Control**, 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". Further features which can be unlocked by a purchasable license:



- Graphical visualization of the actual values
- **Multi Control** - an app to control up to 20 units at once, including Sequencing and Logging



There is furthermore an optionally available, USB dongle licensed battery simulation software for Windows PCs, the **EA Battery Simulator**. In combination with one or multiple EA-PSBE 10000 devices and within their ratings it can simulate standard lead-acid (AGM) and lithium-ion batteries in series or parallel connection for a wide variety of battery related tests. The user can adjust typical battery parameters for the test profile. Once the test has started, it runs automatically. The combination of a power supply and this software covers a wide range of battery voltages and also charging/discharging currents and helps to eliminate the requirement for multiple different test equipments and softwares.



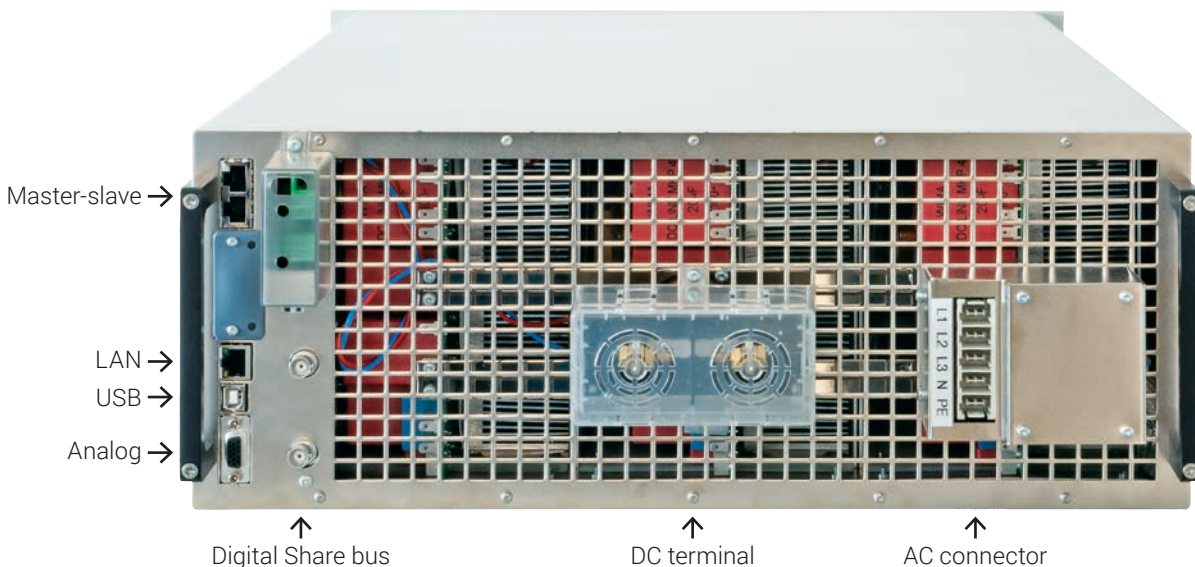
Water-cooling

While standard water-cooling systems use an air flow-through engaged by fans in order to cool internal electronic components like an auxiliary power supply, this series premieres a new water-cooling system where no additional heat is exhausted anymore. All internal heat is dissipated into the water. This can help to cut down on additional, expensive exhaust systems for cabinets or rooms. Also, this option will be available for all voltage classes.

Options

- Digital interface modules for RS232, CAN, CANopen, ModBus TCP, Profibus, Profinet or EtherCAT. The interface slot is located on the rear panel, making it easy for the user to plug in a new interface or to replace an existing one
- Water-cooling
- Grid protection & supervision module EA-ENS2 (only for 400 V supply)
- EA-PSB 10000 Slave (optional, suitable slave modules for cost saving master-slave systems)

Product views



EA-PSBE 10000 30 kW

Technical Data	PSBE 10060-1000 4U	PSBE 10080-1000 4U	PSBE 10200-420 4U
Rated voltage & range	0...60 V	0...80 V	0...200 V
- Ripple (source mode) ⁽¹⁾	≤480 mV _{pp} / ≤37 mV _{RMS}	≤480 mV _{pp} / ≤37 mV _{RMS}	≤450 mV _{pp} / ≤60 mV _{RMS}
Insulation			
- Negative DC <-> PE	±500 V DC	±500 V DC	±725 V DC
- Positive DC <-> PE	+600 V DC	+600 V DC	+1000 V DC
Rated current & range	0...1000 A	0...1000 A	0...420 A
Rated power	0...30 kW (0...15 kW ⁽⁴⁾)	0...30 kW (0...15 kW ⁽⁴⁾)	0...30 kW (0...15 kW ⁽⁴⁾)
Efficiency ⁽⁵⁾	Up to 94%	Up to 94%	Up to 94.2%
Weight ⁽²⁾	≈ 50 kg (110 lb)	≈ 50 kg (110 lb)	≈ 50 kg (110 lb)
Ordering number (standard)	30000840	30000841	30000842
Ordering number (WC) ⁽³⁾	30000860	30000861	30000862
Ordering number (US208V)	30008840	30008841	30008842
Ordering number (US208V+WC) ⁽³⁾	30008860	30008861	30008862

Technical Data	PSBE 10360-240 4U	PSBE 10500-180 4U	PSBE 10750-120 4U
Rated voltage & range	0...360 V	0...500 V	0...750 V
- Ripple (source mode) ⁽¹⁾	≤480 mV _{pp} / ≤83 mV _{RMS}	≤525 mV _{pp} / ≤105 mV _{RMS}	≤1200 mV _{pp} / ≤300 mV _{RMS}
Insulation			
- Negative DC <-> PE	±1500 V DC	±1500 V DC	±1500 V DC
- Positive DC <-> PE	+2000 V DC	+2000 V DC	+2000 V DC
Rated current & range	0...240 A	0...180 A	0...120 A
Rated power	0...30 kW (0...15 kW ⁽⁴⁾)	0...30 kW (0...15 kW ⁽⁴⁾)	0...30 kW (0...15 kW ⁽⁴⁾)
Efficiency ⁽⁵⁾	Up to 94.6%	Up to 95.3%	Up to 95.5%
Weight ⁽²⁾	≈ 50 kg (110 lb)	≈ 50 kg (110 lb)	≈ 50 kg (110 lb)
Ordering number (standard)	30000843	30000844	30000845
Ordering number (WC) ⁽³⁾	30000863	30000864	30000865
Ordering number (US208V)	30008843	30008844	30008845
Ordering number (US208V+WC) ⁽³⁾	30008863	30008864	30008865

Technical Data	PSBE 11000-80 4U	PSBE 11500-60 4U	PSBE 12000-40 4U
Rated voltage & range	0...1000 V	0...1500 V	0...2000 V
- Ripple (source mode) ⁽¹⁾	≤2400 mV _{pp} / ≤450 mV _{RMS}	≤3600 mV _{pp} / ≤600 mV _{RMS}	≤3600 mV _{pp} / ≤600 mV _{RMS}
Insulation			
- Negative DC <-> PE	±1500 V DC	±1500 V DC	±1500 V DC
- Positive DC <-> PE	+2000 V DC	+2000 V DC	+2000 V DC
Rated current & range	0...80 A	0...60 A	0...40 A
Rated power	0...30 kW (0...15 kW ⁽⁴⁾)	0...30 kW (0...15 kW ⁽⁴⁾)	0...30 kW (0...15 kW ⁽⁴⁾)
Efficiency ⁽⁵⁾	Up to 94.6%	Up to 95.3%	Up to 95.5%
Weight ⁽²⁾	≈ 50 kg (110 lb)	≈ 50 kg (110 lb)	≈ 50 kg (110 lb)
Ordering number (standard)	30000846	30000847	30000848
Ordering number (WC) ⁽³⁾	30000866	30000867	30000868
Ordering number (US208V)	30008846	30008847	30008848
Ordering number (US208V+WC) ⁽³⁾	30008866	30008867	30008868

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

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

(3) WC = water-cooling

(4) US 208 V models

(5) Both directions, i. e. source and sink mode

