



Elektro-Automatik



HIGH-TECH POWER SUPPLIES AND ELECTRONIC LOADS

(주)베스텍 코리아(BesTEQ Korea)
www.besteq.co.kr
TEL: 02) 305-4566



DEVELOPING TOMORROW'S VISIONS TODAY...

Technical know-how, flexibility and short lead times make EA the preferred supplier for well-known companies and institutes.

HIGH POWER ELECTRONICS MADE IN GERMANY

EA-Elektro-Automatik LLC is Germany's leading manufacturer of laboratory power supplies, high performance mains units and electronic loads. EA-Elektro-Automatik was founded in 1974 by Helmut Nolden with the vision of developing high quality power supplies for all applications. Today EA-Elektro-Automatik is a modern medium-sized enterprise.

Approximately 250 employees research, develop and manufacture at the ca. 11.500 m² (123,785 sqft) main site in Viersen. With the aid of an extensive dealer network, high-tech technology from Niederrhein is delivered globally.

INNOVATION THROUGH R & D

Innovation is of major significance at EA. We are passionate in our development and production of laboratory and high performance power supplies as well as electronic loads, which set standards for functionality, flexibility and reliability. The results of more than four decades research and development flow directly into new products. With the introduction of flexible output stages in laboratory power supplies and energy recovery from electronic loads we are pioneers of new technologies.

SWITCHED ON: DEVELOPMENT COMPETENCE OF THE HIGHEST LEVEL

Concept, design, technical development and specification of our power supply systems is carried out in-house as a matter of principle. In this way the technical advances made by our development team can be incorporated directly in finished products. Thus our engineers look not only at the market requirements of today but develop solutions for the technical challenges of tomorrow.

ENERGIZED: SHORT TIME-TO-MARKET

Development cycles for new systems are getting shorter. Technological excellence means that we must have flexible production processes so that we can answer short term production-specific customer demands. We guarantee our customers rapid reaction in the event of an emergency.



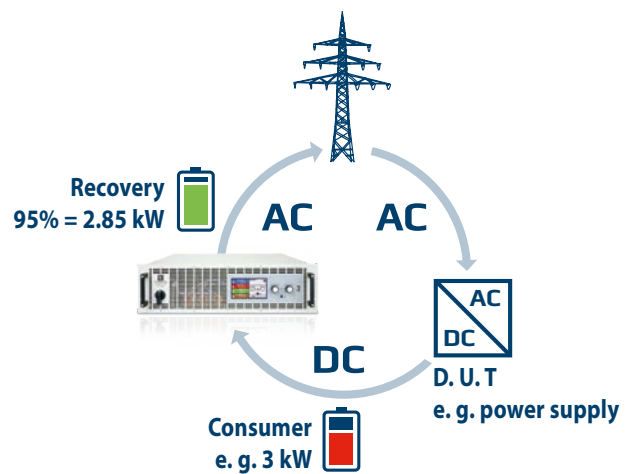
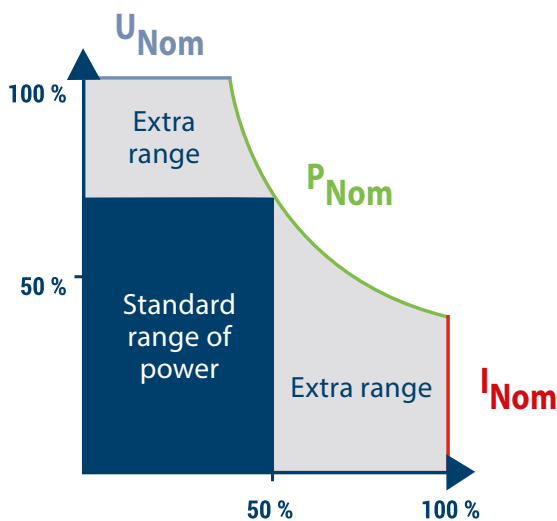


TECHNOLOGICAL LEADERSHIP

COMPETENCE IN TESTING AT OUR OWN LABORATORIES

All EMC measurements and safety related tests are carried out in our in-house testing laboratories. Furthermore, our high-tech devices are TÜV certified to the safety requires of EN 61010-1 and EMI proof according EN 61000-6-3 class B. During the manufacturing process the incorporated modules and building blocks are tested with an automatic test adapter. Subsequently a computer controlled test system calibrates and performs tests for function and all quality relevant parameters.

All test and calibration data are recorded and can be retrieved. Following final control all devices undergo a "burn-in test" under maximum load. These are carried out at an ambient temperature of 40°C using an electronic load with energy feedback. Thus the power consumed in the test is not released as heat but rather fed back into the domestic power supply.



Auto-range principle

Circular energy flow when using recovering devices



PROXIMITY TO CUSTOMERS

We maintain close contact with our customers. Thus we understand their needs. The high level of technical know-how of our associates enable us to deliver power supply units and systems which exactly meet customer requirements. Our highly specialized team are developing innovative solutions today for the technical demands of tomorrow.

FOCUS ON NEW TECHNOLOGY

When it comes to introducing new technologies EA is the leader in its sector. Laboratory power supplies with an auto-ranging feature of a flexible output stage and electronic loads with energy recovery were both the brainchild of EA. Color TFT touch screens for intuitive operation of laboratory power supplies also have their origin at EA.

CUSTOM MADE: PRODUCTS AND SUPPORT

Whether in the laboratory, industry or training, EA offers a wide and deep product spectrum for virtually any application: laboratory and industry power supplies, as well as electronic loads for laboratory desktop applications or 19" plug-in systems. Based on these standard programs we also develop custom built equipment and systems to meet your requirements. A specific attribute is that all our products have an optimized energy usage by reaching an above average efficiency of up to 95%. In addition, our EA team of highly specialized technology experts are there to help with all issues around power supply units and electronic loads.

QUALITY IS OUR STANDARD

A quality management system certified to DIN ISO 9001-2015 ensures that processes in all phases of the value chain are documented. This leads to the high technical reliability of our power supply equipment and electronic loads. We guarantee a continuous high quality, from goods receipt through all manufacturing steps to final inspection.

WELL PREPARED: VIEWING THE FUTURE

With manufacturing sites in Germany and the Far East, EA is well prepared for the future. The signs are set for expansion: technical know-how, flexibility and short lead times make us a globally preferred supplier of well-known companies and institutes.

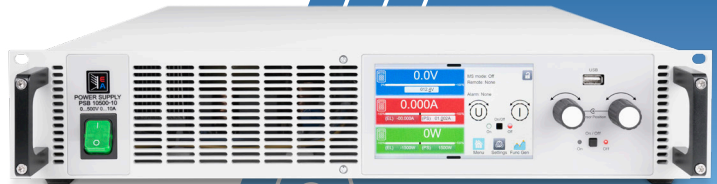
EA BATTERY SIMULATOR AND EA POWER CONTROL

In order to support end users of EA products in their hardware-in-the-loop (HIL) tests zu, EA has developed the EA Battery Simulator in cooperation with the renowned Fraunhofer Institute. This smart software is compatible to the power supply series EA-PSB 9000 and EA-PSB 10000 and offers extensive battery simulation features.

The Windows software EA Power Control furthermore simplifies remote control of all device series which have been developed since 2012. The optional application "Multi Control" allows for the management and control of up to 20 EA devices at once from one PC, with all their functions available at one glance.

EA-PSI 10000 2U 1.5 KW / 3.0 KW

Programmable DC-Power Supply



Features

- Wide range input, 110 V - 240 V \pm 10 % 1ph AC
- Active Power-Factor-Correction, typical 0.99
- Very high efficiency up to over 95 %
- Voltage from 0 - 60 V up to 0 - 1500 V
- Currents from 0 - 6 A up to 0 - 120 A
- Flexible power regulated DC output stages (autoranging)
- Regulation mode CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs, selection of control speed: Normal, Fast, Slow
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Integrated function generator with predefined curves
- Predefined automotive test procedures for LV123, LV124 and LV148
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Build-in Interfaces

- USB
- Ethernet
- Analog
- USB Host
- Master-Slave-Bus
- Share-Bus

Optional Interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA-Power Control

Technical Specifications	PSI 10060-60	PSI 10080-60	PSI 10200-25	PSI 10360-15	PSI 10500-10
DC-Output					
Voltage range	0 - 60 V	0 - 80 V	0 - 200 V	0 - 360 V	0 - 500 V
Ripple rms CV	10 mV BW 300 kHz	10 mV BW 300 kHz	30 mV BW 300 kHz	30 mV BW 300 kHz	40 mV BW 300 kHz
Ripple and noise p-p CV	100 mV BW 20 MHz	100 mV BW 20 MHz	300 mV BW 20 MHz	300 mV BW 20 MHz	500 mV BW 20 MHz
Current range	0 - 60 A	0 - 60 A	0 - 25 A	0 - 15 A	0 - 10 A
Power range *1	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)
Resistance range	0.04 Ω - 80 Ω	0.04 Ω - 80 Ω	0.25 Ω - 500 Ω	0.8 Ω - 1600 Ω	2 Ω - 3000 Ω
Output capacity	8640 μF	8640 μF	800 μF	330 μF	120 μF
Efficiency up to	94.0% *2	94.0% *2	94.5% *2	94.5% *2	95.0% *2
Isolation					
Negative DC-Pol <-> PE	±1000 V DC	±1000 V DC	±1000 V DC	±1000 V DC	±1500 V DC
Positive DC-Pol <-> PE	+1000 V DC	+1000 V DC	+1000 V DC	+1000 V DC	+2000 V DC
Article number	06230840	06230841	06230842	06230843	06230844

*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

Technical Specifications	PSI 10750-06				
DC-Output					
Voltage range	0 - 750 V				
Ripple rms CV	50 mV BW 300 kHz				
Ripple and noise p-p CV	500 mV BW 20 MHz				
Current range	0 - 6 A				
Power range *1	0 - 1500 W (0 - 1200 W)				
Resistance range	4 Ω - 6000 Ω				
Output capacity	40 μF				
Efficiency up to	95.0% *2				
Isolation					
Negative DC-Pol <-> PE	±1500 V DC				
Positive DC-Pol <-> PE	+2000 V DC				
Article number	06230845				

*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

Technical Specifications	PSI 10060-120	PSI 10080-120	PSI 10200-50	PSI 10360-30	PSI 10500-20
DC-Output					
Voltage range	0 - 60 V	0 - 80 V	0 -200 V	0 - 360 V	0 - 500 V
Ripple rms CV	10 mV BW 300 kHz	10 mV BW 300 kHz	30 mV BW 300 kHz	30 mV BW 300 kHz	40 mV BW 300 kHz
Ripple and noise p-p CV	100 mV BW 20 MHz	100 mV BW 20 MHz	300 mV BW 20 MHz	300 mV BW 20 MHz	500 mV BW 20 MHz
Current range	0 - 120 A	0 - 120 A	0 - 50 A	0 - 30 A	0 - 20 A
Power range *1	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)
Resistance range	0.02 Ω - 24 Ω	0.02 Ω - 40 Ω	0.1 Ω - 250 Ω	0.4 Ω - 800 Ω	1 Ω - 1500 Ω
Output capacity	17280 μF	17280 μF	1600 μF	660 μF	240 μF
Efficiency up to	94.0% *2	94.0% *2	94.5% *2	94.5% *2	95.0% *2
Isolation					
Negative DC-Pol <-> PE	±1000 V DC	±1000 V DC	±1000 V DC	±1000 V DC	±1500 V DC
Positive DC-Pol <-> PE	+1000 V DC	+1000 V DC	+1000 V DC	+1000 V DC	+2000 V DC
Article number	06230846	06230847	06230848	06230849	06230850

*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

Technical Specifications	PSI 10750-12	PSI 11000-10	PSI 11500-06		
DC-Output					
Voltage range	0 - 750 V	0 - 1000 V	0 - 1500 V		
Ripple rms CV	50 mV BW 300 kHz	100 mV BW 300 kHz	150 mV BW 300 kHz		
Ripple and noise p-p CV	500 mV BW 20 MHz	2000 mV BW 20 MHz	6500 mV BW 20 MHz		
Current range	0 - 12 A	0 - 10 A	0 - 6 A		
Power range *1	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)		
Resistance range	2 Ω - 3000 Ω	3 Ω - 6000 Ω	8 Ω - 6000 Ω		
Output capacity	80 μF	60 μF	20 μF		
Efficiency up to	95.0% *2	95.0% *2	95.0% *2		
Isolation					
Negative DC-Pol <-> PE	±1500 V DC	±1500 V DC	±1500 V DC		
Positive DC-Pol <-> PE	+2000 V DC	+2000 V DC	+2000 V DC		
Article number	06230851	06230852	06230853		

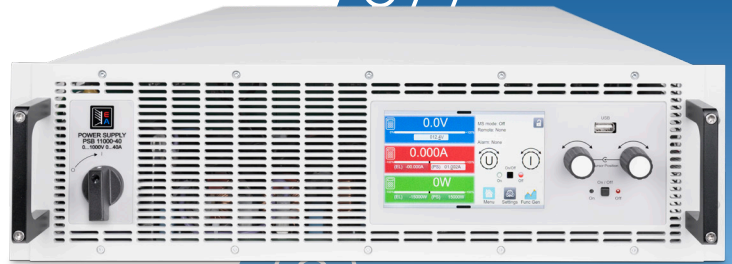
*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

EA-PSI 10000 3U

5 KW - 10 KW - 15 KW

Programmable
DC-Power Supply



Features

- Wide range input, 208 V - 480 V \pm 10 % 3ph AC
- Active Power-Factor-Correction, typical 0.99
- Very high efficiency up to 96 %
- High performance of up to 15 kW per unit
- Voltage from 0 - 60 V up to 0 - 2000 V
- Currents from 0 - 20 A up to 0 - 510 A
- Flexible power regulated DC output stages (autoranging)
- Regulation mode CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs, selection of control speed: Normal, Fast, Slow
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Integrated function generator with predefined curves
- Predefined automotive test procedures for LV123, LV124 and LV148
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Build-in Interfaces

- USB
- Ethernet
- Analog
- USB Host
- Master-Slave-Bus
- Share-Bus

Optional Interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA-Power Control

Technical specifications	PSI 10060-170	PSI 10080-170	PSI 10200-70	PSI 10360-40	PSI 10500-30
DC Output					
Voltage range	0 - 60 V	0 - 80 V	0 -200 V	0 - 360 V	0 - 500 V
Ripple rms CV	≤10 mV BW 300 kHz	≤10 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz	≤70 mV BW 300 kHz
Ripple and noise p-p CV	≤100 mV BW 20 MHz	≤100 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz	≤350 mV BW 20 MHz
Current range	0 - 170 A	0 - 170 A	0 - 70 A	0 - 40 A	0 - 30 A
Power range	0 - 5000 W	0 - 5000 W	0 - 5000 W	0 - 5000 W	0 - 5000 W
Resistance range	0.016 Ω - 26 Ω	0.016 Ω - 26 Ω	0.1 Ω - 160 Ω	0.3 Ω - 520 Ω	0.6 Ω - 1000 Ω
Output capacity	7790 μF	7790 μF	2520 μF	393 μF	180 μF
Efficiency up to	94.5% *1	94.5% *1	94.5% *1	95.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±600 V DC	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC
Positive DC pole <-> PE	+600 V DC	+600 V DC	+1000 V DC	+1000 V DC	+2000 V DC
Article number	06230829	06230830	06230831	06230832	06230833

*1 100% Power and 100% Output voltage

Technical specifications	PSI 10750-20				
DC Output					
Voltage range	0 - 750 V				
Ripple rms CV	≤200 mV BW 300 kHz				
Ripple and noise p-p CV	≤800 mV BW 20 MHz				
Current range	0 - 20 A				
Power range	0 - 5000 W				
Resistance range	1.2 Ω - 2200 Ω				
Output capacity	180 μF				
Efficiency up to	95.5% *1				
Insulation					
Negative DC pole <-> PE	±1500 V DC				
Positive DC pole <-> PE	+2000 V DC				
Article number	06230834				

*1 100% Power and 100% Output voltage

Technical specifications	PSI 10060-340	PSI 10080-340	PSI 10200-140	PSI 10360-80	PSI 10500-60
DC Output					
Voltage range	0 - 60 V	0 - 80 V	0 - 200 V	0 - 360 V	0 - 500 V
Ripple rms CV	≤10 mV BW 300 kHz	≤10 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz	≤70 mV BW 300 kHz
Ripple and noise p-p CV	≤100 mV BW 20 MHz	≤100 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz	≤350 mV BW 20 MHz
Current range	0 - 340 A	0 - 340 A	0 - 140 A	0 - 80 A	0 - 60 A
Power range	0 - 10000 W	0 - 10000 W	0 - 10000 W	0 - 10000 W	0 - 10000 W
Resistance range	0.008 Ω - 13 Ω	0.008 Ω - 13 Ω	0.05 Ω - 80 Ω	0.15 Ω - 260 Ω	0.3 Ω - 500 Ω
Output capacity	15980 μF	15980 μF	5040 μF	786 μF	360 μF
Efficiency up to	94.5% *1	94.5% *1	94.5% *1	95.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±600 V DC	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC
Positive DC pole <-> PE	+600 V DC	+600 V DC	+1000 V DC	+1000 V DC	+2000 V DC
Article number	06230835	06230836	06230837	06230838	06230839

*1 100% Power and 100% Output voltage

Technical specifications	PSI 10750-40	PSI 11000-30	PSI 11500-20		
DC Output					
Voltage range	0 - 750 V	0 - 1000 V	0 - 1500 V		
Ripple rms CV	≤200 mV BW 300 kHz	≤200 mV BW 300 kHz	≤400 mV BW 300 kHz		
Ripple and noise p-p CV	≤800 mV BW 20 MHz	≤1000 mV BW 20 MHz	≤2000 mV BW 20 MHz		
Current range	0 - 40 A	0 - 30 A	0 - 20 A		
Power range	0 - 10000 W	0 - 10000 W	0 - 10000 W		
Resistance range	0.6 Ω - 1100 Ω	1.2 Ω - 2000 Ω	2.6 Ω - 4500 Ω		
Output capacity	360 μF	90 μF	90 μF		
Efficiency up to	95.5% *1	95.5% *1	95.5% *1		
Insulation					
Negative DC pole <-> PE	±1500 V DC	±1500 V DC	±1500 V DC		
Positive DC pole <-> PE	+2000 V DC	+2000 V DC	+2000 V DC		
Article number	06230854	06230855	06230856		

*1 100% Power and 100% Output voltage

Technical specifications	PSI 10060-510	PSI 10080-510	PSI 10200-210	PSI 10360-120	PSI 10500-90
DC Output					
Voltage range	0 - 60 V	0 - 80 V	0 - 200 V	0 - 360 V	0 - 500 V
Ripple rms CV	≤10 mV BW 300 kHz	≤10 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz	≤70 mV BW 300 kHz
Ripple and noise p-p CV	≤100 mV BW 20 MHz	≤100 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz	≤350 mV BW 20 MHz
Current range	0 - 510 A	0 - 510 A	0 - 210 A	0 - 120 A	0 - 90 A
Power range	0 - 15000 W	0 - 15000 W	0 - 15000 W	0 - 15000 W	0 - 15000 W
Resistance range	0.006 Ω - 9 Ω	0.006 Ω - 9 Ω	0.03 Ω - 50 Ω	0.1 Ω - 180 Ω	0.2 Ω - 330 Ω
Output capacity	23970 μF	23970 μF	7560 μF	1179 μF	540 μF
Efficiency up to	94.5% *1	94.5% *1	94.5% *1	95.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±600 V DC	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC
Positive DC pole <-> PE	+600 V DC	+600 V DC	+1000 V DC	+1000 V DC	+2000 V DC
Article number	06230820	06230821	06230822	06230823	06230824

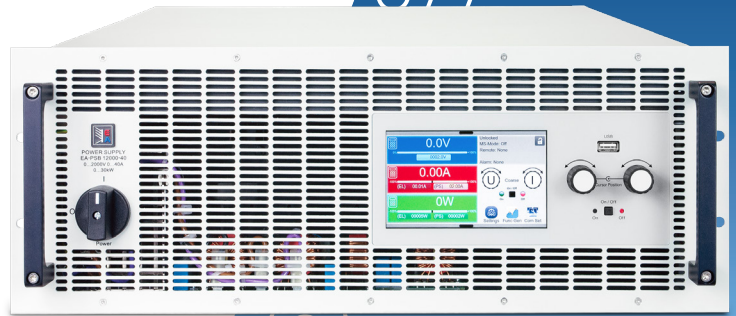
*1 100% Power and 100% Output voltage

Technical specifications	PSI 10750-60	PSI 11000-40	PSI 11500-30	PSI 12000-20	
DC Output					
Voltage range	0 - 750 V	0 - 1000 V	0 - 1500 V	0 - 2000 V	
Ripple rms CV	≤200 mV BW 300 kHz	≤300 mV BW 300 kHz	≤400 mV BW 300 kHz	≤400 mV BW 300 kHz	
Ripple and noise p-p CV	≤800 mV BW 20 MHz	≤1600 mV BW 20 MHz	≤2400 mV BW 20 MHz	≤2400 mV BW 20 MHz	
Current range	0 - 60 A	0 - 40 A	0 - 30 A	0 - 20 A	
Power range	0 - 15000 W	0 - 15000 W	0 - 15000 W	0 - 15000 W	
Resistance range	0.4 Ω - 750 Ω	0.8 Ω - 1300 Ω	1.8 Ω - 3000 Ω	1.7 Ω - 2700 Ω	
Output capacity	540 μF	131 μF	60 μF	60 μF	
Efficiency up to	95.5% *1	95.5% *1	95.5% *1	95.5% *1	
Insulation					
Negative DC pole <-> PE	±1500 V DC	±1500 V DC	±1500 V DC	±1500 V DC	
Positive DC pole <-> PE	+2000 V DC	+2000 V DC	+2000 V DC	+2000 V DC	
Article number	06230825	06230826	06230827	06230828	

*1 100% Power and 100% Output voltage

EA-PSI 10000 4U 30 KW

Programmable
DC-Power Supply



Features

- Wide range input, 208 V - 480 V \pm 10 % 3ph AC
- Active Power-Factor-Correction, typical 0.99
- Very high efficiency up to over 96 %
- High performance of 30 kW per unit
- Voltage from 0 - 10 V up to 0 - 2000 V
- Currents from 0 - 20 A up to 0 - 1000 A
- Flexible power regulated DC-output stages (autoranging)
- Regulation mode CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs, selection of control speed: Normal, Fast, Slow
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Integrated function generator with predefined curves
- Predefined automotive test procedures for LV123, LV124 and LV148
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Build-in Interfaces

- USB
- Ethernet
- Analog
- USB Host
- Master-Slave-Bus
- Share-Bus

Optional Interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA-Power Control
- EA-Battery Simulator

Options

- Water Cooling in stainless steel

Technical Specifications	PSI10060-1000	PSI 10080-1000	PSI 10200-420	PSI 10360-240
DC-Output				
Voltage range	0 - 60 V	0 - 80 V	0 - 200 V	0 - 360 V
Ripple rms CV	≤25 mV BW 300 kHz	≤25 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz
Ripple and noise p-p CV	≤320 mV BW 20 MHz	≤320 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz
Current range	0 - 1000 A	0 - 1000 A	0 - 420 A	0 - 240 A
Power range	0 - 30000 W	0 - 30000 W	0 - 30000 W	0 - 30000 W
Resistance range	0.003 Ω - 5 Ω	0.003 Ω - 5 Ω	0.0165 Ω - 25 Ω	0.05 Ω - 90 Ω
Output capacity	25380 μF	25380 μF	5400 μF	1800 μF
Efficiency up to	95.1% *1	95.5% *1	95.3% *1	95.8% *1
Isolation				
Negative DC-Pol <-> PE	±600 V DC	±600 V DC	±1000 V DC	±1000 V DC
Positive DC-Pol <-> PE	+600 V DC	+600 V DC	+1000 V DC	+1000 V DC
Article number				
Article number Standard	06230800	06230801	06230802	06230803
Article number Water cooling	06250800	06250801	06250802	06250803

*1 At 100% Power and 100% Output voltage

Technical Specifications	PSI 10500-180	PSI 10750-120	PSI 10920-125	PSI 11000-80
DC-Output				
Voltage range	0 - 500 V	0 - 750 V	0 - 920 V	0 - 1000 V
Ripple rms CV	≤70 mV BW 300 kHz	≤200 mV BW 300 kHz	≤200 mV BW 300 kHz	≤300 mV BW 300 kHz
Ripple and noise p-p CV	≤350 mV BW 20 MHz	≤800 mV BW 20 MHz	≤800 mV BW 20 MHz	≤1600 mV BW 20 MHz
Current range	0 - 180 A	0 - 120 A	0 - 125 A	0 - 80 A
Power range	0 - 30000 W	0 - 30000 W	0 - 30000 W	0 - 30000 W
Resistance range	0.08 Ω - 170 Ω	0.2 Ω - 370 Ω	0.25 Ω - 550 Ω	0.4 Ω - 650 Ω
Output capacity	675 μF	450 μF	100 μF	200 μF
Efficiency up to	96.5% *1	96.5% *1	96.5% *1	95.8% *1
Isolation				
Negative DC-Pol <-> PE	±1500 V DC	±1500 V DC	±1500 V DC	±1500 V DC
Positive DC-Pol <-> PE	+2000 V DC	+2000 V DC	+2000 V DC	+2000 V DC
Article number				
Article number Standard	06230804	06230805	06230809	06230806
Article number Water cooling	06250804	06250805		06250806

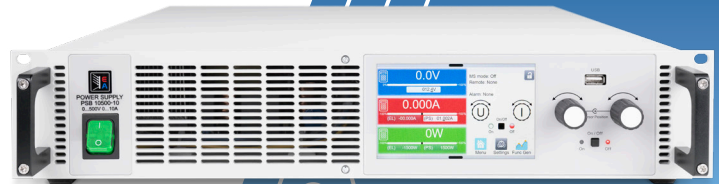
*1 At 100% Power and 100% Output voltage

Technical Specifications	PSI 11500-60	PSI 12000-40		
DC-Output				
Voltage range	0 - 1500 V	0 - 2000 V		
Ripple rms CV	≤400 mV BW 300 kHz	≤400 mV BW 300 kHz		
Ripple and noise p-p CV	≤2400 mV BW 20 MHz	≤2400 mV BW 20 MHz		
Current range	0 - 60 A	0 - 40 A		
Power range	0 - 30000 W	0 - 30000 W		
Resistance range	0.8 Ω - 1500 Ω	1.7 Ω - 2700 Ω		
Output capacity	75 μF	50 μF		
Efficiency up to	96.5% *1	96.5% *1		
Isolation				
Negative DC-Pol <-> PE	±1500 V DC	±1500 V DC		
Positive DC-Pol <-> PE	+2000 V DC	+2000 V DC		
Article number				
Article number Standard	06230807	06230808		
Article number Water cooling	06250807	06250808		

*1 At 100% Power and 100% Output voltage

EA-PSB 10000 2U 1.5 KW / 3.0 KW

Programmable Bidirectional DC-Power Supply



Features

- Wide range input, 110 V - 240 V \pm 10 % 1ph AC
- Active Power-Factor-Correction, typical 0.99
- Bidirectional power supply, 2-quadrants in source and sink
- In load operation, regenerative with energy recovery into the grid
- Very high efficiency up to over 95 %
- Voltage from 0 - 10 V up to 0 - 1500 V
- Currents from 0 - 6 A up to 0 - 120 A
- Flexible power regulated DC input/output stages (autoranging)
- Regulation mode CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Integrated function generator with predefined curves
- Predefined automotive test procedures for LV123, LV124 and LV148
- Integrated battery test mode, battery and fuel cell simulation
- Photovoltaics test mode, MPPT, EN 50530
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Build-in Interfaces

- USB
- Ethernet
- Analog
- USB Host
- Master-Slave-Bus
- Share-Bus

Optional Interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA-Power Control
- EA-Battery Simulator

Technical Specifications	PSB 10010-60	PSB 10060-60	PSB 10080-60	PSB 10200-25	PSB 10360-15
DC-Output					
Voltage range	0 - 10 V	0 - 60 V	0 - 80 V	0 - 200 V	0 - 360 V
Ripple rms CV	10 mV BW 300 kHz	10 mV BW 300 kHz	10 mV BW 300 kHz	30 mV BW 300 kHz	30 mV BW 300 kHz
Ripple and noise p-p CV	100 mV BW 20 MHz	100 mV BW 20 MHz	100 mV BW 20 MHz	300 mV BW 20 MHz	300 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	0.8 V	0.8 V	0.8 V	2 V	2 V
Current range	0 - 60 A	0 - 60 A	0 - 60 A	0 - 25 A	0 - 15 A
Power range *1	0 - 600 W	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)
Resistance range	0.04 Ω - 80 Ω	0.04 Ω - 80 Ω	0.04 Ω - 80 Ω	0.25 Ω - 500 Ω	0.8 Ω - 1600 Ω
Output capacity	8640 μ F	8640 μ F	8640 μ F	800 μ F	330 μ F
Efficiency up to	93.0% *2	94.0% *2	94.0% *2	94.5% *2	94.5% *2
Isolation					
Negative DC-Pol <-> PE	\pm 1000 V DC	\pm 1000 V DC	\pm 1000 V DC	\pm 1000 V DC	\pm 1000 V DC
Positive DC-Pol <-> PE	+1000 V DC	+1000 V DC	+1000 V DC	+1000 V DC	+1000 V DC
Article number	30000734	30000720	30000721	30000722	30000723

*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

Technical Specifications	PSB 10500-10	PSB 10750-06			
DC-Output					
Voltage range	0 - 500 V	0 - 750 V			
Ripple rms CV	40 mV BW 300 kHz	50 mV BW 300 kHz			
Ripple and noise p-p CV	500 mV BW 20 MHz	500 mV BW 20 MHz			
U_{Min} for I_{Max} (Sink)	2.5 V	2.5 V			
Current range	0 - 10 A	0 - 6 A			
Power range *1	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)			
Resistance range	2 Ω - 3000 Ω	4 Ω - 6000 Ω			
Output capacity	120 μ F	40 μ F			
Efficiency up to	95.0% *2	95.0% *2			
Isolation					
Negative DC-Pol <-> PE	\pm 1500 V DC	\pm 1500 V DC			
Positive DC-Pol <-> PE	+2000 V DC	+2000 V DC			
Article number	30000724	30000725			

*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

Technical Specifications	PSB 10010-120	PSB 10060-120	PSB 10080-120	PSB 10200-50	PSB 10360-30
DC-Output					
Voltage range	0 - 10 V	0 - 60 V	0 - 80 V	0 - 200 V	0 - 360 V
Ripple rms CV	10 mV BW 300 kHz	10 mV BW 300 kHz	10 mV BW 300 kHz	30 mV BW 300 kHz	30 mV BW 300 kHz
Ripple and noise p-p CV	100 mV BW 20 MHz	100 mV BW 20 MHz	100 mV BW 20 MHz	300 mV BW 20 MHz	300 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	0.8 V	0.8 V	0.8 V	2 V	2 V
Current range	0 - 120 A	0 - 120 A	0 - 120 A	0 - 50 A	0 - 30 A
Power range *1	0 - 1200 W	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)
Resistance range	0.02 Ω - 24 Ω	0.02 Ω - 24 Ω	0.02 Ω - 40 Ω	0.1 Ω - 250 Ω	0.4 Ω - 800 Ω
Output capacity	17280 μ F	17280 μ F	17280 μ F	1600 μ F	660 μ F
Efficiency up to	93.0% *2	94.0% *2	94.0% *2	94.5% *2	94.5% *2
Isolation					
Negative DC-Pol <-> PE	\pm 1000 V DC	\pm 1000 V DC	\pm 1000 V DC	\pm 1000 V DC	\pm 1000 V DC
Positive DC-Pol <-> PE	+1000 V DC	+1000 V DC	+1000 V DC	+1000 V DC	+1000 V DC
Article number	30000735	30000726	30000727	30000728	30000729

*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

Technical Specifications	PSB 10500-20	PSB 10750-12	PSB 11000-10	PSB 11500-06	
DC-Output					
Voltage range	0 - 500 V	0 - 750 V	0 - 1000 V	0 - 1500 V	
Ripple rms CV	40 mV BW 300 kHz	50 mV BW 300 kHz	100 mV BW 300 kHz	150 mV BW 300 kHz	
Ripple and noise p-p CV	500 mV BW 20 MHz	500 mV BW 20 MHz	2000 mV BW 20 MHz	6500 mV BW 20 MHz	
U_{Min} for I_{Max} (Sink)	2.5 V	2.5 V	4 V	4.2 V	
Current range	0 - 20 A	0 - 12 A	0 - 10 A	0 - 6 A	
Power range *1	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	
Resistance range	1 Ω - 1500 Ω	2 Ω - 3000 Ω	3 Ω - 6000 Ω	8 Ω - 6000 Ω	
Output capacity	240 μ F	80 μ F	60 μ F	20 μ F	
Efficiency up to	95.0% *2	95.0% *2	95.0% *2	95.0% *2	
Isolation					
Negative DC-Pol <-> PE	\pm 1500 V DC	\pm 1500 V DC	\pm 1500 V DC	\pm 1500 V DC	
Positive DC-Pol <-> PE	+2000 V DC	+2000 V DC	+2000 V DC	+2000 V DC	
Article number	30000730	30000731	30000732	30000733	

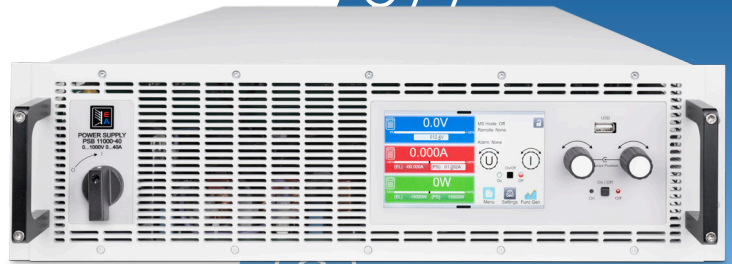
*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

EA-PSB 10000 3U

5 KW - 10 KW - 15 KW

Programmable Bidirectional DC-Power Supply



Features

- Wide range input, 208 V - 480 V $\pm 10\%$ 3ph AC
- Active Power-Factor-Correction, typical 0.99
- Bidirectional power supply, 2-quadrants in source and sink
- In load operation, regenerative with energy recovery into the grid
- Very high efficiency up to over 96 %
- High performance of up to 15 kW per unit
- Voltage from 0 - 10 V up to 0 - 2000 V
- Currents from 0 - 20 A up to 0 - 510 A
- Flexible power regulated DC input/output stages (autoranging)
- Regulation mode CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs, selection of control speed: Normal, Fast, Slow
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Integrated function generator with predefined curves
- Predefined automotive test procedures for LV123, LV124 and LV148
- Integrated battery test mode, battery and fuel cell simulation
- Photovoltaics test mode, MPPT, EN 50530
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Build-in Interfaces

- USB
- Ethernet
- Analog
- USB Host
- Master-Slave-Bus
- Share-Bus

Optional Interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA-Power Control
- EA-Battery Simulator

Technical specifications	PSB 10010-170	PSB 10060-170	PSB 10080-170	PSB 10200-70	PSB 10360-40
DC Output					
Voltage range	0 - 10 V	0 - 60 V	0 - 80 V	0 - 200 V	0 - 360 V
Ripple rms CV	≤10 mV BW 300 kHz	≤10 mV BW 300 kHz	≤10 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz
Ripple and noise p-p CV	≤100 mV BW 20 MHz	≤100 mV BW 20 MHz	≤100 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<0.5 V	<0.5 V	<0.5 V	<2.0 V	<2.0 V
Current range	0 - 170 A	0 - 170 A	0 - 170 A	0 - 70 A	0 - 40 A
Power range	0 - 1700 W	0 - 5000 W	0 - 5000 W	0 - 5000 W	0 - 5000 W
Resistance range	0.016 Ω - 26 Ω	0.016 Ω - 26 Ω	0.016 Ω - 26 Ω	0.1 Ω - 160 Ω	0.3 Ω - 520 Ω
Output capacity	7790 μF	7790 μF	7790 μF	2520 μF	393 μF
Efficiency up to	93.5% *1	94.5% *1	94.5% *1	94.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±600 V DC	±600 V DC	±600 V DC	±1000 V DC	±1000 V DC
Positive DC pole <-> PE	+600 V DC	+600 V DC	+600 V DC	+1000 V DC	+1000 V DC
Article number	30000736	30000737	30000738	30000739	30000740

*1 100% Power and 100% Output voltage

Technical specifications	PSB 10500-30	PSB 10750-20			
DC Output					
Voltage range	0 - 500 V	0 - 750 V			
Ripple rms CV	≤70 mV BW 300 kHz	≤200 mV BW 300 kHz			
Ripple and noise p-p CV	≤350 mV BW 20 MHz	≤800 mV BW 20 MHz			
U_{Min} for I_{Max} (Sink)	<2.2 V	<2.2 V			
Current range	0 - 30 A	0 - 20 A			
Power range	0 - 5000 W	0 - 5000 W			
Resistance range	0.6 Ω - 1000 Ω	1.2 Ω - 2200 Ω			
Output capacity	180 μF	180 μF			
Efficiency up to	95.5% *1	95.5% *1			
Insulation					
Negative DC pole <-> PE	±1500 V DC	±1500 V DC			
Positive DC pole <-> PE	+2000 V DC	+2000 V DC			
Article number	30000741	30000742			

*1 100% Power and 100% Output voltage

Technical specifications	PSB 10010-340	PSB 10060-340	PSB 10080-340	PSB 10200-140	PSB 10360-80
DC Output					
Voltage range	0 - 10 V	0 - 60 V	0 - 80 V	0 - 200 V	0 - 360 V
Ripple rms CV	≤10 mV BW 300 kHz	≤10 mV BW 300 kHz	≤10 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz
Ripple and noise p-p CV	≤100 mV BW 20 MHz	≤100 mV BW 20 MHz	≤100 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<0.5 V	<0.5 V	<0.5 V	<2.0 V	<2.0 V
Current range	0 - 340 A	0 - 340 A	0 - 340 A	0 - 140 A	0 - 80 A
Power range	0 - 3400 W	0 - 10000 W	0 - 10000 W	0 - 10000 W	0 - 10000 W
Resistance range	0.008 Ω - 13 Ω	0.008 Ω - 13 Ω	0.008 Ω - 13 Ω	0.05 Ω - 80 Ω	0.15 Ω - 260 Ω
Output capacity	15980 μF	15980 μF	15980 μF	5040 μF	786 μF
Efficiency up to	93.5% *1	94.5% *1	94.5% *1	94.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±600 V DC	±600 V DC	±600 V DC	±1000 V DC	±1000 V DC
Positive DC pole <-> PE	+600 V DC	+600 V DC	+600 V DC	+1000 V DC	+1000 V DC
Article number	30000743	30000744	30000745	30000746	30000747

*1 100% Power and 100% Output voltage

Technical specifications	PSB 10500-60	PSB 10750-40	PSB 11000-30	PSB 11500-20	
DC Output					
Voltage range	0 - 500 V	0 - 750 V	0 - 1000 V	0 - 1500 V	
Ripple rms CV	≤70 mV BW 300 kHz	≤200 mV BW 300 kHz	≤200 mV BW 300 kHz	≤400 mV BW 300 kHz	
Ripple and noise p-p CV	≤350 mV BW 20 MHz	≤800 mV BW 20 MHz	≤1000 mV BW 20 MHz	≤2000 mV BW 20 MHz	
U_{Min} for I_{Max} (Sink)	<2.2 V	<2.2 V	<4.0 V	<4.0 V	
Current range	0 - 60 A	0 - 40 A	0 - 30 A	0 - 20 A	
Power range	0 - 10000 W	0 - 10000 W	0 - 10000 W	0 - 10000 W	
Resistance range	0.3 Ω - 500 Ω	0.6 Ω - 1100 Ω	1.2 Ω - 2000 Ω	2.6 Ω - 4500 Ω	
Output capacity	360 μF	360 μF	90 μF	90 μF	
Efficiency up to	95.5% *1	95.5% *1	95.5% *1	95.5% *1	
Insulation					
Negative DC pole <-> PE	±1500 V DC	±1500 V DC	±1500 V DC	±1500 V DC	
Positive DC pole <-> PE	+2000 V DC	+2000 V DC	+2000 V DC	+2000 V DC	
Article number	30000748	30000749	30000750	30000751	

*1 100% Power and 100% Output voltage

Technical specifications	PSB 10010-510	PSB 10060-510	PSB 10080-510	PSB 10200-210	PSB 10360-120
DC Output					
Voltage range	0 - 10 V	0 - 60 V	0 - 80 V	0 - 200 V	0 - 360 V
Ripple rms CV	≤10 mV BW 300 kHz	≤10 mV BW 300 kHz	≤10 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz
Ripple and noise p-p CV	≤100 mV BW 20 MHz	≤100 mV BW 20 MHz	≤100 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<0.5 V	<0.5 V	<0.5 V	<2.0 V	<2.0 V
Current range	0 - 510 A	0 - 510 A	0 - 510 A	0 - 210 A	0 - 120 A
Power range	0 - 5100 W	0 - 15000 W	0 - 15000 W	0 - 15000 W	0 - 15000 W
Resistance range	0.006 Ω - 8 Ω	0.006 Ω - 9 Ω	0.006 Ω - 9 Ω	0.03 Ω - 50 Ω	0.1 Ω - 180 Ω
Output capacity	23970 μF	23970 μF	23970 μF	7560 μF	1179 μF
Efficiency up to	93.5% *1	94.5% *1	94.5% *1	94.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±600 V DC	±600 V DC	±600 V DC	±1000 V DC	±1000 V DC
Positive DC pole <-> PE	+600 V DC	+600 V DC	+600 V DC	+1000 V DC	+1000 V DC
Article number	30000709	30000700	30000701	30000702	30000703

*1 100% Power and 100% Output voltage

Technical specifications	PSB 10500-90	PSB 10750-60	PSB 11000-40	PSB 11500-30	PSB 12000-20
DC Output					
Voltage range	0 - 500 V	0 - 750 V	0 - 1000 V	0 - 1500 V	0 - 2000 V
Ripple rms CV	≤70 mV BW 300 kHz	≤200 mV BW 300 kHz	≤300 mV BW 300 kHz	≤400 mV BW 300 kHz	≤400 mV BW 300 kHz
Ripple and noise p-p CV	≤350 mV BW 20 MHz	≤800 mV BW 20 MHz	≤1600 mV BW 20 MHz	≤2400 mV BW 20 MHz	≤2400 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<2.2 V	<2.2 V	<5.2 V	<5.2 V	<5.2 V
Current range	0 - 90 A	0 - 60 A	0 - 40 A	0 - 30 A	0 - 20 A
Power range	0 - 15000 W	0 - 15000 W	0 - 15000 W	0 - 15000 W	0 - 15000 W
Resistance range	0.2 Ω - 330 Ω	0.4 Ω - 750 Ω	0.8 Ω - 1300 Ω	1.8 Ω - 3000 Ω	1.7 Ω - 2700 Ω
Output capacity	540 μF	540 μF	131 μF	60 μF	60 μF
Efficiency up to	95.5% *1	95.5% *1	95.5% *1	95.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±1500 V DC	±1500 V DC	±1500 V DC	±1500 V DC	±1500 V DC
Positive DC pole <-> PE	+2000 V DC	+2000 V DC	+2000 V DC	+2000 V DC	+2000 V DC
Article number	30000704	30000705	30000706	30000707	30000708

*1 100% Power and 100% Output voltage

EA-PSB 10000 4U 30 KW

Programmable Bidirectional DC Power Supply



Features

- Wide range input, 208 V - 480 V \pm 10 % 3ph AC
- Active Power Factor Correction, typical 0.99
- Bidirectional power supply, 2-quadrants in source and sink
- In load operation, regenerative with energy recovery into the grid
- Very high efficiency up to over 96 %
- High performance of 30 kW per unit
- Voltage from 0 - 10 V up to 0 - 2000 V
- Currents from 0 - 40 A up to 0 - 1000 A
- Flexible power regulated DC -input/output stages (autoranging)
- Regulation mode CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs, selection of control speed: Normal, Fast, Slow
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave-Bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Integrated function generator with predefined curves
- Predefined automotive test procedures for LV123, LV124 and LV148
- Integrated battery test mode, battery and fuel cell simulation
- Photovoltaics test mode, MPPT, EN 50530
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Build-in Interfaces

- USB
- Ethernet
- Analog
- USB Host
- Master-Slave-Bus
- Share-Bus

Optional Interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA-Power Control
- EA-Battery Simulator

Options

- Water Cooling in stainless steel

Technical Specifications	PSB 10010-1000	PSB 10060-1000	PSB 10080-1000	PSB 10200-420
DC-Output				
Voltage range	0 - 10 V	0 - 60 V	0 - 80 V	0 - 200 V
Ripple rms CV	≤25 mV BW 300 kHz	≤25 mV BW 300 kHz	≤25 mV BW 300 kHz	≤40 mV BW 300 kHz
Ripple and noise p-p CV	≤320 mV BW 20 MHz	≤320 mV BW 20 MHz	≤320 mV BW 20 MHz	≤300 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<0.66 V	<0.66 V	<0.66 V	<2 V
Current range	0 - 1000 A	0 - 1000 A	0 - 1000 A	0 - 420 A
Power range	0 - 10000 W	0 - 30000 W	0 - 30000 W	0 - 30000 W
Resistance range	0.003 Ω - 5 Ω	0.003 Ω - 5 Ω	0.003 Ω - 5 Ω	0.0165 Ω - 25 Ω
Output capacity	25380 μF	25380 μF	25380 μF	5400 μF
Efficiency up to	93.8% *1	95.1% *1	95.5% *1	95.3% *1
Isolation				
Negative DC-Pol <-> PE	±600 V DC	±600 V DC	±600 V DC	±1000 V DC
Positive DC-Pol <-> PE	+600 V DC	+600 V DC	+600 V DC	+1000 V DC
Article number				
Article number Standard	30000810	30000800	30000801	30000802
Article number Water cooling		30000820	30000821	30000822

*1 At 100% Power and 100% Output voltage

Technical Specifications	PSB 10360-240	PSB 10500-180	PSB 10750-120	PSB 10920-125
DC-Output				
Voltage range	0 - 360 V	0 - 500 V	0 - 750 V	0 - 920 V
Ripple rms CV	≤55 mV BW 300 kHz	≤70 mV BW 300 kHz	≤200 mV BW 300 kHz	≤200 mV BW 300 kHz
Ripple and noise p-p CV	≤320 mV BW 20 MHz	≤350 mV BW 20 MHz	≤800 mV BW 20 MHz	≤800 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<2.5 V	<2.3 V	<2 V	<2 V
Current range	0 - 240 A	0 - 180 A	0 - 120 A	0 - 125 A
Power range	0 - 30000 W	0 - 30000 W	0 - 30000 W	0 - 30000 W
Resistance range	0.05 Ω - 90 Ω	0.08 Ω - 170 Ω	0.2 Ω - 370 Ω	0.25 Ω - 550 Ω
Output capacity	1800 μF	675 μF	450 μF	100 μF
Efficiency up to	95.8% *1	96.5% *1	96.5% *1	96.5% *1
Isolation				
Negative DC-Pol <-> PE	±1000 V DC	±1500 V DC	±1500 V DC	±1500 V DC
Positive DC-Pol <-> PE	+1000 V DC	+2000 V DC	+2000 V DC	+2000 V DC
Article number				
Article number Standard	30000803	30000804	30000805	30000809
Article number Water cooling	30000823	30000824	30000825	

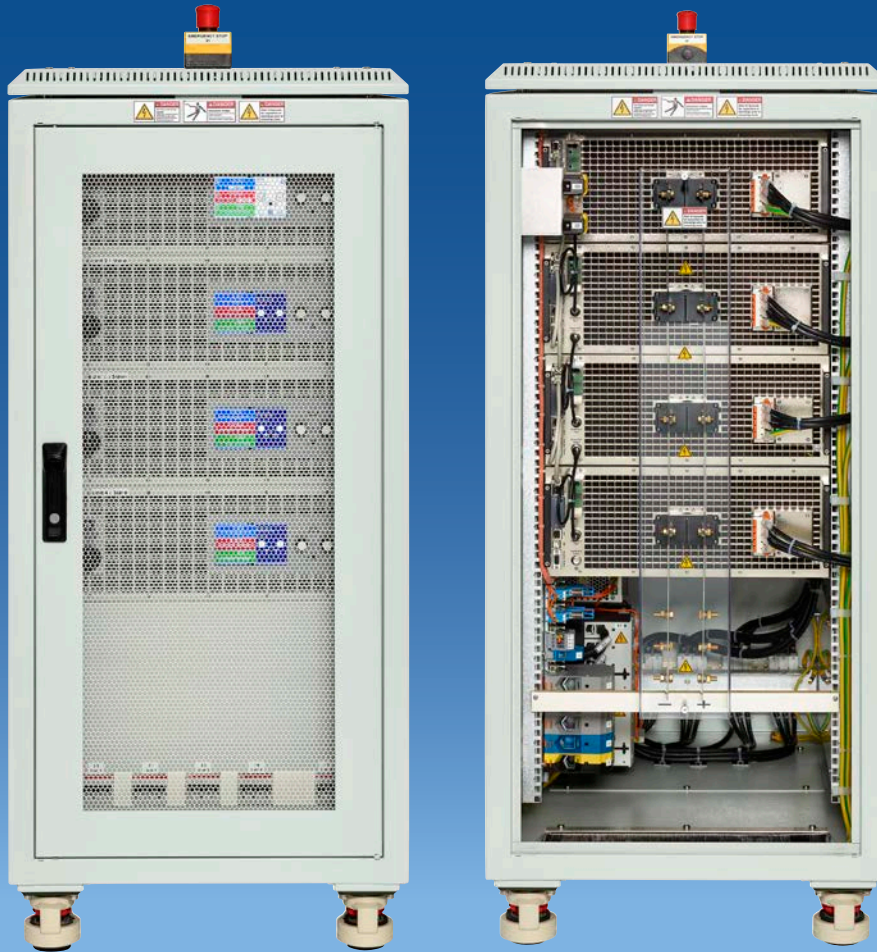
*1 At 100% Power and 100% Output voltage

Technical Specifications	PSB 11000-80	PSB 11500-60	PSB 12000-40	
DC-Output				
Voltage range	0 - 1000 V	0 - 1500 V	0 - 2000 V	
Ripple rms CV	≤300 mV BW 300 kHz	≤400 mV BW 300 kHz	≤400 mV BW 300 kHz	
Ripple and noise p-p CV	≤1600 mV BW 20 MHz	≤2400 mV BW 20 MHz	≤2400 mV BW 20 MHz	
U_{Min} for I_{Max} (Sink)	<3.9 V	<3.4 V	<3.7 V	
Current range	0 - 80 A	0 - 60 A	0 - 40 A	
Power range	0 - 30000 W	0 - 30000 W	0 - 30000 W	
Resistance range	0.4 Ω - 650 Ω	0.8 Ω - 1500 Ω	1.7 Ω - 2700 Ω	
Output capacity	200 μF	75 μF	50 μF	
Efficiency up to	95.8% *1	96.5% *1	96.5% *1	
Isolation				
Negative DC-Pol <-> PE	±1500 V DC	±1500 V DC	±1500 V DC	
Positive DC-Pol <-> PE	+2000 V DC	+2000 V DC	+2000 V DC	
Article number				
Article number Standard	30000806	30000807	30000808	
Article number Water cooling	30000826	30000827	30000828	

*1 At 100% Power and 100% Output voltage

HIGH RATING DC POWER SUPPLY SYSTEMS

30 KW - 120 KW IN 19" CABINETS



PSB 10000 24U

U I P R OVP OCP OPP OTP USB LAN

- For 380 V, 400 V and 480 V supply
- Flexible power stage
- 60 V models for SELV
- With bidirectional power supplies with energy recovery (PSB) or standard power supplies (PSI)
- Intuitive handling due to multi-language color TFT touch panel
- Extensive function generator
- For photovoltaics, battery and fuel cell tests
- Master-slave feature (PSI)
- Protective features (OVP, OCP, OT...)
- Plug&Play slot for digital interfaces
- All interfaces galvanically isolated
- Optional: water cooling
- Optional: grid protection ⁽¹⁾ plus emergency stop
- Optional: emergency stop without grid protection
- Remote control software EA Power Control
- LabVIEW VI package
- IVI driver support
- SCPI and ModBus protocol
- 19" cabinet in 24 U
- Extendable to 4 units per cabinet

(1) Grid protection device for backfeeding installations according to VDE AR-N 4105

OVERVIEW

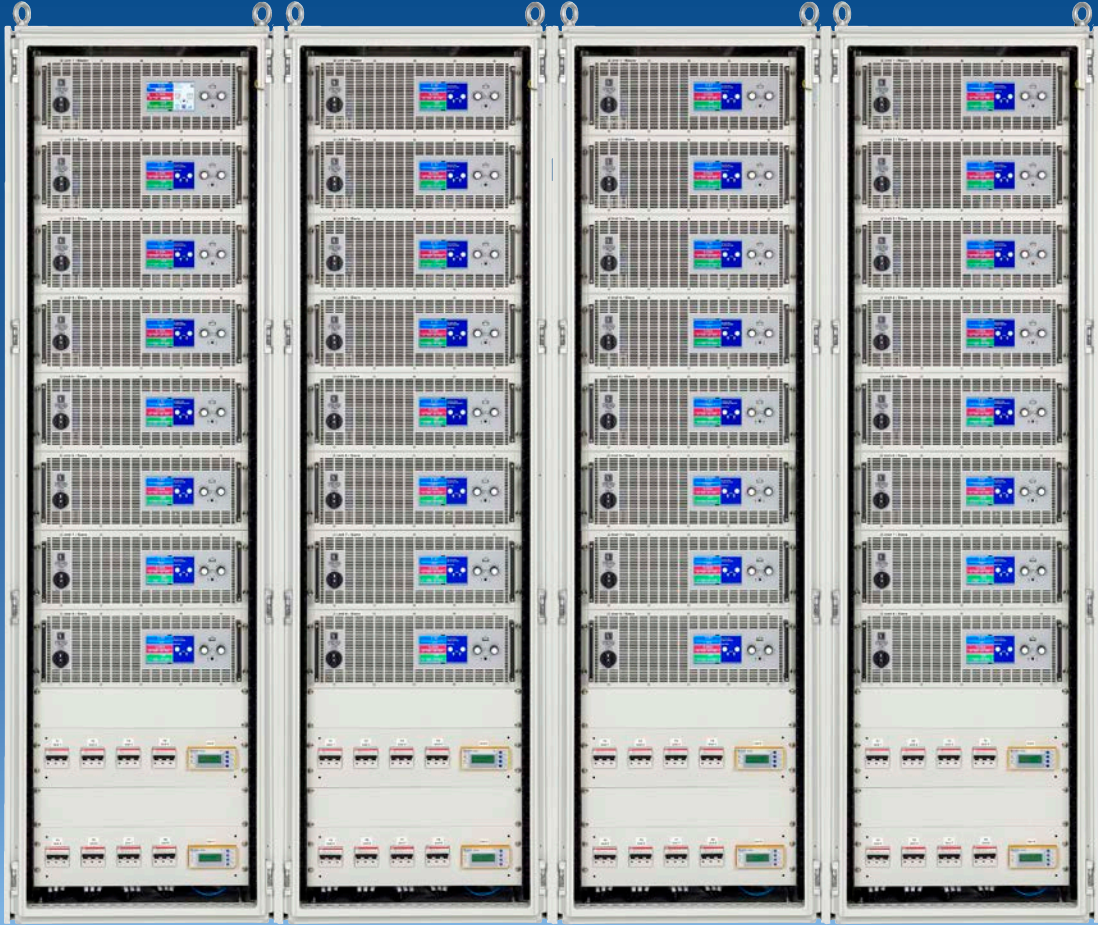
SERIES	POWERS	VOLTAGES	CURRENTS	R MODE	FG ¹	DISPLAY	OPTIONAL DIGITAL INTERFACES
PSB 10000 24U	30 kW - 120 kW	60 - 2000 V	40 - 3000 A	yes	yes	TFT Touch	CAN, CANopen, Profibus, Profinet, EtherCAT, RS232

(1 Function generator (2 Master-Slave)

MODELS PSB	MODELS PSI	VOLTAGE RATINGS	CURRENT RATINGS	POWER RATINGS	INSULATION *		INSTALLED UNITS / REMAINING SLOTS
PSB 10060-1000	PSI 10060-1000	0...60 V	0...1000 A	0...30 kW	± 500 V	+ 600 V	1 / 3
PSB 10080-1000	PSI 10080-1000	0...80 V	0...1000 A	0...30 kW	± 500 V	+ 600 V	1 / 3
PSB 10200-420	PSI 10200-420	0...200 V	0...420 A	0...30 kW	± 800 V	+ 1000 V	1 / 3
PSB 10360-240	PSI 10360-240	0...360 V	0...240 A	0...30 kW	± 1500 V	+ 2000 V	1 / 3
PSB 10500-180	PSI 10500-180	0...500 V	0...180 A	0...30 kW	± 1500 V	+ 2000 V	1 / 3
PSB 10750-120	PSI 10750-120	0...750 V	0...120 A	0...30 kW	± 1500 V	+ 2000 V	1 / 3
PSB 11000-80	PSI 11000-80	0...1000 V	0...80 A	0...30 kW	± 1500 V	+ 2000 V	1 / 3
PSB 11500-60	PSI 11500-60	0...1500 V	0...60 A	0...30 kW	± 1500 V	+ 2000 V	1 / 3
PSB 12000-40	PSI 12000-40	0...2000 V	0...40 A	0...30 kW	± 1500 V	+ 2000 V	1 / 3
PSB 10060-2000	PSI 10060-2000	0...60 V	0...2000 A	0...60 kW	± 500 V	+ 600 V	2 / 2
PSB 10080-2000	PSI 10080-2000	0...80 V	0...2000 A	0...60 kW	± 500 V	+ 600 V	2 / 2
PSB 10200-840	PSI 10200-840	0...200 V	0...840 A	0...60 kW	± 800 V	+ 1000 V	2 / 2
PSB 10360-480	PSI 10360-480	0...360 V	0...480 A	0...60 kW	± 1500 V	+ 2000 V	2 / 2
PSB 10500-360	PSI 10500-360	0...500 V	0...360 A	0...60 kW	± 1500 V	+ 2000 V	2 / 2
PSB 10750-240	PSI 10750-240	0...750 V	0...120 A	0...60 kW	± 1500 V	+ 2000 V	2 / 2
PSB 11000-120	PSI 11000-120	0...1000 V	0...80 A	0...60 kW	± 1500 V	+ 2000 V	2 / 2
PSB 11500-120	PSI 11500-120	0...1500 V	0...60 A	0...60 kW	± 1500 V	+ 2000 V	2 / 2
PSB 12000-80	PSI 12000-80	0...2000 V	0...40 A	0...60 kW	± 1500 V	+ 2000 V	2 / 2
PSB 10060-3000	PSI 10060-3000	0...60 V	0...3000 A	0...90 kW	± 500 V	+ 600 V	3 / 1
PSB 10080-3000	PSI 10080-3000	0...80 V	0...3000 A	0...90 kW	± 500 V	+ 600 V	3 / 1
PSB 10200-1260	PSI 10200-1260	0...200 V	0...1260 A	0...90 kW	± 800 V	+ 1000 V	3 / 1
PSB 10360-720	PSI 10360-720	0...360 V	0...720 A	0...90 kW	± 1500 V	+ 2000 V	3 / 1
PSB 10500-540	PSI 10500-540	0...500 V	0...540 A	0...90 kW	± 1500 V	+ 2000 V	3 / 1
PSB 10750-360	PSI 10750-360	0...750 V	0...360 A	0...90 kW	± 1500 V	+ 2000 V	3 / 1
PSB 11000-240	PSI 11000-240	0...1000 V	0...240 A	0...90 kW	± 1500 V	+ 2000 V	3 / 1
PSB 11500-180	PSI 11500-180	0...1500 V	0...180 A	0...90 kW	± 1500 V	+ 2000 V	3 / 1
PSB 12000-120	PSI 12000-120	0...2000 V	0...120 A	0...90 kW	± 1500 V	+ 2000 V	3 / 1
PSB 10200-1680	PSI 10200-1680	0...200 V	0...1680 A	0...120 kW	± 800 V	+ 1000 V	4 / 0
PSB 10360-960	PSI 10360-960	0...360 V	0...960 A	0...120 kW	± 1500 V	+ 2000 V	4 / 0
PSB 10500-720	PSI 10500-720	0...500 V	0...720 A	0...120 kW	± 1500 V	+ 2000 V	4 / 0
PSB 10750-480	PSI 10750-480	0...750 V	0...480 A	0...120 kW	± 1500 V	+ 2000 V	4 / 0
PSB 11000-240	PSI 11000-240	0...1000 V	0...240 A	0...120 kW	± 1500 V	+ 2000 V	4 / 0
PSB 11500-180	PSI 11500-180	0...1500 V	0...180 A	0...120 kW	± 1500 V	+ 2000 V	4 / 0
PSB 12000-160	PSI 12000-160	0...2000 V	0...160 A	0...120 kW	± 1500 V	+ 2000 V	4 / 0

* Left: DC- to PE / right: DC+ to PE

HIGH RATING DC POWER SUPPLY SYSTEMS UP TO 1920 KW IN 19" CABINETS



SYSTEM 960

U I P R OVP OCP OPP OTP USB ...

- For 380 V, 400 V and 480 V supply
 - With bidirectional power supplies with energy recovery (PSB 10000) or electronic loads with energy recovery (ELR 10000) or standard power supplies (PSI 10000)
 - Power ratings of up to 240 kW per cabinet
 - Master-Slave systems with up to 1920 kW
 - Voltage ratings of up to 2000 V per cabinet or system
 - Current ratings of up to 8000 A per cabinet
 - 60 V systems for SELV
 - Intuitive handling with multi-language color TFT touch panel
 - Extensive function generator
 - For photovoltaics, battery and fuel cell tests
 - Protective features (OVP, OCP, OT...)
 - USB, Ethernet and analog interface integrated
 - Plug&Play slot for digital interfaces
 - All interfaces galvanically isolated
 - Built according standard EN 60204-1 (machine safety)
- Various options:
 - Emergency stop circuit
 - Isometer (insulation guard)
 - Grid protection and supervision (for recovering devices)
 - Water cooling
 - 19" cabinets in 24 U or 42 U for following series:
 - PSB 10000
 - PSI 10000
 - ELR 10000

TECHNICAL DATA

	SYSTEM CABINETS							
SYSTEM CODE	240	480	720	960	1200	1440	1680	1920
NR OF CABINETS	1	2	3	4	5	6	7	8
AC SUPPLY	2x three-phase supply per cabinet (L1, L2, L3, N, PE)							
AC VOLTAGE	380 / 400 / 480 V (with installed option "grid protection": 400 V), ±10%, 45-66 Hz, PF > 0.99							
SYSTEM HEIGHT	24 U or 42 U, depending on the number of devices per cabinet							
SYSTEM WIDTH	0.6 m (2 ft)	1.2 m (3.9 ft)	1.8 m (5.9 ft)	2.4 m (7.9 ft)	3 m (9.8 ft)	3.6 m (11.8 ft)	4.2 m (13.8)	4.8 m (15.7 ft)
POSSIBLE NR OF DEVICES	8	9 - 16	17 - 24	25 - 32	33 - 40	41 - 48	49 - 56	57 - 64
MAX. ACHIEVABLE POWER	240 kW	480 kW	720 kW	960 kW	1200 kW	1440 kW	1680 kW	1920 kW

SYSTEM	240	480	720	960
VOLTAGE RATINGS	60 - 2000 V	60 - 2000 V	60 - 2000 V	60 - 2000 V
CURRENT RATINGS	40...8000 A	360...16000 A	680...24000 A	1000...32000 A
POWER RATINGS	(1 - 8) x 30 kW	(9 - 16) x 30 kW	(17 - 24) x 30 kW	(25 - 32) x 30 kW
AC SUPPLY CONNECTORS	2	4	6	8
MAX. AC CURRENT	448 A (2 x 224 A)	996 A (4 x 224 A)	1344 A (6 x 224 A)	1792 A (8 x 224 A)

SYSTEM	1200	1440	1680	1920
VOLTAGE RATINGS	60 - 2000 V	60 - 2000 V	60 - 2000 V	60 - 2000 V
CURRENT RATINGS	1320...40000 A	1640...48000 A	1960...56000 A	2280...64000 A
POWER RATINGS	(33 - 40) x 30 kW	(41 - 48) x 30 kW	(49 - 56) x 30 kW	(57 - 64) x 30 kW
AC SUPPLY CONNECTORS	10	12	14	16
MAX. AC CURRENT	2240 A (10 x 224 A)	2688 A (12 x 224 A)	3136 A (14 x 224 A)	3584 A (16 x 224 A)



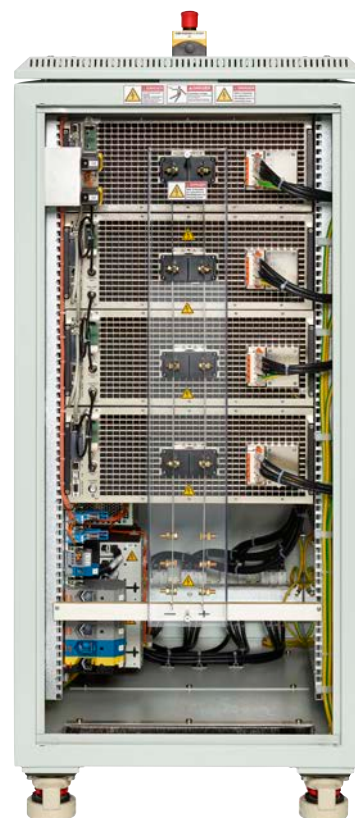
Front view of a 24 U model

← Master device →

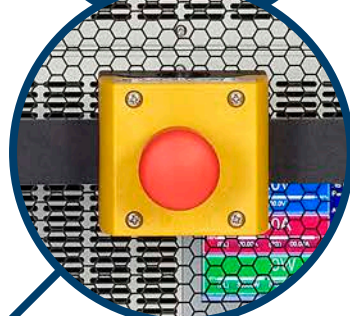
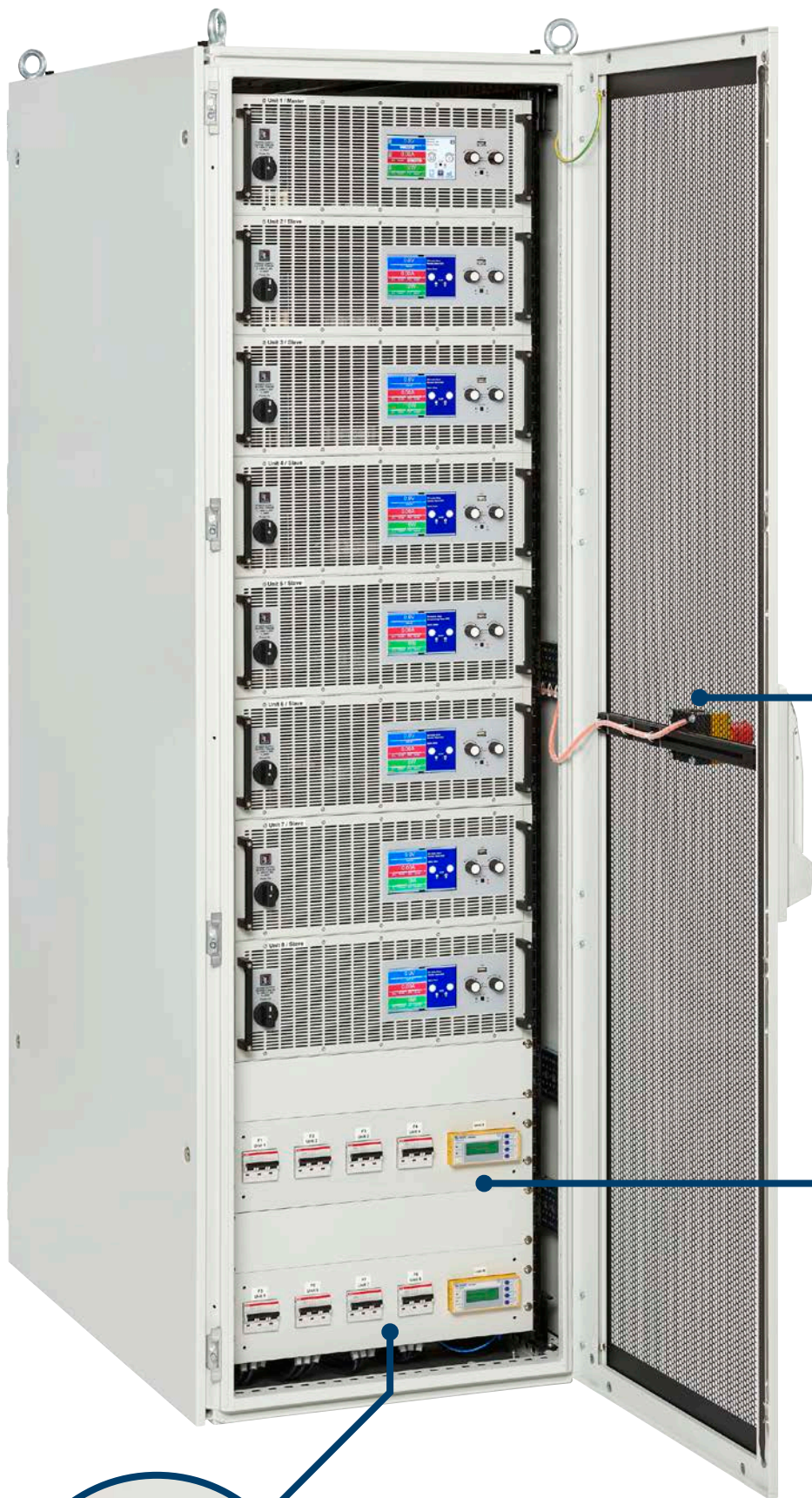
← Slave 1 →

← Slave 2 →

← Slave 3 →



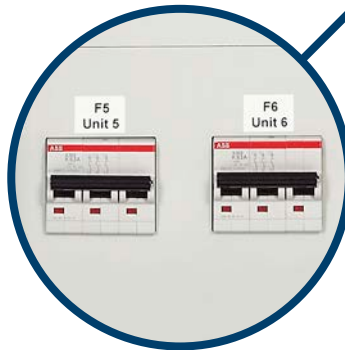
Rear view of a 24 U model



Emergency stop circuit with redundant breakers



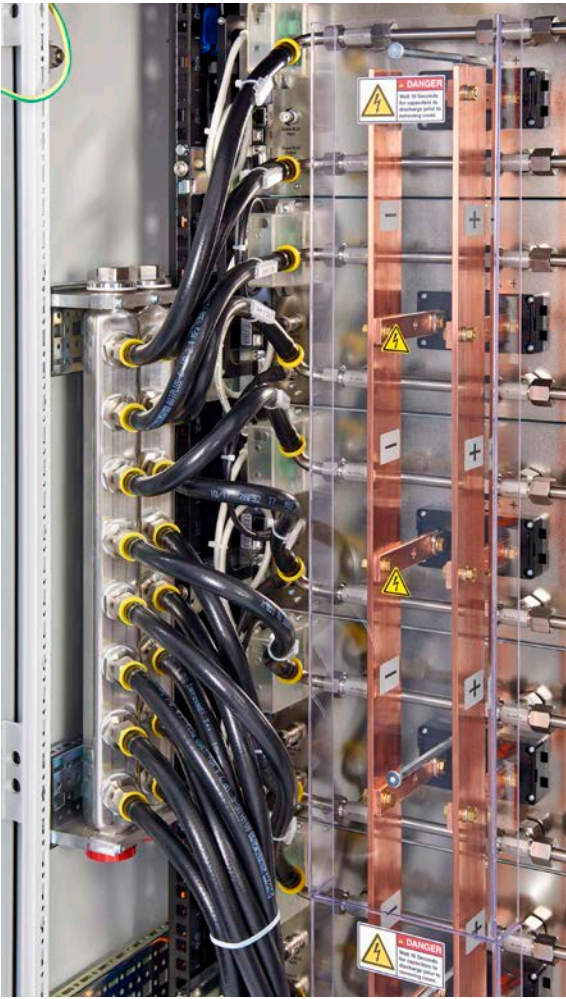
Supervision device (optional grid protection for backfeeding systems)



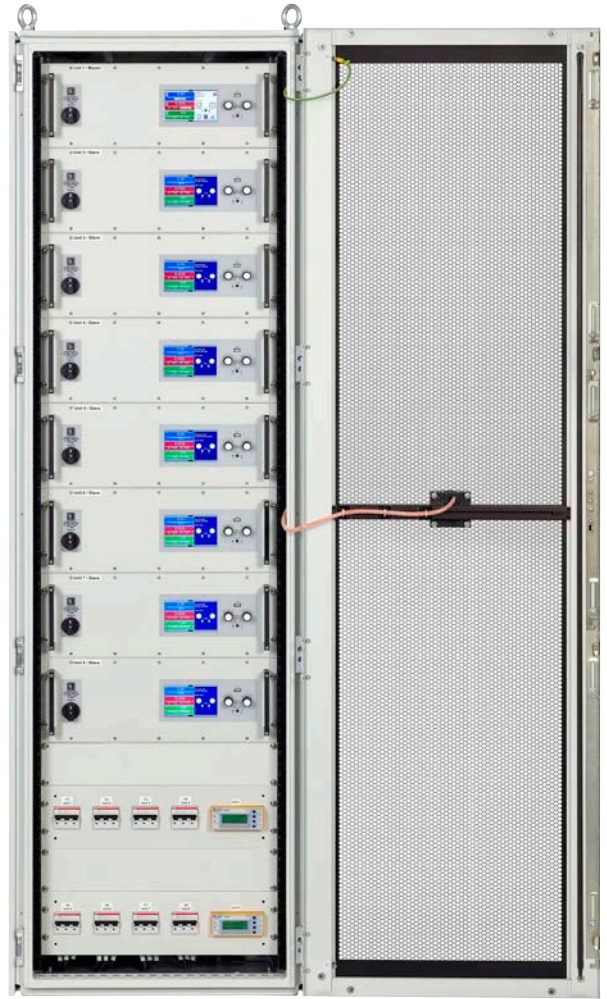
All circuit breakers accessible on the front

Cabinet system 240 kW with 8 units of PSB 10000 in master-slave operation (air cooled)

WATER COOLING



Closeup of the water distribution in a cabinet with eight units and water cooling installed (240 kW system), DC bus



Front view of a water cooled system with eight units in hermetically closed chassis



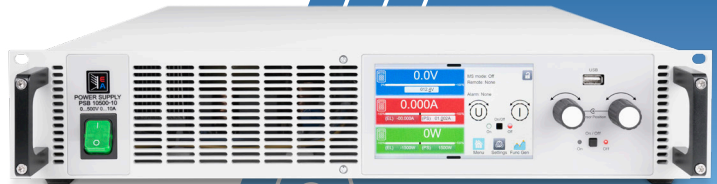
Closeup of the DC bus (24 U cabinet)



Closeup of Share bus and master-slave bus

EA-ELR 10000 2U 1.5 KW / 3.0 KW

Programmable Electronic DC-Loads
With Energy Recovery



Features

- Wide range input, 110 V - 240 V $\pm 10\%$ 1ph AC
- Active Power-Factor-Correction, typical 0.99
- Regenerative with energy recovery into the grid
- Very high efficiency up to over 95 %
- Voltage from 0 - 80 V up to 0 - 1500 V
- Currents from 0 - 6 A up to 0 - 120 A
- Flexible power regulated DC input stages (autoranging)
- Regulation mode CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs, selection of control speed: Normal, Fast, Slow
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Integrated function generator with predefined curves
- Integrated battery test mode
- Photovoltaics test mode, MPPT
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Build-in Interfaces

- USB
- Ethernet
- Analog
- USB Host
- Master-Slave-Bus
- Share-Bus

Optional Interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA-Power Control

Technical Specifications	ELR 10080-60	ELR 10200-25	ELR 10360-15	ELR 10500-10	ELR 10750-06
DC-Input					
Voltage range	0 - 80 V	0 - 200 V	0 - 360 V	0 - 500 V	0 - 750 V
Ripple rms CV	10 mV BW 300 kHz	30 mV BW 300 kHz	30 mV BW 300 kHz	40 mV BW 300 kHz	50 mV BW 300 kHz
Ripple and noise p-p CV	100 mV BW 20 MHz	300 mV BW 20 MHz	300 mV BW 20 MHz	500 mV BW 20 MHz	500 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	0.8 V	2 V	2 V	2.5 V	2.5 V
Current range	0 - 60 A	0 - 25 A	0 - 15 A	0 - 10 A	0 - 6 A
Power range *1	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)	0 - 1500 W (0 - 1200 W)
Resistance range	0.04 Ω - 80 Ω	0.25 Ω - 500 Ω	0.8 Ω - 1600 Ω	2 Ω - 3000 Ω	4 Ω - 6000 Ω
Output capacity	8640 μ F	800 μ F	330 μ F	120 μ F	40 μ F
Efficiency up to	94.0% *2	94.5% *2	94.5% *2	95.0% *2	95.0% *2
Isolation					
Negative DC-Pol <-> PE	\pm 1000 V DC	\pm 1000 V DC	\pm 1000 V DC	\pm 1500 V DC	\pm 1500 V DC
Positive DC-Pol <-> PE	+1000 V DC	+1000 V DC	+1000 V DC	+2000 V DC	+2000 V DC
Article number	33200840	33200841	33200842	33200843	33200844

*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

Technical Specifications	ELR 10080-120	ELR 10200-50	ELR 10360-30	ELR 10500-20	ELR 10750-12
DC-Input					
Voltage range	0 - 80 V	0 - 200 V	0 - 360 V	0 - 500 V	0 - 750 V
Ripple rms CV	10 mV BW 300 kHz	30 mV BW 300 kHz	30 mV BW 300 kHz	40 mV BW 300 kHz	50 mV BW 300 kHz
Ripple and noise p-p CV	100 mV BW 20 MHz	300 mV BW 20 MHz	300 mV BW 20 MHz	500 mV BW 20 MHz	500 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	0.8 V	2 V	2 V	2.5 V	2.5 V
Current range	0 - 120 A	0 - 50 A	0 - 30 A	0 - 20 A	0 - 12 A
Power range *1	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)
Resistance range	0.02 Ω - 40 Ω	0.1 Ω - 250 Ω	0.4 Ω - 800 Ω	1 Ω - 1500 Ω	2 Ω - 3000 Ω
Output capacity	17280 μ F	1600 μ F	660 μ F	240 μ F	80 μ F
Efficiency up to	94.0% *2	94.5% *2	94.5% *2	95.0% *2	95.0% *2
Isolation					
Negative DC-Pol <-> PE	\pm 1000 V DC	\pm 1000 V DC	\pm 1000 V DC	\pm 1500 V DC	\pm 1500 V DC
Positive DC-Pol <-> PE	+1000 V DC	+1000 V DC	+1000 V DC	+2000 V DC	+2000 V DC
Article number	33200845	33200846	33200847	33200848	33200849

*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

Technical Specifications	ELR 11000-10	ELR 11500-06			
DC-Input					
Voltage range	0 - 1000 V	0 - 1500 V			
Ripple rms CV	100 mV BW 300 kHz	150 mV BW 300 kHz			
Ripple and noise p-p CV	2000 mV BW 20 MHz	6500 mV BW 20 MHz			
U_{Min} for I_{Max} (Sink)	4 V	4.2 V			
Current range	0 - 10 A	0 - 6 A			
Power range *1	0 - 3000 W (0 - 1500 W)	0 - 3000 W (0 - 1500 W)			
Resistance range	3 Ω - 6000 Ω	8 Ω - 6000 Ω			
Output capacity	60 μ F	20 μ F			
Efficiency up to	95.0% *2	95.0% *2			
Isolation					
Negative DC-Pol <-> PE	\pm 1500 V DC	\pm 1500 V DC			
Positive DC-Pol <-> PE	+2000 V DC	+2000 V DC			
Article number	33200850	33200851			

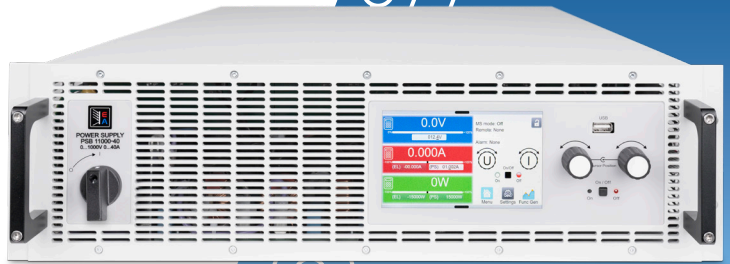
*1 The value in brackets applies to the state of derating (power reduction) for 110 V AC and 120 V AC grid

*2 100% Power and 100% Output voltage

EA-ELR 10000 3U

5 KW - 10 KW - 15 KW

Programmable Electronic DC-Loads
With Energy Recovery



Features

- Wide range input, 208 V - 480 V $\pm 10\%$ 3ph AC
- Active Power-Factor-Correction, typical 0.99
- Regenerative with energy recovery into the grid
- Very high efficiency up to over 96 %
- High performance of up to 15 kW per unit
- Voltage from 0 - 80 V up to 0 - 2000 V
- Currents from 0 - 20 A up to 0 - 510 A
- Flexible power regulated DC input stages (autoranging)
- Regulation mode CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs, selection of control speed: Normal, Fast, Slow
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave-Bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Integrated function generator with predefined curves
- Integrated battery test mode
- Photovoltaics test mode, MPPT
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Build-in Interfaces

- USB
- Ethernet
- Analog
- USB Host
- Master-Slave-Bus
- Share-Bus

Optional Interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA-Power Control

Technical specifications	ELR 10080-170	ELR 10200-70	ELR 10360-40	ELR 10500-30	ELR 10750-20
DC Output					
Voltage range	0 - 80 V	0 -200 V	0 - 360 V	0 - 500 V	0 - 750 V
Ripple rms CV	≤10 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz	≤70 mV BW 300 kHz	≤200 mV BW 300 kHz
Ripple and noise p-p CV	≤100 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz	≤350 mV BW 20 MHz	≤800 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<0.5 V	<2.0 V	<2.0 V	<2.2 V	<2.2 V
Current range	0 - 170 A	0 - 70 A	0 - 40 A	0 - 30 A	0 - 20 A
Power range	0 - 5000 W	0 - 5000 W	0 - 5000 W	0 - 5000 W	0 - 5000 W
Resistance range	0.016 Ω - 26 Ω	0.1 Ω - 160 Ω	0.3 Ω - 520 Ω	0.6 Ω - 1000 Ω	1.2 Ω - 2200 Ω
Output capacity	7790 μF	2520 μF	393 μF	180 μF	180 μF
Efficiency up to	94.5% *1	94.5% *1	95.5% *1	95.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC	±1500 V DC
Positive DC pole <-> PE	+600 V DC	+1000 V DC	+1000 V DC	+2000 V DC	+2000 V DC
Article number	33200828	33200829	33200830	33200831	33200832

*1 100% Power and 100% Output voltage

Technical specifications	ELR 10080-340	ELR 10200-140	ELR 10360-80	ELR 10500-60	ELR 10750-40
DC Output					
Voltage range	0 - 80 V	0 -200 V	0 - 360 V	0 - 500 V	0 - 750 V
Ripple rms CV	≤10 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz	≤70 mV BW 300 kHz	≤200 mV BW 300 kHz
Ripple and noise p-p CV	≤100 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz	≤350 mV BW 20 MHz	≤800 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<0.5 V	<2.0 V	<2.0 V	<2.2 V	<2.2 V
Current range	0 - 340 A	0 - 140 A	0 - 80 A	0 - 60 A	0 - 40 A
Power range	0 - 10000 W	0 - 10000 W	0 - 10000 W	0 - 10000 W	0 - 10000 W
Resistance range	0.008 Ω - 13 Ω	0.05 Ω - 80 Ω	0.15 Ω - 260 Ω	0.3 Ω - 500 Ω	0.6 Ω - 1100 Ω
Output capacity	15980 μF	5040 μF	786 μF	360 μF	360 μF
Efficiency up to	94.5% *1	94.5% *1	95.5% *1	95.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC	±1500 V DC
Positive DC pole <-> PE	+600 V DC	+1000 V DC	+1000 V DC	+2000 V DC	+2000 V DC
Article number	33200833	33200834	33200835	33200836	33200837

*1 100% Power and 100% Output voltage

Technical specifications	ELR 11000-30	ELR 11500-20			
DC Output					
Voltage range	0 - 1000 V	0 - 1500 V			
Ripple rms CV	≤200 mV BW 300 kHz	≤400 mV BW 300 kHz			
Ripple and noise p-p CV	≤1000 mV BW 20 MHz	≤2000 mV BW 20 MHz			
U_{Min} for I_{Max} (Sink)	<4.0 V	<4.0 V			
Current range	0 - 30 A	0 - 20 A			
Power range	0 - 10000 W	0 - 10000 W			
Resistance range	1.2 Ω - 2000 Ω	2.6 Ω - 4500 Ω			
Output capacity	90 μF	90 μF			
Efficiency up to	95.5% *1	95.5% *1			
Insulation					
Negative DC pole <-> PE	±1500 V DC	±1500 V DC			
Positive DC pole <-> PE	+2000 V DC	+2000 V DC			
Article number	33200838	33200839			

*1 100% Power and 100% Output voltage

Technical specifications	ELR 10080-510	ELR 10200-210	ELR 10360-120	ELR 10500-90	ELR 10750-60
DC Input					
Voltage range	0 - 80 V	0 - 200 V	0 - 360 V	0 - 500 V	0 - 750 V
Ripple rms CV	≤10 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz	≤70 mV BW 300 kHz	≤200 mV BW 300 kHz
Ripple and noise p-p CV	≤100 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz	≤350 mV BW 20 MHz	≤800 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<0.5 V	<2.0 V	<2.0 V	<2.2 V	<2.2 V
Current range	0 - 510 A	0 - 210 A	0 - 120 A	0 - 90 A	0 - 60 A
Power range	0 - 15000 W	0 - 15000 W	0 - 15000 W	0 - 15000 W	0 - 15000 W
Resistance range	0.006 Ω - 9 Ω	0.03 Ω - 50 Ω	0.1 Ω - 180 Ω	0.2 Ω - 330 Ω	0.4 Ω - 750 Ω
Output capacity	23970 μF	7560 μF	1179 μF	540 μF	540 μF
Efficiency up to	94.5% *1	94.5% *1	95.5% *1	95.5% *1	95.5% *1
Insulation					
Negative DC pole <-> PE	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC	±1500 V DC
Positive DC pole <-> PE	+600 V DC	+1000 V DC	+1000 V DC	+2000 V DC	+2000 V DC
Article number	33200820	33200821	33200822	33200823	33200824

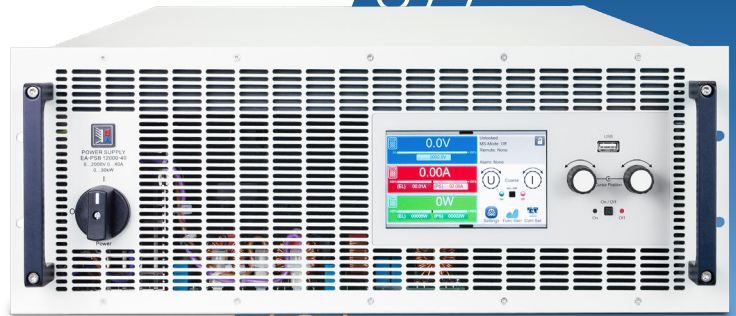
*1 100% Power and 100% Output voltage

Technical specifications	ELR 11000-40	ELR 11500-30	ELR 12000-20		
DC Input					
Voltage range	0 - 1000 V	0 - 1500 V	0 - 2000 V		
Ripple rms CV	≤300 mV BW 300 kHz	≤400 mV BW 300 kHz	≤400 mV BW 300 kHz		
Ripple and noise p-p CV	≤1600 mV BW 20 MHz	≤2400 mV BW 20 MHz	≤2400 mV BW 20 MHz		
U_{Min} for I_{Max} (Sink)	<5.2 V	<5.2 V	<5.2 V		
Current range	0 - 40 A	0 - 30 A	0 - 20 A		
Power range	0 - 15000 W	0 - 15000 W	0 - 15000 W		
Resistance range	0.8 Ω - 1300 Ω	1.8 Ω - 3000 Ω	1.7 Ω - 2700 Ω		
Output capacity	131 μF	60 μF	60 μF		
Efficiency up to	95.5% *1	95.5% *1	95.5% *1		
Insulation					
Negative DC pole <-> PE	±1500 V DC	±1500 V DC	±1500 V DC		
Positive DC pole <-> PE	+2000 V DC	+2000 V DC	+2000 V DC		
Article number	33200825	33200826	33200827		

*1 100% Power and 100% Output voltage

EA-ELR 10000 4U 30 KW

Programmable Electronic DC-Loads
With Energy Recovery



Features

- Wide range input, 208 V - 480 V ± 10 % 3ph AC
- Active Power-Factor-Correction, typical 0.99
- In load operation, regenerative with energy recovery into the grid
- Very high efficiency up to over 96 %
- High performance of 30 kW per unit
- Voltage from 0 - 80 V up to 0 - 2000 V
- Currents from 0 - 40 A up to 0 - 1000 A
- Flexible power regulated DC -input stages (autoranging)
- Regulation mode CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs, selection of control speed: Normal, Fast, Slow
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave-Bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Integrated function generator with predefined curves
- Integrated battery test mode
- Photovoltaics test mode, MPPT
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Built-in Interfaces

- USB
- Ethernet
- Analog
- USB-Host
- Master-Slave-Bus
- Share-Bus

Optional Interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA-Power Control

Options

- Water Cooling in stainless steel

Technical Specifications	ELR 10080-1000	ELR 10200-420	ELR 10360-240	ELR 10500-180	ELR 10750-120
DC-Input					
Voltage range	0 - 80 V	0 - 200 V	0 - 360 V	0 - 500 V	0 - 750 V
Ripple rms CV	≤25 mV BW 300 kHz	≤40 mV BW 300 kHz	≤55 mV BW 300 kHz	≤70 mV BW 300 kHz	≤200 mV BW 300 kHz
Ripple and noise p-p CV	≤320 mV BW 20 MHz	≤300 mV BW 20 MHz	≤320 mV BW 20 MHz	≤350 mV BW 20 MHz	≤800 mV BW 20 MHz
U_{Min} for I_{Max} (Sink)	<0.66 V	<2 V	<2.5 V	<2.3 V	<2 V
Current range	0 - 1000 A	0 - 420 A	0 - 240 A	0 - 180 A	0 - 120 A
Power range	0 - 30000 W	0 - 30000 W	0 - 30000 W	0 - 30000 W	0 - 30000 W
Resistance range	0.003 Ω - 5 Ω	0.0165 Ω - 25 Ω	0.05 Ω - 90 Ω	0.08 Ω - 170 Ω	0.2 Ω - 370 Ω
Output capacity	25380 μF	5400 μF	1800 μF	675 μF	450 μF
Efficiency up to	95.5% *1	95.3% *1	95.8% *1	96.5% *1	96.5% *1
Isolation					
Negative DC-Pol <-> PE	±600 V DC	±1000 V DC	±1000 V DC	±1500 V DC	±1500 V DC
Positive DC-Pol <-> PE	+600 V DC	+1000 V DC	+1000 V DC	+2000 V DC	+2000 V DC
Article number					
Article number Standard	33200801	33200802	33200803	33200804	33200805
Article number Water cooling					

*1 At 100% Power and 100% Output voltage

Technical Specifications	ELR 10920-125	ELR 11000-80	ELR 11500-60	ELR 12000-40	
DC-Input					
Voltage range	0 - 920 V	0 - 1000 V	0 - 1500 V	0 - 2000 V	
Ripple rms CV	≤200 mV BW 300 kHz	≤300 mV BW 300 kHz	≤400 mV BW 300 kHz	≤400 mV BW 300 kHz	
Ripple and noise p-p CV	≤800 mV BW 20 MHz	≤1600 mV BW 20 MHz	≤2400 mV BW 20 MHz	≤2400 mV BW 20 MHz	
U_{Min} for I_{Max} (Sink)	<2 V	<3.9 V	<3.4 V	<3.7 V	
Current range	0 - 125 A	0 - 80 A	0 - 60 A	0 - 40 A	
Power range	0 - 30000 W	0 - 30000 W	0 - 30000 W	0 - 30000 W	
Resistance range	0.25 Ω - 550 Ω	0.4 Ω - 650 Ω	0.8 Ω - 1500 Ω	1.7 Ω - 2700 Ω	
Output capacity	100 μF	200 μF	75 μF	50 μF	
Efficiency up to	96.5% *1	95.8% *1	96.5% *1	96.5% *1	
Isolation					
Negative DC-Pol <-> PE	±1500 V DC	±1500 V DC	±1500 V DC	±1500 V DC	
Positive DC-Pol <-> PE	+2000 V DC	+2000 V DC	+2000 V DC	+2000 V DC	
Article number					
Article number Standard	33200809	33200806	33200807	33200808	
Article number Water cooling					

*1 At 100% Power and 100% Output voltage



Elektro-Automatik

LEADING-EDGE POWER ELECTRONICS MADE BY EA

Wide application spectrum. Technological excellence.

Global customer contact.

The EA Elektro-Automatik Group is Europe's leading supplier in the area of power electronics for R & D and industrial application. At the headquarters in Germany in the industrial center of North Rhine Westphalia, more than 300 qualified associates, research, develop and manufacture high-tech devices such as laboratory power supplies, high-power supplies and electronic loads with and without mains feedback..

Development partner in forward looking industries

With leading edge technology and a broad application spectrum, EA has established itself as the development partner in forward looking industries. Our devices are used across industries – from battery and fuel cell technology, wind and solar energy, to electrochemicals processes, telecommunications and more.

Automated quality assurance

Results and experience from decades of R & D flow continually into new solutions. Automatic test systems with specially developed soft- and hardware assure consistent high product quality. Flexible production processes support fast reaction to changing customer requirements.

Global customer contact, value sharing

As a mid-size company, EA manufactures local in Germany but acts globally with branches in China and USA, sales office in Spain and a wide network of partners. Value sharing, mutual respect and open communication characterise our organization.

Technological excellence is the demand of tomorrow

The foundation of the company in 1974 was based on innovation, a tradition which is maintained today. What started with the development of simple mains adaptors is continued today in the overall concept of technology leadership. With highly specialized power supply systems for a multitude of applications, EA is driving the future of power electronics – technologically excellent for high performance and designed for resource protection and energy saving.

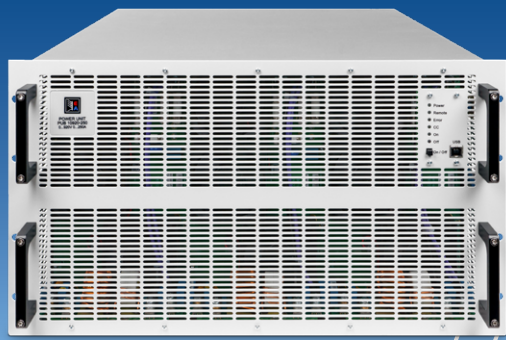


PURE & POWERFUL

EA-10000 Industrial Series

60 kW in 6U.
30 kW in 4U.
Up to 300 kW
in a single rack.





EA-10000 INDUSTRIAL SERIES

New power density

With the new EA-10000 Industrial series, EA Elektro-Automatik (EA) has achieved a breakthrough in power density. The motto: Pure & Powerful! Powerful performance with 60 kW in 6U, 30 kW in 4U and up to 300 kW in a single rack, combined with pure design without manual display on the front.

Large product variety

The product variety includes a total of 50 models with the device types EA-PU 10000 programmable DC power supplies, EA-PUB 10000 programmable bidirectional power supplies and EA-PUL 10000 DC regenerative electronic loads.

High safety, low operating costs

The new Industrial series combines high safety with low operating costs. All models feature overcurrent, overvoltage, overpower and overtemperature protection functions. The bidirectional power supplies and regenerative electronic loads have power factor correction of 0.99 and return up to over 96% of the absorbed power to the grid.

Efficiency in development and testing

All devices work with the same firmware and have similar input and output characteristics. The common programming and user interface saves time when developing and setting up test and control systems that require multiple power units.

EA-10000 Industrial Series with 6U Power

21 models with 60 kW power

Power Unit	EA-PU 10000 6U
Power Unit Bidirectional	EA-PUB 10000 6U
Power Unit Load	EA-PUL 10000 6U

Model	Voltage	Current	Power
10360-480	0 – 360 V	0 – 480 A	0 – 60000 W
10500-360	0 – 500 V	0 – 360 A	0 – 60000 W
10750-240	0 – 750 V	0 – 240 A	0 – 60000 W
10920-250	0 – 920 V	0 – 250 A	0 – 60000 W
11000-160	0 – 1000 V	0 – 160 A	0 – 60000 W
11500-120	0 – 1500 V	0 – 120 A	0 – 60000 W
12000-80	0 – 2000 V	0 – 80 A	0 – 60000 W

EA-10000 Industrial Series with 4U Power

29 models with 30 kW power

Power Unit	EA-PU 10000 4U
Power Unit Bidirectional	EA-PUB 10000 4U
Power Unit Load	EA-PUL 10000 4U

Model	Voltage	Current	Power
10060-1000	0 – 60 V	0 – 1000 A	0 – 30000 W
10080-1000	0 – 80 V	0 – 1000 A	0 – 30000 W
10200-420	0 – 200 V	0 – 420 A	0 – 30000 W
10360-240	0 – 360 V	0 – 240 A	0 – 30000 W
10500-180	0 – 500 V	0 – 180 A	0 – 30000 W
10750-120	0 – 750 V	0 – 120 A	0 – 30000 W
10920-125	0 – 920 V	0 – 125 A	0 – 30000 W
11000-80	0 – 1000 V	0 – 80 A	0 – 30000 W
11500-60	0 – 1500 V	0 – 60 A	0 – 30000 W
12000-40	0 – 2000 V	0 – 40 A	0 – 30000 W

POWERFUL FEATURES

- DC input/output with autoranging
- Digitally (FPGA) controlled DC input/output U – I – P – R
- Latest SiC technology
- LEDs in the front to indicate the device status
- Optional stainless steel water cooling system
- AC mains input with extended range (380 V – 480 V, 3ph AC)
- Built-in interfaces: Ethernet, USB, Analog
- Optional interfaces: CAN, CANopen, EtherCAT, RS232, Profibus, Profinet, Modbus, Ethernet
- Communication with PCs and PLCs
- SCPI or ModBus programming modes
- Galvanically isolated Share-Bus
- Master-Slave-Bus up to 64 participants of the EA-10000 series
- Integrated function generator with predefined curves

FOR INDUSTRIAL APPLICATIONS

- For use in ATE systems and automated process control systems
- For testing batteries and fuel cells
- For simulations of batteries and solar systems
- For the complete discharge of batteries for recycling
- Reliable power supply for electrolysis plants
- As sustainable power electronics for aviation application



HIGH-POWER RACKS

Save equipment costs and rack space

Increased performance can reduce the number of power supplies needed for a high-performance system. This saves significant capital and operating costs as well as important rack space. Power is provided in a smaller footprint. In addition, the electronic loads operate regeneratively, with efficiencies up to over 96 %.

Powerful rack performance

- A 19" rack with 42 U for a system with 300 kW
- One system with up to 13 racks with 64 units of 60 kW each
- For high power applications up to 3.84 MW

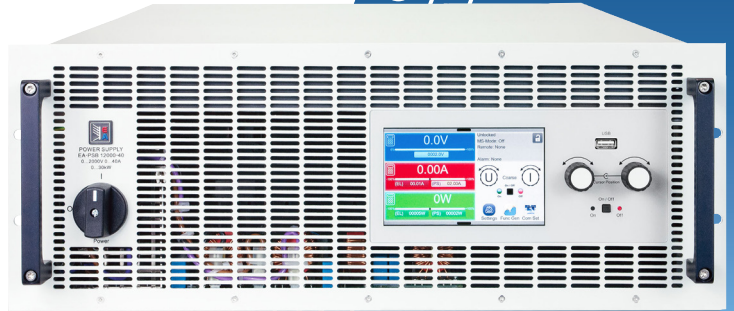
Optionally available:

- Emergency stop (machine standard EN60204-1)
- Mains monitoring (ENS)
- Insulation monitor
- Copper busbar for DC output



EA-BT 20000 TRIPLE

Battery Tester
with regenerative energy recovery



Features

- Wide range input: 208 V - 480 V, $\pm 10\%$, 3ph AC
- Active Power Factor Correction, typical 0.99
- Battery tester, 2-quadrants for charge and discharge
- In discharge operation regenerative with energy recovery into the grid
- Very high efficiency of up to over 96%
- Voltages from 0 - 10 V up to 0 - 920 V
- High performance with up to 10 kW per channel
- Currents from 0 - 40 A up to 0 - 600 A per channel
- Flexible power regulated DC output/input stages (autoranging)
- Regulation modes CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16bit ADCs and DACs, selection of control speed: Normal, Fast, Slow
- Galvanically isolated Share-Bus for parallel operation
- Master-Slave-Bus for parallel operation
- Built-in Interfaces with 1 ms communication speed
- Typical battery tester functionality integrated
- Integrated Battery test mode, battery simulation
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Built-in interfaces

- USB
- Ethernet 1Gbit/s
- EtherCAT
- CAN FD
- Master-Slave-Bus
- Share-Bus
- USB Host on Front panel
- 3 digital inputs
- 3 relay contacts
- 3 temperature sensor inputs

Software

- EA-Power Control
- EA-Battery Simulator

Options

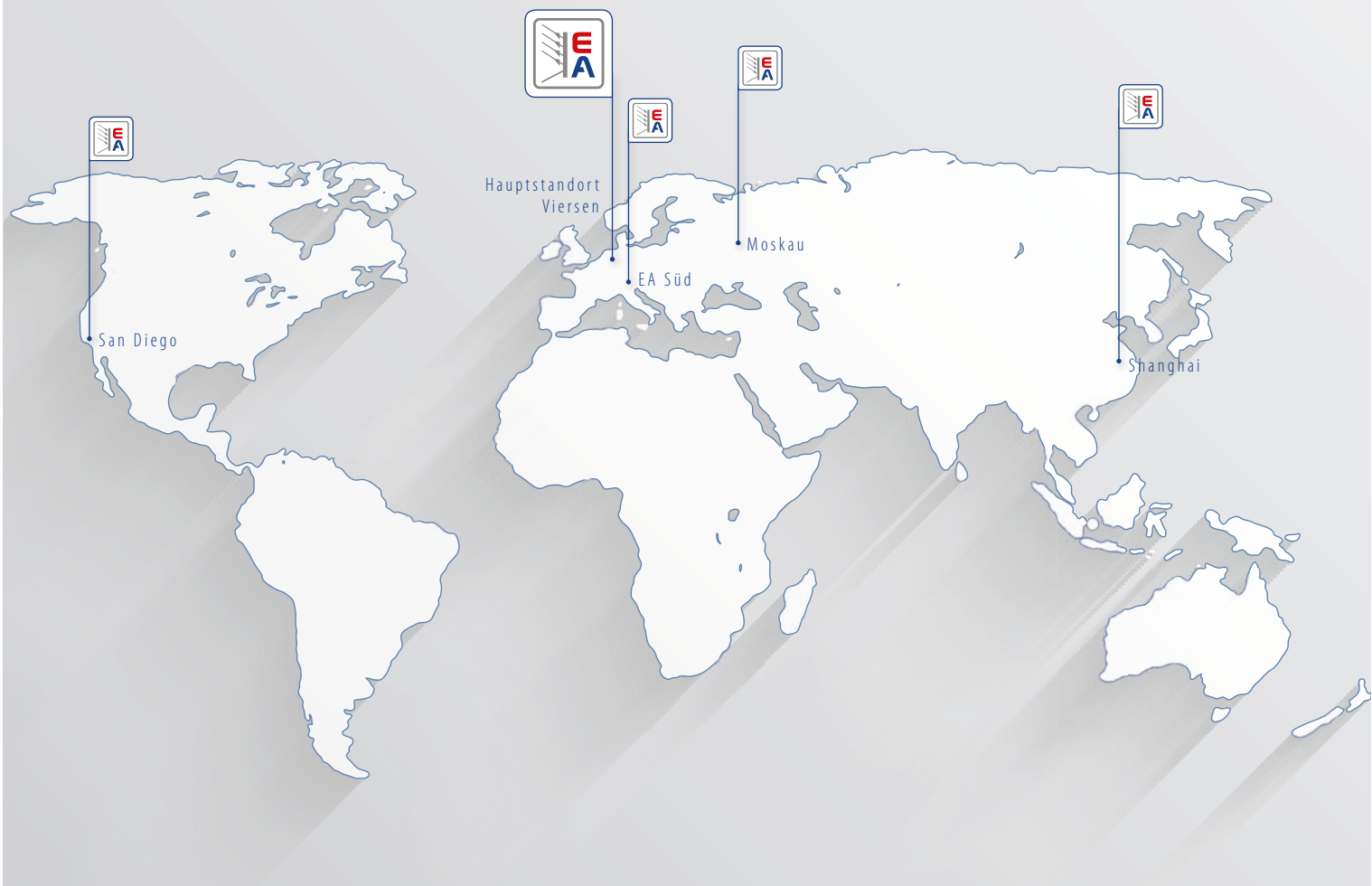
- Water Cooling in stainless steel

Technical specifications	BT 20010-400 Triple	BT 20010-600 Triple	BT 20060-340 Triple	BT 20080-340 Triple
DC output per channel				
Number of channels	3 channels	3 channels	3 channels	3 channels
Voltage range	0 - 10 V	0 - 10 V	0 - 60 V	0 - 80 V
Ripple in CV (rms)	≤25 mV (BW 300 kHz)	≤25 mV (BW 300 kHz)	≤25 mV (BW 300 kHz)	≤25 mV (BW 300 kHz)
Ripple in CV (pp)	≤320 mV (BW 20 MHz)	≤320 mV (BW 20 MHz)	≤320 mV (BW 20 MHz)	≤320 mV (BW 20 MHz)
U_{Min} for I_{Max} (sink)	0.62 V	0.62 V	0.62 V	0.62 V
Current range	±400 A per channel	±600 A per channel	±340 A per channel	±340 A per channel
Power range	±4000 W per channel	±6000 W per channel	±10000 W per channel	±10000 W per channel
Device power range	±12000 W	±18000 W	±30000 W	±30000 W
Resistance range				
Output capacitance	8460 µF	8460 µF	8460 µF	8460 µF
Efficiency sink/source (up to)	95.1% *1	95.1% *1	95.1% *1	95.5% *1
Insulation				
Negative DC pole <-> PE	±600 V DC	±600 V DC	±600 V DC	±600 V DC
Positive DC pole <-> PE	+600 V DC	+600 V DC	+600 V DC	+600 V DC
Article numbers				
Standard	02133001	02133002	02133003	02133004
Standard + Water Cooling	02143001	02143002	02143003	02143004

*1 At 100% power and 100% output voltage

Technical specifications	BT 20200-140 Triple	BT 20360-80 Triple	BT 20500-60 Triple	BT 20920-40 Triple
DC output per channel				
Number of channels	3 channels	3 channels	3 channels	3 channels
Voltage range	0 - 200 V	0 - 360 V	0 - 500 V	0 - 920 V
Ripple in CV (rms)	≤40 mV (BW 300 kHz)	≤55 mV (BW 300 kHz)	≤70 mV (BW 300 kHz)	≤250 mV (BW 300 kHz)
Ripple in CV (pp)	≤300 mV (BW 20 MHz)	≤320 mV (BW 20 MHz)	≤350 mV (BW 20 MHz)	≤1200 mV (BW 20 MHz)
U_{Min} for I_{Max} (sink)	1.8 V	2.5 V	1.1 V	2 V
Current range	±140 A per channel	±80 A per channel	±60 A per channel	±40 A per channel
Power range	±10000 W per channel	±10000 W per channel	±10000 W per channel	±10000 W per channel
Device power range	±30000 W	±30000 W	±30000 W	±30000 W
Resistance range				
Output capacitance	1800 µF	600 µF	225 µF	40 µF
Efficiency sink/source (up to)	95.3% *1	95.8% *1	96.5% *1	96.5% *1
Insulation				
Negative DC pole <-> PE	±1000 V DC	±1000 V DC	±1500 V DC	±1500 V DC
Positive DC pole <-> PE	+1000 V DC	+1000 V DC	+2000 V DC	+2000 V DC
Article numbers				
Standard	02133005	02133006	02133007	02133008
Standard + Water Cooling	02143005	02143006	02143007	02143008

*1 At 100% power and 100% output voltage



We are a global supplier

The EA supply chain covers the whole world. Our headquarters site and main research center is placed directly in the strategic heart of Europe, in Viersen.

There, and in our subsidiaries in Germany, China (Shanghai, Shenzhen, Hongkong), USA (San Diego) and Russia (Moscow), we employ approx. 250 members of staff. They all work to provide the optimal solutions to the requirements of each and every customer, now and in the future.

(주)베스텍 코리아(BesTEQ Korea)

www.besteq.co.kr

TEL: 02) 305-4566

EA Elektro-Automatik GmbH & Co. KG
Helmholtzstraße 31-37, 41747 Viersen, Deutschland

Telefon: +49 (0) 21 62 / 37 85 - 0
Mail: ea1974@elektroautomatik.de
Web: www.elektroautomatik.de



Elektro-Automatik

www.elektroautomatik.com