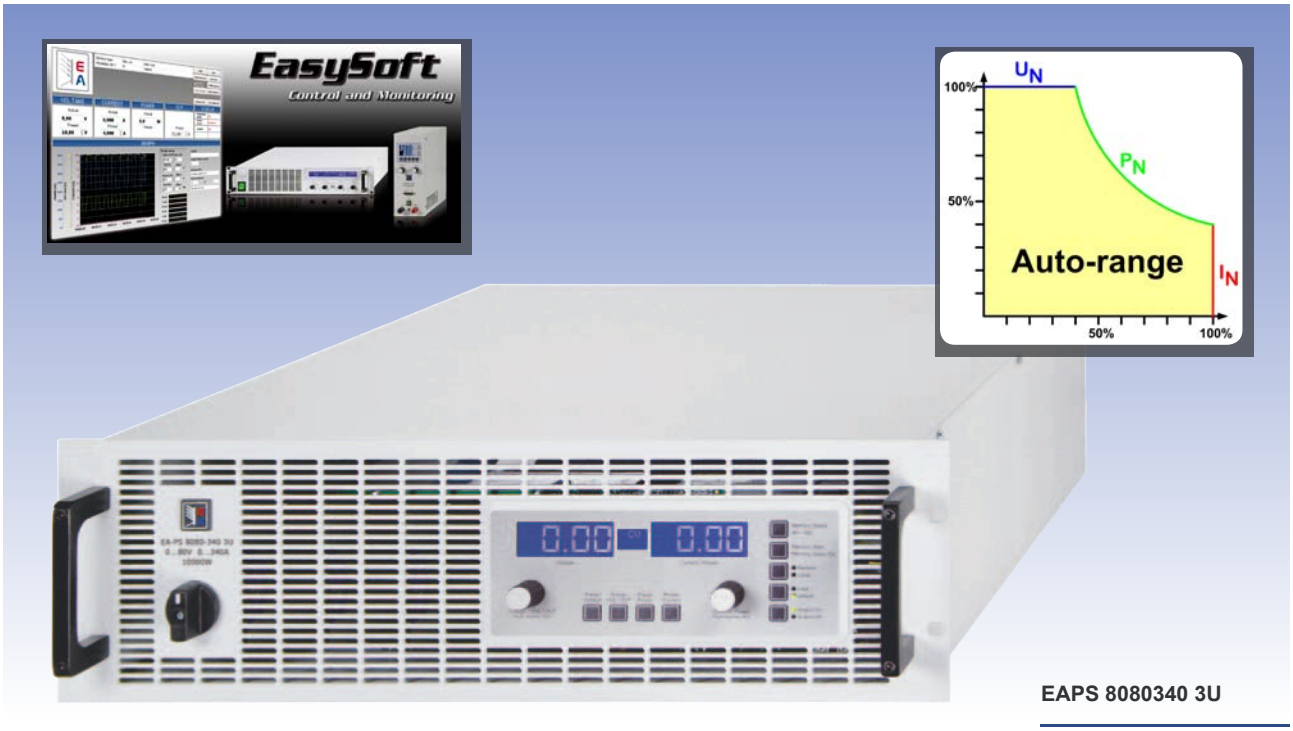
SNAPTEC
www.snaptec.com.au

Meaning of the symbols

Spannungsregelung mit einstellbarer Spannung	Voltage control with adjustable voltage
Stromregelung mit einstellbarem Strom	Current control with adjustable current
Leistungsregelung mit einstellbarer Leistung	Power control with adjustable power
Optionale Innenwiderstandsregelung mit einstellbarem Widerstand	Internal resistance control with adjusta ble resistance (optional)
Überspannungsschutz, einstellbar	Overvoltage protection, adjustable
Überhitzungsschutz	Overtemperature protection
Integrierte Analogschnittstelle	Integrated analogue interface
Schnittstelle für MasterSlave vorhanden	Terminal for masterslave equipped
19“ Gehäuse, standard oder optional	19“ form factor, standard or optional
Funktionsmanager	Function manager
Optionale, digitale Schnittstelle USB	Optional, digital interface USB
Optionale, digitale Schnittstelle RS232	Optional, digital interface RS232
Optionale, digitale Schnittstelle Ethernet	Optional, digital interface Ethernet
Optionale, digitale Schnittstelle IEEE/GPIB	Optional, digital interface IEEE/GPIB
Optionale, digitale Schnittstelle CAN	Optional, digital interface CAN
Optionale, analoge Schnittstelle	Optional, isolated analogue interface
Optionale, digitale Schnittstelle Profibus	Optional, digital interface Profibus

EA-PS 8000 3U 5KW - 150KW



EAPS 8080340 3U

- **Multiphase input 340...460V_{AC} 50/60Hz**
- **High efficiency up to 95.5%**
- **Output power ratings: 0...5kW, 0...10kW, 0...15kW Expandable up to 0...150kW**
- **Output voltages: 0...80V up to 0...1500V**
- **Output currents: 0...30A up to 0...510A Expandable up to 0...5100A**
- **Autoranging output stage**
- **Overvoltage protection (OVP)**
- **Overtemperature protection (OT)**
- **Fourdigit display for voltage and current**
- **Status indication via LEDs**
- **Redundancy (from 10kW)**
- **Remote sense with automatic detection**
- **Temperature controlled fans for cooling**
- **19“ housing in 3U**
- **Various options**

General
The microprocessor controlled high efficiency laboratory power supplies of series EAPS 8000 3U offer many func tions and features in their standard version, making the use of this equipment remarkably easy and most effective.

The units are provided with a memory function for five different preset values, with the ability to save and recall these just by the push of a button Thus frequently used settings are at immediate reach to the user, making the work easy and time efficient.

Cabinets with up to 150kW and 42U can be configured to suit custom requirements.

EA-PS 8000 3U 5KW - 150KW
HOCHLEISTUNGS-LABORNETZGERÄTE / HIGH EFFICIENCY LABORATORY POWER SUPPLIES

Power
The devices are equipped with a flexible, autoranging out put stage which provides a higher output voltage at lower output current, resp. a higher output current at lower output voltage, while always being limited to the max. output po wer. Therefore, a wide range of applications can already be covered by the use of just one single unit.

Input
All models are provided with an active Power Factor Correction circuit and require a multiphase input with 340...460V AC or optionally 588...796V plus middle point (15kW models only).

Output
Output voltages between 0...80V and 0...1500V, output currents between 0...40A and 0...510A and output power ratings of 0...5kW, 0...10kW or 0...15kW are available. The output terminal is located in the rear panel.

Overvoltage protection (OVP)
For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP).
Should the output voltage for any reason exceed the thres hold set, the output will be immediately shut down and a status text will be displayed.

Display and controls
All important information is clearly visualised on a 4 line dot display.
With this, information about the actual output values, preset set values for U, I, P, undervoltage limit and overvoltage protection, the actual control state (CV, CC, CP), errors and settings of the setup menu are clearly displayed.
In order to ease adjusting of values by the existing rotary encoders, it can be switched between coarse and fine setting mode, just by a key stroke.
All these features contribute to an operator friendliness.
With the LOCK push button the controls can be locked, in order to protect the equipment and the loads from unin tentional misuse.
Analogue terminals on the rear of the unit provide functio nality for series or parallel connection. Thus the devices can be combined into a complete system without much effort.

Extensibility
The singles units can be combined into various configura tions upon request, in cabinets of up to 42U. Poweronly modules without control panel are available for this pur pose, which are set up with a main unit to a system of up to 150kW total power.
There is totals formation of power, voltage and current on the main unit. Also see page 8.

Presetting of output values
To set output values without a direct transmission to the output, a preset function is implemented.
With this function the user can preset values for the output voltage, output current, overvoltage protection (OVP), undervoltage limit (UVL) and power.

Redundancy
Models with 10kW or 15kW output power are redundant. It means, they have multiple power stages and will continue working if at least one power stage remains operable.
The same behaviour applies to cabinet systems with multiple units.

Remote sense
The standard sense input can be connected directly to the load in order to compensate voltage drops along the power leads. If the sense input is connected to the load, the power supply will be adjusting the output voltage automatically to ensure the accurate required voltage is available at the load.

Options
- Isolated digital interface cards for RS232, CAN, USB, GPIB (IEEE), Profibus or Ethernet to control the device by PC. 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. The interface will be au tomatically detected by the device and requires no or only little configuration.
  Included with the interface cards is a free Windows soft ware which provides control and monitoring, data log ging and automated sequences. See pages 7 and 10.
- Isolated analogue interface card
- High speed ramping (see page 6)
- Water cooling
- Threephase input with 588...796V AC für 690V grids (15kW models only)

Technische Daten	Technical Data	PS 8080170 3U	PS 820070 3U	PS 850030 3U	PS 8080340 3U	PS 8160170 3U
Eingangsspannung	Input voltage	340...460V	340...460V	340...460V	340...460V	340...460V
Frequenz	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Leistungsfaktor	Power factor	>0,99	>0,99	>0,99	>0,99	>0,99
Ausgangsspannung (DC)	Output voltage (DC)	0...80V	0...200V	0...500V	0...80V	0...160V
Stabilität bei 0100% Last	Stability at 0100% load	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
Stabilität bei ±10% ΔU_E	Stability at ±10% ΔU_{IN}	<0,02%	<0,02%	<0,02%	<0,02%	<0,02%
Restwelligkeit BWL 20MHz	Ripple BWL 20MHz	<200mV$_{PP}$ <12mV$_{RMS}$	<300mV$_{PP}$ <18mV$_{RMS}$	<600mV$_{PP}$ <40mV$_{RMS}$	<180mV$_{PP}$ <9mV$_{RMS}$	<450mV$_{PP}$ <25mV$_{RMS}$
Ausregelung 10100% Last	Regulation 10100% load	<1ms	<1ms	<2ms	<1ms	<1ms
OVPEinstellung	OVP adjustment	0...88V	0...220V	0...550V	0...88V	0...176V
Ausregelung Fernfühlung	Sense regulation	max. 2V				
Anstiegszeit 1090%	Slew rate 1090%	max. 30ms				
Ausgangsstrom	Output current	0...170A	0...70A	0...30A	0...340A	0...170A
Stabilität bei 0100% ΔU_A	Stability at 0100% ΔU_{OUT}	<0,15%	<0,15%	<0,15%	<0,15%	<0,15%
Stabilität bei ±10% ΔU_E	Stability at ±10% ΔU_{IN}	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
Restwelligkeit BWL 20MHz	Ripple BWL 20MHz	<280mA$_{PP}$ <25mA$_{RMS}$	<150mA$_{PP}$ <6mA$_{RMS}$	<50mA$_{PP}$ <3mA$_{RMS}$	<500mA$_{PP}$ <14mA$_{RMS}$	<700mA$_{PP}$ <25mA$_{RMS}$
Ausgangsleistung	Output power	0...5000W	0...5000W	0...5000W	0...10000W	0...10000W
Wirkungsgrad bei 100% Last	Efficiency at 100% load	93% typ.	95,2% typ.	95,5% typ.	93% typ.	93% typ.
Überspannungskategorie	Overvoltage category	2				
Verschmutzungsgrad	Pollution degree	2				
Schutzklasse	Protection class	1				
Analogsteuerung (optional)	Analogue programming (opt.)	0...5V oder / or 0...10V (umschaltbar / switchable)				
Kühlung	Cooling	Lufteinlaß Front, Luftauslaß Rückseite / Front air stream inlet and rear exhaust				
Betriebstemperatur	Operation temperature	0...50°C				
Abmessungen (B H T)	Dimensions (W H D)	19“ 3HE/U 580mm	19“ 3HE/U 580mm	19“ 3HE/U 580mm	19“ 3HE/U 580mm	19“ 3HE/U 580mm
Gewicht *	Weight *	19,5kg	19,5kg	19,5kg	26,5kg	26,5kg
Artikelnummer	Article No.	09230160	09230170	09230165	09230161	09230163

* der Standardversion, Modelle mit Optionen können abweichen / of standard version, models with options may var

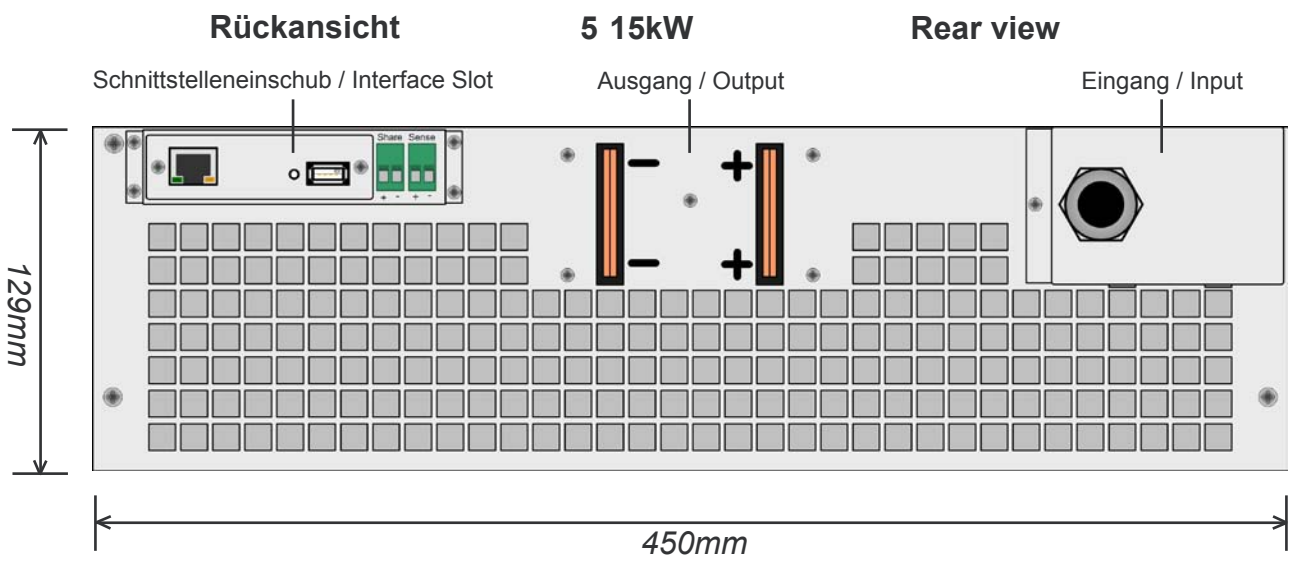
EA-PS 8000 3U 5KW - 150KW
HOCHLEISTUNGS-LABORNETZGERÄTE / HIGH EFFICIENCY LABORATORY POWER SUPPLIES

Technische Daten	Technical Data	PS 8200140 3U	PS 840070 3U	PS 850060 3U	PS 8100030 3U	PS 8080510 3U
Eingangsspannung	Input voltage	340...460V	340...460V	340...460V	340...460V	340...460V
Eingangsspannung opt.	Input voltage opt.					588...796V + MP
Frequenz	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Leistungsfaktor	Power factor	>0,99	>0,99	>0,99	>0,99	>0,99
Ausgangsspannung (DC)	Output voltage (DC)	0...200V	0...400V	0...500V	0...1000V	0...80V
Stabilität bei 0100% Last	Stability at 0100% load	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
Stabilität bei ±10% ΔU_E	Stability at ±10% ΔU_{IN}	<0,02%	<0,02%	<0,02%	<0,02%	<0,02%
Restwelligkeit BWL 20MHz	Ripple BWL 20MHz	<270mV$_{PP}$ <15mV$_{RMS}$	<650mV$_{PP}$ <40mV$_{RMS}$	<300mV$_{PP}$ <30mV$_{RMS}$	<1400mV$_{PP}$ <40mV$_{RMS}$	<180mV$_{PP}$ <9mV$_{RMS}$
Ausregelung 10100% Last	Regulation 10100% load	<1ms	<2ms	<2ms	<2ms	<1ms
OVPEinstellung	OVP adjustment	0...220V	0...440V	0...550V	0...1100V	0...88V
Ausregelung Fernfühlung	Sense regulation	max. 2V				
Anstiegszeit 1090%	Slew rate 1090%	max. 30ms				
Ausgangsstrom	Output current	0...140A	0...70A	0...60A	0...30A	0...510A
Stabilität bei 0100% ΔU_A	Stability at 0100% ΔU_{OUT}	<0,15%	<0,15%	<0,15%	<0,15%	<0,15%
Stabilität bei ±10% ΔU_E	Stability at ±10% ΔU_{IN}	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
Restwelligkeit BWL 20MHz	Ripple BWL 20MHz	<220mA$_{PP}$ <6mA$_{RMS}$	<170mA$_{PP}$ <5mA$_{RMS}$	<80mA$_{PP}$ <3mA$_{RMS}$	<60mA$_{PP}$ <1mA$_{RMS}$	<750mA$_{PP}$ <21mA$_{RMS}$
Ausgangsleistung	Output power	0...10000W	0...10000W	0...10000W	0...10000W	0...15000W
Wirkungsgrad bei 100% Last	Efficiency at 100% load	95,2% typ.	95,2% typ.	95,5% typ.	95,5% typ.	93% typ.
Überspannungskategorie	Overvoltage category	2				
Verschmutzungsgrad	Pollution degree	2				
Schutzklasse	Protection class	1				
Analogsteuerung (optional)	Analogue programming	0...5V oder / or 0...10V (umschaltbar / switchable)				
Kühlung	Cooling	Lufteinlaß Front, Luftauslaß Rückseite / Front air stream inlet and rear exhaust				
Betriebstemperatur	Operation temperature	0...50°C				
Abmessungen (B H T)	Dimensions (W H D)	19" 3HE/U 580mm	19" 3HE/U 580mm	19" 3HE/U 580mm	19" 3HE/U 580mm	19" 3HE/U 580mm
Gewicht *	Weight *	26,5kg	26,5kg	26,5kg	26,5kg	32,5kg
Artikelnummer	Article No.	09230171	09230173	09230166	09230168	09230162

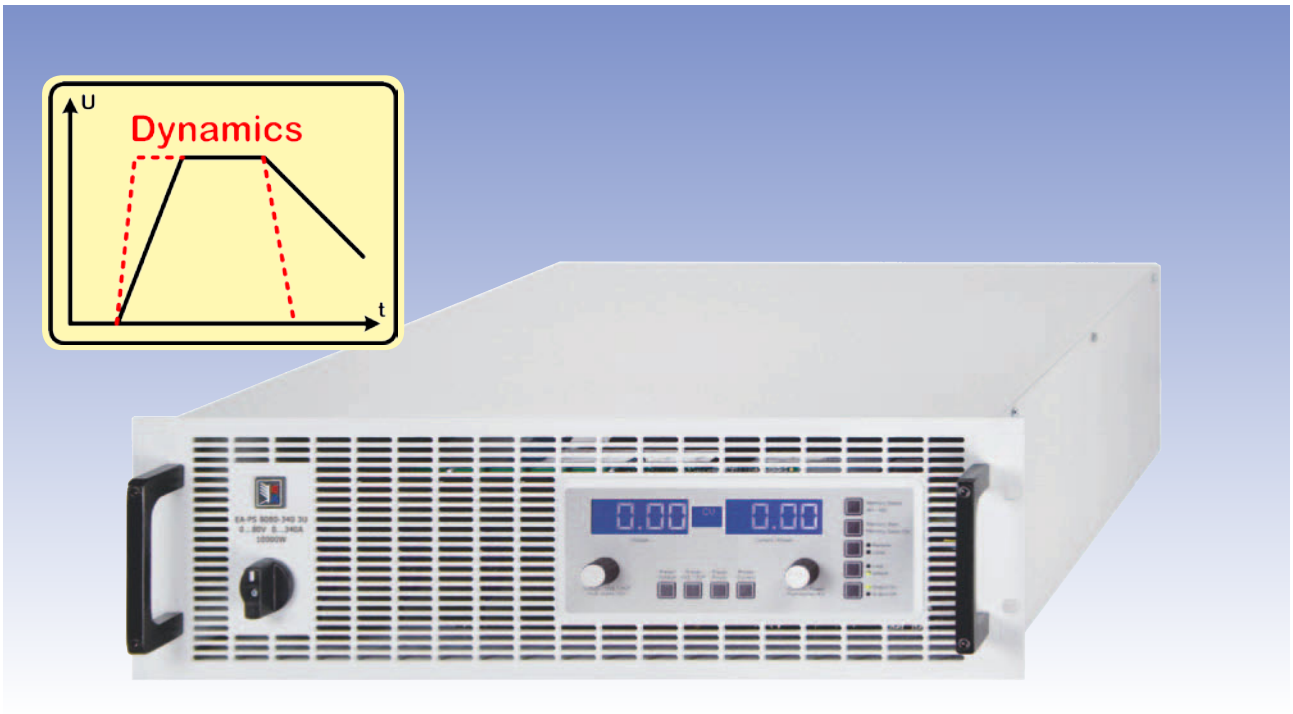
Technische Daten	Technical Data	PS 8200210 3U	PS 8240170 3U	PS 850090 3U	PS 860070 3U	PS 8150030 3U
Eingangsspannung	Input voltage	340...460V	340...460V	340...460V	340...460V	340...460V
Eingangsspannung opt.	Input voltage opt.	588...796V + MP	588...796V + MP	588...796V + MP	588...796V + MP	588...796V + MP
Frequenz	Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Leistungsfaktor	Power factor	>0,99	>0,99	>0,99	>0,99	>0,99
Ausgangsspannung (DC)	Output voltage (DC)	0...200V	0...240V	0...500V	0...600V	0...1500V
Stabilität bei 0100% Last	Stability at 0100% load	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
Stabilität bei ±10% ΔU_E	Stability at ±10% ΔU_{IN}	<0,02%	<0,02%	<0,02%	<0,02%	<0,02%
Restwelligkeit BWL 20MHz	Ripple BWL 20MHz	<270mV$_{PP}$ <15mV$_{RMS}$	<450mV$_{PP}$ <25mV$_{RMS}$	<500mV$_{PP}$ <30mV$_{RMS}$	<450mV$_{PP}$ <25mV$_{RMS}$	<1400mV$_{PP}$ <40mV$_{RMS}$
Ausregelung 10100% Last	Regulation 10100% load	<1ms	<1ms	<2ms	<2ms	<2ms
OVPEinstellung	OVP adjustment	0...220V	0...264V	0...550V	0...660V	0...1650V
Ausregelung Fernfühlung	Sense regulation	max. 2V				
Anstiegszeit 1090%	Slew rate 1090%	max. 30ms				
Ausgangsstrom	Output current	0...210A	0...170A	0...90A	0...70A	0...30A
Stabilität bei 0100% ΔU_A	Stability at 0100% ΔU_{OUT}	<0,15%	<0,15%	<0,15%	<0,15%	<0,15%
Stabilität bei ±10% ΔU_E	Stability at ±10% ΔU_{IN}	<0,05%	<0,05%	<0,05%	<0,05%	<0,05%
Restwelligkeit BWL 20MHz	Ripple BWL 20MHz	<410mA$_{PP}$ <12mA$_{RMS}$	<700mA$_{PP}$ <25mA$_{RMS}$	<125mA$_{PP}$ <4mA$_{RMS}$	<700mA$_{PP}$ <15mA$_{RMS}$	<60mA$_{PP}$ <1mA$_{RMS}$
Ausgangsleistung	Output power	0...15000W	0...15000W	0...15000W	0...15000W	0...15000W
Wirkungsgrad bei 100% Last	Efficiency at 100% load	95,2% typ.	93% typ.	95,5% typ.	95,2% typ.	95,5% typ.
Überspannungskategorie	Overvoltage category	2				
Verschmutzungsgrad	Pollution degree	2				
Schutzklasse	Protection class	1				
Analogsteuerung (optional)	Analogue programming	0...5V oder / or 0...10V (umschaltbar / switchable)				
Kühlung	Cooling	Lufteinlaß Front, Luftauslaß Rückseite / Front air stream inlet and rear exhaust				
Betriebstemperatur	Operation temperature	0...50°C				
Abmessungen (B H T)	Dimensions (W H D)	19" 3HE/U 580mm	19" 3HE/U 580mm	19" 3HE/U 580mm	19" 3HE/U 580mm	19" 3HE/U 580mm
Gewicht *	Weight *	32,5kg	32,5kg	32,5kg	32,5kg	32,5kg
Artikelnummer	Article No.	09230172	09230164	09230167	09230174	09230169

* der Standardversion, Modelle mit Optionen können abweichen / of standard version, models with options may vary

EA-PS 8000 3U 5KW - 150KW
HOCHLEISTUNGS-LABORNETZGERÄTE / HIGH EFFICIENCY LABORATORY POWER SUPPLIES



OPTION SCHNELLE AUSREGELUNG FÜR LABORNETZGERÄTE
HIGH SPEED OPTION FOR POWER SUPPLIES

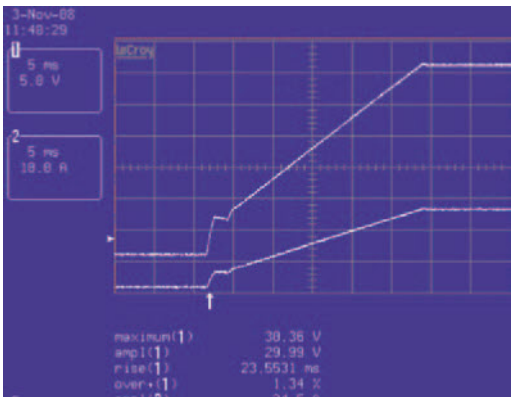


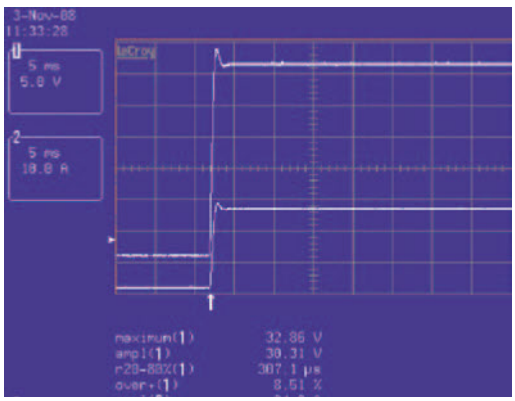
Improved regulation speed
In order to achieve rapid voltage changes with minimal ramp up and down times, the filter capacity can be reduced upon request.

This reduction, combined with an external electronic load, can result in ramp times for the output voltage from 0100% and 1000% from less than 1ms.

It is to be noted that a reduction in filter capacity results in a higher output ripple.

Visualisation of the ramp time with normal (left figure) and reduced output capacity (right figure)





EasySoft - Software für Netzgeräte und Elektronische Lasten
EasySoft - Software for Power Supplies and Electronic Loads

Windows based software tools are available to control and monitor power supplies and electronic loads. These are very easy to handle with a minimum of setup required. The surface will be completely in english. The tools are only compatible to the device series and interface cards listed below.

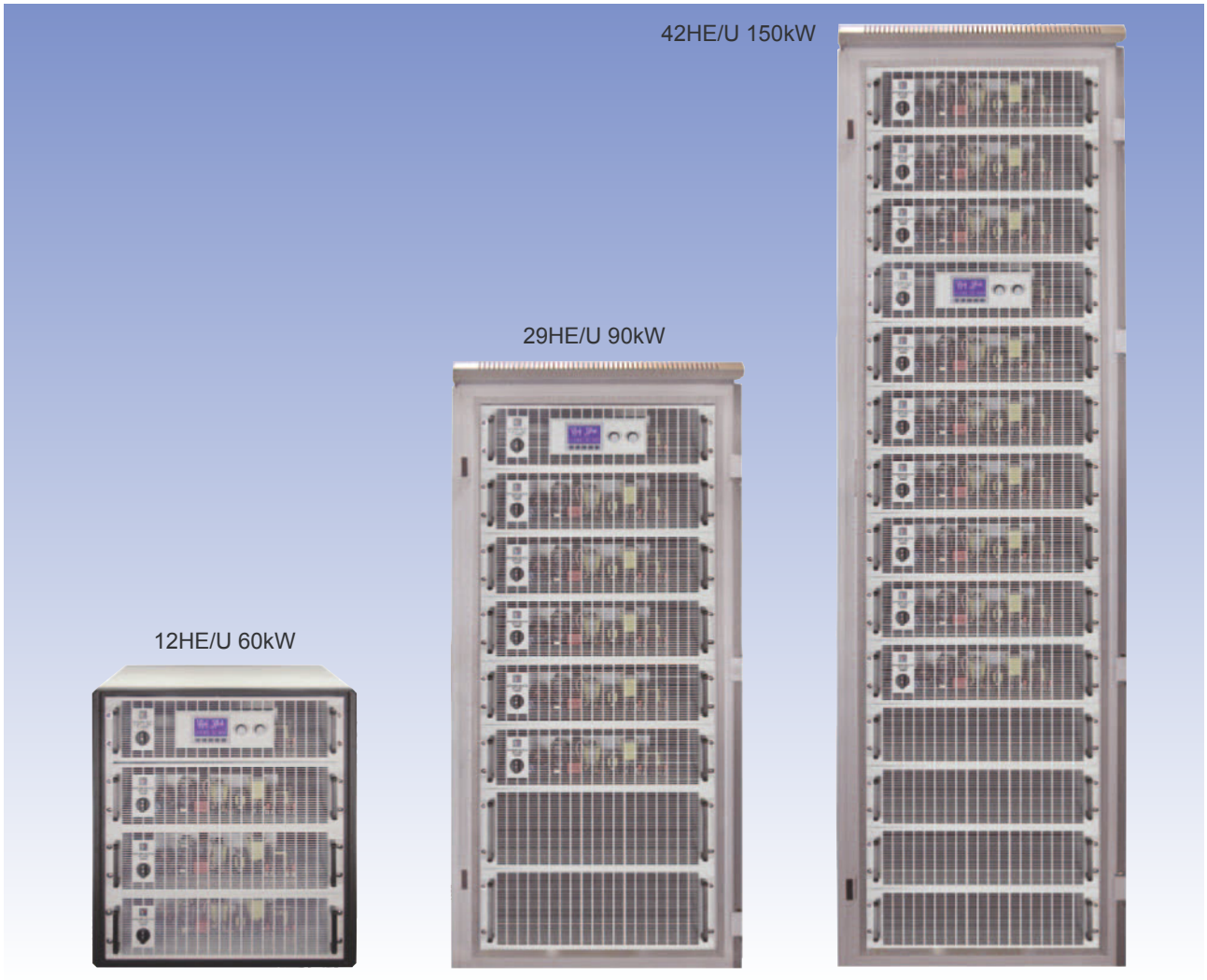
EasyPower Lite
- One device can be controlled per instance
- Compatible to the series:
  - PSI 9000
  - PSI 8000 T / DT / 2U / 3U
  - PS 8000 T / DT / 2U / 3U
  - PSI 800 R
- Data acquisition (CSV files)
- Automated sequences by list tables
- ***Compatible to USB (IFUx, IFEx) and RS232 (IFRx)***

EasyLoad Lite
- One device can be controlled per instance
- Compatible to the series:
  - EL 3000
  - EL 9000
  - EL 9000 HP
- Data acquisition (CSV files)
- Automated sequences by list tables
- ***Compatible to USB (IFU1, IFE1) and RS232 (IFR1)***

System requirements
- WindowsPC (XP or newer) with min. 512MB RAM
- 150MB free harddisk space
- Excel or OpenOffice Calc for data analysis

Other softwares or versions with extended functionality upon request.

SCHRANKSYSTEME
CABINETS



General
These cabinet systems are available for following power supply and battery charger series with 19“ housing:

- PSI 8000 3U
- PS 8000 3U
- BCI 8000 3U

Configuration
The cabinets are always preconfigured to the customer‘s choice and calibrated. Depending on the cabinet type, up to 10 units can be equipped.
The system is always working in parallel connection.
The 60kW type uses single power grid connection for all units, while the 90kW and 150kW types feature a three phase power grid connection terminal.

The DC outputs are connected in parallel via copper bars or high voltage leads and are readytouse.

The base system consists of the cabinet, power grid termi nal (only with 90kW and 150kW) and input wiring.

Various options are available upon request.

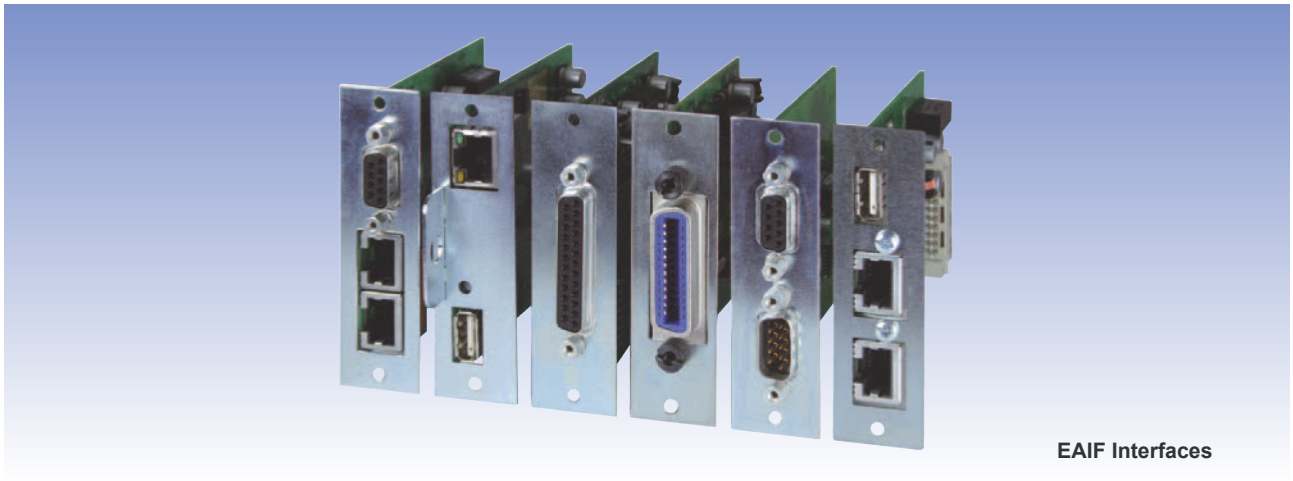
SCHRANKSYSTEME
CABINETS

Technische Daten	Technical Data	System 1	System 2	System 3
Höhe Schrank (HE)	Height cabinet (U)	12	29	42
Höhe Schrank *	Height cabinet *	600mm	1400mm	2000mm
Breite	Width	535mm	600mm	600mm
Tiefe	Depth	800mm	800mm	800mm
Gewicht voll bestückt **	Weight fully equipped **	170kg	328kg	485kg
Netzanschlußtyp	Grid connection	Zwei oder drei Phasen, alle Geräte einzeln / Two or three phases, all units seperately	DreiPhasenAnschluß / Threephase terminal	DreiPhasenAnschluß / Threephase terminal
Netzanschlußspannung Δ	Grid voltage Δ	340...460V	340...460V	340...460V
Netzanschlußspannung Y	Grid voltage Y	588...796V + MP	588...796V + MP	588...796V + MP
Anzahl möglicher Geräte	Number of max. devices	4	6	10
Max. Leistung	Maximum power	60kW	90kW	150kW
Optionen	Options		Sockel / Pedestal Kühlaggregat / Cooling device Rollen / Wheels	Sockel / Pedestal Kühlaggregat / Cooling device Rollen / Wheels

* Höhe kann abweichen bei Optionen / Height may vary depending due to options

** Gewicht ist CircaGewicht und weicht bei etwaigen Optionen ab / Weight is approximate and may vary due to options

EA-IF-U1 / EA-IF-R1 / EA-IF-C1 / EA-IF-G1 / EA-IF-A1 / IF-E1 / IF-PB1
DIGITALE & ANALOGE SCHNITTSTELLENKARTEN / DIGITAL & ANALOGUE INTERFACE CARDS



EAIF Interfaces

- **Retrofittable, simple installation (plug'n'play)**
- **Easy configuration via a setup menu on the device**
- **Simple networking of different devices**
- **Support for masterslave operation***
- **Galvanic isolation up to 2000V**
- **Software CD with tools and manuals**

General
The EA interface cards are pluggable digital resp. analogue cards for different series of programable power supplies, battery charger or electronic loads.
Depending on the device, 1 or 2 card slots are available. The models EAIFU2, C2, R2 and E2 are only usable for the wall mount series **PSI 800** and **BCI 800**.

Support for LabView
For some of the digital cards we provide readytouse LabView VIs. See table below.

Support for other programming languages
The communication protocol is open and included in the documentation. Thus it can be integrated in virtually any programming language. Example code upon request.

Software
The interface cards are delivered with a tools CD that inclu des documentation and software. The software is divided into the Windows software suite ***EasySoft*** (also see page 7) and LabView compatible VIs. For the software support of the particular interface cards see table below.

* Via System Link, only available with series PSI 9000 and only with IFR1 and IFU1

EA-IF-U1 / EA-IF-R1 / EA-IF-C1 / EA-IF-G1 / EA-IF-A1 / IF-E1 / IF-PB1
DIGITALE & ANALOGE SCHNITTSTELLENKARTEN / DIGITAL & ANALOGUE INTERFACE CARDS

Type overview

USB
- EAIFU1 Art.No. 33100212
- EAIFU2 Art.No. 33100220
- USB and VCP drivers
- System Link Mode (only with series PSI 9000)
- Transfer speed: max. 57600 Bd

CAN
- EAIFC1 Art.No. 33100214
- EAIFC2 Art.No. 33100222
- Variable data transmission rates up to 1Mbit/s
- CAN2.0A compatible
- Gateway to USB or RS232 (only in a PSI 9000)
- Reloctable adress segment
- Integrated, selectable bus termination

Analog
- EAIFA1 Art.No.33100215
- Voltage range adjustable (e.g. 0...5V, 2...7V)
- Digital and analogue inputs and outputs
- Outputs / inputs parameterisable

IEEE/GPIB
- EAIFG1 Art.No. 33100216
- Command execution time <5ms typ.
- SCPI command set
- Up to 15 devices at the bus

RS232
- EAIFR1 Art.No. 33100213
- EAIFR2 Art.No. 33100221
- Variable baud rates up to 57600 Baud
- System link mode (only with series PSI 9000)

LAN
- EAIFE1 Art.Nr. 33100218
- EAIFE2 Art.Nr. 33100223
- SCPI command set
- HTTP server with user control interface
- Integrated IFU1 functionality by add. USB port

Profibus
- EAIFPB1 Art.Nr. 33100219
- According to standard IEC 611582,
- Data transmission rate up to 12MBit/s
- Up to 32 devices on a bus segment
- Integrated IFU1 functionality by add. USB port

	IFU1	IFU2	IFR1	IFR2	IFC1	IFC2	IFG1	IFE1	IFE2	IFPB1	IFA1	
	USB	USB	RS232	RS232	CAN	CAN	GPIB	Ethernet	Ethernet	Profibus	Analog	
PS 8000 T / DT / 2U	●		●		●		●	●		●		
PS 8000 3U	●		●		●		●	●		●	●	
PSI 8000 T / DT / 2U	●		●		●		●	●		●	●	
PSI 8000 3U	●		●		●		●	●		●	●	
PSI 800 R		●		●		●			●			
BCI 800 R		●		●		●			●			
PSI 9000	●		●		●		●	●		●	●	
EL 3000	●		●		●		●	●		●		
EL 9000 (HP)	●		●		●		●	●		●		
BCI 8000	●		●		●		●	●			●	
EasySoft	●	●	●	●				●	●	●[1]		
LabView VIs	●	●	●	●			●	●	●			

1) nur über den zusätzlichen USBPort / only via the additional USB port