



**ИБП АЕГ Protect Blue - расширенная брошюра на продукцию. Юниджет**

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**PROTECT  
BLUE**

UPS SOLUTIONS  
FOR LARGE  
DATA CENTERS

**AEG**  
POWER SOLUTIONS

AEG POWER  
SOLUTIONS

# LEADING THROUGH INNOVATIVE POWER MANAGEMENT



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At the peak of the industrial revolution, founded in 1887 by Emil Rathenau (1838 – 1915), AEG began working on large scale industrial electrification projects. Always leading from the fore, AEG soon developed a globally respected name leading the world in the fields of AC and DC generation and switching technology.

Always leading through innovation, our mission is to continually deliver improvements to power solutions across the globe.

Our customers range from traditional power generation, oil, gas and petrochemical companies through to cutting edge renewable energy plants and polysilicon manufacturers.

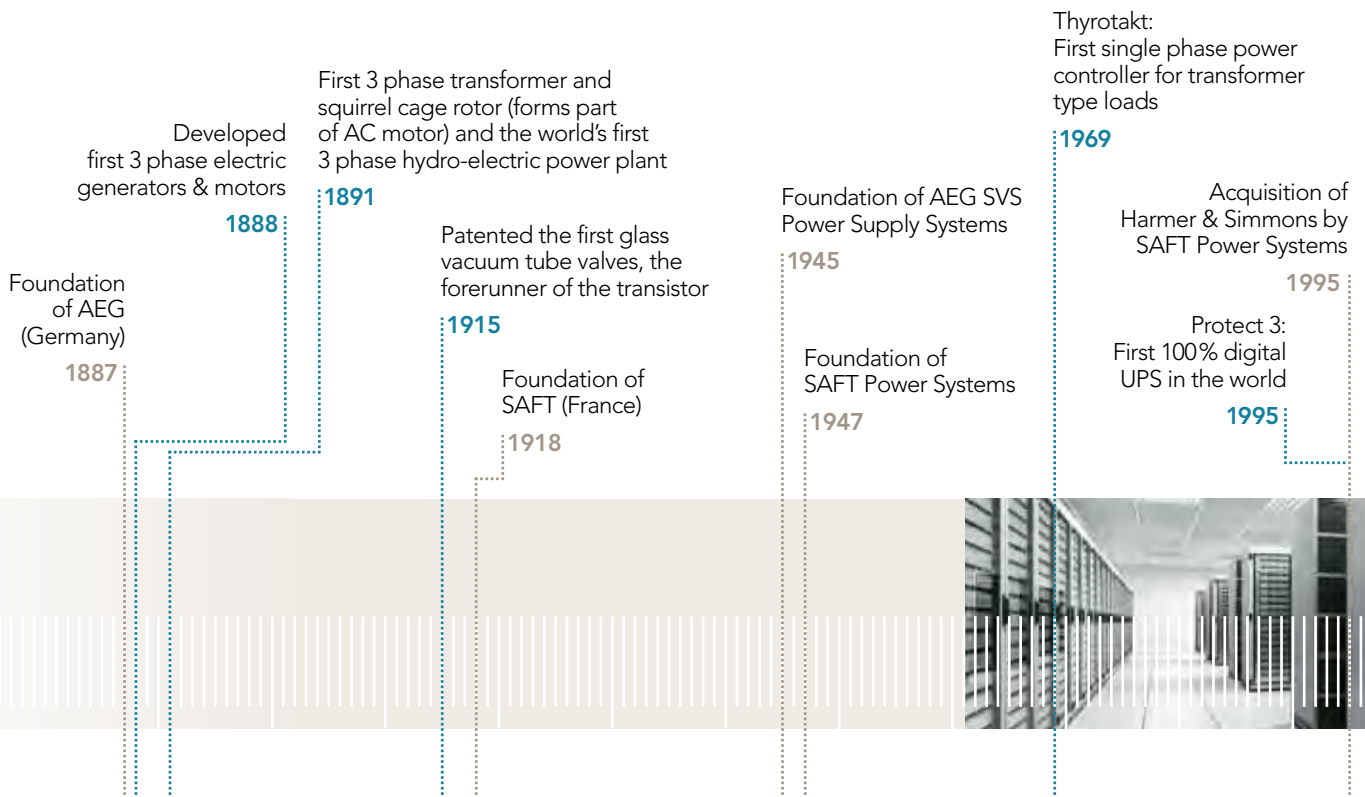
Our extensive products and services portfolio bridges both AC and DC power technologies and delivers comprehensive solutions for both conventional and renewable energy sources as well as for a broad range

of demanding and specialist industrial applications where reliability and efficiency are of crucial importance.

AEG Power Solutions activities consist of two complementary operating segments:

- Renewable Energy Solutions
- Energy Efficiency Solutions

*“Never ending  
technological progress  
in the service of mankind”*





Our vision is to maintain our position as the world's leading power solutions company and to continue in the delivery of outstanding service, innovative products and customizable, robust and reliable solutions that meet the demands of today's energy provision and to prepare for tomorrow's challenges.

AEG Power Solutions is uniquely positioned to benefit long-term from emerging demand for intelligent micro-energy grids and the increasing demand for reliable renewable energy sources that will grow over the coming years.

**Innovation:**

Innovation has been at the core of AEG Power Solutions values since it was founded. We constantly conduct research and development using innovative ideas, approaches, methods and solutions.

**Respect:**

We respect all of our internal and external stakeholders as well as our professional partners and industry peers. Both internally and externally, we respect each individual's professional needs and aspirations. We always take into account such diverse considerations as culture, gender, job status and professional responsibilities as well as each stakeholder's health, safety and well-being.

**Accountability:**

We take responsibility for our actions and behavior. We are each accountable to all of our internal and external stakeholders, including co-workers, management, customers and business partners.

**Reliability:**

Beyond the reliability of our products, reliability permeates all of our business encounters, both inside and outside the company. As reliable professionals, we always respect and deliver on our commitments.

Acquisition of AEG SVS Power Supply Systems by SAFT Power Systems

1998

Thyro A: First power controller with complete digital 16/24 bit scope

2002

Merger of SAFT Power Systems with Alcatel Converters

2002

Acquisition of SAFT Power Systems by Ripplewood from Alcatel

2005

Thyrobox MV-I: First ultra small medium voltage ignition system for polysilicon reactors and processes

2007

Protect MIP: Highly efficient and easily scalable rectifier system for the industrial market

2008

Rebranding: SAFT Power Systems to AEG Power Solutions

2008

Protect PV.250: Ultra efficient inverter for photovoltaic power plants (eff. >98.7%)

2009

eco<sup>px</sup> Pioneering hybrid power systems for telecom

2010

Protect Blue: New world beating UPS for large data centers launched

2012





UNRIVALLED  
SECURITY FOR  
YOUR LARGE  
DATA CENTER

# HIGHEST POWER EFFICIENCY

Protect Blue, the new high power flagship UPS model from AEG Power Solutions has been designed especially for use in large data centers. The full three level IGBT technology for both rectifier and inverter and in both directions offers up an unrivalled 96 % double conversion efficiency.

## Fulfilling your global ecological responsibilities

With Protect Blue, fulfilling your environmental responsibilities couldn't be easier. Meeting the EU's 20-20-20 carbon reduction goals is high on the social responsibility agenda of many leading companies. The clearly defined targets are set up to minimize wasteful energy loss, to ensure that UPS's are used in their most efficient mode and to determine increases in overall efficiency.

## Improve the eco-credentials of your data center

Improving the emissions of your data center could not be easier. The current industry standard of double conversion mode has been increased by AEG Power Solutions to reach levels of 99 % in VI mode and 96 % efficiency in VFI mode.

### Key applications

- Large data centers
- Server farms
- Telecommunications installations
- ISP's
- Financial systems
- Credit card operations



AEG PS is amongst the first to market with its leading edge three power protection.

## German innovation at its best

AEG Power Solutions have achieved a genuine technological breakthrough in establishing new industry performance standards for a range of "best in class" products and solutions delivering efficiency, reliability and high capacity UPS systems to our customers.

Using a modular building block approach, the Protect Blue 250 kVA single unit can be combined to achieve up to 4 MVA enabling our customers to grow as the demands of their businesses grow. Protect Blue is AEG PS's flagship UPS with full rectifier and inverter three level technology which guarantees significant reductions in switching losses. Each power conversion module (both rectifier and inverter) is able to achieve an unrivalled 98 % efficiency as standard.

## Protect Blue delivers premium power performance and true reliability:

- Double-conversion design and lower THDi enhances power protection
- Distributed or centralized static bypass switch for parallel systems build options
- Distributed or centralized battery options to build parallel systems
- Higher efficiency due to longer battery runtimes

## Lower TCO through sustainable design

- Reduction in energy consumption during manufacturing, testing and use
- Electrical and cooling cost savings due to higher efficiency
- Flexible, upgradeable architecture for future expansion needs
- Longer component life due to robust internal design – 15 years expected lifetime

# PROTECT BLUE



## UPS system for large data centers

The new UPS series Protect Blue by AEG Power Solutions offers a highly efficient UPS solution for large data centers and IT applications in power ranges up to 4 MVA.

### Created for the future of power supply

In times of constantly increasing energy prices, Protect Blue helps reduce the costs for operation and cooling to a great extent through high efficiency.

Protect Blue is able to feed energy back into the circuit and to communicate with intelligent power supply systems. This allows for future energy demands and price oriented management with regard to alternative energy sources.

### Modular architecture, flexible performance and maximum redundancy

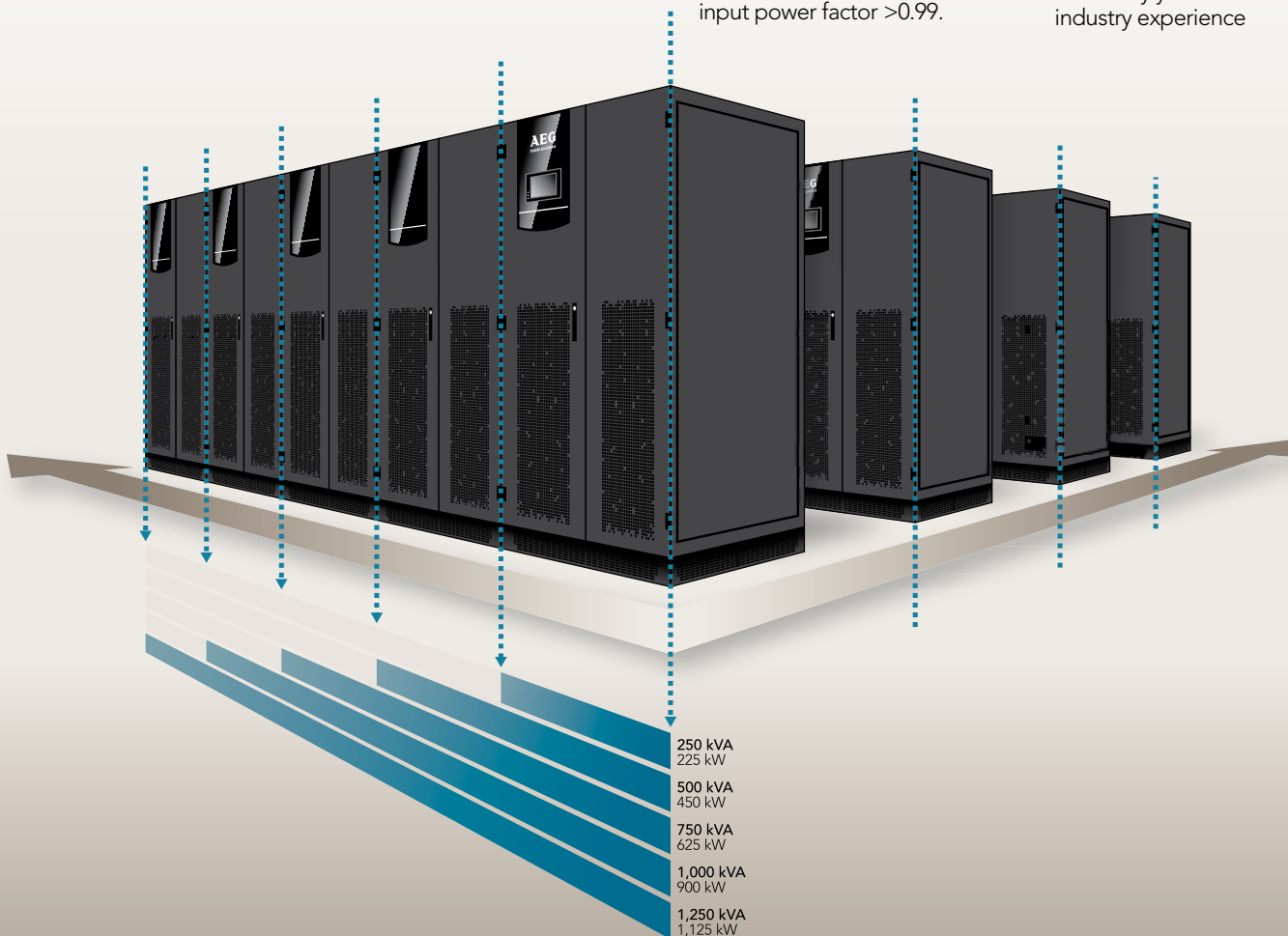
Protect Blue is based on a 250 kVA power block architecture. With this, power levels of 250 – 1,250 kVA can be achieved per UPS. N+1 redundancy operation is possible. All "Power Blocks" are equipped with decentralized control mechanisms to increase operational safety. When used in parallel operation with up to 4 UPS devices, a total power of up to 4 MVA can be achieved.

### Highest efficiency during online operation

Protect Blue is transformer-less, works with the latest IGBT technology and therefore reaches an efficiency level of up to 96 % at a load of at least 40 %. Protect Blue combines all further advantages of this technology such as low circuit feedbacks <3 % and a high input power factor >0.99.

### Main characteristics

- Flexible power configuration from 250 up to 1,250 kVA
- Parallel switching of up to 4 UPS with a total power of up to 4 MVA
- Developed for tomorrow's power supply system: need- and price-oriented energy management
- High operating security through a flexible redundancy concept
- Highest possible efficiency of up to 96 % during genuine "online" operation
- Low circuit feedback <3 %
- Intuitive 7" touch screen
- Front access to all important components
- Wall assembly possible
- Extensive communication options
- Highest reliability based on quality components and many years of AEG industry experience



# MINIMIZING THE TOTAL COST OF OWNERSHIP

# OUTSTANDING PERFORMANCE

## Maximum savings

With its outstanding efficiency of >96 % in VFI mode and 99 % in ECO mode, Protect Blue's design greatly reduces the total cost of ownership from installation to end of operational life.

- Optimized power/ footprint ratio
- Reduced footprint
- Reduced air conditioning requirements
- Fast and safe maintenance

## Delivering savings

- Minimized cost of installation
- Minimized cost of operation
- Minimized air conditioning requirement
- Highly efficient
- Reduced generator set size and operating costs

## Lifetime savings

- Highest quality components limit thermal stress and increase overall lifetime
- Typical operational lifetime of 15 years
- High quality components ensure reliability and performance
- Up to 40 °C ambient temperature operating mode without de-rating

## Extraordinary savings

The modular architecture of AEG PS' Protect Blue UPS allows for great advantages in terms of installation:

- Reduce the size of electrical infrastructure
- Reduce the size of circuit protection devices
- Reduce the amount of cabling

AEG PS' Protect Blue features an almost unitary input power factor. Together with its low harmonics, which provide full compatibility with generator sets, Protect Blue greatly contributes to reduced installation and running costs.

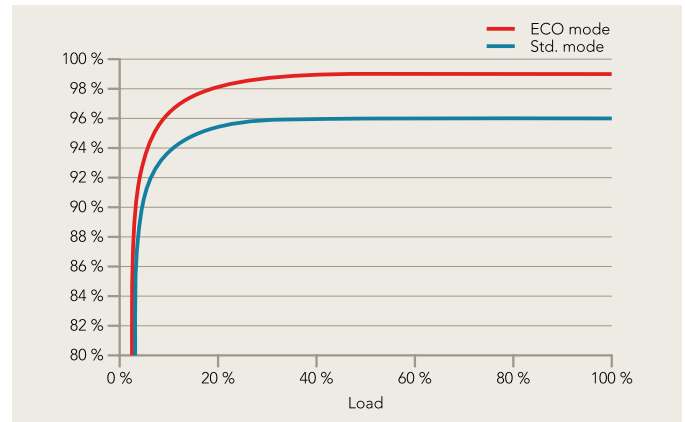
AEG PS' Protect Blue delivers 0.9 output power factor which for a given kVA will deliver 12 % additional kW compared to the existing 0.8 inverter topology.

Double conversion efficiency of 2 – 3 % is achieved through transformerless topology which delivers improvement as copper heat losses are eliminated.

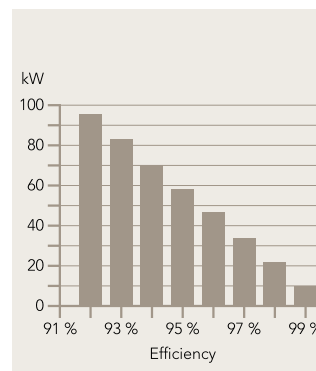
## Running cost savings

### Power module shedding

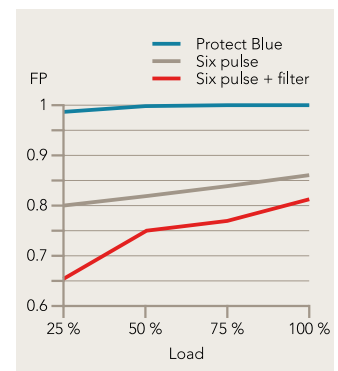
The multi-module configurable design of Protect Blue includes automatic adjustment of UPS capacity to meet immediate load demands by switching surplus module capacity to standby. This improves efficiency markedly at partial load and further reduces operating costs.



Maximum efficiency reached at 40 % of total load  
95 % VFI111 reached as low as 20 %  
99 % efficiency in ECO mode



Air conditioning size and power reduced by 400 %



Input power factor vs load percentage

### Reduction in air conditioning requirement

The extremely high efficiency achieved by AEG PS' Protect Blue reduces the energy dissipated by the UPS (kW). This has the effect of reducing the demand and power consumption of the air conditioning system. AEG PS' Protect Blue can deliver 100 % power at

40 °C operating ambient temperature without de-rating. UPS rooms equipped with Protect Blue do not require massive cooling to manage a constant 25 °C temperature, unlike some legacy UPS systems.

## FEATURE RICH LARGE SCALE UPS SYSTEM



### Protect Blue – standard features

- Three level IGBT rectifier
- Three level IGBT inverter
- Embedded static switch
- Embedded manual bypass switch
- Redundant cooling fans
- Input inrush current limitation
- DSP control
- Bottom cable entry

#### Battery management

- IU characteristic
- Automatic battery test
- Frequent testing without battery capacity reduction
- Autonomy time reduction
- Display remaining autonomy time
- Programmable alarm

#### Graphic display and alarms

- Touch screen display
- 800 x 480 pixel wide screen
- 3 status LEDs
- Audible alarm

#### Remote signaling card

- Standard configuration with options for customized configuration
- 1 x isolated input
- 5 x isolated relay outputs

### Protect Blue – optional features

#### Remote signaling extension

- Up to 2 x cards, stackable, configurable
- 2 x optical isolated inputs
- 3 x isolated relay output

#### Remote signaling alarm terminal

- Separate terminals to connect to remote signaling card

#### BLU PRO

- Battery voltage monitoring for battery block aging detection

#### Battery compensated charging

- Battery charge/float charge voltage adapted to battery temperature

#### Communication

- Modem, ISDN or GSM
- Alarm management
- RS485 PROFIBUS DP interface, CCP
- RS485/RS232 MODBUS
- Ethernet interface bus connection IEC61850
- SNMP adapter
  - Embedded web server
  - Embedded email client
  - Embedded event manager
  - Direct multi server shutdown in heterogeneous networks
- Environmental manager
- "CompuWatch" monitoring software
- COM server



AEG POWER  
SOLUTIONS

# YOUR POWER PARTNER – ALSO FOR SERVICES

## Rely on the experts to reduce failure costs and increase system availability

Global network of 20 Services Centers supported by over 150 field engineers and more than 100 certified service partners around the world. From power solution selection to process installation and commissioning, our certified experts exceed your expectations. Their excellent service helps you achieve the lowest operating cost for your mission-critical power solution.

A Global Service Team renowned for its short response time and trouble shooting efficiency ensures the reliability of your installed power solution.

### Pro Care™ Start Commissioning

Ramp-up by the most experienced service experts and benefit from the manufacturer warranty. Commissioned in compliance with the latest local and international electronic norms, your system is carefully checked and optimized to meet specific on-site power needs. Full operating training and hands-on advice.



### Pro Care™ Preventive Maintenance

It is well known that scheduled, recurring preventive maintenance performed by accredited service experts is the most cost effective way to secure the full performance of your Protect Power Solution at all times. Ensuring complete cost control, security and uninterrupted power supply for your most critical processes.

### Pro Care™ Safe

Annual scheduled on-site preventive maintenance program, to secure your system operations at all times. Over 50 functionality assessments and on-site numerical diagnostics to keep your system operating at peak performance.

### Pro Care™ Excel

Replacement and on-site installation of all defective parts at no additional cost (in addition to Pro Care™ Safe.)

### Pro Care™ Premium

Long-term piece of mind at a set price. Our service engineering team performs annual maintenance of your system and replaces all necessary parts and battery units at no additional cost.

## SERVICE PACKAGES



### Service for data center solutions

Increasing system availability and reducing failure costs with the help of our experts.

As a globally recognized systems provider, AEG Power Solutions offers a worldwide network with 20 customer service centers and more than 150 field service technicians.

In addition, we can rely on more than 100 certified service partners all over the world. Thanks to our comprehensive service, you can reduce the operating costs of your business power supply solutions to a minimum.

Short reaction times and efficient troubleshooting by our global service team ensure maximum operating security for your installed power supply solution.

Especially for the data center solutions Protect Blue. AEG Power Solutions has developed special service packages.

Pro-Care Safe is a comprehensive, preventive maintenance program that is run on-site once a year. It includes more than 50 clearly designed functional tests and diagnoses.

Pro-Care Excel contains, in addition to the diagnosis, replacement of faulty parts and installation of spare parts. The spare parts themselves are included.

Pro-Care Premium ensures a service that covers replacement of used batteries.

Choose the suitable maintenance contract for your power supply solution.

	PRO-CARE SAFE	PRO-CARE EXCEL	PRO-CARE PREMIUM
<b>Service description</b>	Annual preventive maintenance on-site	Annual preventive maintenance on-site, including replacement of faulty parts	Annual preventive maintenance on-site, including replacement of faulty parts and batteries
Visual inspection	■	■	■
Functional tests	■	■	■
Elimination of organic and inorganic impurities	■	■	■
Battery function test	■	■	■
Computer-based fault diagnosis	■	■	■
Setting and optimization of parameters	■	■	■
Repair on the same day after customer agreement	■	■	■
Maintenance report	■	■	■
Functional test run	■	■	■
Software update	■	■	■
Hotline available 24/7	■	■	■
Additional phone support on workdays during regular working hours	■	■	■
Includes travel expenses and service technicians on-site	■	■	■
Includes replacement of faulty parts <sup>1</sup>		■	■
Includes replacement of batteries in accordance with the lifespan			■
3-year maintenance contract	■	■	■
Finalization after expiration of the warranty period		■	■

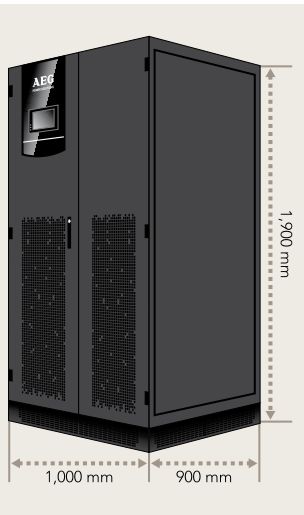
<sup>1</sup> Excludes unrelated failures or acts of God

SCALABLE  
POWER

# POWER BLOCKS CONFIGURATION

Multi-module  
configuration supplies

- Redundancy
- Scalability
- High availability
- High reliability
- N+1 configuration
- High power configuration



POWER BLOCKS	DISTRIBUTION CUBICLE	RATING	TOTAL WIDTH (MM)
		250 kVA	1,000
		500 kVA	3,000
		750 kVA	5,000
		1,000 kVA	6,000
		1,250 kVA	7,000

## PROTECT BLUE TECHNICAL DATA

Classification VFI SS 111 acc. to IEC 62040-3					
Power type rating	250 kVA	500 kVA	750 kVA	1,000 kVA	1,250 kVA
	225 kW	450 kW	675 kW	900 kW	1,125 kW
<b>SYSTEM</b>					
Nominal input current (A)	336	672	1,008	1,344	1,680
Rectifier efficiency	98 %				
AC/AC efficiency (VFI SS 111)	96 %				
Waste heat from power in normal use kW	9	19	28	37	47
Waste heat from power in normal use BTU/h	29,447	58,894	88,341	117,788	147,235
<b>UPS INPUT</b>					
Nominal voltage	3 x 400 V, 3 Phase				
Input voltage range	340 – 440 V				
Frequency	50 Hz / 60 Hz (adjustable)				
Total harmonic distortion (THDi)	≤3 %				
Power factor	>0.99				
<b>INVERTER</b>					
Nominal voltage	3 x 400 V (380 V, 415 V adjustable), 3 phase + neutral				
Frequency	50 Hz / 60 Hz (adjustable)				
Precision static/dynamic	±1 % / ±2 %				
Total harmonic distortion	<3 %				
Max. short circuit current	125 % for 10 min., 150 % for 60 s				
Crest factor	3 : 1				
Max. short circuit current	300 % of the rated current				
Admissible power factor	0.1 inductive to 0.1 capacitive				
<b>BATTERY</b>					
Rated voltage	480 V DC				
Max. charging power	54 A	108 A	162 A	216 A	270 A
Charging characteristics per IEC 478-11	IU				
<b>STATIC BYPASS</b>					
Nominal voltage	3 x 400 V (380, 415 V adjustable), 3 phase + neutral				
Frequency	50 Hz / 60 Hz (adjustable)				
Synchronization range	±10 % (adjustable)				
Transfer time at mains outage	0 ms (without interruption)				
Admissible overload	500 % for 10 ms				
<b>GENERAL DATA</b>					
Parallel mode	Up to 4 UPS (3 devices at 1250 kVA)				
Audible noise	62 – 69 dB(A) dependent on equipment installed and load state				
Operating temperature range/humidity	0 – 40 °C / <95 % (without condensation)				
Protection	IP20				
Color	RAL 9005				
Cable entry	Underside				
Environmental conditions	Free from corrosive air and conductive dust				
<b>COMMUNICATION</b>					
Display	480 x 800 pixel graphical LCD touch screen				
Alarm signals	Acoustic and visual				
Interfaces	Remote signal contact, RS232 / 485, SNMP, Modbus, Profibus, GSM modem, COM server				
<b>DIMENSIONS</b>					
Dimensions approx. H x W x D (mm)	1,900 x 1,000 x 900	1,900 x 2,000 x 900	1,900 x 3,000 x 900	1,900 x 4,000 x 900	1,900 x 5,000 x 900
Footprint (m²)	0.9	1.8	2.7	3.6	4.5
Weight approx.	897 kg	1794 kg	2,691 kg	3,588 kg	4,485 kg



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## AEG Power Solutions

Approach your local AEG Power Solutions representative for further support. Contact details can be found on:

[www.aegps.com](http://www.aegps.com)

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