ENERTRONIC modular

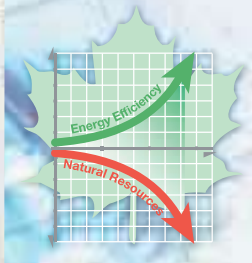
Three Phase UPS System with Modular, Hot-Plug Design 10 – 100 kVA

BENNING
World Class Power Solutions

Excellent Technology, Efficiency and Quality

Power without Compromise!
4 critical applications – 4 precise answers:

- **Maximum availability**
  - N+1 redundancy
  - Advanced UPS design with IGBT and MOSFET semiconductors and DSP processors
  - UPS classification VFI-SS-111 in accordance with EN/IEC 62040-3
  - Online diagnosis and monitoring by MCU 2500
- **Maximum cost-effectiveness**
  - High efficiency, also at partial load, reduces energy losses
  - Sinewave input current (powerfactor 0.99)
  - Input current with low harmonic distortion (THDi < 4%)
  - Minimal Footprint
  - Best in Class for Efficiency and Envoiremental Impact
- **Efficient Maintenance and Service**
  - Short MTTR (Mean Time To Repair)
  - Hot-Swappable Key Components and Modules
- **Highest financial flexibility – pay as you grow**
  - Scaleable UPS system
  - Excellent Modularity



ENERTRONIC modular, 10 kVA module

ENERTRONIC modular
90 kVA n+1

Highly reliable and scaleable UPS-System for small- and medium-sized power

BENNING has been supplying modular DC power solutions for IT, telecom and industrial applications for more than 25 years.
These DC systems are very reliable as they consist of parallel operating hot-plug DC power modules with n+1 redundant configuration. This design allows easy and rapid replacement as well as upgrade or downgrade of the power capacity following any change in the load requirements.

More and more customers are now demanding a similar modular, n+1 redundant, solution for their UPS requirements also concerning small- and medium-sized power (10 – 100kVA).
Bringing into market the ENERTRONIC *modular* UPS based on 10 kVA modules, BENNING followed these customers requests. ENERTRONIC *modular* UPS systems are now available with steps between 10 kVA and 480 kVA (440 kVA n+1 redundant).

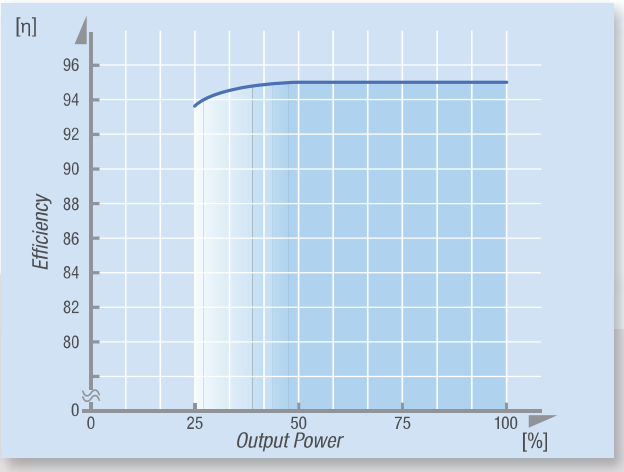


Fig. 1: Efficiency versus output power (10 kVA module)

ENERTRONIC *modular* the modular UPS System with premium Availability and high Flexibility

Each module within the ENERTRONIC *modular* is an independent double conversion UPS with three phase input, rectifier, inverter, static-bypass, DSP regulator and three phase output.

The power modules, with true hot-plug design, allow the addition or replacement of modules without any power interruption. The advanced decentralised parallel architecture of the ENERTRONIC *modular* UPS system offers maximum power protection availability (Fig. 2).

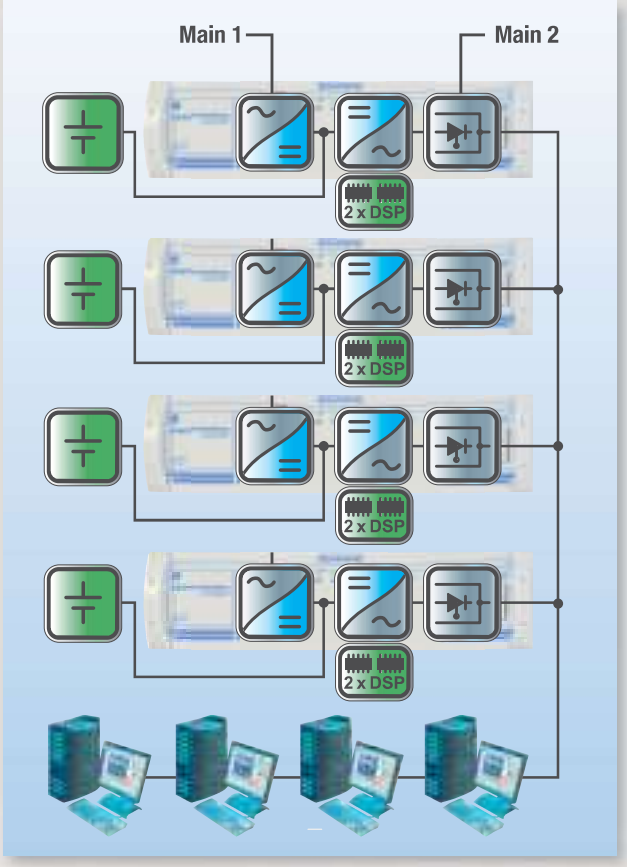
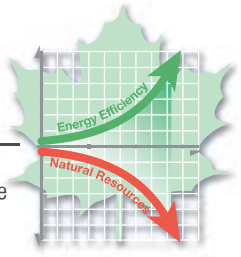


Fig. 2: Decentralised parallel architecture

High Efficiency, even at partial loads, means less TCO (Total Cost of Ownership)



High efficiency of UPS systems is essential to reduce operating costs. The ENERTRONIC *modular* UPS has been designed to provide high efficiency at full rated loads and also at partial loads (Fig. 1).

This excellent efficiency lowers the UPS energy consumption as well as the investment and operating costs for the airconditioning equipment.

UPS ENERTRONIC *modular* with 10 kVA modules											
Rated output power	[kVA]	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
	[kW]	8	16	24	32	40	48	56	64	72	80
No. of modules		1	2	3	4	5	6	7	8	9	10
Input											
Input current	[A]	15,4	30,8	46,2	61,6	77	92,4	107,8	123,2	138,6	154
Nominal voltage	[V]	3 x 400 / 230 ± 15 %, +N									
Nominal frequency	[Hz]	50 ± 5 %									
Distortion factor	[THDi]	≤ 4 %									
Power factor	[cos φ]	≥ 0,99									
Output											
Output voltage	[V]	3 x 400 / 230 +N (± 5 % programmable)									
Voltage tolerance static asymmetric load dynamic	[%]	≤ 1 ≤ 2 with 100 % ≤ 5 with 100 % load step									
Regulation time	[ms]	≤ 20									
Nominal frequency	[Hz]	50 ± 0.1 %									
Distortion factor	[%]	≤ 2 with linear load ≤ 5 with non linear load EN 50091-1-1									
Crest factor	[%]	≥ 3 : 1									
Overload Inverter Electronic by-pass		150 % for 60 sec, 125 % for 10 min with three phase load 150 % for 10 min, 500 % for 100 ms									
Short circuit Inverter		200 % for 3 s									
Service by-pass		installed									
Other specifications											
Efficiency	[%]	94.5									
EMC		IEC 62040 - C3									
Permitted ambient temp.	[°C]	0 to +40									
Storage temp.	[°C]	-25 to +70									
Relative humidity	[%]	5 to 95 non condensing									
Installation height	[m]	< 2000 m ASL without derating									
Cabinet protection		IP 20, air inlet with filter mat									
Painting		RAL 7035 textured									
Weight (per module)	[kg]	22									
Pb-Battery											
No. of cells		2 x 108 – 144									
Standards		EN 60801, EN 60950, EN 61000, EN 62040-1, EN 62040-2, EN 62040-3, EN 62040-1-1, VGB 4									
Cabinets for systems with 10 kVA modules											
Type											
PSJ 1868 (8 modules)		1800 x 600 x 800 mm (H x B x T), 190 kg*1									
PSJ 2068 (5 modules)		2000 x 600 x 800 mm (H x B x T), 210 kg*1									
PSJ 2068 (10 modules)		2000 x 600 x 800 mm (H x B x T), 210 kg*1									
PSJ 2268 (11 modules)		2200 x 600 x 800 mm (H x B x T), 210 kg*1									

(*1: without modules)

Subject to alterations.

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