

# 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 Environmental Impact

### • Efficient Maintenance and Service

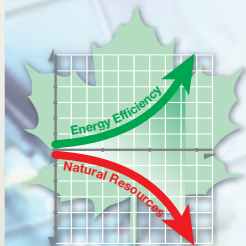
- Short MTTR (Mean Time To Repair)
- Hot-Swappable Key Components and Modules

### • Highest financial flexibility – pay as you grow

- Scalable UPS system
- Excellent Modularity



ENERTRONIC modular  
90 kVA n+1



ENERTRONIC modular, 10 kVA module

## Highly reliable and scalable 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).

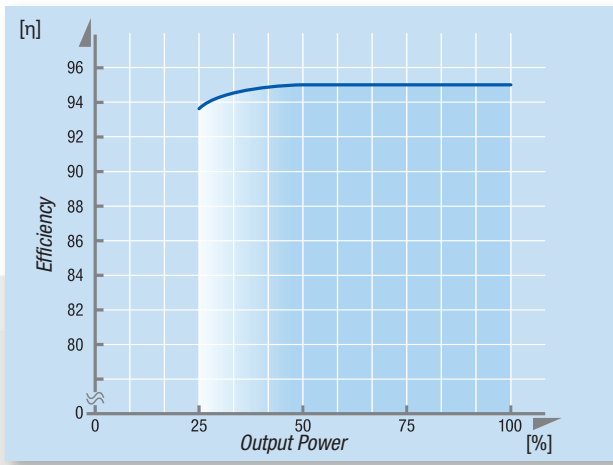
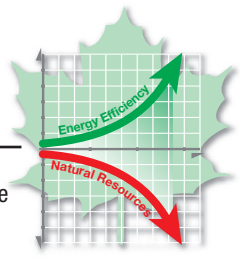


Fig. 1: Efficiency versus output power (10 kVA module)

**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.

**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).

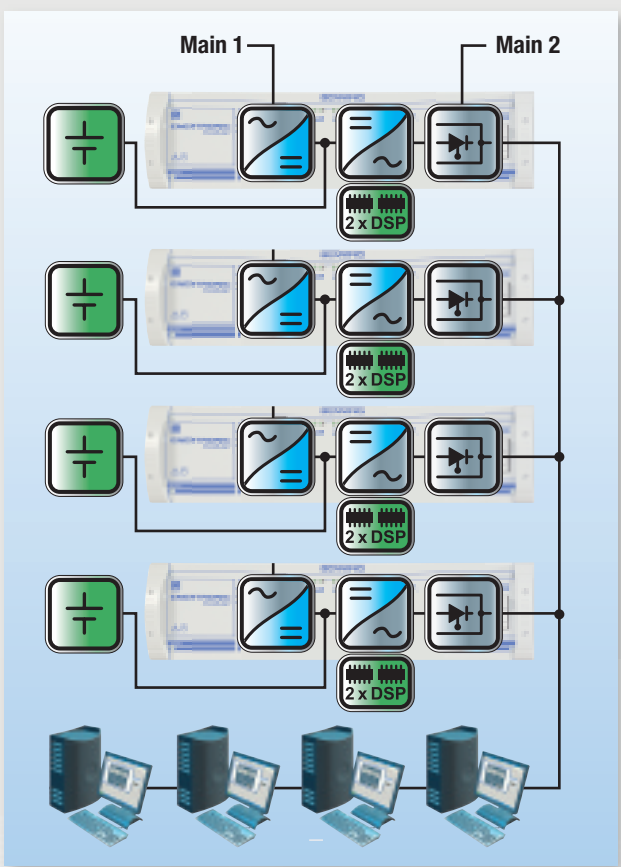


Fig. 2: Decentralised parallel architecture

**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	[THD <sub>i</sub> ] ≤ 4 %
Power factor	[cos φ] ≥ 0,99

Output	
Output voltage	[V] 3 x 400 / 230 +N (± 5 % programmable)
Voltage tolerance	
static	[%] ≤ 1
asymmetric load	≤ 2 with 100 %
dynamic	≤ 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	150 % for 60 sec, 125 % for 10 min with three phase load
Electronic by-pass	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*
PSJ 2068 (5 modules)	2000 x 600 x 800 mm (H x B x T), 210 kg*
PSJ 2068 (10 modules)	2000 x 600 x 800 mm (H x B x T), 210 kg*
PSJ 2268 (11 modules)	2200 x 600 x 800 mm (H x B x T), 210 kg*

(\*): without modules

Subject to alterations.



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