

**BRN**<sup>®</sup>  
Industrial Power Solutions

# B9600 **3/3**

400 - 500 - 600 - 800 kVA  
Three-phase UPS

High feature solutions for large,  
mission-critical systems



**... we commit**

**The innovation and design of the BORRI B9600 high power UPS has resulted in being the most technologically advanced in its class . It delivers an incredible combination of low input current distortion and unity input power factor. The benefits of these advances results in lower running costs and substantially increased reliability**

#### INFORMATION AND COMMUNICATION TECHNOLOGY

- Large data centers
- Server farms
- Telecommunication installations
- Broadcasting and entertainment
- Internet Service Providers (ISP)

#### CRITICAL ELECTRICAL ENGINEERING

- Industrial systems
- Financial and banking
- Security operations
- Transportation systems
- Medical / Healthcare

#### Low THDi and power factor performance enhance compatibility with input mains and generators

The BORRI B9600 UPS uses a new input IGBT rectifier and an advanced PFC (Power Factor Control) capable of keeping input current Total Harmonic Distortion (THDi) at a low level (<3%), as well as the input power factor very close to unit (0,99).

The key benefits are that the UPS is therefore *compatible* with the upstream source, the mains or any kind of generator and the transfer of power between source and load is more efficient. This results in a *saving* in terms of scale of sources, cables and protective devices.



#### High efficiency reduces overall cost of ownership

The B9600 operates at a *high efficiency* of over 95%, which reduces utility costs. Moreover higher system efficiency reduces facility air *conditioning costs*, increasing overall reliability. Because of the technology and topology used, no additional losses are generated to get low input harmonics or *input/output galvanic isolation*.

Additionally, **Eco-mode** function can be set. In this intelligent mode, the mains line is continuously being monitored in order to supply with high reliability the load by the same line. If the line is downgraded and required to be conditioned, the inverter supports the load in less than 4msec. Once the load is accessed to properly operate in this way, in Eco-mode *efficiency is considerably increased*, allowing high energy saving.

#### Double conversion topology offers protection for every application

The *on-line double conversion* topology (VFI, Voltage and Frequency independent) with *built-in inverter transformer* completely isolates output power from all the input power anomalies and delivers fully conditioned, pure sine-wave output. B9600 is designed to provide excellent output voltage, suited to very demanding applications with either 100% step load, unbalanced, non-linear or modern IT *loads with a leading power factor up to 0,9*.



#### The most advanced technology

If your business application needs an extremely flexible and reliable UPS protection, B9600 delivers advanced features based on state-of-the-art total digital control (Tricore technology incorporating both DSP and  $\mu$ C). The design ensures that auxiliary power supplies and processors are no longer single points of failure that would compromise high availability of clean power to the load. In fact, with B9600 distributed control architecture, there will always be a UPS circuit protecting the load. The status of the most critical components is constantly monitored. This allows predictive maintenance and avoids unexpected breakdowns.

#### Accurate Battery Management

Since batteries are electro-chemical devices, their performance gradually decreases over time. B9600 performs *Accurate Battery Management* according to the battery manufacturers' requirements.

Following a UI characteristic curve, the charger starts at a *constant current* appropriate for the battery type used, preventing detrimental excess charging. In addition to the float voltage level, *boost charge* can be set, optimising the recharge time when there may be consecutive power outages within a short period.

Accurate Battery Management also reduces the residual *current ripple*, one of the causes of premature battery wear, as well as protecting the battery from

damaging *deep discharges*.

An automatic *temperature compensation* of battery charge voltage can be implemented, properly charging the battery and greatly extending battery life.

By means of the *DCM (Dynamic Charging Mode)* function, very long battery autonomy times can be achieved without increasing total charging time. It is achieved further increasing the maximum battery charge current, without the whole inverter power being drawn by the load.

An integrated periodical battery *function tests and monitors battery health*, providing advance notification to guide preventive maintenance.

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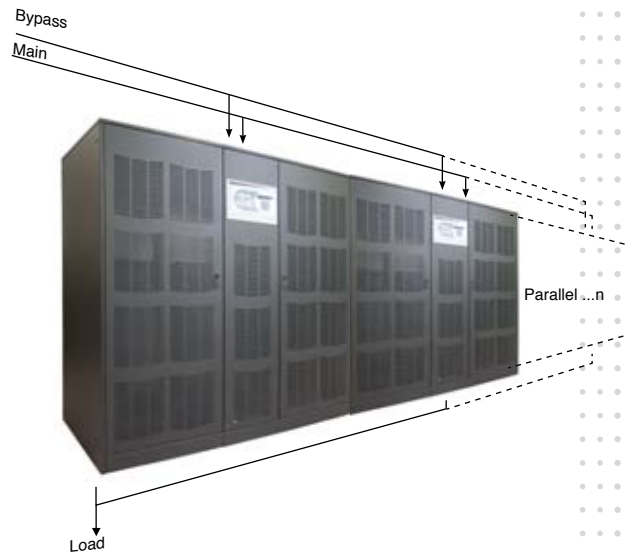
## Parallel systems for redundancy or capacity increasing

The parallel UPS configuration is provided with control for operation of both *redundant* and *capacity* increase.

The parallel control is fully digital and acts on both active and reactive power on each output phase, allowing an *accurate load current sharing* among the UPSs', even during transient conditions.

Parallel control is *distributed* (not centralised control, but on each UPS microcontroller) and communication among units uses CAN BUS connection loop, providing a *highly reliable* system without "single points of failure".

Extremely simple parallel control and interconnections make *easy installations* and on field upgrading, adding new units to the system according to the customer's needs.



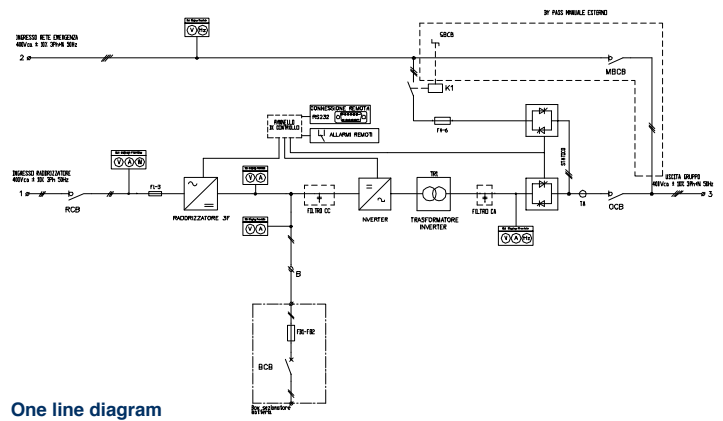
## Easy installation, operation and maintenance

The B9600 can be easily moved and positioned in subassemblies not wider than 1200mm.

The UPS can be installed in close proximity against rear and side walls or other cabinets. Cooling air is expelled through top vents. A significant *space saving and a compact design* allow a lower deployment cost in locations where floor space is in short supply.

Despite the compact design, most of the components, including the critical ones, are *accessible from the front* of the cabinet. Front panel access facilitates service and operation, thereby reducing Mean Time to Repair (MTTR).

The B9600 features a unique back-feed power protection system: in the event that the output of the UPS is fed back to mains, it will immediately be isolated. This results in lower installation cost as additional MCB's or similar safety devices are not required.



One line diagram

## User Interface and Accessories



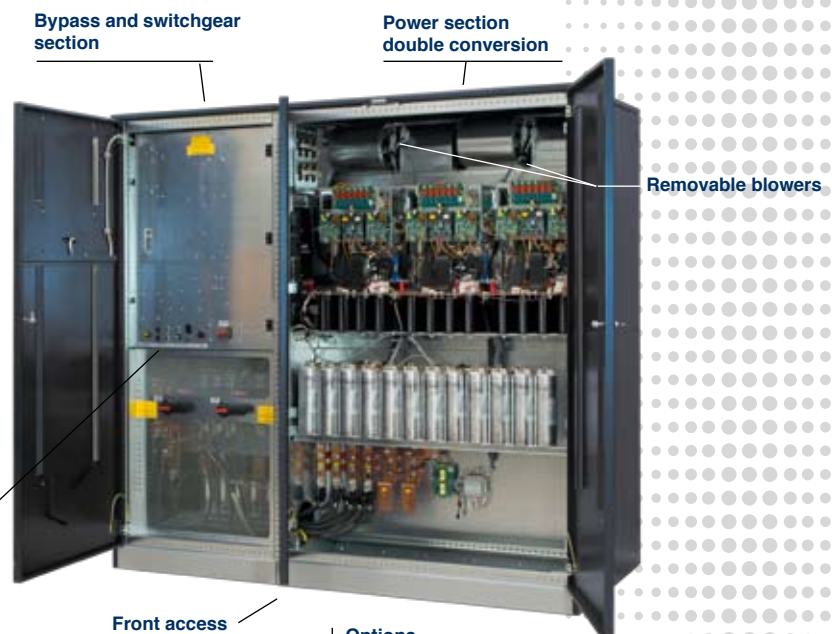
User-friendly Interface



Monitoring, managing and shutdown software

- Communication**
- RS232 serial port
  - USB port
  - EPO

- Optional**
- Web/SNMP
  - ModBus
  - Relè
  - Modem
  - Remote panel



Bypass and switchgear section

Power section double conversion

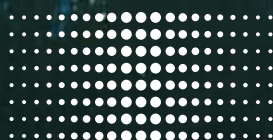
Removable blowers

Front access

### Options

- Parallel capacity/redundancy
- Isolation transformer
- External bypass
- External battery cabinets
- Battery switch box
- Battery thermal probe
- Transformers/ autotransformers for voltage adaption
- Top cable entry

<b>Rating</b>	<b>400 kVA</b>	<b>500 kVA</b>	<b>600 kVA</b>	<b>800kVA</b>
Capacity (kVA/kW)	400/320	500/400	600/480	800/640
Dimensions WxHxD (mm)	1990x1920x952	2440x2020x952		3600x2020x952
Weight (kg)	1820	2220	2400	4000
Input/output connection	Hardwired (dual input)			
Battery	External, 300 cells			
<b>Input</b>				
Nominal voltage	220/380, 230/400, 240/415 Vac three phase			
Voltage range	-20%, +10% from nominal			
Frequency	50/60 Hz (45-65 Hz)			
Power factor	0,99			
Current distortion (THDi)	< 3%			
<b>Output</b>				
Nominal voltage	220/380, 230/400, 240/415 Vac three phase			
Frequency	50/60 Hz			
Voltage regulation	±1% static; ± 5% dynamic 100% load change, <20 ms recovery time			
PF acceptable without de-rating	Lagging to 0.9 leading			
Overload capacity	101÷125% for 10 min (on-line); 126÷150% for 1 min (on-line); 1000% for 1 cycle (bypass)			
Efficiency	95%			
(Eco-mode)	98%			
<b>Options</b>	Parallel capacity/redundancy; isolation transformer; external bypass; external battery cabinets, battery switch box; battery thermal probe; transformers / autotransformers for voltage adaption; top cable entry			
<b>User Interface</b>				
Front panel	Graphical LCD display, mimic with LED's and keyboard			
Standard communication ports	RS232 serial port, USB port, Remote Emergency Power Off input, battery switch monitoring port			
Optional	Web/SNMP, ModBus, relay, modem cards; remote panel; monitoring, managing and shutdown software			
<b>Environmental</b>				
Operating temperature	0°C ÷ +40°C			
Storage temperature	-10°C ÷ +70°C			
Altitude	<1000 m			
Audible noise at 1 meter (dBA)	<60			
<b>Standards and Certification</b>				
Marking	CE			
Safety	IEC EN 62040-1			
EMC	IEC EN 62040-2			
Test and Performance	IEC EN 62040-3			
Quality	ISO9001 : 2000			



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