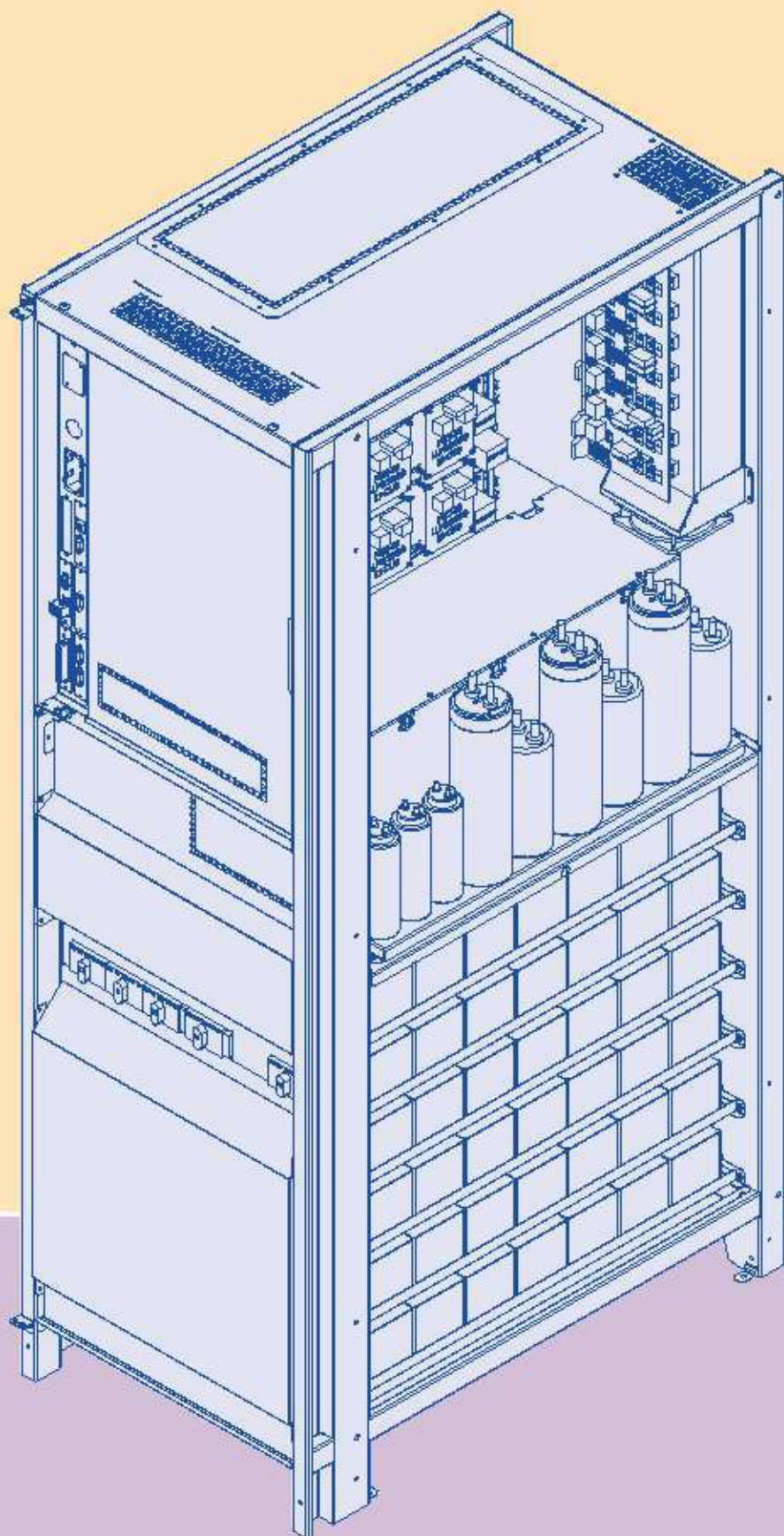


INGENI

60 to 160 kVA

PLUS UPS



BORRI



Low TCO, efficient and compact solution for supplying reliable uninterrupted quality power to all critical applications in networking and small to medium datacenter, health, finance, industrial processing, building and transportation markets and for TLC.

Featuring Green Conversion patented technology, INGENIO PLUS provides high efficiency even at light loads and ensures 100% battery expected life, thus ensuring low opex and capex savings.



INGENIO PLUS UPS



Application

• Networking and telecommunication

• Data server

• Process automation

• Medical equipment

• Emergency and safety systems

• Continuous cooling

Features and benefits

- Continuous savings with Green Conversion patented technology, providing high efficiency and UPS critical components' life care
- Clean mains and full compatibility with Genset operation due to its low input current distortion and soft start features
- No costs related to electrical infrastructure oversizing and power factor correction thanks to its 0.99 input PF
- Reduced commissioning and floor space related costs and lower environmental footprint with transformer free design and common battery management
- Capital expenditure protection thanks to hot expandability and load based shutdown in parallel systems
- High flexibility for all types of loads with full output power rating and different operating modes



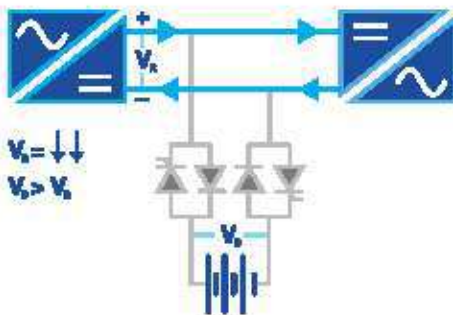
Green Conversion

Green Conversion technology is based on a patented control algorithm, managing the battery-inverter subsystem in order to enhance double conversion efficiency and to extend battery life.

The innovative Green Conversion inverter design increases efficiency and reduces switching stress on all components subject to wear.

The new Green Conversion battery charger completely filters voltage ripple and floating voltage micro currents to the battery; main causes for early battery ageing.

Benefits are 30% saving on maintenance cost and battery's operating life extension by as much as 40%.



Energy saving operating modes

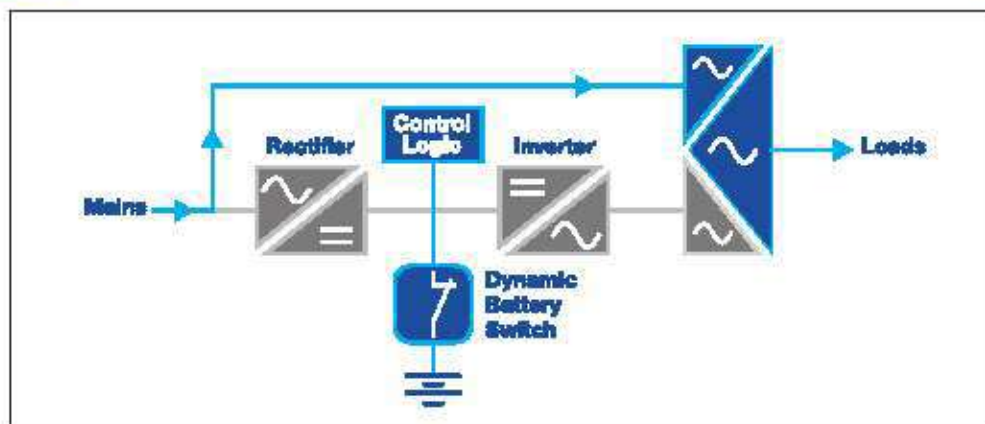
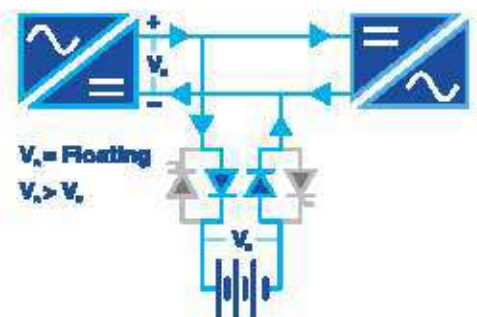
Set the best mode of operation for any application according to mains quality, load immunity grade to mains disturbances and system features, to always deliver the best reliable quality power at the highest efficiency.

- On-line double conversion: VFI (Voltage Frequency Independent) double conversion total protection with up to 96% efficiency thanks to our Green Conversion patented technology.
- ECO mode: suitable for stable mains, in VFD (Voltage Frequency Dependent) mode of operation, achieving 98% efficiency.
- Ultra High Efficiency: the most innovative power protection technology for high immunity grade applications, up to 99% efficiency, with the lowest TCO

Battery life care

Protecting capital expenditure on batteries, whilst ensuring full availability of mission critical applications can only be achieved by keeping them in perfect condition. INGENIO PLUS comes with advanced charging and battery managing features, providing best battery performance and extended lifetime:

- Intermittent charging, with adjustable charging cycle (27-3 typical), to extend battery operating life and to achieve maximum energy savings
- Dynamic Charging Mode (DCM): automatic setting of battery charging current, with feeding priority to output loads, ensuring low charging times for long autonomy applications
- Battery charging voltage temperature compensation: to prevent excess battery charging and overheating
- Automatic and manual battery test to detect any battery performance deterioration
- Common battery management: the right feature when pricing and footprint are important factors



One to one power factor

INGENIO PLUS features both input and output unity power factor. Its "full-IGBT" technology makes it a linear and power factor corrected load for the upstream mains, whilst being capable of feeding its loads at any output power factor, up to full rated real power.

Smart parallel

Smart-parallel control continuously monitors load power requirements and maximizes system efficiency, by turning off all unnecessary units whilst keeping the required level of redundancy.

Backfeed protection

INGENIO PLUS series comes with backfeed energy detection circuit and output contact for remote tripping coil. Local tripping device for bypass disconnecter can be fitted as an option, for total upstream protection and operator safety, without additional installation costs.

INGENIO PLUS technical data

Rating (kVA)	60	80	100	125	160
Nominal power (kW)	60	80	100	125	160
UPS dimensions WxDxH (mm)	360x940x1800				
UPS weight (kg)	250	300	320	360	380
UPS weight with int. battery (kg)	800	850	-	-	-
Battery configuration	Internal or external, 360+372 cells, VRLA (other options)		External 360+372 cells, VRLA (other options)		
Max autonomy with int. battery 70% load (min)	16	11	-	-	-
Input					
Connection type	Hardwired 4w (rectifier), 4w (bypass)				
Nominal voltage	400 Vac 3-phase with neutral (rectifier) 380/400/415 Vac 3-phase with neutral (bypass)				
Voltage tolerance	-20%, +15% (rectifier) ±10% (bypass)				
Frequency and range	50/60 Hz, 45-65 Hz				
Power factor	>0.99				
Current distortion (THDi)	<3%				
Output					
Connection type	Hardwired 4w				
Nominal voltage	380/400/415 Vac 3-phase with neutral				
Frequency	50/60 Hz				
Voltage regulation	±1% static; dynamic: IEC/EN 62040-3 Class 1				
Power factor	up to 1, without power derating				
Overload capacity	Inverter: 101±12.5% for 10 min, 126±1.50% for 30 s, >1.50% for 0.1 s; bypass: 1.50% continuous, 1000% for 1 cycle				
Efficiency (AC/AC)*	up to 99%				
Classification as per IEC/EN 62040-3	VFI-SS-111				
Connectivity and function extensions					
Front panel	Graphic display, mimic LED panel and keyboard, local EPO				
Remote communication	Included: serial RS232 and USB, backfeed protection monitoring contact, input terminal block (remote emergency power off, battery circuit breaker aux. cont., external maintenance bypass circuit breaker aux. cont., diesel mode aux. cont.); Optional SNMP adapter (Ethernet), Web interface (Ethernet), from ModBus-RTU to PROFIBUS DP adapter, SPDT contact relay board; remote system monitoring panel; UPS managng and server shutdowns software				
Optional function extension	Isolation transformer; transformers/autotransformers for voltage adjustment; external maintenance bypass; custom battery cabinets; wall-mounted battery fuse; battery thermal probe; parallel kit, load-sync for single UPS and load-sync box (2 UPS systems)				
System					
Protection degree	IP20				
Colour	RAL 9003				
Installation layout	Wall and side by side installation allowed, 80 cm clearance on one side only with internal battery				
Accessibility	front access, side access (only with internal battery), bottom cable entry				

* according to IEC/EN 62040-3

Advanced connectivity

LCD graphic display or 7" touch screen display (optional) front panel ensure clear and quick access to all UPS status. Remote communication is managed through most common protocols and interfaces such as voltage free relay contacts, RS485 ModBus-RTU, Ethernet ModBus over IP or SNMP protocol, as well as dedicated web server for remote UPS monitoring from any workstation or web based mobile device.



Low total cost of ownership

INGENIO PLUS is designed to reduce TCO. Transformer-free architecture and internal battery layout cut commissioning costs and footprint. High efficiency double conversion and advanced energy saving modes ensure low operating costs. Green Conversion control dramatically reduces maintenance costs, extending all critical components and battery's life. Full rated output power results in optimal UPS sizing and utilization.

Other features

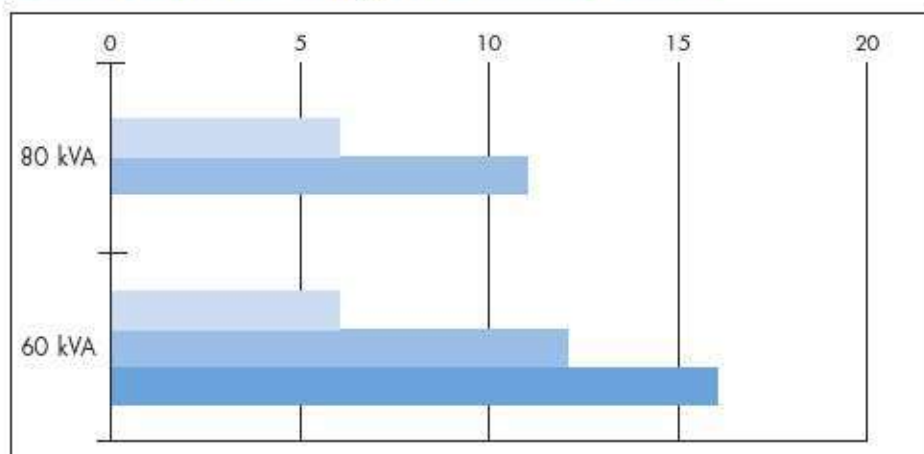
Environmental

Operating temperature range	0°C + +40°C
Storage temperature range	-10°C + +70°C
Altitude (AMSL)	< 1000 m without power reduction, > 1000 with reduction of 0.5% per 100 m
Audible noise at 1 m (dBA)	<60


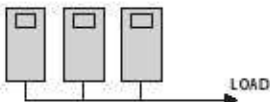

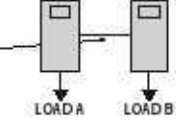

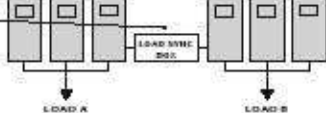

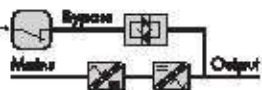

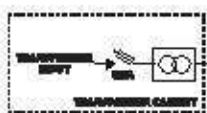



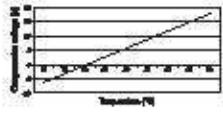





Standards and certifications

Quality assurance, environment, health and safety	ISO 9001:2008, ISO 14001:2004, BS OHSAS 18001:2007
Safety	IEC/EN 62040-1
EMC	IEC/EN 62040-2
Environmental aspects	IEC/EN 62040-4
Test and performance	IEC/EN 62040-3
Protection degree	IEC 60529
Marking	CE

Autonomy time in minutes with different types of internal batteries



INGENIO PLUS 60-160 kVA series options

	Description	When do I use it
 	Parallel kit	When the unit is to be paralleled for load sharing
 	load-sync for single units	To synchronize single units' output for no-break load transfers by downstream static transfer switches
 	load-sync box for two sets of paralleled UPS	To synchronize the output of two paralleled UPS systems for no-break load transfers by downstream static transfer switches
 	Tripping coil for bypass disconnecter	To be fully protected against back-feed energy upon static bypass failure. Detection circuit is included
 	Input transformer (to be installed internally or in extended cabinet)	To galvanically isolate UPS from load or to change system's earth arrangement
 	Battery fused switch box	To disconnect and protect an external battery pack (wall mounted box)
 	Internal battery temperature probe	When the unit has internal batteries for charging voltage compensation with temperature
	Internal battery + UPS temperature probe	When the unit has internal batteries for charging voltage compensation with temperature and UPS temperature monitoring
	External battery temperature probe	When the unit has external batteries for charging voltage compensation with temperature (10 m cable length)
	Dry contact relay card	To send UPS status to PLC's, SCADA's or AS400's by voltage free SPDT contacts
	Remote monitoring panel	To monitor UPS status by a LED panel from a remote control room
	RS485 ModBus-RTU port	To send UPS status to BMS's by RS485 connection and ModBus-RTU protocol. For telemonitoring and teleservice
	Web/SNMP Adapter	To send UPS status to BMS's by Ethernet connection and SNMP or ModBus over IP protocol. To monitor UPS status by any internet browser from workstations. To receive SMS or e-mail alerts from the UPS on any portable device
	Input terminal block for remote EPO	When the Emergency Power Off (EPO) has to be commanded by a remote control button
	Input terminal block for external manual bypass switch auxiliary contact	When there is an external maintenance bypass switch, for state monitoring
	Input terminal block for external battery switch auxiliary contact	When there is an external battery switch, for state monitoring
	Input terminal block for diesel mode contact	When battery recharge has to be inhibited over genset operation

INCLUDED



Who we are

Borri is a company specializing in the custom design, manufacturing and servicing of power supply protection systems in key sectors such as ICT, industrial processes and service, oil & gas and energy, utilities, also of static conversion for renewable energy sources. The Borri research and development department is among the most complete regarding the coverage of the various disciplines involved in power conversion. On the strength of proven expertise in product customization and a continuous quest for excellence, Borri is named in more than 40 vendor lists and enjoys a position of prominence in the oil & gas sector.

Similarly, with extensive experience in various branches of power electronics such as UPS systems for data centres, inverters for renewable energy projects and storage systems.

Borri is a dependable partner able to offer power supply solutions used in ICT applications, in the process industry and for services, with numerous installations to its credit UPSaver[®], the most recent three-phase solution, based on Green Conversion patent technology, is able to guarantee unparalleled energy savings, and the best PUE for data centres with lower environmental impact, proof of the ongoing company commitment to innovation.

Under the Astrid brand, Borri offers a wide range of renewable energy solutions, reflecting its commitment to our pursuit of sustainable development.

Headquartered in Italy, with 15,000 m² of production area and a fully equipped inspection and testing area, the company is able to count on more than 80 years of experience, multidisciplinary R&D and a highly application specialized custom engineering capability.

Borri has a presence on all 5 continents with thousands of installations worldwide, professional staff and a network of partners able to provide you value added technical support and services.

Borri S.p.A.

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