

# E2001.igbt Industrial 1-Ph UPS

From 5 to 200 kVA

Borri AC Industrial 1-Ph Uninterruptible Power System E2001.igbt is designed and manufactured to withstand harsh environment and operating conditions of industrial applications with state-of-the-art technology, providing reliable and customizable AC power backup solutions.

E2001.igbt uses a three-phase, three-level PFC rectifier bridge which combines thyristor and IGBT technologies for rugged design and best-in-class performance, providing very low THDi rejection and high power factor.

Borri's E2001.igbt is a heavy-duty on-line double conversion AC Industrial UPS with full galvanic isolation. The UPS design ensures very high reliability, safe operations and a very low mean time to repair (MTTR), achieving the highest possible availability.

UPS version with options



## Industrial Power

### Applications

- Oil & Gas.
- Power Generation.
- Transportation.
- Water Desalination.
- Chemical Industries.
- Marine.
- Other Heavy Industries.

### Main features

- Rugged rectifier IGBT-thyristor bridge with input isolation transformer.
- Input THDi <5%, P.F. up to 0.99.
- Large LCD panel with mimic diagram and history.
- Wide selection of alarms, indications and measurements.
- Built-in inverter transformer.
- PWM IGBT Inverter Bridge.
- Built-in manual bypass.
- Advanced battery management.
- Flexible in-built features.
- Highly customizable.
- Easy maintenance and serviceability.

**BORRI**®

## E2001.igbt technical data

### Rating (kVA)\* @ P.F. 0.8 vs DC Rated Voltage

110 Vdc	5	10	15	20	-	-	-	-	-	-	-	-	-
220 Vdc	5	10	15	20	30	40	50	60	80	100	-	-	-
400 Vdc	-	-	-	-	-	40	50	60	80	100	120	160	200
Nominal power (kW)	4	8	12	16	24	32	40	48	64	80	96	128	160

### Input

Input voltage	380/400/415 (optional 208 to 690) Vac 3-phase $\pm 10\%$ , 50/60 Hz $\pm 10\%$
Power Factor	Up to 0.99
Input THDi	<5% @ rated load
Bypass input voltage	110/115/120 or 220/230/240 Vac 1-phase $\pm 20\%$ (adjustable according to inverter output voltage)

### Battery

DC voltage	110 Vdc (90÷160 Vdc range) / 220 Vdc (180÷300 Vdc range) / 400 Vdc (320÷480 Vdc range)
Input voltage	Floating: 2.27 (VRLA), 2.2÷2.3 (VLA), 1.4÷1.5 (Ni-Cd) V/cell adjustable Boost: 2.4÷2.45 (VLA), 1.5÷1.65 (Ni-Cd) V/cell adjustable Equalizing: up to 2.35 (VRLA), up to 2.7 (VLA), up to 1.7 (Ni-Cd) V/cell adjustable
Battery technologies	Maintenance free Lead Acid and Ni-Cd / Vented Lead Acid and Ni-Cd, Li-Ion battery compatible

### Output

Nominal voltage	110/115/120/220/230/240 Vac 1-phase
Frequency	50/60 Hz (selectable), $\pm 0.001$ Hz free running, $\pm 2$ Hz synchronized with mains
Voltage regulation	$\pm 1\%$ static; $\pm 5\%$ dynamic (80% load change), <40 ms recovery time
Overload capacity	125% for 10 min; 150% for 1 min; 200% for 100 ms
Harmonic Distortion THDv	<2% linear load; <5% non-linear load

### System

Dimensions	From 800 mm to 3000 mm width, 800/1000 mm depth, 2100 height
Cooling	Forced ventilation (optional redundant fans)
Colour	RAL 7035 (optional other colours)
Protection degree (IEC 60529)	IP 20 (optional up to IP 54)

### Environmental

Operating temperature	-10° C to 40° C (up to 55° C with de-rating) / Storage: -20° C to 70° C
Altitude	< 1000 m (up to 2000 m de-rating according to EN 62040-3)
Audible noise at 1 meter (dBA)	65 to 72 (depending on rating and options)

### User Interface

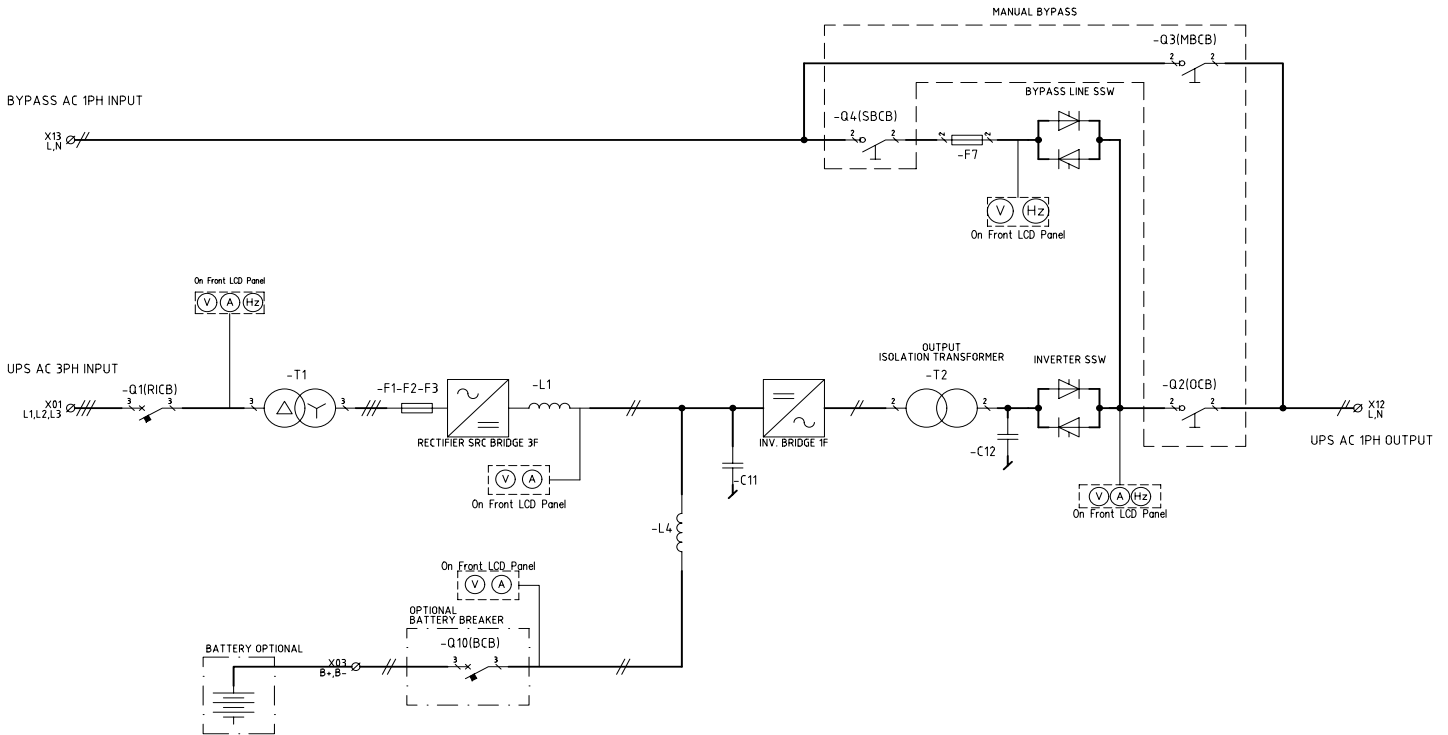
Front panel	Graphic display, mimic LED panel, function keys, local EPO
Connectivity	Included: USB, alarm relay card, terminal block for auxiliary contacts

### Standards

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 VFI-SS-111;  
Protection degree: IEC 60529;  
Marking: CE; Optional: UL Certified

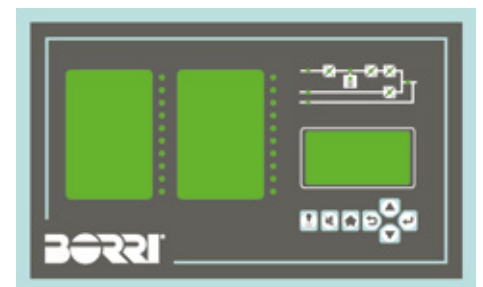
\*other ratings available on request

## E2001 .igbt schematic



## Standard features

- Rugged IGBT-thyristor bridge with isolation transformer.
- 4 level battery charging including optional manual charge.
- Active parallel configuration via CANBUS connection.
- Standard configuration for cost-effective, short lead time solutions.
- Electronic current limit.
- 20 programmable alarm and status LEDs.
- Built-in inverter transformer.
- Communication ports and potential free contacts.



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## Options

Borri's engineer can help you to design the best solution for your application with a wide range of options, some of which are:

### System

- Redundant/Parallel Load Sharing Configuration.
- Redundant/Parallel Dual Configuration.
- AC & DC distribution.
- AC and DC earth-fault monitoring.
- Input harmonic filter.

### Rectifier

- Oversized rectifier.
- Rectifier output isolator/circuit breaker.
- Reverse polarity protection.

### Battery

- Battery circuit protection in rectifier (MCCB/fuse).
- Battery circuit protection box (MCCB/fuse) also EEx-d.
- Low voltage disconnect.
- Temperature dependent battery charging with temp. probe.
- Battery monitor.
- Battery management system (single cell type).

### Inverter

- Inverter input isolator/circuit breaker.
- Black start facility.
- Oversized inverter for higher short circuit capability.

### Bypass

- External manual bypass switch.
- Bypass isolation transformer.
- Bypass voltage stabiliser.

### Alarms and measurement

- Analogue meters.
- Transducer.
- Additional LED alarm indicators.
- Additional relay board NO/NC contacts.
- Low battery electrolyte level alarm.
- Temperature alarm.
- Battery circuit failure alarm.
- Ground fault alarm.
- High rate interlock.

### Communication interfaces

- RS-232/485 interface.
- SNMP adapter for Web browser-based monitoring.
- Modbus protocol on RS-485 or TCP/IP.
- IEC 61850 protocol.
- Protocol converters Profibus DP.

### Mechanical

- Protection up to IP54 (or NEMA 12).
- Top/bottom cable entry.
- 100% redundant ventilation.
- Interior cabinet light.
- Cabinet heater.
- Special colour.
- Ambient temperature maximum 55°C (+131 °F) with derating.
- Altitude up to 4,000 m asl (13,000 ft) with derating.
- Air filters at air inlet.

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## Batteries

Borri has over 80 years of experience in designing and supplying AC and DC UPS systems with batteries.

With our vast experience in battery technologies and our close technical and commercial relationships with the world largest manufacturers of Nickel Cadmium, Lead Acid and Lithium ion Industrial batteries we are able to offer expert advice on the specifying, selection, operation and testing of batteries to best suite your application and needs.

## Service

Customer's expectation defines Borri's priority from the early analysis of the project requirements to a worldwide commissioning and service.

Many thousands of systems have been successfully installed and maintained globally, with continuous support from a highly trained team of expert, certified technicians and engineers.

From the professional set-up of Borri's training centre or on site, the training and service team stand ready to provide support and contribute to tailored training at Borri or on site. You can be assured of Borri support to the highest standards no matter where in the world you are.

## Planning, installation, commissioning

Borri assist you in every single step of your project.

Our R&D team can analyse and develop solutions to a wide range of edge system requirements.

## Maintenance

Preventive maintenance guarantees uninterrupted operations and optimized system efficiency.

## Analytical tests

Borri undertakes a series of analytical tests in order to guarantee higher efficiency and continuity to your system operation.

## Battery tests

Batteries have a limited time life and their proper maintenance is of high importance to guarantee efficiency to the UPS and avoid potential failures. Borri delivers high quality and performing batteries to assure smooth operations.

## Repair & spare parts

All spare parts supplied by Borri are original, tested and guaranteed to be fully compliant with Borri solutions.

## Training

Borri offers distributors and customers a service training structured in 3 levels. Courses can be held in Borri training centres or on-site.



## Who we are

Borri has been developing and building uninterruptible power systems since 1932 and is a global provider of power electronics systems and solutions for harsh industrial and demanding critical power requirements.

Borri is a brand of Legrand, a publicly traded company and a global specialist in electrical and digital infrastructures, offering high-value-added products and solutions for commercial, residential and industrial buildings.

Borri's R&D vast expertise in all facets of firmware, power electronics and mechanical design provides innovative solutions for tomorrow's problems in Industrial and Critical Power applications.

The company prides itself on its first-class service and superior engineering disciplines. To ensure sustained quality, Borri manages all its processes in house from feed studies to design, production and after sales service technology.

Based in Bibbiena, Italy with over 20,000 m<sup>2</sup> production area, Borri operates across all five continents with subsidiaries in USA, Canada, Germany, UAE, India and Malaysia.

It has also established a strong distributor network, able to deliver on site support and technical guidance indicative of our own capabilities.