

# RTB

## Industrial 3-Ph Battery Chargers

From 24 to 220 Vdc, 50-2000 A

DC UPS

Borri RTB range of Industrial Thyristor Controlled 3-Phase Battery Chargers are designed and built for the harshest conditions and to provide high reliable power supply and battery charging capability. Using a powerful microprocessor to control all the functions provides reliable operations with ease of settings and communication.

Built with a rugged thyristor-controlled rectifier bridge suitable for charging nickel-cadmium or lead acid batteries while simultaneously supplying DC loads. It can also be used without batteries as a direct power supply.



## Industrial Power

### Applications

- Oil & Gas.
- Petrochemical.
- Power Generation.
- Transportation.
- Mining industries.
- Transmission & distribution.
- Other Heavy Industries.

### Main features

- Proven microprocessor control.
- Large LCD panel with mimic panel and history.
- Wide selection of alarms, indications and measurements.
- Electronic battery and charger output current limit.
- Rugged thyristor bridge with isolation transformer.
- Communication ports and potential free contacts.
- 4 level battery charging including manual charge.
- High MTBF and low MTTR.
- 20 programmable alarm and status LEDs.
- Operates with Nickel-cadmium (vented/ gas recombination) and Lead acid batteries (vented/ gas recombination).
- Advanced Battery Management.
- Flexible in-built features.
- Operation without battery (Rectifier).
- Highly customizable.
- Easy maintenance and serviceability.

**BORRI**®

# RTB

## Industrial 3-ph Battery Chargers

### RTB technical data

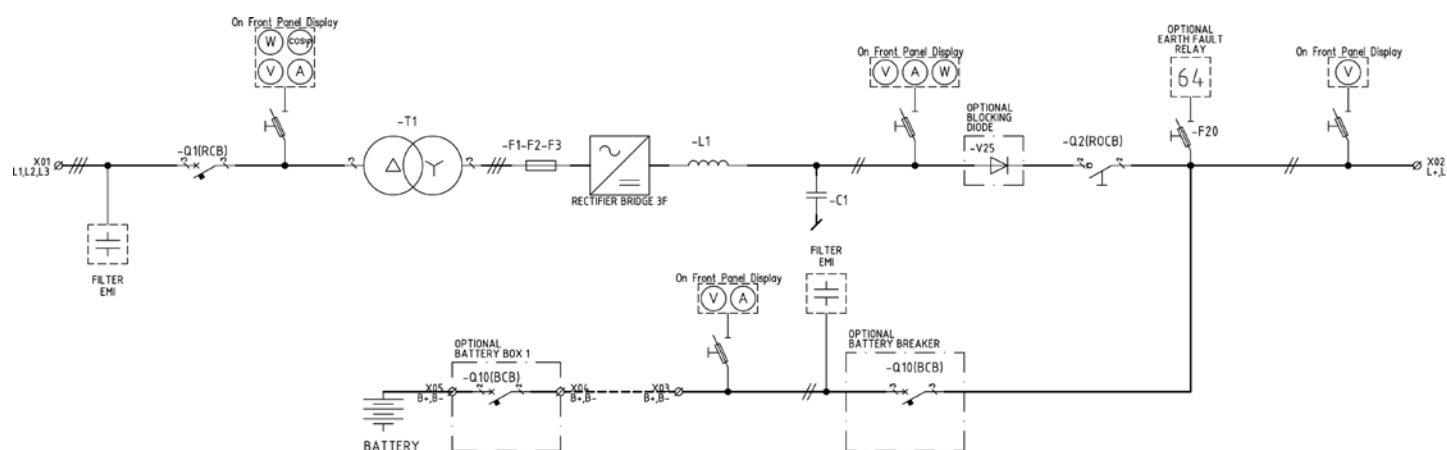
| Rating (A)   | 50  | 100     | 150     | 200     | 300     | 400     | 500     | 600      | 800      | 1000      | 1600      | 2000      |           |
|--|---|---------|---------|---------|---------|---------|---------|----------|----------|-----------|-----------|-----------|-----------|
| <b>Input</b>   |   |         |         |         |         |         |         |          |          |           |           |           |           |
| Nominal voltage  | 208/380/400/415/480 Vac 3-phase $\pm 10\%$  |         |         |         |         |         |         |          |          |           |           |           |           |
| Frequency  | 50/60 Hz $\pm 5$ Hz   |         |         |         |         |         |         |          |          |           |           |           |           |
| <b>Output</b>  |   |         |         |         |         |         |         |          |          |           |           |           |           |
| Nominal voltage  | 24/48/60/110/125/220 Vdc (other voltages up to 900 Vdc on request)  |         |         |         |         |         |         |          |          |           |           |           |           |
| Static voltage regulation  | $\pm 1\%$   |         |         |         |         |         |         |          |          |           |           |           |           |
| Voltage ripple   | $\leq 1-2\%$ with and without battery depending on output voltage   |         |         |         |         |         |         |          |          |           |           |           |           |
| Overload capacity  | $< 120\%$ for 20 min; $< 150\%$ for 2 min; $> 150\%$ for 20 s (protection electronic current limit)                             |         |         |         |         |         |         |          |          |           |           |           |           |
| Charging characteristic  | Constant current / constant voltage (I/U as per IEC 478-1) during float charge  |         |         |         |         |         |         |          |          |           |           |           |           |
| <b>System</b>  |   |         |         |         |         |         |         |          |          |           |           |           |           |
| Dimensions WxD (mm)  | Height is 2100 mm, width and depth vary with output rating (see the table below)  |         |         |         |         |         |         |          |          |           |           |           |           |
| Rating   | 50  | 100     | 150     | 200     | 300     | 400     | 500     | 600      | 800      | 1000      | 1600      | 2000      |           |
| Output voltage   | 24 Vdc  | 600x800 | 600x800 | 600x800 | 600x800 | 600x800 | 800x800 | 800x800  | 800x800  | 800x800   | 1000x800  | 2000x800  | 2000x800  |
|  | 48/60 Vdc   | 600x800 | 600x800 | 600x800 | 600x800 | 800x800 | 800x800 | 800x800  | 1000x800 | 1000x800  | 1000x800  | 2000x800  | 2000x800  |
|  | 110/125 Vdc   | 600x800 | 600x800 | 600x800 | 600x800 | 800x800 | 800x800 | 1000x800 | 1000x800 | 1000x1000 | 1000x1000 | 2000x1000 | 2000x1000 |
|  | 220 Vdc   | 600x800 | 600x800 | 600x800 | 800x800 | 800x800 | 800x800 | 1000x800 | 1000x800 | 1000x800  | 1000x1000 | 2000x1000 | 2000x1000 |
| Cooling  | Natural convection or forced cooling depending on rating and IP protection  |         |         |         |         |         |         |          |          |           |           |           |           |
| Colour   | RAL 7035 (other colours optional)   |         |         |         |         |         |         |          |          |           |           |           |           |
| Protection degree  | IP30 as per IEC 60529 (other protection degrees up to IP54 optional)  |         |         |         |         |         |         |          |          |           |           |           |           |
| Operating temperature  | $-10\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$ (up to $55\text{ }^{\circ}\text{C}$ optional)                    |         |         |         |         |         |         |          |          |           |           |           |           |
| Storage temperature  | $-20\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$  |         |         |         |         |         |         |          |          |           |           |           |           |
| Altitude   | $< 1000$ m (derating according to EN 62040-3)   |         |         |         |         |         |         |          |          |           |           |           |           |
| Audible noise (dBA)  | $< 55$ to $70$ dBA at 1m depending on rating and fan redundancy   |         |         |         |         |         |         |          |          |           |           |           |           |
| <b>User Interface</b>  |   |         |         |         |         |         |         |          |          |           |           |           |           |
| Front panel  | LCD panel, LED mimic, keyboard. 20 programmable alarm and status LEDs   |         |         |         |         |         |         |          |          |           |           |           |           |
| Standard alarms  | AC Fail, DC Hi, DC Low, Charger Fail, Overload, Blown Fuses, Battery Discharge, Common Alarm (many other available as standard) |         |         |         |         |         |         |          |          |           |           |           |           |
| Connectivity   | Potential free contacts x 8 standard, RS-485 MODBUS (optional)  |         |         |         |         |         |         |          |          |           |           |           |           |
| <b>Standards</b>   |   |         |         |         |         |         |         |          |          |           |           |           |           |
| CE- Label<br>Safety: IEC EN 50178, IEC EN 62040-1<br>EMC: IEC EN 61000-6-2, IEC EN 61000-6-4, IEC EN 62040-2<br>Test and performance: IEC EN 60146<br>Optional: CSA/UL Certified |   |         |         |         |         |         |         |          |          |           |           |           |           |

## Standard features

- Internal rectifier input and output switches.
- 6-pulse rectifier bridge with input isolation transformer.
- Output LC ripple filter.
- Rectifier protection fuse.
- Battery monitoring and testing system.
- Audible alarm.
- 8 potential free contacts fault remote alarm.
- Floor mounted cabinet with IP30 protection and IP20 open door.
- Power and control cable markings.
- Halogen free cable.
- Component markings.
- Bottom cable entry.
- Standard labeling / nameplate.
- Advanced Multi-functional LCD panel.
- 20 programmable alarm and status LEDs.



## RTB schematic (single configuration)



Other configurations available:

- Dual Charger (one battery with load sharing)
- Redundant
- Others on request

## 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

- RS485 MODBUS communication port.
- Advanced Multi-functional LCD panel (UFP) with built-in MODBUS RS485 communication port.
- Parallel redundant (CANBUS) with load sharing.
- Special mains input voltages up to 690 VAC and frequency 60 Hz.
- Tropicalized control electronics boards.
- DC ripple filter 1%, 0.1 %, 200mV.
- 12 pulse rectifier with isolation transformer for low THD.
- IGBT rectifier for < 5% THD.
- Rectifier input CB or fuse or switch.
- Battery CB, fuse or switch in rectifier.
- Battery CB or fuse box.

- Load CB, fuse or switch.
- DC voltage dropper diodes.
- DC distribution.
- Battery installed inside the rectifier cabinet.

### Alarms and measurement

- Analog meters.
- Additional LED alarm indicators.
- Additional Relay cards 2 x 8 free contacts.
- Fan failure alarm.
- Low battery electrolyte level alarm.
- Temperature dependent battery charging with temp. probe.
- Temperature alarm.
- Battery circuit failure alarm.
- Ground fault alarm.
- High rate interlock.

### Control options

- Remote rectifier shutdown.
- Remote forced floating charge.
- Remote room fan control.

- Remote high rate charge.
- Communication
  - TCP / IP interface
  - Protocol converters Profibus DP
  - J-bus DNP3
  - IEC 61850.
- Monitoring and management software.

### Mechanical

- Protection up to IP54.
- Natural cooled bridge.
- Ventilation n+1 or 100% redundant.
- Vermin proof.
- Top cable entry.
- Interior cabinet light.
- AC single phase socket.
- Cabinet heater.
- Special colour.
- Protection plates.
- Special cable marking (both ends).
- Air filters at air inlet.

## 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 center or on site, the training and service team provide support and tailored training at Borri or at your site. You can be assured of Borri support to the highest standards no matter where in the world you are.

- Planning, installation, commissioning
- Maintenance and Service
- Analytical testing
- Battery tests
- Spare parts
- Training



## Who we are

Borri Group is a global provider of power electronics systems and solutions for harsh industrial and demanding commercial and ICT secure power requirements merging eighty years of experience in developing, manufacturing and supplying uninterruptable power systems and solutions.

The Research and Development Team's expertise combines AC and DC power technologies and spanning the worlds of both conventional and renewable energy, to provide innovative solutions for tomorrows problems.

The company is comprised of three business units: Industrial Power, Critical Power and Renewable Power, headquartered in Bibbiena, Italy. Borri's latest products, based on Green Conversion operation, guarantee the best PUE for green data centers: proof of the ongoing company commitment to innovation.

Thanks to its highly skilled custom engineers Borri controls in-house the entire process: from feed studies to design, production and after-sales service guaranteeing state-of-the-art solutions.

Based in Italy with over 15,000 m<sup>2</sup> production area and a large high power test field, Borri can depend on its more than 90 years of experience and multidisciplinary research and development to serve our customers best.

**Since 1932, securing your power with passion and commitment.**

