

CONVEL

*Electronic Innovation*

*We Power Your Projects...*

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#### **- COMPANY PRESENTATION -**

Our Firm  
Company Profile  
Our Organisation

#### **- OUR PRODUCTION -**

Equipment's General Characteristics  
Industrial Battery Chargers & Rectifiers:  
    Two Branches series **ALS**  
    Single or Parallel Redundant series **BTE** (Three phase) & **BTM** (Single phase)  
    Battery Charger Data Table ALS, BTE & BTM  
UPS & Inverter:  
    Single or Parallel Redundant, Single phase and Three phase  
Static Switches  
Disconnecting & Protection Battery Boxes (Atex Eexd)

#### **- OUR SERVICES -**

Before and After Sales Services

#### **- EQUIPMENTS BUILT EXAMPLE -**

One line A.C. Systems: **UPS & Inverters**  
One line D.C. Systems: **Battery Chargers & Rectifiers**

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Reference List

# - COMPANY PRESENTATION -

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**Convel Srl** is a company which has operated in Electronics' field for more than 40 years. It specialised in study, design and construction of power supply systems.

Over the last years, the Company has further strengthened and upgraded its production by adding microprocessor based electronic control cards, in addition of the "load-sharing" technology already in use, for both chargers and UPS'.

Our production includes:

**Power Supplies - Battery charger – Rectifiers - Energy systems with batteries included - A.C. & D.C. UPS' - Frequency converters.**

Our main services are:

**Technical support during quotation - on-site assistance – Spare parts – Maintenance contracts – Personnel training – Phone support**

Convel's commercial success is based on the CUSTOM MADE construction of systems using electronic and mechanical solutions, developed for special Customer requirements.

Due to this specialisation, the production has diversified and the scale of work has increased from small protective equipment to complex solutions for large industrial plants. The work standard has been maintained at the ISO 9001 certificate level and we use the best quality materials available. We pride ourselves on our design and construction work and our equipment is supplied with user's and maintenance manuals, guarantees and technical assistance.



## *Our Factory*

Convel's main building is located in Biassono (MB) - Via dei Tigli, 3 - Zona ind.le.

The settlement that covering an area of approx. 2200 m<sup>2</sup>, takes the entire production and testing.

Convel production has a quality system which ensures that the Customer specification is respected; and is also subjected to further controls, to ensure that the specification has no inherent technical weaknesses.

Our supplier controls ensure that we receive top quality semi-finished goods and these are scrupulously checked against the project documentation and requirements. This attention to detail ensures that our finished goods meet specification in all respects.

Convel technical staff have a continuous dialogue with our Customers, with the aim of giving complete satisfaction. This process also ensures that the equipment produced, meets their real design requirements.

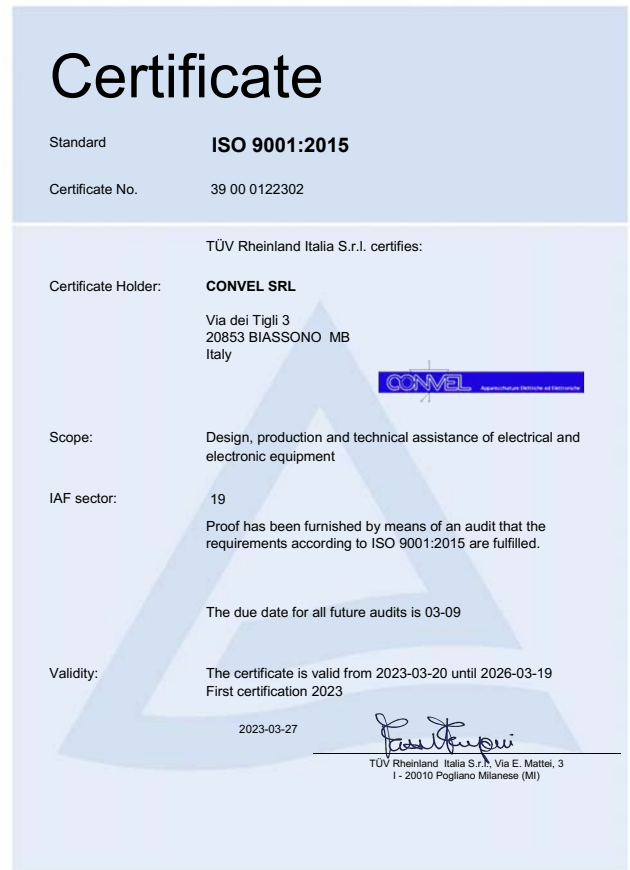
Our installation staff and our after sales service personnel are all highly specialised, and guarantee that the equipment installed performs to Customer satisfaction.

This reliability and our Customer orientation, have made Convel one of the best companies in its sector. We are pleased to count some of the best known names in the telecommunications, oil industry, and broadcasting fields amongst our customers, designing and producing equipments installed in World-Wide Plants as you can see from the enclosed reference list.

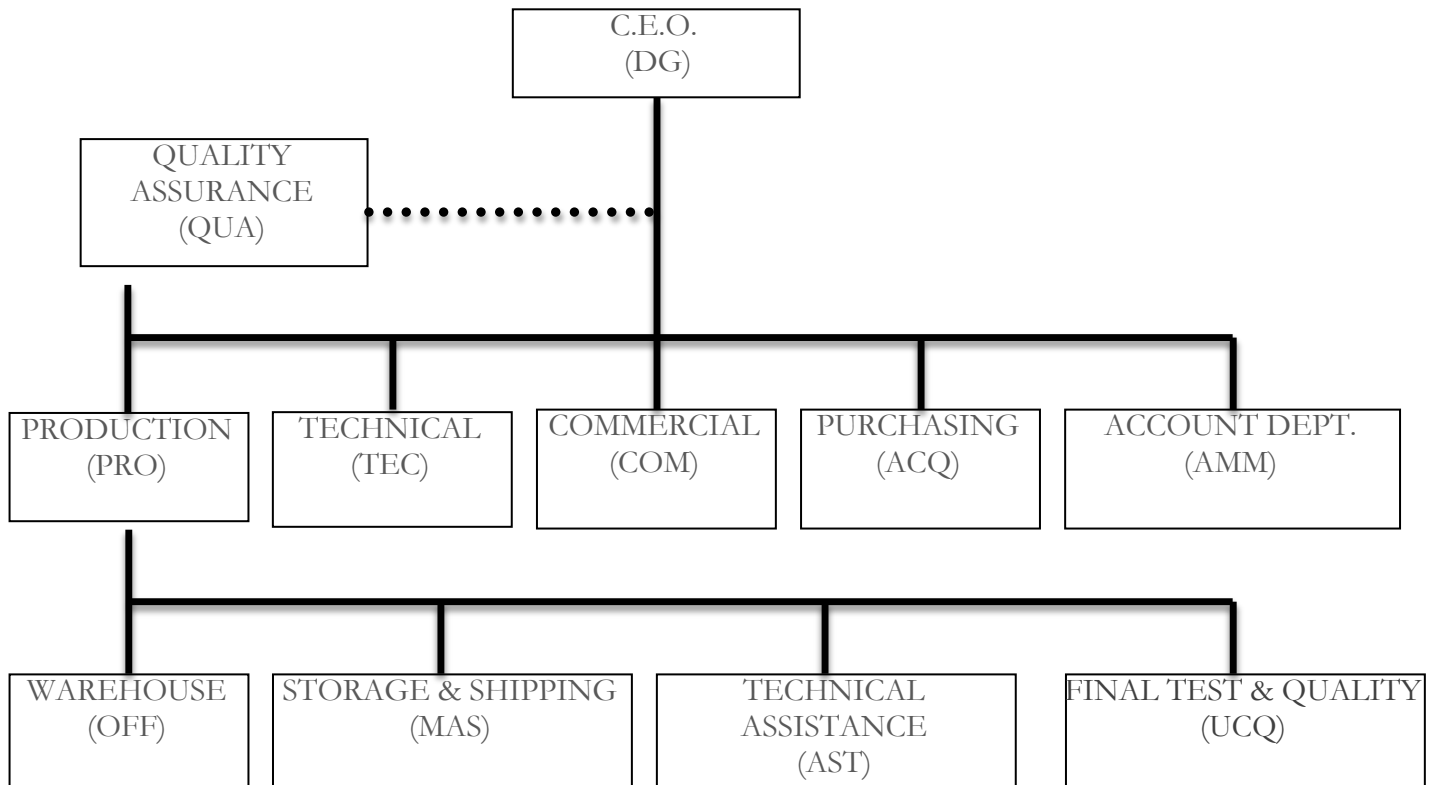
We are pleased to enclose our organisation structure, for your further information.



*The Convel Quality in the ISO:9001 Certificate*



*The Convel Structure in our Organization Chart.*



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Member since Account of Italy  
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# - OUR PRODUCTION -

## Equipment's General Characteristics

In response to a market demand that does not find any solution in the standard design, and on account of its flexibility in designing and construction, CONVEL is in a position to manufacture the equipment with personalized electronic and mechanical solutions.

CONVEL solves any problem requiring custom products with specific technical data, subject to Specifications or international standard, or involving the application of a Quality Guarantee Program according to ISO 9000.

### Cubicle

Pickled polished steel cubicle, 20/10 minimum thickness, with hinged opening inspection door with locking by means of safety key in two points. The sides are provided with wings in order to improve cooling.

The cubicle is provided with protection according to IP 30 standards; standards are higher on request (for example: IP 55). All parts that are not painted, are tropicalized in order to avoid the formation of rust. Electric and electronic parts of the equipment are fitted on an inside tropicalized plate, in a position that is accessible from the board front.

### Painting

Epoxy type painting, dried in the oven, colour according to «RAL» Specifications. Standard colour is RAL 7035 grey. Versions with a different RAL colour are possible (for example: RAL 5010, RAL 7030), or with several colours (for example: RAL 7035 structure, RAL 5010 doors).

### Protections

They are carried out with mains circuit breakers, extra-rapid fuses on rectifying bridges, electronic circuits for voltage and current control, several fuses. Electrical connections are made with 20-22 type anti-flame 3 kV insulated cable, or, on request, with special low-smoke and fume cable N07G9-K.

### Distribution

All systems can be provided with integral, or separated, load distribution avoiding a further external distribution panel.

### Controls

The equipment is complete with 1.5 class measuring instruments and leds of the various functions (for example: mains, charging condition, alarms, etc.), for the constant control of the correct operation. All most important functions are brought back to the terminal strip for remote control through potential free contact (SPDT) or communication system having RS485/Ethernet ports with MODBUS, PROFIBUS transmission protocol.

During the last years, CONVEL has developed new technologies and new microprocessor based electronic cards, already implemented in all new D.C. & A.C. systems.



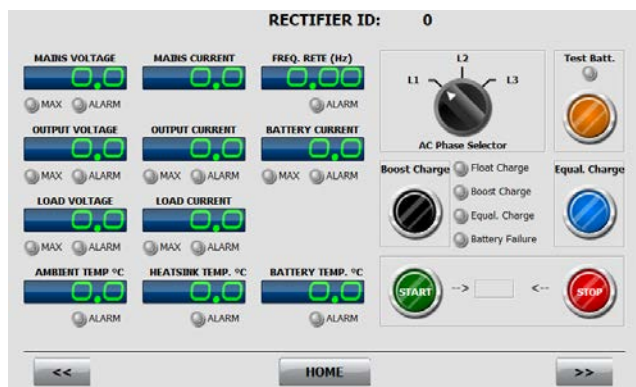
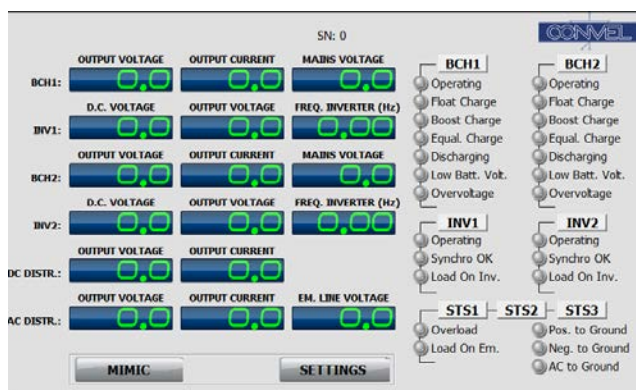
# - OUR DIGITAL PANEL - HMI, digital LCD touchscreen

In response to a market demand that does not find any solution in the standard design, and on account of its flexibility in designing and construction, CONVEL is in a position to manufacture the equipment with personalized electronic and mechanical solutions.

CONVEL solves any problem requiring custom products with specific technical data, subject to Specifications or international standard, or involving the application of a Quality Guarantee Program according to ISO 9000.

Convel's UPS' and chargers can be provided with an HMI (Human Machine Interface) color touchscreen panel to show the equipment running conditions including measuring of the voltage, current, frequency, temperature, the presence of alarms, set different charging modes, read the operating Event Log History and much more.

The HMI function is obtained with a resistive 4 wires touchscreen panel with screen resolution 800x480 pixel and provided with front ingress protection IP66, suitable for industrial applications, based on a microprocessor-controlled card with operating system Windows CE.



The different features are divided over several pages that can be activated starting from the Home Page. The access to the equipment settings is password protected and the panel is provided with a screen saver which will dim the screen light showing Convel's logo. The panel includes also one serial RS485 port and one TCP/IP Ethernet port.

The Home Page contains all the main information about the equipment operating status. In this page it is immediately possible to identify the operating status and/or the presence of alarms/anomalies

Above and at side are some pictures showing screenshots of the panel in some of its several functions.

For more details, please refer the manual of the panel on our website [www.convel.com](http://www.convel.com).





# Industrial Battery Chargers & Rectifiers: ALS series

## Industrial battery charger

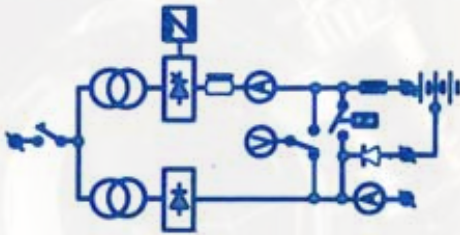
Equipment according to EN and IEC specifications, correctly applied in relation to the type of battery, either lead, or sealed lead or nickel-cadmium battery. The general characteristic for the stabilized voltage system, both single-phase and three-phase, is a maximum variation of output current and voltage within 1% of the rated value, with mains variations of 15%, or from 0 to 100% of the load, considering an alternate residue of 1%, thanks to the LC filter at the output, all models are equipped with.

### ALS series

It is to be considered as the most complete series, since it provides a stabilized voltage branch for the loads, and a second branch, that is also stabilized, for the battery with the possibility to be DUAL, and therefore, to make them redundant through an automatic «transfer» among themselves in event of failure.

In the smaller versions, they may be carried out with self-contained batteries.

(see photo detail)



## GENERAL TECHNICAL CHARACTERISTICS

- Input:** single-phase or three-phase 230-400 Vca 50-60 Hz  $\pm$  10%
- 1st branch:** intended to supply the load at stabilized voltage and maximum current limiting
- 2nd branch:** intended for battery recharging according to the relevant standards, either lead, sealed lead or nickel-cadmium battery
- Recharge:** it is normally carried out at two levels with ampere metric switch from Full Charge into Float Charge (IU-DIN 41773) For VRLA battery, one level only is provided.
- Manual Charge:** the manual charge is started by a 12-24h timer. At the end of time, the charger switch back into Float Charge automatically
- Values:** output currents and voltages are in relation to the load and to the type of battery used with  $\pm$  1% stabilization
- Output:** output continuity is ensured by the battery also in case of mains lack without any solution of continuity
- Configuration:** single-phase, three phase, semi-controlled, total-controlled (6 pulse) or dodeca-phase (12 pulse)
- Filters:** LC standard filter d.c. side with 5% ripple at output both 1st and 2nd Branch; on request with 1% ripple and/or mains filter at «N» or «G» degree
- Optionals:** voltmeteric relays for the control of battery minimum and/or maximum voltage and/or load voltage, relay for polarity indication to earth (ground), automatic circuit breakers at input and output, output filter for 1% ripple, maximum charging time adjustable from 0 to 14 hours, possibility of insulating completely and galvanically the regulation card from the power circuit, remote signalization of operating conditions and/or alarms through potential free (SPDT) contacts or RS485/Ethernet serial communication with MODBUS/PROFIBUS protocol.

# Industrial Battery Chargers & Rectifiers: BTE & BTM series

## BTE & BTM Series

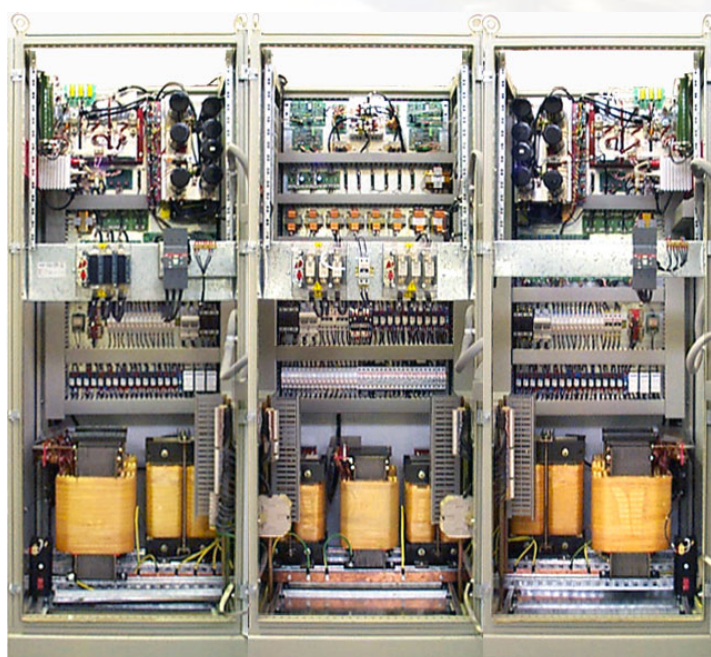
They are provided with one single stabilized branch, both single-phase (BTM) and three-phase (BTE), the last one more suitable for higher power.

Available for any kind of battery, Lead vented, sealed Lead Batteries or NiCd vented, or recombination.

Loads are connected directly in parallel to the battery, or electronic Chopper regulator, in the event voltage on the load should be maintained within 1% of rated value, or a diode drop voltage regulator if a load voltage variation of 5% can be accepted.

For high performance applications, the rectifier and/or the DC/DC converter (diode or chopper) can be provided with dual parallel redundant configuration.

Can operate with voltages up to 600 V.d.c., being equipped with I/O galvanic insulation of all reference signals, like voltage and current.



## GENERAL TECHNICAL CHARACTERISTICS

**Input:** single-phase or three-phase 230-400 Vea 50-60 Hz

**One only branch:** intended for battery recharging according to the relevant specifications, either lead, or sealed lead, or nickel-cadmium battery, and to supply the load through a drop diode voltage regulator or electronic chopper regulator.

**Recharge:** it is normally carried out at two levels with ampere metric switch from Full Charge into Float Charge (IU-DIN 41773)  
For VRLA battery, one level only is provided.

**Manual charge:** the manual charge is started by a 12-24h timer. At the end of time, the charger switch back into Float Charge automatically

**Values:** Output currents and voltages are in relation to the load and to the type of battery used with  $\pm 1\%$  stabilization

**Configuration:** single-phase, three phase, semi-controlled, total-controlled (6 pulse) or dodeca-phase (12 pulse)

**Filters:** LC standard filter D.C. side with 5% ripple at output both 1st and 2nd Branch; on request with 1% ripple and/or mains filter at «N» or «G» degree

**Optionals:** voltmetric relays for the control of battery minimum or maximum voltage, or services, relay for polarity indication to earth (ground), automatic switches at input and output, output filter for 1% ripple, maximum charging time adjustable from 0 to 14 hours, possibility of insulating completely and galvanically the regulation card from the power circuit, remote signalization of operating conditions and/or alarms through potential free (SPDT) contacts or RS485/Ethernet serial communication with MODBUS/PROFIBUS protocol.



# Battery Charger Data Table: ALS, BTE & BTM

SIZE (Ampere)	25 A	50 A	100 A	150 A	200 A	250 A	300 A	400 A	500 A	630 A	800 A	1000 A
AC main voltage	230Vac 1ph or 400Vac 3ph. ±10% - Other on specific request											
AC main frequency	50 or 60Hz ±5Hz											
Short circuit capability	16/25kA rms @ 400Vac - Other on specific request											
Input power factor	0,8 at RATED VOLTAGE and FULL LOAD											
Overload capability	110% for 10 minutes											
Charger Configuration	Single, Dual Redundant, Dual Parallel with Load Sharing											
Charger Control Type	Microprocessor Based with Analogue Feedback											
Battery Configuration	Single, Dual Redundant 50%, Dual Redundant 100%											
Recharging Battery Type	Sealed Lead AGM or GEL, Lead Vented, NiCd Recombination, NiCd Vented											
Load Voltage stabilization	Drop Voltage Diode Regulator or DC/DC High Frequency Electronic regulator upon request											
DC OUTPUT VOLTAGE	110Vdc (adjustable 90÷160Vdc) / 220Vdc (adjustable 180÷320Vdc) - Other on specific request (Available from 24Vdc up to 600Vdc)											
Static stability	±1% in all conditions											
Output ripple	≤ 1 % with connected batteries; ≤ 2% with batteries not connected											
Efficiency at 25% load	70%	70%	70%	70%	72%	72%	72%	73%	75%	75%	75%	75%
Efficiency at 50% load	85%	86%	86%	86%	86%	86%	87%	87%	88%	88%	88%	89%
Efficiency at 75% load	90%	90%	90%	90%	90%	92%	92%	92%	92%	92%	92%	92%
Efficiency at 100% load	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Protection degree	IP30 - (IP20 Open door) - Other on specific request											
Operating temperatures	from -10°C up to +40°C (up to 55°C environment with 2% output derating for every °C over 40°C) - Other on specific request											
Cooling	AN	AN	AN	AN	AN	AN/AF	AN/AF	AN/AF	AF	AF	AF	AF
Standard Features	Min/Max Voltage Control, Internal Light, Space Heaters, Earth Fault Control, DC Embedded Distribution, Mimic Panel with Leds & Instruments											
Operating R.U.	up to 95% non condensing											
Operating altitude a.s.l.	up to 1,500m											
Operating environment	Indoor, industrial but clean environment											
Colour	Standard: RAL 7035 (Available RAL7030, RAL 7032) - Other on specific request											
Access	Standard: front, cable from bottom - Other on specific request											
Cabinet Steel Type	Standard: Steel Metal Type with Doors & Panels Thickness 2mm (Stainless Steel, Antiseismic upon request)											
WIDTH dimension	600 mm	600 mm	800 mm	800 mm	800 mm	800 mm	1000 mm	1000 mm	1200 mm	1200 mm	1600 mm	1600 mm
DEPTH dimension	600 mm	600 mm	600 mm	600 mm	800 mm	800 mm	800 mm	800 mm	800 mm	800 mm	800 mm	800 mm
HEIGHT dimension	2100 mm	2100 mm	2100 mm	2100 mm	2100 mm	2100 mm	2100 mm	2100 mm	2100 mm	2100 mm	2100 mm	2100 mm
Weight	250 kg	290 kg	320 kg	360 kg	400 kg	460 kg	530 kg	650 kg	750 kg	850 kg	900 kg	1100 kg

# UPS & Inverter

## UPS

Available with many different configurations and technical solutions, the UPS' are covering a power range from 1kVA up to 200kVA. Furthermore, Convel is specialised in low power three phase UPS (1÷8kVA), with very long back-up time up to, and more, 24 hours and with input and output customized voltages. For an easier erection & installation, the battery can be supplied complete with steel type rack with acid proof protection coating or mounting cabinet, even for NiCd battery.

## Inverter

Thanks to a "made to measure" and with great design flexibility, the Inverter can be realized to satisfy any plant requirement. It can be operated with D.C. input voltage from 24Vdc up to 600Vdc, with single phase or three phase output voltage according to the load topology, the output power and adapted to the D.C. voltage available in the Plant.

All of them are provided with output isolation transformer which increase the robustness permitting to operate in application having the earth completely isolated (IT systems) It can be provided with emergency line static switch, manual by-pass and/or voltage stabilizer.

## Customization

Our A.C. systems can be extremely customized, even mechanically. The cabinets can be realized on request with specific dimension, colour, door opening and protection degree IP. Big systems can be divided in more sections for an easier transportation & installation. The internal components, material & circuit breakers may be chosen respecting a Customer's vendor list and much more.

## GENERAL TECHNICAL CHARACTERISTICS

**Input:** Single phase 110-230Vac 50÷60Hz  
Three phase 200-400-415 Vac 50÷60 Hz

**Battery Charger:** intended for battery recharging according to the relevant specifications, either lead, or sealed lead, or nickel-cadmium battery, it can be provided with fully-controlled (6 pulse) or dodeca-phase (12 pulse) rectifier bridge. It can be also included the A.C. input isolation transformer.

**Inverter:** it is realized with PWM technology using IGBT power modules and provided of output isolation **transformer**. The electronic control card is microprocessor based.

**Static Switch:** it is realized with high power Thyristor (SCR) with very fast switching between inverter-mains, and vice versa, in zero time.  
The electronic control card is microprocessor based.

**Manual By-Pass:** always available with static switch, it is very useful for a complete output side sectioning for maintenance. Realized with the "Make-Before-Break" configuration, it ensures manoeuvres without any micro-interruption of the power the load.

**Emergency Line Stabilizer:** on request, it can be added an emergency line voltage stabilizer. In this case, the output voltage will be stabilized within  $\pm 2\%$  even with inverter OFF.

**Parallel & Redundant:** both UPS & Inverters may be realized according to redundant configuration or with more paralleled systems.

**Distribution:** they can be provided with integral, or separated, load distribution avoiding a further external distribution panel.







# Static Switches

## Static Switches

They are covering an output power range from 1kVA up to 200kVA, single and three phase. They are supplied in Rack 19" or in steel cabinet with protection degree on request. Thanks to its fully digital control are ensuring high performances increasing the reliability of the all systems where are installed.



100kVA Three Phase Static Switch

### GENERAL TECHNICAL CHARACTERISTICS

- Input:** single or three phase 110-230-400 Vac 50-60 Hz
- Switching Time:** zero ( $\leq 2\text{ms}$ )
- Neutral:** pass-through (switchable on request)
- Output Power:** 1÷200 kVA
- Operating:** line 1 priority, line 2 reserve with possibility of reverse the logic operating mode, line synch control and control card microprocessor based.
- Mechanical Solution:** in rack 19" or steel cabinet (IP on request)
- Manual By-Pass:** available only on request

# Disconnecting & Protection Battery Boxes (Atex Eexd)



## Disconnecting & Protection Battery Boxes

To complete the products range, we find the Disconnecting & Protection Battery Boxes which can be realized in wall mounting boxes with protection degree IP-55 or with higher protection (IP-65) suitable for classified area (Hydrogen) in Atex Eexd boxes.

The battery protection can be done with automatic circuit breaker, contactor or fuses.

Are also available Eexd multiple boxes with internal logic wiring and/or distribution automatic circuit breakers and much more.



# - OUR SERVICES -

## Before and After Sales Services

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### May We Help You?

In addition to systems production, Convel offers many support services before and after sales.

The main purpose is to be a partner of our Customers, providing specific support, maintenance and assistance services, offering the greatest serenity and assuring the best performances of our systems.

The first service is certainly the phone support: we're always at full disposal for any needs, any technical or commercial information and, most important, for the first evaluation in event of trouble with our systems.

Here below our main offered services:

- **Technical support before quotation**
- **On-site assistance**
- **Maintenance contract**
- **Spare parts**
- **Personnel Training**

### Technical Support Before Quotation

Due to specific and variable technical characteristics of the D.C. & A.C. systems, Convel is at full disposal of the Customers for a very highly qualified and complete technical support, proposing the best solution according to plant requirements .

### On-Site Assistance

The On-Site assistance is performed by our highly qualified and specialised personnel, operating in fully safety condition and fully respecting all different plant requirements. (On-Shore Plant, Platform...).

### Maintenance Contract

For any equipment, it can be stipulated a Maintenance Contract including one or more visits per year, for preventive, corrective or emergency maintenance.

It will be also possible to include other manufacturer's systems, prior agreement with our Customer Assistance Service.

### Spare Parts

All our systems will be supplied complete with start-up & commissioning spare parts.

Can be also supplied 2/5 years spare parts, with 12 months warranty, which will be available for a minimum period of 10 years after system purchasing date and they can be ordered with the system or later contacting our Customer Service.

### Personnel Training

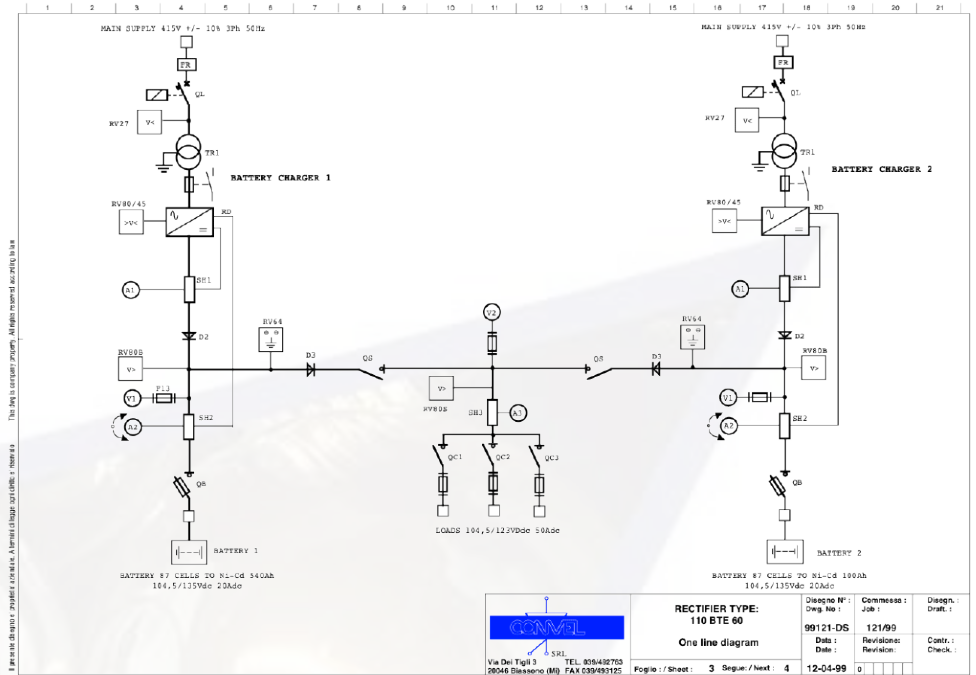
It is possible arrange Training courses for staff of Customers using an own internal maintenance service. The training courses can be done at our premise or directly on-site or Customer's plant. After the course, a training certificate will be given.



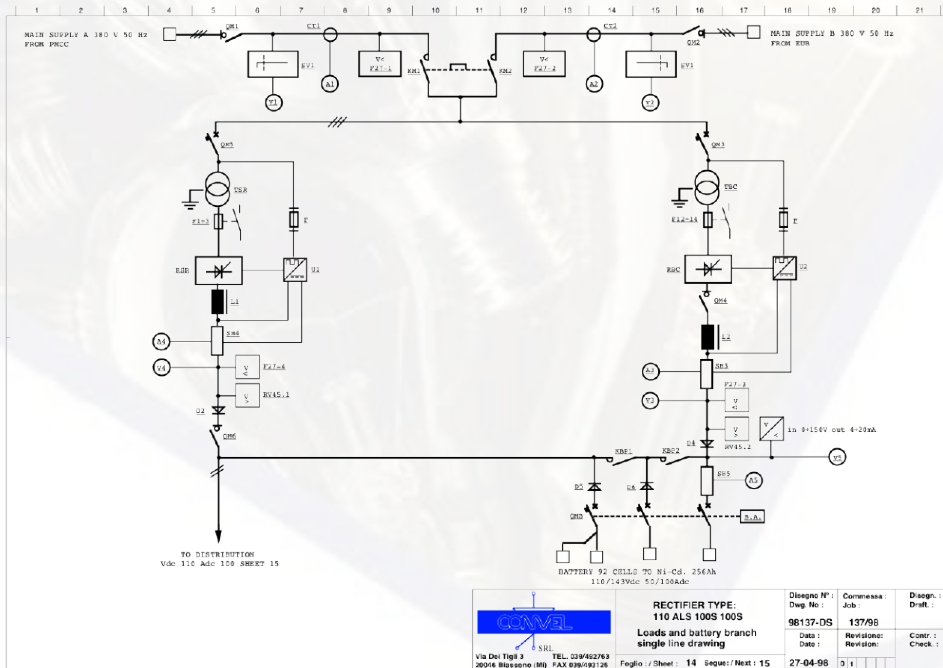


# Online D.C. Systems: Battery Chargers & Rectifiers

Dual Fully Redundant Battery Charger with Dual Fully Redundant Battery (BTE)



Two independent Branches (ALS)



Dual Fully Redundant Battery Charger with Dual Fully Redundant DC/DC Chopper Regulator (BTE)

