

# B<sup>2</sup>C – Bidirectional battery charger

The **Bidirectional Battery Charger** is a regenerative AC/DC converter designed to generate a controlled DC output from 12 to 750V. Its main application is the charge and discharge of batteries, or other DC storage systems. It produces important energy savings in battery testing or characterization when regenerating the stored energy to the grid.

6.75 kW – 160 kW

DC output voltage:  
12V to 750V

DC output current:  
±10A to ±690A

Regenerative

## Functional description

The equipment is integrated by an Active Front End, a DC link, and 3 independent DC/DC converters with output filters and sensors. Each DC output channel can be regulated independently or can be parallelized for high current applications. The following operating modes can be selected by the user:

- Constant Voltage (CV)
- Constant Current (CC)
- Constant Power (CP)
- Battery Charge (BC): the output DC combines constant current and constant voltage modes to charge the battery in a IUoU charge mode

## Regenerative power supply

The converter is based on a hardware topology allowing a bidirectional power flow from the grid input to a battery providing important energy savings when cycling batteries

## Reactive Power control

During charging/discharging operation, the rest of apparent power that is not being used for the battery may be used for reactive power compensation. The user may set a reactive power command during the converter utilization.

## Communication interfaces

Different interfaces can be integrated to communicate with the Battery Management System (BMS) (optional).

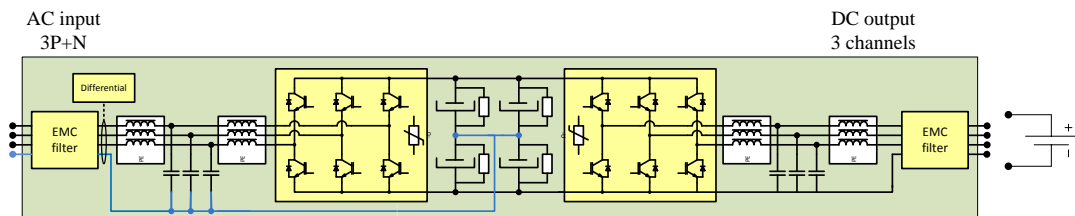
## Applications

- Production and Quality tests
- Characterization tests
- Research and Development
- Battery charge and discharge
- Battery refreshing
- Battery equalizing
- Vehicle to grid (V2G)



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## Technical Diagram



AC input is connected to the grid  
DC output are 3 independent channels connected to the batteries

## User interface

Local 3.2" Touchscreen

Control port:

- 3 analog inputs +/-10V
- 3 analog outputs 0-10V
- 5 digital inputs
- 3 relay outputs
- 1 Emergency stop

*Note: all inputs/outputs are isolated*

Remote interface: Modbus/TCP

Windows 7/XP application for remote operation and data acquisition.

## Cooling

The power supply is air-cooled internally.

## Mechanical housing

The power supplies are housed in compact mechanical cabinets with wheels (up to 100kVA) for easier transportation.

## Options

Galvanic solution

IEC61850

RS485

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## Range and specifications

Magnitude	Value		
Power	6.75kW-160kW		
<b>Input</b>			
AC Voltage	Rated	3x400V+Neutral+Earth	
Voltage range	+15% / -20 %		
AC Current	10A-290Arms		
Frequency	50/60Hz		
Power Factor	Controllable	-1/1 (capacitive/inductive)	
Efficiency	at full load	>92%	
Overload	125% for 10 min / 150% for 60 s		
<b>DC Outputs</b>			
DC Current	3 independent channels	0-230A (per channel)	
DC Current	1 parallelized channel	0-690A	
DC Voltage	0-750V		
Minimum voltage	at rated power	220V	
Modes of operation	Range	Resolution	Ripple
Constant Current	0-100%	<±0.1%	<1%
Constant Voltage	0-100%	<±0.1%	<1%
Constant Power	0-100%	<±0.1%	<1%
<b>GENERAL</b>			
Measurements	Input Voltage (Vrms) and Current (Irms)		
	Active and Reactive Input Power (P,Q)		
	Output Voltages (Vdc) and Currents (Idc)		
	Output Power		
	Temperatures		
User interface	3.2" Touchscreen		
	Control port: 3 analog inputs, 3 analog outputs, 5 inputs, 3 relay		
	Communication Ports: Ethernet, RS485 (optional)		
	Communication Protocols: Modbus/TCP Communications for IEC61850, ERP or MATLAB® (optional)		
Humidity	10-90% (Absolute maximum, without condensation)		
Temperature	5-40°C (Absolute maximum)		
Refrigeration	Forced air		
Protections	Over Current, Over Voltage		
	Over Temperature		
	Shortcircuit		
<b>Standards</b>			
Safety	EN-62040-1-2, EN-60950-1		
EMC	EMC: EN-62040-2		

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## B<sup>2</sup>C models

Reference	Rated		Rated Current			Rated Voltage	Dimension
	kVA	kW	AC rms	DC (per channel)	DC (total)	DC	DxWxH
B2C7.5	7.5	6.75	10A	10A	30A	0-750V	700x450x1100
B2C10	10	9	15A	15A	45A	0-750V	700x450x1100
B2C15	15	13.5	20A	20A	60A	0-750V	700x450x1100
B2C20	20	18	30A	25A	75A	0-750V	700x450x1100
B2C30	30	27	40A	40A	120A	0-750V	805x590x1320
B2C40	40	36	55A	50A	150A	0-750V	805x590x1320
B2C50	50	45	70A	65A	195A	0-750V	805x590x1320
B2C60	60	54	85A	80A	240A	0-750V	805x590x1320
B2C80	80	72	115A	105A	315A	0-750V	805x590x1320
B2C100	100	90	145A	130A	390A	0-750V	805x590x1320
B2C120	120	108	175A	155A	465A	0-750V	805x590x1320
B2C160	160	128	230A	185A	555A	0-750V	850x900x2000
B2C200	200	160	290A	230A	690A	0-750V	850x900x2000