B2C
Bidirectional Battery Charger

CINERGIA's Bidirectional Battery Chargers are Programmable DC Power Supplies designed specifically to charge and discharge batteries or other storage systems. Based on the DCPS hardware and firmware, the B2C add a IU Battery Charge mode to the Voltage, Current, Power and Resistance modes.
The equipment is regenerative so the energy discharged from the battery will be injected back to the electrical grid.

FUNCTIONAL DESCRIPTION

Operation modes:

-Battery Charge (BC)
-Constant Current (CC)
-Constant Resistance (CR)
-Constant Voltage (CV)
-Constant Power (CP)
-Automatic test from Excel file

It provides three DC channels:

-The three channels can be controlled independently, allowing different charge parameters, voltage, current or power setpoints
-The three channels can be controlled in parallel, sharing the same setpoint and providing 3 times the current

Battery charge is controlled with an IU algorithm. Equalization, Boost and Float charge are possible. **Battery discharge** can be done at constant current, power, resistance or by programming a sequence in an Excel file.

KEY FEATURES

6.75 – 160 kW

2 Quadrant Power Supply

Regenerative up to 100% rated power

1 channel Output:
0 to 750V, 0 to ±690A

3 channels Output:
0 to 750V, 0 to ±230A/ch

BC, CV, CC, CP, CR modes

Equalization, Boost and Float charge

Constant current or power discharge

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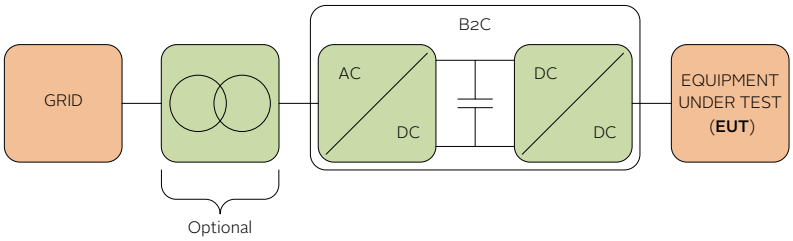
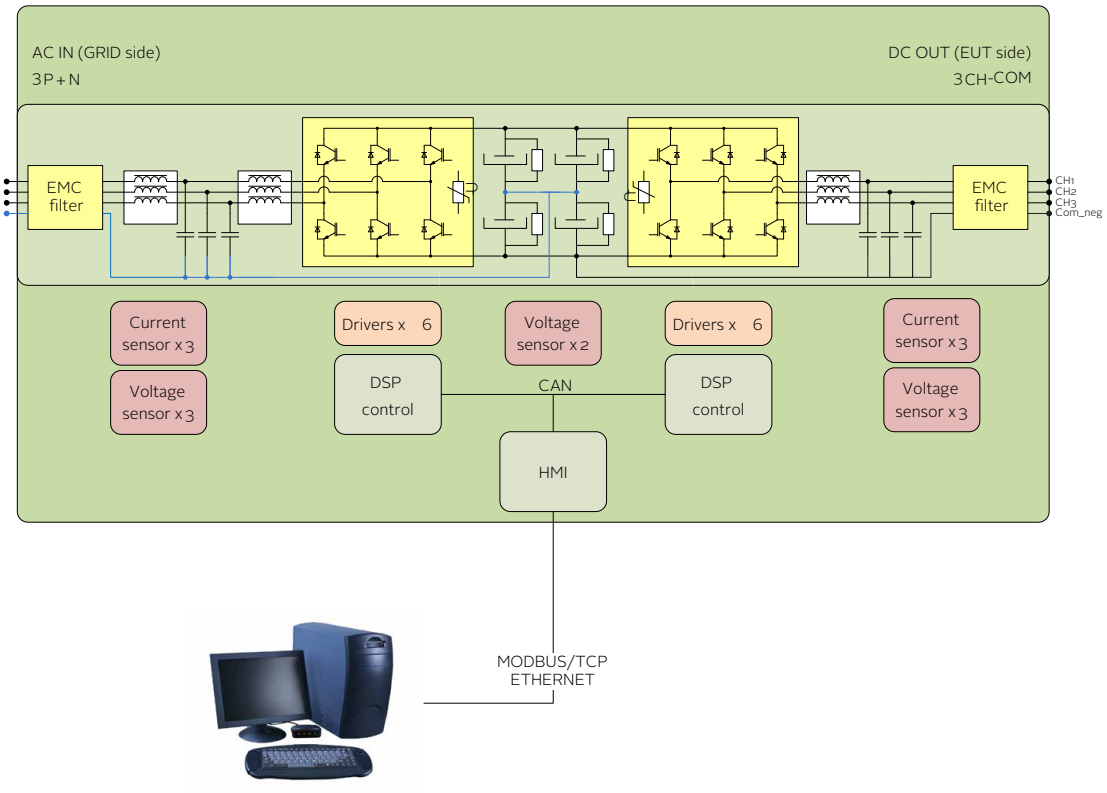
CONCEPTUAL SCHEMATIC



BACK-TO-BACK TOPOLOGY

The converter is formed by a grid-side Active Rectifier and an output DCDC converter sharing a DC-link. The Active Rectifier allows sinusoidal current consumption with low harmonic distortion and unity power factor. The DCDC converter generates three independent DC voltages controlling the voltage, current or power.

TECHNICAL DIAGRAM



AC Input is connected to the grid (neutral connection is required). Galvanic isolation is recommended.
AC Output is connected to the Equipment Under Test (EUT) and can be used as:
- Three independent 2Q channels
- One 2Q channel (3 times rated current)

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USER INTERFACE

Local 3.2” Touchscreen panel

Local control port:
-1 analog input 0-10V
-3 analog outputs 0-10V
-4 digital inputs
-3 relay outputs
-1 Emergency stop

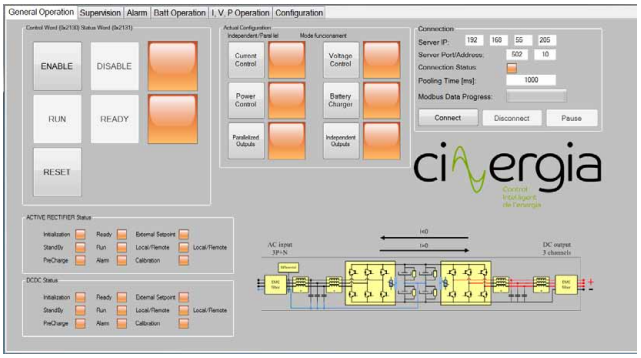
Note: all inputs/outputs are isolated

Communications port:
LAN Ethernet with Modbus/TCP protocol.

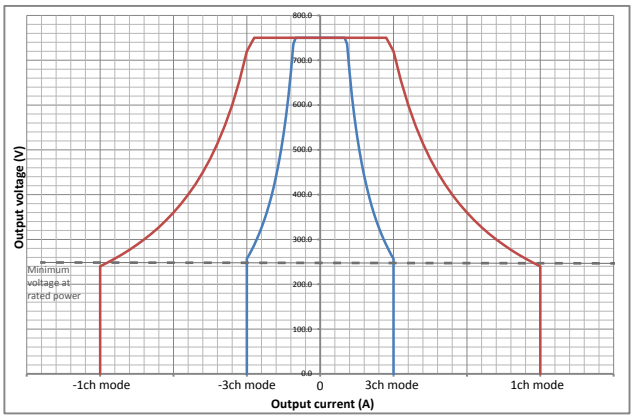
Optional communications:
RS485, RS232, CAN, LabView

SOFTWARE FEATURES

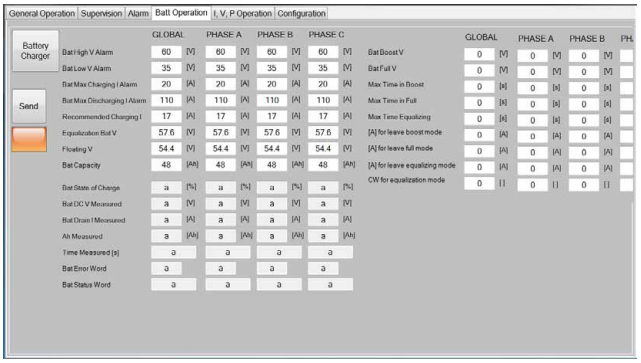
Windows 7 user interface for remote operation and data acquisition.



OPERATION AREA: 1/3 CHANNELS



BATTERY CHARGE MODE



Cooling
The power supply is air-cooled internally.

Mechanical housing
The power supplies are housed in compact cabinets with wheels up to 120kVA for easier transportation.

Options
Galvanic Isolation
Isolation monitor
Isolated analog inputs
RS485, RS232, CAN
Labview drivers

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RANGE AND SPECIFICATIONS

MAGNITUDE			VALUE	
Power			7.5kVA-200kVA	
Input side (GRID side)				
AC Voltage	Rated		3x400Vrms+Neutral+Earth	
Voltage range			+15% / -20 %	
AC Current	(at rated power)		10-290Arms	
Frequency			48-62Hz	
THDi	(at rated power)		<3%	
Power Factor	Typical at rated power Configurable by user		≥0.99 0-1 (capacitive/inductive)	
Efficiency	(at rated power)		>92%	
Overload			125% for 10 min / 150% for 60 s	
Output side (EUT side)				
DC Voltage	Channel-Com_neg Channel-Channel		0-750V -750 to 750V	
Minimum voltage	at rated power†		220V	
DC Current	1 channel output 3 channels output Bipolar output		0 to ±690A 0 to ±230A/ch 0 to ±230A	
Modes of operation		Range	Resolution	Ripple
Constant Voltage		0-100%	<±0.1%	<1%
Constant Current		0-±100%	<±0.1%	<1%
Constant Power		0-±100%	<±0.1%	<1%
Constant Resistance		Min.-100%	<±0.1%	<1%
Battery Charge		0-±100%	<±0.1%	<1%
Response time	Rated resistance load		1-5ms (10-90%)	
General				
Measurements	Input Voltage (Vrms) and Current (Irms)			
	Input and Output Power			
	Output Voltage and Current			
	Temperatures			
User interface	3.2" Touchscreen			
	Local Control port: 1 analog input, 3 analog outputs, 4 inputs, 3 relays			
	Communication Port: Ethernet (Optionals: RS485, RS232, CAN)			
	Communication Protocol: Modbus/TCP			
Humidity	10-90% (Absolute maximum, without condensation)			
Temperature	5-35 °C (Absolute maximum)			
Cooling	Forced air			
Protections	Over Current, Over Voltage, Shortcircuit, Overtemperature			
Standards				
CE Marking				
Safety	EN-62040-1-2, EN-60950-1			
EMC	EMC: EN-62040-2			

† Below minimum voltage the power is derated due to the current limitation. See operation area for further detail

All specifications are subject to change without notice.

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MODELS

REFERENCE	RATED kVA	RATED kW	RATED CURRENT 3channels / 0-750V	RATED CURRENT 1channel / 0-750V	WEIGHT kg	DIMENSIONS DxWxH (mm)
B2C7.5	7.5	6.75	±10A	±30A	100	770x450x1100
B2C10	10	9	±15A	±45A	100	
B2C15	15	13.5	±20A	±60A	102	
B2C20	20	18	±25A	±75A	105	
B2C30	30	27	±40A	±120A	150	
B2C40	40	36	±50A	±150A	175	
B2C50	50	45	±65A	±195A	185	
B2C60	60	54	±80A	±240A	185	880x590x1320
B2C80	80	72	±105A	±315A	265	
B2C100	100	90	±130A	±390A	290	
B2C120	120	108	±130A	±390A	290	
B2C160	160	128	±155A	±465A	540	850x900x2000
B2C200	200	160	±185A	±555A	550	

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GALVANIC ISOLATION (optional)

REFERENCE	RECOMMENDED CIRCUIT BREAKER	WEIGHT kg	DIMENSIONS DxWxH (mm)
IT7.5	Type D - 25A	67	Inside the cabinet
IT10	Type D - 32A	94	
IT15	Type D - 50A	125	
IT20	Type D - 63A	145	
IT30	Type D - 80A	174	595x415x708 (*)
IT40	Type D - 100A	217	789x490x865 (*)
IT50	Type D - 125A	280	
IT60	Type D - 160A	381	
IT80	Type D - 200A	435	964x684x1252 (*)
IT100	Type D - 250A	458	
IT120	Type D - 315A	514	
IT160	Type D - 400A	612	
IT200	Type D - 500A	753	1192x744x1430 (*)

(*) The transformer is delivered in a stand-alone cabinet IP23

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