

EL-DC

DC Electronic Load

CINERGIA's DC converters are power electronics devices designed to generate a DC constant voltage, current, power, resistance or IU battery charge profile. Our DC products (DCPS, EL-DC, B2C) differ in the possible operation modes.

Thanks to its bidirectional power hardware, the test energy can be regenerated to the electrical grid.

FUNCTIONAL DESCRIPTION

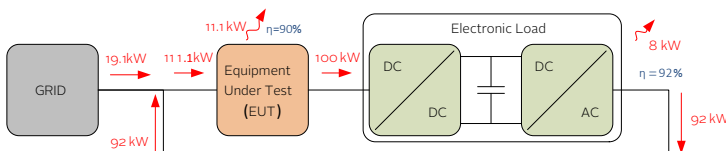
Operation modes:

- Constant Current (CC) -Constant Voltage (CV)
- Constant Power (CP) -Automatic test from csv file
- Constant Resistance (CR)

Three DC channels:

- The three channels can be controlled independently, allowing different setpoints on each channel
- The three channels can be controlled in parallel, sharing the same setpoint and providing 3 times the current
- In Unipolar 2Q applications, the sources will be connected between one channel and the common negative.
- In Bipolar 4Q applications, the source will be connected between two channels

80% typical energy saving by regenerating to the grid:



KEY FEATURES

6.75 – 160 kW

2/4 Quadrant Power Supply

Regenerative up to 100% rated power

1 channel Output:
20 to 750V, 0 to ±555A

3 channels Output:
20 to 750V, 0 to ±185A/ch

Bipolar Output
-350 to +350V, 0 to ±185A

+270V/0/-270V Output
for Avionics applications

CV, CC, CP, CV modes

Option for Independent Channels Operation

AC&DC version available

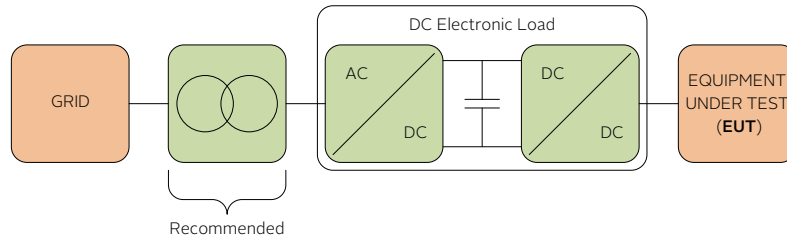
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CONCEPTUAL SCHEMATIC

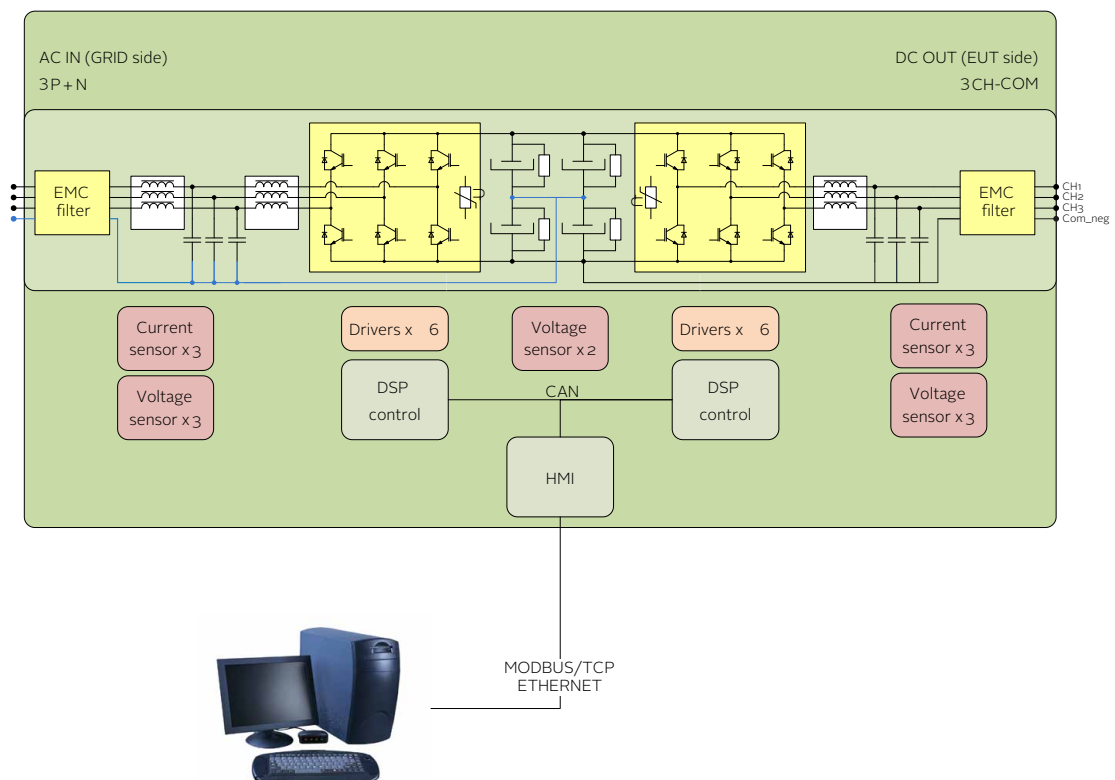


BACK-TO-BACK TOPOLOGY

The equipment is formed by two IGBT-based power stages: a grid-side Active Rectifier producing sinusoidal currents with low harmonic distortion and close to unity power factor; and three output DCDC converters generating three independent DC channels.

Thanks to the bidirectionality of this topology the test energy can be injected back to the grid.

TECHNICAL DIAGRAM



AC Input is connected to the grid (isolation transformer with neutral is recommended)

DC Output is connected to the Equipment Under Test (EUT) and can be used as:

- Independent channels mode: three 2Q channels with a common negative
- Parallel channels mode: one 2Q channel (3 times rated current per phase)
- One 4Q bipolar channel (connecting the load between two channels)
- One +270/0/-270V channels for avionics applications

USER INTERFACE

Local 3.2" Touchscreen panel

Remote Control port:

LAN Ethernet with Modbus/TCP protocol.

Digital IO port:

- 4 digital inputs
- 3 relay outputs
- 1 Emergency stop

Optional analog port:

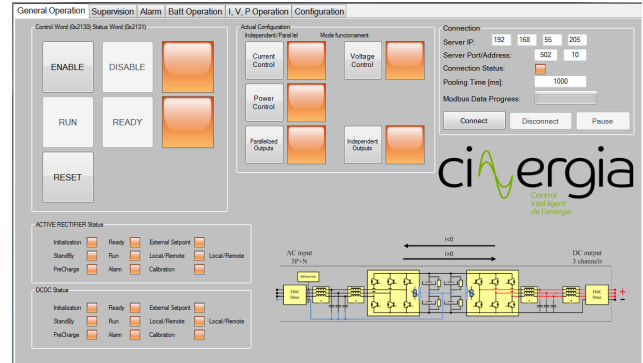
- 1 analog input 0-10V
- 3 analog outputs 0-10V

Optional communications:

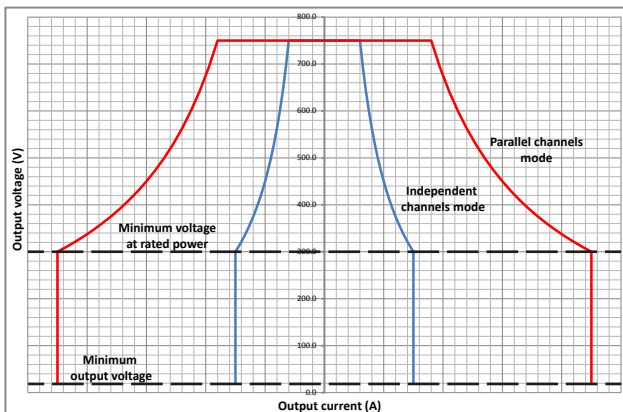
RS485, RS232, CAN, LabView

SOFTWARE FEATURES

Windows 7/10 user interface for remote operation and data acquisition.



OPERATION AREA: UNIPOLAR

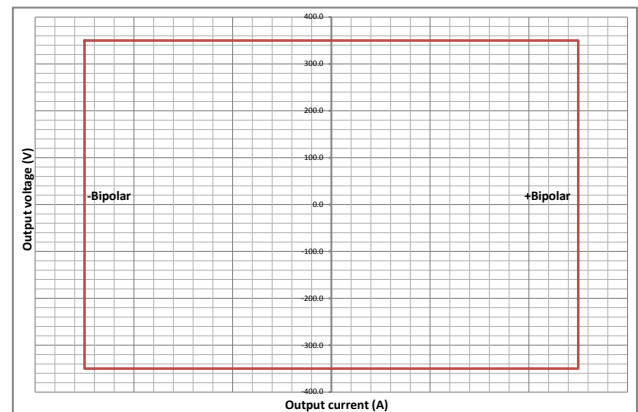


In UNIPOLAR the equipment under test is connected between a channel and the common negative. Two possible configurations:

Independent channels: CH1, CH2 and CH3 are available and can be parametrized with different voltage, current or power setpoint.

Paralleled channels: the three channels are “shortcircuited” internally to provide three times the current.

OPERATION AREA: BIPOLAR



In BIPOLAR the equipment under test is connected between channels CH1, CH2 and CH3. The common negative is not connected and CH2 is used as 0V reference for CH1 and CH3.

This connection will be used to create +270V/0/-270V avionics DC bus system.

Maximum voltage in bipolar connection is ±350V. Ask for further information if ±750V are needed.

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 (recommended)
- Isolation monitor
- Independent Channels Operation
- Analog Input/Output Port
- RS485, RS232, CAN
- Labview drivers

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RANGE AND SPECIFICATIONS

MAGNITUDE		VALUE	
Power	(grid side)	7.5kVA-200kVA	
Input side (GRID side)			
AC Voltage	Rated	3x400Vrms+Neutral+Earth	
Voltage range		+15% / -20 %	
Rated AC Current	Depends on model (see table)	10-290Arms per phase	
Frequency		48-62Hz	
THDi	(at rated power)	<3%	
Power Factor	Typical at rated power	≥0.99	
	Configurable by user	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	20 to 750V (≤60kVA)	
	Channel-Com_neg	40 to 750V (>60kVA)	
	Channel-Channel	-350 to 350V	
Minimum voltage	at rated power ¹	320V	
DC Current	Parallel channels mode	0 to ±555A global	
	Independent channels mode	0 to ±185A per channel	
	Bipolar output	0 to ±185A per channel	
DC Overcurrent		110% during 1 min	
Operation Modes	Range ²	Resolution ³	Ripple ³
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%
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: 4 digital inputs, 3 relay outputs (Option for AIO)		
	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		

¹ Below minimum voltage the power is limited by the rated current of the unit. Contact us for further detail

² Range is related to rated values of each model as defined in table MODELS

³ Resolution and ripple are related to the FS of each model. Contact us for further information.

All specifications are subject to change without notice.

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MODELS

REFERENCE	RATED		RATED CURRENT			WEIGHT kg	DIMENSIONS DxWxH (mm)	
	kVA	kW	Independent 0-750V	Parallel 0-750V	Bipolar -350 to 350V			
EL7.5-DC	7.5	6.75	±10A	±30A	±10A	150	770x450x1100	
EL10-DC	10	9	±15A	±45A	±15A	150		
EL15-DC	15	13.5	±20A	±60A	±20A	150		
EL20-DC	20	18	±25A	±75A	±25A	150		
EL30-DC	30	27	±30A	±90A	±30A	150		
EL40-DC	40	36	±38A	±115A	±38A	185		
EL50-DC	50	45	±47A	±140A	±47A	185		
EL60-DC	60	54	±57A	±180A	±57A	185		
EL80-DC	80	72	±105A	±315A	±105A	265		880x590x1320
EL100-DC	100	90	±130A	±390A	±130A	290		
EL120-DC	120	108	±130A	±390A	±130A	290	850x900x2000	
EL160-DC	160	128	±155A	±465A	±155A	540		
EL200-DC	200	160	±185A	±555A	±185A	550		

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GALVANIC ISOLATION (recommended)

REFERENCE	RECOMMENDED CIRCUIT BREAKER	WEIGHT kg	DIMENSIONS DxWxH (mm)
IT7.5	Type C - 25A	145	Inside the cabinet
IT10	Type C - 25A	145	
IT15	Type C - 32A	145	
IT20	Type C - 40A	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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