

# EL-DC

## DC Electronic Load

DC Electronic Loads are devices that behave as a load and are designed to test electric and electronic DC sources.

While most electronic loads are dissipative, CINERGIA offers a comprehensive range of DC, AC and AC&DC regenerative electronic loads producing significant energy savings, optimizing the electrical and cooling installation and reducing test costs.

### FUNCTIONAL DESCRIPTION

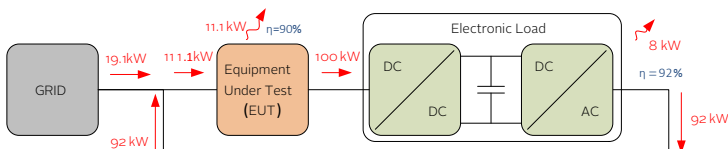
#### Operation modes:

- Constant Current (CC)
- Constant Voltage (CV)
- Constant Power (CP)
- Automatic test from Excel 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:**  
0 to 750V, 0 to ±690A

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

**Bipolar Output**  
-750 to +750V, 0 to ±230A

**CC, CP, CR, CV modes**

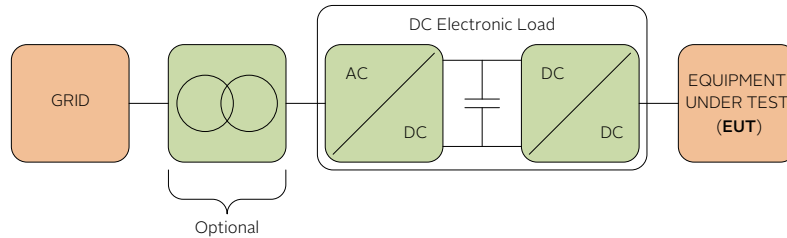
**AC&DC version available**

#### CINERGIA

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## DC Electronic Load

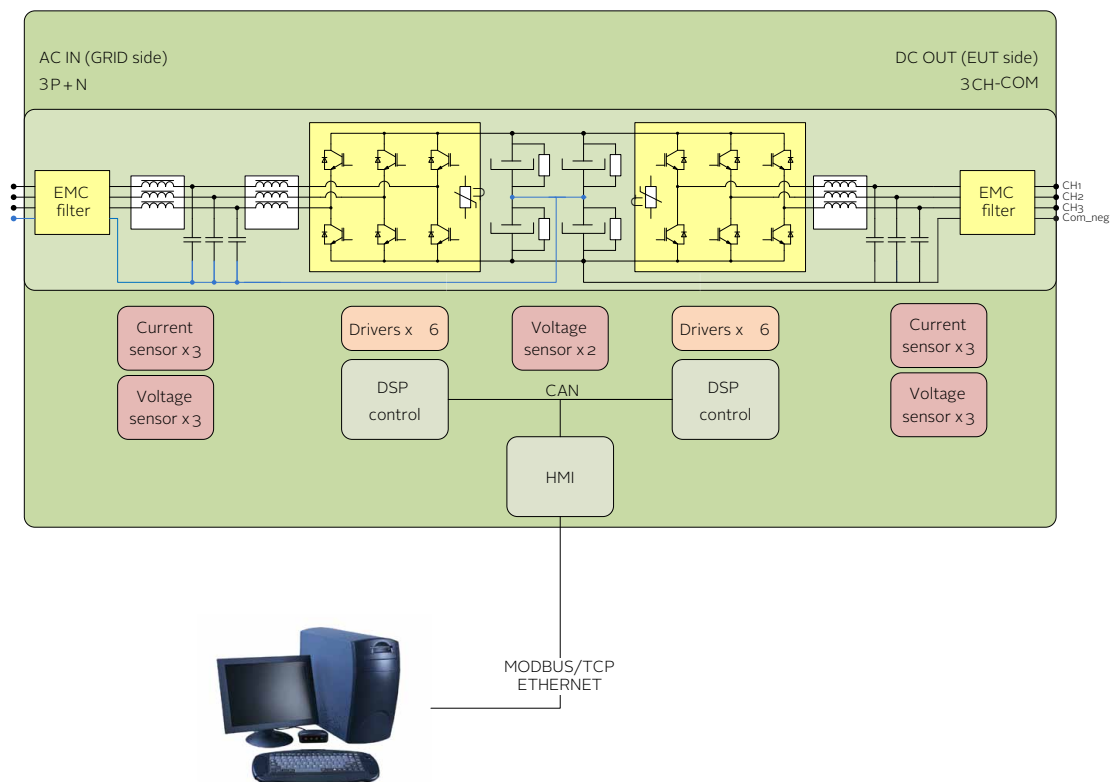
### CONCEPTUAL SCHEMATIC



### 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)
- One 4Q bipolar channel (connecting the load between two channels)

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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:

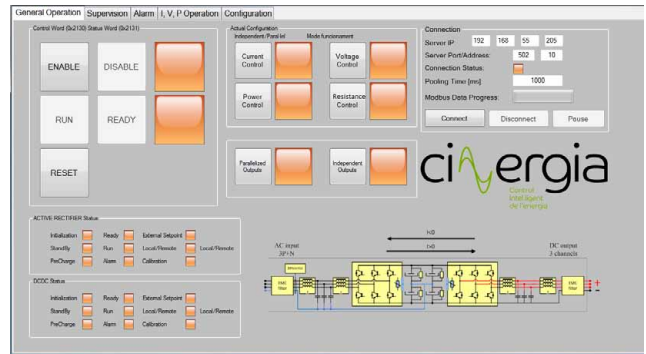
LAN Ethernet with Modbus/TCP protocol.

#### Optional communications:

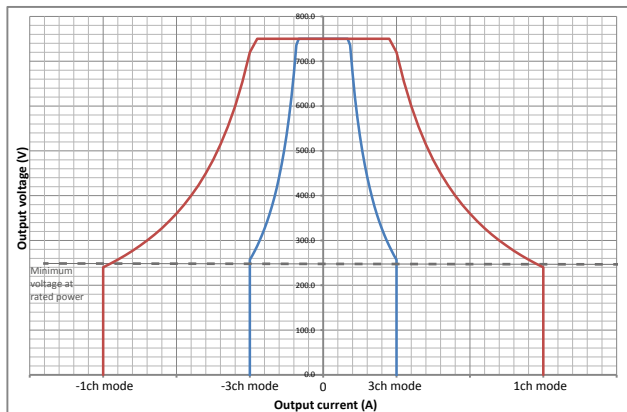
RS485, RS232, CAN, LabView

## SOFTWARE FEATURES

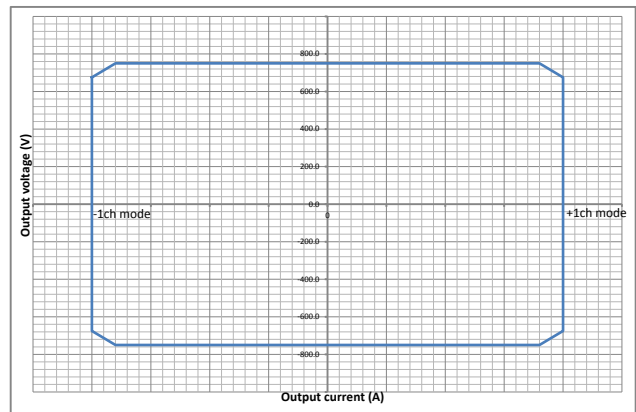
Windows 7 user interface for remote operation and data acquisition.



## OPERATION AREA: 1/3 CHANNELS



## OPERATION AREA: BIPOLAR



### 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
<b>Power</b>		7.5kVA-200kVA
<b>Input side (GRID side)</b>		
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	≥0.99
Efficiency	Configurable by user	0-1 (capacitive/inductive)
Overload	(at rated power)	>92%
		125% for 10 min / 150% for 60 s
<b>Output side (EUT side)</b>		
DC Voltage	Channel-Com_neg Channel-Channel	0-750V -750 to 750V
Minimum voltage	at rated power <sup>†</sup>	220V
DC Current	1 channel output 3 channels output Bipolar output	0 to ±690A 0 to ±230A/ch 0 to ±230A
<b>Modes of operation</b>		Range Resolution Ripple
Constant Voltage	0-100% <sup>‡</sup>	<±0.1% <1%
Constant Current	0-±100%	<±0.1% <1%
Constant Power	0-±100%	<±0.1% <1%
Constant Resistance	Min.-100%	<±0.1% <1%
<b>Response time</b>	Rated resistance load	1-5ms (10-90%)
<b>General</b>		
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	
<b>Standards</b>		
CE Marking		
Safety	EN-62040-1-2, EN-60950-1	
EMC	EMC: EN-62040-2	

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

<sup>‡</sup> 0-±100% in bipolar mode (galvanic isolation requested)

All specifications are subject to change without notice.

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### MODELS

REFERENCE	RATED		RATED CURRENT			WEIGHT kg	DIMENSIONS DxWxH (mm)	
	kVA	kW	3channels 0-750V	1channel 0-750V	Bipolar -750 to 750V			
<b>EL7.5-DC</b>	7.5	6.75	±10A	±30A	±10A	100	770x450x1100	
<b>EL10-DC</b>	10	9	±15A	±45A	±15A	100		
<b>EL15-DC</b>	15	13.5	±20A	±60A	±20A	102		
<b>EL20-DC</b>	20	18	±25A	±75A	±25A	105		
<b>EL30-DC</b>	30	27	±40A	±120A	±40A	150		
<b>EL40-DC</b>	40	36	±50A	±150A	±50A	175		
<b>EL50-DC</b>	50	45	±65A	±195A	±65A	185		
<b>EL60-DC</b>	60	54	±80A	±240A	±80A	185		880x590x1320
<b>EL80-DC</b>	80	72	±105A	±315A	±105A	265		
<b>EL100-DC</b>	100	90	±130A	±390A	±130A	290		850x900x2000
<b>EL120-DC</b>	120	108	±130A	±390A	±130A	290		
<b>EL160-DC</b>	160	128	±155A	±465A	±155A	540		
<b>EL200-DC</b>	200	160	±185A	±555A	±185A	550		

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### GALVANIC ISOLATION (optional)

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

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

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