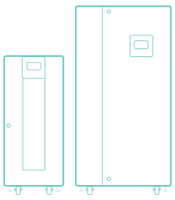


GE&EL+ vAC/DC ePlus

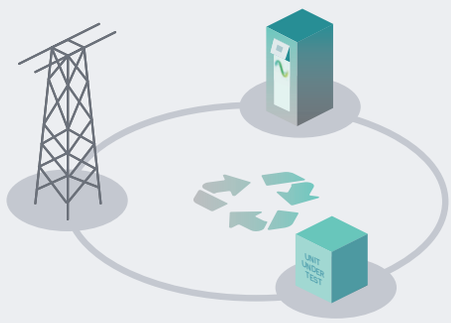
The All-Terrain AC/DC Regenerative Converter

The GE/EL+ vAC/DC is the most complete and versatile converter in the regenerative energy testing market. The whole CINERGIA's catalogue in a single unit. A Grid Emulator (GE), an Electronic Load (EL) and a DC Bidirectional (B2C). This All-Terrain converter is suitable for the majority of test applications in the field of Renewable Energies, Smartgrids, Batteries and Electrical Vehicles.

Regenerative Technology

Thanks to our bi-directional topology, the All-Terrain AC/DC Converter are regenerative, resulting in a reduction of both the consumed energy during the tests and the power required from the electrical installation.

This technology allows us to work in both directions, as power generators or offering a consumption for the realization of all types of tests.



Main Applications

- Electromobility
- Smart Grids
- Anti-Islanding
- IEC Testing (pre-compliance)
- Photovoltaic
- Academical & Industrial Test
- Power HiL
- Energy Storage System

Bidirectional and Regenerative

Clean grid current

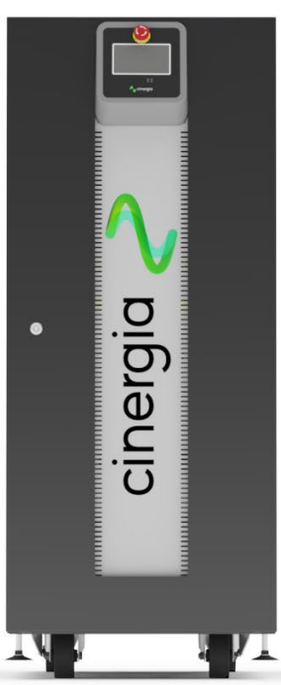
THDi <3% and PF > 0.98

13 Models

from 7.5kW to 160kW

Same Power in AC | DC

Parallelization of units to increase the power



Operation Modes

Complete DC Load/Source
Full 4Q AC Grid Emulator
Power Amplifier for Power HiL
Full 4Q AC Electronic Load
Battery Emulation and Testing
PV Panel Emulation

Intuitive User Interface

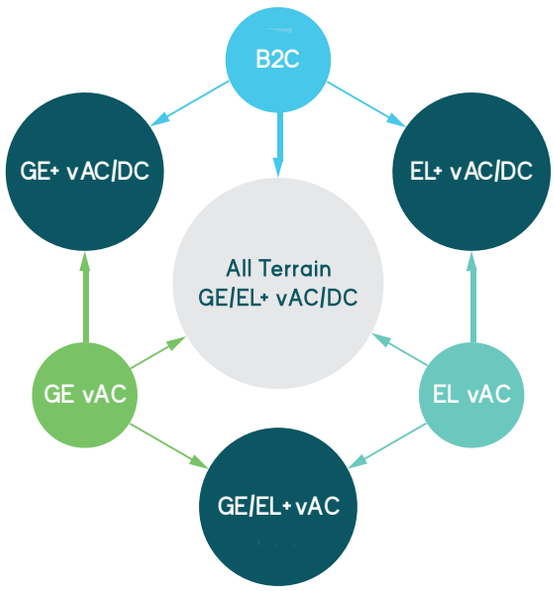
Modbus/Ethernet Open protocol, Labview drivers

Product Family

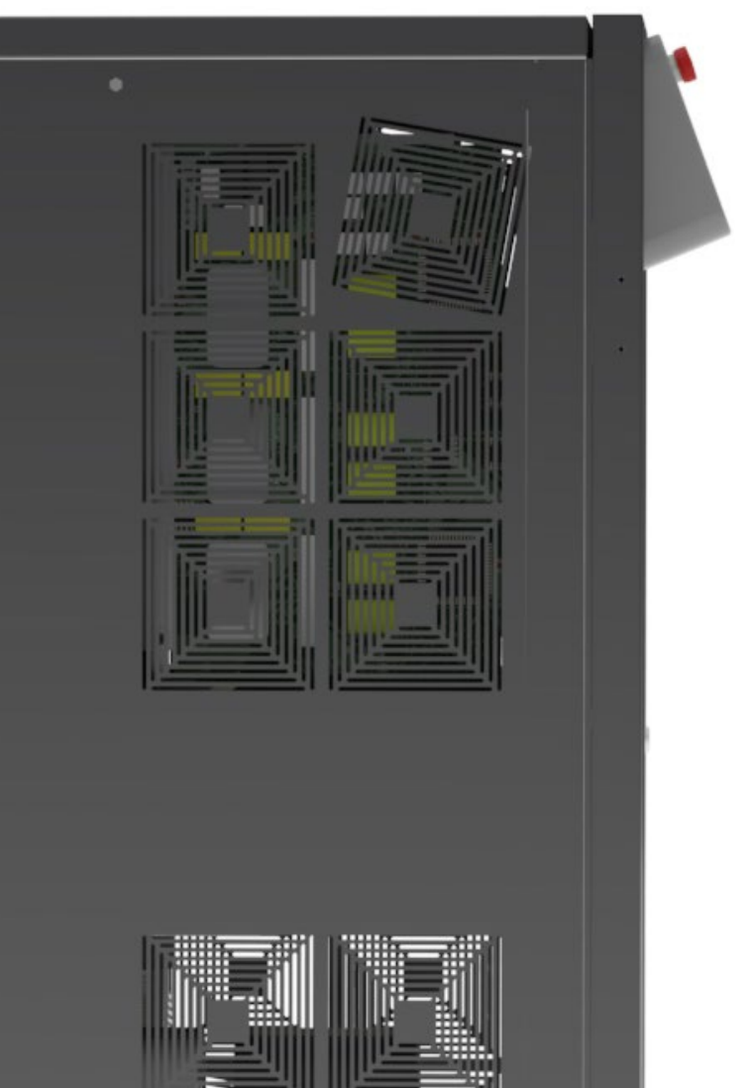
The whole cinergia's catalogue in a single unit

CINERGIA has ingenuously combined the functionalities of several products in a single cabinet to offer the most flexible and unique testing equipment. The GE&EL product family is the aggregation of Grid Simulators, Electronic Loads and Bidirectional DC Converters in one product.

The All-in-One AC GE&EL includes, in one single cabinet, an AC Grid Simulator and an AC Electronic Load without any limitation. The All-Terrain GE&EL vAC/DC is all CINERGIA catalogue in one system: Grid Simulators, Electronic Loads and Bidirectional DC.



Operation Modes



DC

Programmable Voltage (CV)
Programmable Current (CC)
Programmable Power (CP)
Programmable Resistance (CR)
Power Amplifier (HiL)
Steps
Battery Testing (BTest) (charge/discharge/cycling) Optional
Battery Emulation (Bemu) Optional
PV Panel Emulation (PVEmu) Optional

AC

Programmable Voltage (CV) (only in GE+)
Programmable Current (CC) (only in EL+)
Programmable Power (CP / CS) (only in EL+)
Programmable Impedance (CZ) (only in EL+)
Power Amplifier (HiL)
Steps
LVRT, IEC 61000 -4-11, 4-13, 4-14, 4-28 (for pre-compliance) Optional

OUTPUT SIDE IN DC (EUT SIDE)

Terminals
Number: 4 (3 phases + 1 neutral)
Configuration of Channels
Unipolar 3-channels 2Q, independent setpoints per channel
Unipolar 1-channel 2Q, one global setpoint for all channels
Multichannel: 2Q, independent start/stop, operation mode and setpoints per channel (note: multichannel is an option for ≥ 80kVA)
Bipolar (4Q two independent setpoints)
Voltage Mode (CV)
Range: 2Q: 20[1] to 750V (800V with High Voltage option) 4Q: 0 to +350V / 0 to -350 (+ rail / 0 / - rail, Bipolar configuration)
Setpoint Resolution: 10mV
Effective Resolution[2]: < 0.05% of FS[3]
Setpoint Accuracy[4]: ± 0.1% of FS[3]
Transient Time[5]: < 1ms (10% to 90% at a step to Vrated)
Ripple[7] (peak-peak): < 0.55% of FS[3]
Current Mode (CC)
Range: from 0 to ± 110% of Irated (see models table)
Setpoint Resolution: 10mA
Effective Resolution[2]: < 0.05% of FS[3] (< 0.1% models 7.5 & 10)
Setpoint Accuracy[4]: ± 0.2% of FS[3]
Transient Time[5]: < 1ms (10% to 90% at a step to Irated)
Ripple[7] (peak-peak): < 0.7% of FS[3]
Power Mode (CP)
Range: from 0 to ± 200%[8] of Prated (see models table)
Derived current setpoint: Psetpoint / Vmeasured
Setpoint Resolution: 1W
Effective Resolution[2]: < 0.1% of FS[3] (< 0.25% models 7.5 & 10)
Setpoint Accuracy[4]: ± 0.4% of FS[3]
Transient Time[5]: < 2.5ms (10% to 90% at a step to Prated)
Resistance Mode (CR)
Range: from 0.1 to 1000 Ohm
Derived current: Vmeasured / Rsetpoint
Setpoint Resolution: 0.01 Ohm
Setpoint Accuracy[4]: ± 0.2% of FS[3]
Transient Time[5]: < 2ms (10% to 90% at a step to Rrated)

OUTPUT SIDE EL-AC (EUT SIDE)

Admissible Voltage
Connection: 1-phase, 3-phase star or 3-phase delta
Maximum: ± 400V peak
Range: 10-100Hz 35[1] to 277Vrms phase-neutral (295Vrms with HV option) 35[1] to 480Vrms phase-phase (510Vrms with HV option) > 100Hz: maximum rms voltage follows V·f < 46000
Frequency: 10 to 400Hz
Current Mode (CC)
Range: from 0 to ± 200%[8] of Irated (see models table)
Setpoint Resolution: 10mArms
Effective Resolution[2]: < 0.05% of FS[3] (< 0.1% models 7.5 & 10)
Setpoint Accuracy[4]: < ± 0.2% of FS[3]
Transient Time[5]: < 1.5ms (10% to 90% at a step transient)
Ripple[7] (peak-peak): < 0.7% of FS[3] (with Low Ripple Inductor option)
Phase Angle (cos ø)
Range: -90 to 90° in Sink / Source
Resolution: 0.01°
Harmonics
Range: up to 50th
50 independent harmonics per phase: 20 free programmable frequency and phase from 0.1 to 50 times f_0 30 fixed frequency
Harmonics content: V·f < 46000 (with current derating)
Setpoint Accuracy[4]: same as current accuracy
Small Signal Bandwidth: up to 5000Hz[9]
Transient Time[5]: < 2ms (10% to 90% at a step change)
Power Mode (CP/CS)
Range: from 0 to ± 200%[8] of Prated (see models table)
Derived current setpoint: calculated from |S| and Φ(S)
Setpoint Resolution: 1W, 1VA
Effective Resolution[2]: < 0.1% of FS[3] (< 0.25% models 7.5 & 10)
Setpoint Accuracy[4]: ± 0.4% of FS[3]
Transient Time[5]: < 2.5ms (10% to 90% at a step to Prated)
Impedance Mode (CZ)
Calculation method configurable (rms, instantaneous)
Range: from 0.8 to 1000 Ohm, 0.1 to 2000mH, 0 to 3.7mF
Derived current/phase setpoint: calculated from |Z| and Φ(Z)
Setpoint Resolution: 0.01 Ohm/mH/mF
Setpoint Accuracy[4]: see current accuracy
Transient Time[5]: < 2.5ms (10% to 90% at a step to Rrated)

OUTPUT SIDE GE-AC (EUT SIDE)

Voltage Mode (CV)
Peak: ± 400V phase-neutral
Range: 0[1] to 277Vrms phase-neutral (295Vrms with HV option) 0[1] to 480Vrms phase-phase (510Vrms with HV option)
THDv: < 0.1% rated linear load at 230Vrms, 50/60Hz < 0.9% rated non linear load CF=3 at 230Vrms, 50/60Hz
Setpoint Resolution: 10mVrms
Effective Resolution[2]: < 0.05% of FS[3]
Setpoint Accuracy[4]: < ± 0.1% of FS[3]
Transient Time[5]: < 1.5ms (10% to 90% at a step to Vrated)
Ripple[7] (peak-peak): < 0.55% of FS[3]
Harmonics
Range: up to 50th (at 50/60 Hz fundamental)
50 independent harmonics per phase: 20 free programmable frequency and phase from 0.1 to 50 times f_0 30 fixed frequency
Harmonics content: V·f < 46000 (with current derating)
Setpoint Accuracy[4]: same as voltage accuracy
Small Signal Bandwidth: up to 5000Hz[9]
Transient Time[5]: < 2ms (10% to 90% at a step change)
Frequency
Fundamental Frequency Range: 10 to 100Hz (up to 400Hz option)
Small Signal Bandwidth: up to 5000Hz[9]
Resolution: 1mHz
Phase Angle
Range: 0 to 360°
Resolution: 0.01°

OUTPUT SIDE IN AC (EUT SIDE)

Terminals
Number: 4 (3 phases + 1 neutral)
Configuration of Channels
3-channels: 4Q, independent setpoints per phase
1-channel: 4Q, global setpoints for all phases (only in GE+)
Multichannel: 4Q, independent start/stop, alarm status and setpoints per phase (note: multichannel is an option for ≥ 80kVA)

To view the complete datasheet, scan the following QR code

Models

GE&EL+ vAC/DC

Reference	AC Power Rated[9]	AC Current Rated[9] RMS 3 channels / 1 channel	DC Power Rated[9]	DC Current Rated[9] RMS 3 channels / 1 channel	Weight (kg) (lbs)	Dimensions DxWxH (mm) (inch)
GE&EL+ 7.5 vAC/DC	7.5 kW	11 A / 33A	7.5 kW	±10A / ±30A	155 kg 341.71 lbs	770 x 450 x 1100 mm 30.31 x 17.71 x 43.30 "
GE&EL+ 10 vAC/DC	10 kW	15 A / 45 A	10 kW	±15A / ±45A		
GE&EL+ 15 vAC/DC	15 kW	22 A / 66 A	15 kW	±20A / ±60A		
GE&EL+ 20 vAC/DC	20 kW	29 A / 87 A	20 kW	±25A / ±75A		
GE&EL+ 30 vAC/DC	27 kW	40 A / 120 A	27 kW	±30A / ±90A		
GE&EL+ 40 vAC/DC	40 kW	58 A / 174 A	40 kW	±40A / ±120A	200 kg 440.92 lbs	
GE&EL+ 50 vAC/DC	50 kW	73 A / 219 A	50 kW	±50A / ±150A		
GE&EL+ 60 vAC/DC	54 kW	80 A / 240 A	54 kW	±57A / ±171A		
GE&EL+ 80 vAC/DC	80 kW	116 A / -	80 kW	±105A / ±315A	400 kg 881.84 lbs	880 x 875 x 1320 mm 34.64 x 34.44 x 51.97 "
GE&EL+ 100 vAC/DC	100 kW	145 A / -	100 kW	±130A / ±390A		
GE&EL+ 120 vAC/DC	108 kW	157 A / -	108 kW	±130A / ±390A		
GE&EL+ 160 vAC/DC	145 kW	211 A / -	145 kW	±155A / ±465A	680 kg 1499.14 lbs	850 x 900 x 2000 mm 33.46 x 35.43 x 78.74 "
GE&EL+ 200 vAC/DC	160 kW	232 A / -	160 kW	±185A / ±555A		

All specifications are subject to change without notice.

Galvanic Isolation

		Circuit Breaker Recommended	Weight (kg) (lbs)
Inside the cabinet	IT 7.5i	Type C - 25 A	145 kg 319.67 lbs
	IT 10i	Type C - 25 A	
	IT 15i	Type C - 32 A	
	IT 20i	Type C - 40 A	
	IT 30i	Type C - 50 A	195 kg 429.90 lbs
	IT 40i*	Type C - 63 A	
	IT 50i*	Type C - 83 A	

*In the **IT 40i** and **IT 50i** models the size of the cabinet increases to a total of 770 x 835 x 1100 mm (27.55 x 32.87 x 43.31 "). The others keep the original size.

		Circuit Breaker Recommended	Weight (kg) (lbs)	Dimensions D x W x H (mm) (inch)
In external cabinet IP20	IT 30e	Type D - 80 A	174 kg 383.60 lbs	595 x 415 x 708 mm 23.42 x 16.33 x 27.87 "
	IT 40e	Type D - 100 A	217 kg 478.40 lbs	725 x 525 x 773 mm 28.54 x 20,67 x 30.43 "
	IT 50e	Type D - 125 A	280 kg 617.29 lbs	
	IT 60e	Type D - 160 A	381 kg 839.96 lbs	875 x 600 x 900 mm 34.44 x 23.62 x 35.43 "
	IT 80e	Type D - 200 A	435 kg 959.01 lbs	
	IT 100e	Type D - 250 A	458 kg 1009.72 lbs	
	IT 120e	Type D - 315 A	514 kg 1133.18lbs	
	IT 160e	Type D - 400 A	612 kg 1349.23 lbs	964 x 648 x 1252 mm 37.95 x 25.51 x 49.29 "
	IT 200e	Type D - 500 A	753 kg 1660.10 lbs	1192 x 744 x 1430 mm 46.92 x 29.29 x 56.29 "

Configuration Modes

GE+ AC | EL+ AC | PHiL DC | PHiL AC | DC

Master / Slave

Parallel				in AC modes (GE & EL)
Parallel	Serial	Serial Parallel		in DC mode

Channel Configuration in GE

3 channels | * 1 channel

*1-channel mode available in standard units up to 60kVA. Consult us for parallel mode above 60kVA.

Channel Configuration in EL

3 channels | * 1 channel

*For 1-channel conf iguration contact us.

Channel Configuration in DC

3 channels | 1 channel | Bipolar | Unipolar

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