



SPHEREA
PUISSANCE PLUS

LINEAR DC POWER SUPPLY / AMPLIFIER

2 x 90 VDC - 200 A - 18 kW - HP

APPLICATIONS

- DC Aeronautic network
- Automotive network
- All kind of DC loads
- Current generator

PERFORMANCES

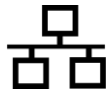
- Insulated output
- Voltage regulation
- Current regulation
- Fast transients < 100µs
- High inrush current possibilities (4 x I_n)
- Signal synthetizer embedded
- Very low internal resistor
- Very low noise S/B > 80 dB
- High accuracy < 0,2%
- High stability < 0,1%



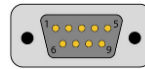
Non-contractual picture



TOUCHSCREEN



ETHERNET



RS232

DESCRIPTION

This DC power supply is using a linear power block which mix high accuracy and high dynamic performances, including for severe loads like capacitor, inductance, PWM...

Thanks to their **linear technology**, it produces no electrical disturbances and can be used in anechoic chambers. This linear technology allows to generate up to 4 times their rated power during 30 ms and 3 times during 3 s.

As all our DC power supplies, this one is “**2-quadrants**” and has a very small rise-time and fall-time. This ensure a perfect tracking of programmed voltage including on capacitive loads (current absorption).

The output is **insulated** from mains and from case ground: several power supplies can be connected in-series to increase output voltage.

An external pilot can be used to manage the output voltage and use this device **as an amplifier**. In addition, each output provides the images of the voltage and of the current.

The high power requires to the form of a cabinet. But to reduce its cost, two power supplies are installed in the same cabinet, 38U height.

Entirely self-sufficient with its local control on touchscreen, each power supply in the cabinet can be controlled separately and remotely from a supervisor system via an Ethernet or RS232 link for easy integration in a complex test system.

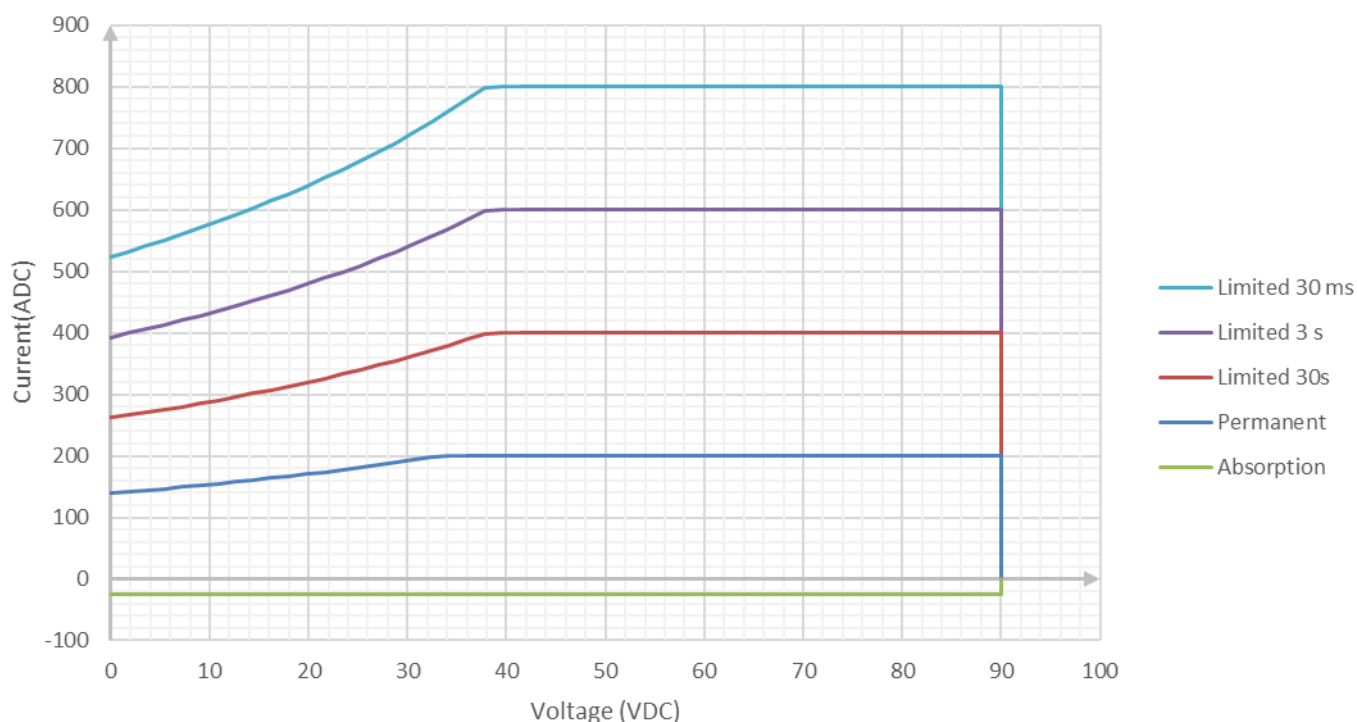


OPERATING DIAGRAMS

Following diagrams explain the relationship between the current and the voltage in the different quadrants. X-axis explain the voltage, Y-axis explain the current.

Continuous operation is allowed “insides areas” curves. Limitations are due to the heating of the power transistors. Operation “outside areas” will result in:

- An immediate switch-off by over-current protection if current is above the limits,
- A break after a delay by thermal protection in case of overheating of the power parts.



PROTECTIONS

Against overload: Voltage limitation

In case of temporary overload, voltage decrease to limit the current. The power supply operates so like in current regulation.

Against a short-circuit on output: output is automatically switched off

Output is switched off and must be reactivated by an action on touchscreen or an external command.

Against overheating: output is automatically switched off

A temperature sensor is installed on each power part. It switches off output in case of overtemperature. After cooling, output must be reactivated by an action on touchscreen or an external command.

LOCAL OR REMOTE CONTROL

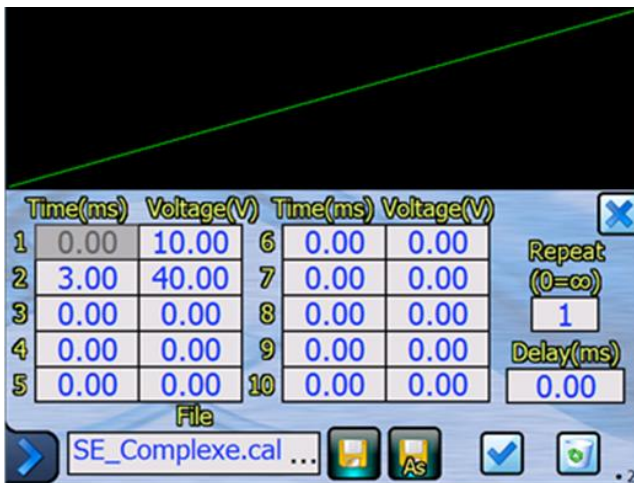
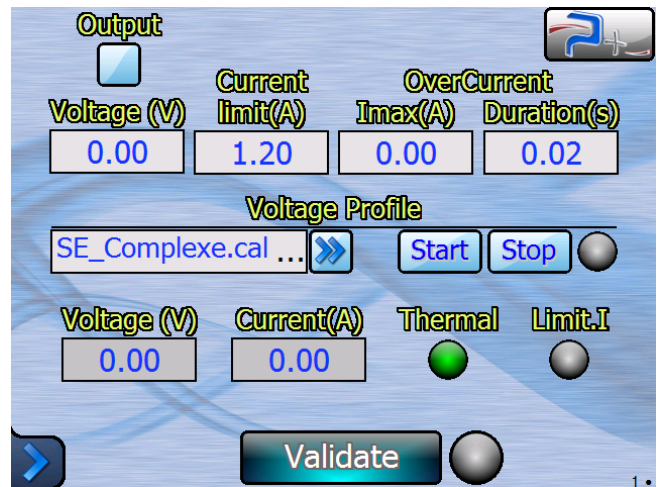
Managed by a Control board, the power supplies have two operating modes:

- **Local control:** The control device equipped with a graphical touchscreen disposed on front panel gives access to all the control functions and the display of the measures.
- **Remote control:** The control device has one TCP/IP Ethernet link and one serial link RS232 for a control through a remote PC.

LOCAL CONTROL

Main screen displays commands, measures and the status of the power supply:

- Output ON / Off
- Voltage programming
- Current programming
- Overcurrent programming
- Voltage profile selection, start and stop
- Measures of voltage and current



The second screen is the voltage profile editor. Up to 100 customized profiles can be stored in power supply flash memory. Time and amplitude are programmable for each step.

Each profile can be executed several times including a delay between each execution.

Other screens are to set up communications links or for the management of variable speed fans.



FEATURES OF THE POWER SUPPLIES

| OUTPUT: POWER FOR EACH OUTPUT | |
|--|--|
| Power | |
| Output power | 18 000 |
| Voltage ranges | one |
| Output voltage | 0~90 VDC |
| Current in source | |
| Permanent | 0~200 ADC |
| Peak 3 s | 600 A |
| Peak 1 s | 800 A |
| Current in sink (1) | |
| Permanent | 25 ADC |
| Max | 200 A |
| Voltage regulation | |
| Accuracy | 0.05% of range + 0.05% of programmed value |
| Resolution | 12 bits |
| Current limitation | |
| Accuracy | 0.1% of range + 0.1% of programmed value |
| Resolution | 12 bits |
| Voltage regulation for a mains variation of +6% -10% | |
| Max | < 0.1% of rated voltage |
| Voltage regulation for a variation of 0 to 100% of the output current | |
| Max | < 0.1% of rated voltage |
| Noise | |
| Max RMS | 0.01% of rated voltage |
| Max peak to peak | 0.04% of rated voltage |
| Variation regarding temperature | |
| Typical | 50 ppm/°C |
| Max | 100 ppm/°C |
| Stability after 15 minutes of operation | |
| Max | < 0.05% of rated voltage |
| Insulation of output versus case ground | |
| Measured at 500 VDC | > 100 MΩ |
| Voltage drop compensation | |
| Max voltage | 4 V (2V on each line) |
| Max length | 30 m |

Notes:

- (1) Sink mode is not programmable by user.



OUTPUT: DYNAMIC FEATURES

| Dynamic mode | |
|--------------------------|--------------|
| Rise time 10%-90% | < 50 μ s |
| Fall time 90%-10% | < 50 μ s |
| Overshoot | < 5 % |
| Recovery time | < 20 μ s |
| Q1 to Q4 transition time | < 10 μ s |

OUTPUT: MEASURES

| Typical accuracy of measurements on touchscreen | |
|---|--|
| Voltage measurement | 0.05% of full scale + 0.05% of measure |
| Current measurement | 0.05% of full scale + 0.05% of measure |
| Images | |
| Voltage image | Max +10V |
| Current image | Max +10V |

INPUT: AMPLITUDE

| Input signal amplitude (external generator) | |
|---|----------------------------|
| Insulation (2) | > 10 M Ω |
| Voltage (full output scale) | 7,07 VRMS / \pm 10V peak |
| Max voltage | \pm 15 V peak |
| Input impedance | 10 k Ω |

MAINS POWER SUPPLY

| Mains network | |
|--|-------------------------------------|
| Number of phases | Three-Phase + Earth without Neutral |
| Voltage (VRMS) | 400 (L-L) \pm 10% |
| Frequency | 47 - 63 Hz |
| Input current | |
| Max at full output power (3) | 80 ARMS / Phase |
| Protection | Magneto-thermal breaker |
| Inrush current | Limited to 2 x max current |
| Dielectric strength mains input versus output connected to case ground | |
| Measured at 2500 VRMS / 50Hz | Current < 10 mA |

Notes:

- (2) The power output is insulated from pilot input.
- (3) This value is when the two outputs are at full power.

| MECANICAL AND ENVIRONMENTAL | |
|--------------------------------|--------------------------|
| Material and surface treatment | |
| Front panel | Aluminum painted RAL7021 |
| Rear panel | Aluminum anodized black |
| Dimensions and weight | |
| Width | 800 mm |
| Depth | 800 mm |
| Height | 1950 mm (38U) |
| Weight | 450 kg |
| Temperature and humidity | |
| Stockage temperature | -10°C à +85°C |
| Operation temperature | +0°C à +40°C |
| Humidity | 10% - 90% non-condensing |
| Noise (fans at full speed) | |
| Measured at 1 m | < 70 dBA |
| Marking | |
| Marking | CE |
| Protection | IP20 |

Power connections are on copper bars on the rear panel, protected by a cover:

- 2 bars for power
- 2 bars for senses



COMMERCIAL REFERENCES

PA-2x18000-DC-90V-200A-HP

Dual DC power supply 18000W – 90V – 200A

OPTIONAL REFERENCE

PA-1x18000-DC-90V-200A-HP

Single DC power supply 18000W – 90V – 200A

DELIVERIES

Power supply is delivered with its mains cable, its user manual, its performances list (acceptance test report), its UE declaration.

Specification may change without notice