



**SPHEREA**  
PUISSANCE PLUS

# LINEAR DC POWER SUPPLIES

## 100 VDC - 600 W / 1000 W / 4000 W

### APPLICATIONS

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

### PERFORMANCES

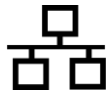
- Insulated output
- Voltage regulation
- Fast transients < 100µs
- High inrush current possibilities (4 x I<sub>n</sub>)
- Signal synthesizer embedded
- Very low internal resistor
- Very low noise S/B > 70 dB
- High accuracy < 0,2%
- High stability < 0,1%



*Non-contractual pictures*



**TOUCHSCREEN**



**ETHERNET**



**RS232**

### DESCRIPTION

The DC power supplies are 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**, they produce no electro-smog and can be used in anechoic chambers.

This **linear technology** allows to generate up to 4 times their rated power during 20 ms and 3 times during 100 ms.

The DC power supplies are “**2-quadrants**” and have 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.

For a maximal security use, the power supplies are equipped with several protection devices:

- Protection against overvoltage, overcurrent, short-circuit on output,
- Protection against overheating using an automatic circuit.

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

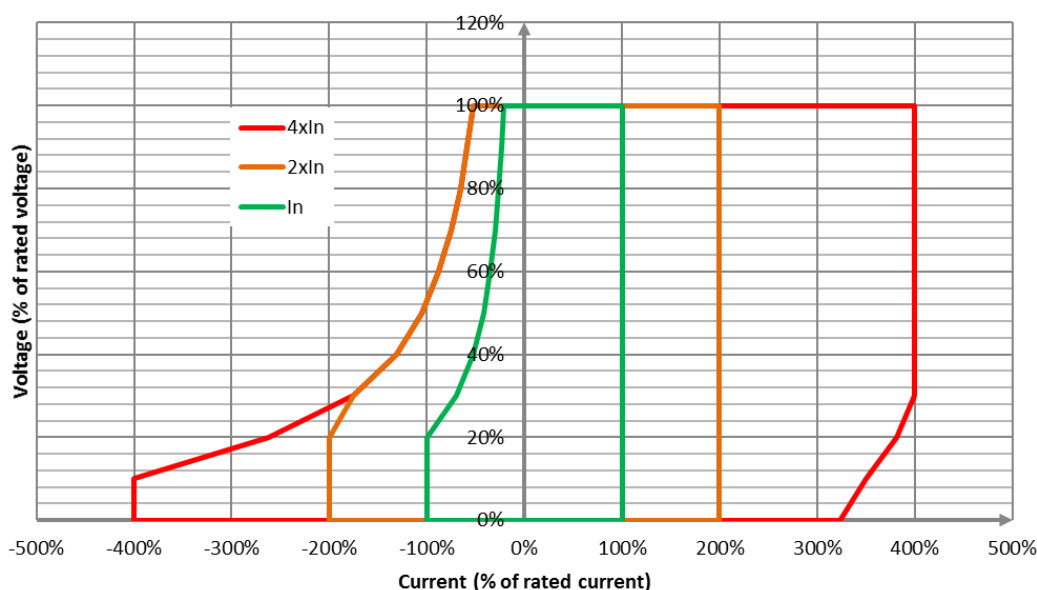


### OPERATING DIAGRAMS

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.



### OVERCURRENT

The DC power supplies in linear technology can generate up to four times their rated current during short times. They operate in voltage regulation with current limitation: if the current is higher than programmed value, a counter starts. After a programmable time between 0.1 and 5 seconds, the power supply reduces its output voltage to reduce current below its programmed value.

Operating limitations are:

- **Green trace:** rated current, permanent operation
- **Orange trace:** 2 times rated current, limited to 200 ms
- **Red trace:** 4 times rated current, limited to 20 ms

### PROTECTIONS

#### Against overload: Voltage limitation

In case of temporary overload, voltage decrease to limit the current.

#### 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

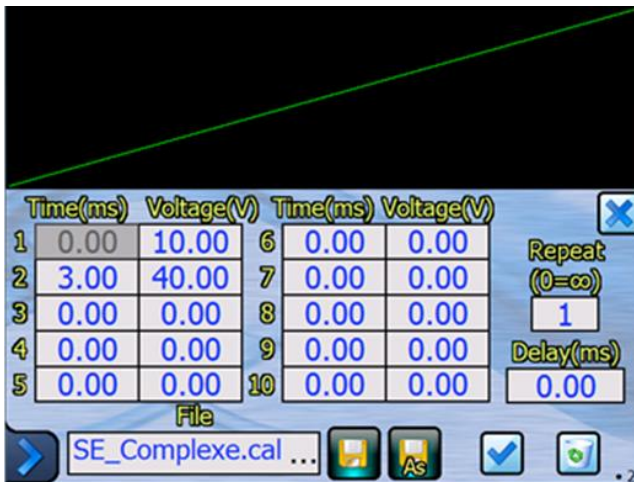
Managed by a Control board, the power supplies have two operating modes:

- **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. Control can be done either using PUISSANCE+ OPS software (not supplied), either directly via instructions TCP/IP or RS232 using customer software.

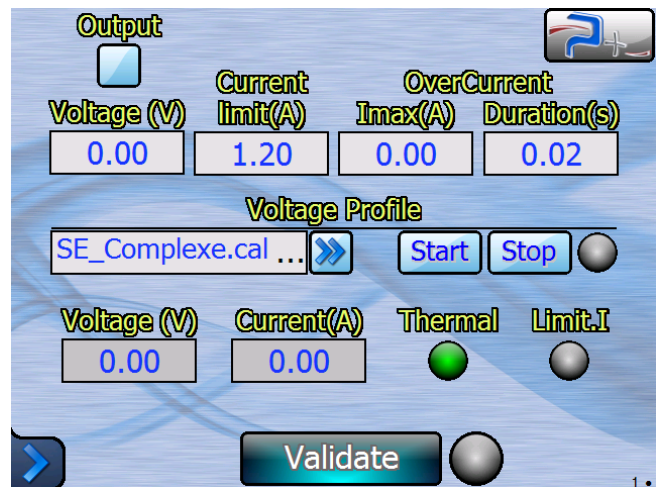
### LOCAL CONTROL

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



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



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.





### FEATURES OF THE POWER SUPPLIES

<b>OUTPUT: POWER</b>			
Power	<b>PS-600 DC-100V-6A</b>	<b>PS-1000 DC 100V-10A</b>	<b>PS-4000 DC 100V-40A</b>
Output power	600 W	1000 W	4000 W
Voltage ranges	one	one	one
Output voltage	0~100 VDC	0~100 VDC	0~100 VDC
Current in source	<b>PS-600 DC-100V-6A</b>	<b>PS-1000 DC 100V-10A</b>	<b>PS-4000 DC 100V-40A</b>
Permanent	0~6 ADC	0~10 ADC	0~40 ADC
Peak 200 ms	12 A	20 A	80 A
Peak 20 ms	24 A	40 A	160 A
Current in sink (1)	<b>PS-600 DC-100V-6A</b>	<b>PS-1000 DC 100V-10A</b>	<b>PS-4000 DC 100V-40A</b>
Permanent	0.75 ADC	1.25 ADC	5 ADC
Max	6 A	10 A	40 A
<b>Voltage regulation</b>			
Accuracy	0.02% of range + 0.02% of programmed value		
Resolution	12 bits		
<b>Current limitation</b>			
Accuracy	0.1% of range + 0.1% of programmed value		
Resolution	12 bits		
<b>Voltage regulation for a mains variation of +6% -10%</b>			
Max	< 0.1% of rated voltage		
<b>Voltage regulation for a variation of 0 to 100% of the output current</b>			
Max	< 0.1% of rated voltage		
<b>Noise</b>			
Max RMS	0.01% of rated voltage		
Max peak to peak	0.04% of rated voltage		
<b>Variation regarding temperature</b>			
Typical	50 ppm/°C		
Max	100 ppm/°C		
<b>Stability after 15 minutes of operation</b>			
Max	< 0.05% of rated voltage		
<b>Insulation of output versus case ground</b>			
Measured at 500 VDC	> 100 MΩ		
<b>Voltage drop compensation</b>			
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 $\mu$ s
Fall time 90%-10%	< 50 $\mu$ s
Overshoot	< 5 %
Recovery time	< 20 $\mu$ s
Q1 to Q4 transition time	< 10 $\mu$ 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

### MAINS POWER SUPPLY

Mains network	PS-600 DC-100V-6A	PS-1000 DC 100V-10A	PS-4000 DC 100V-40A
Number of phases	One-Phase + Neutral + Earth	One-Phase + Neutral + Earth	Three-Phase + Earth without Neutral
Voltage (VRMS)	230 (L-N) $\pm$ 10%	230 (L-N) $\pm$ 10%	400 (L-L) $\pm$ 10%
Frequency	47 - 63 Hz		
Input current	PS-600 DC-100V-6A	PS-1000 DC 100V-10A	PS-4000 DC 100V-40A
Max at full output power	5 ARMS	8 ARMS	13 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		



<b>MECANICAL AND ENVIRONMENTAL</b>			
<b>Material and surface treatment</b>			
Front panel	Aluminum painted RAL7021		
Rear panel	Aluminum anodized black		
<b>Dimensions and weight</b>	<b>PS-600 DC-100V-6A</b>	<b>PS-1000 DC 100V-10A</b>	<b>PS-4000 DC 100V-40A</b>
Width	483 mm (19 inches)		
Depth	600 mm		
Height	177 mm (4U)	222 mm (5U)	355 mm (5U)
Weight	20 kg	33 kg	100 kg
<b>Temperature and humidity</b>			
Stockage temperature	-10°C à +85°C		
Operation temperature	+0°C à +40°C		
Humidity	10% - 90% non-condensing		
<b>Noise (fans at full speed)</b>			
Measured at 1 m	< 70 dBA		
<b>Marking</b>			
Marking	CE		
Protection	IP20		

## COMMERCIAL REFERENCES

### PS-600-DC-100V-6A

DC power supply 600W – 100V – 6A

### PS-1000-DC-100V-10A

DC power supply 1000W – 100V – 10A

### PS-4000-DC-100V-40A

DC power supply 4000W – 100V – 40A

## DELIVERIES

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

Specification may change without notice