



SPHEREA
PUISSANCE PLUS

DC POWER SUPPLY 7800W - 65V - 120 A REVERSIBLE

APPLICATIONS

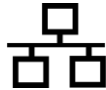
- High accuracy current generator
- High accuracy voltage generator
- Operating on inductive loads
- Charge and discharge of batteries or supercapacitors
- Current reversible to operate as a DC load at full power

PERFORMANCES

- Can be used as an amplifier
- Several devices can be connected in parallel to increase power
- Insulated output:
 - Versus mains
 - Versus its analog input
- Source and Sink in DC
- High inrush currents 4 x Rated current
- Very low internal resistance
- Very low noise S/B > 70 dB
- High accuracy < 0,2%
- High stability < 0,1%



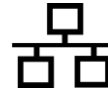
TOUCH SCREEN



ETHERNET



RS232



MODBUS TCP

DESCRIPTION

This DC power supplies is “2 quadrants” and operate I voltage regulation with current limitation:

- Its analogic input receives a “Pilot” signal with amplitude $0 \sim \pm 10$ V peak coming from its internal synthetizer or from an external device,
- Two analogic outputs insulated from power output return images of voltage and current with an amplitude of $0 \sim \pm 10$ V peak.

The **linear** technology of this power supply allows:

- To provide power pics up to 4 times its rated power during 20 ms,
- An easy integration for “Real Time” or “Power Hardware In the Loop” simulation in association with simulators using its “Pilot” input and its “Image” outputs,
- An instantaneous transition between quadrants “Source” and “Sink”.

The output is floating, insulated from mains and from case ground. This allows to connect one output pole, “+” or “0V” to earth.

Entirely self-sufficient with its local control on touchscreen, they can be controlled remotely from a supervisor system via an Ethernet, ModBus TCP or RS232 link.



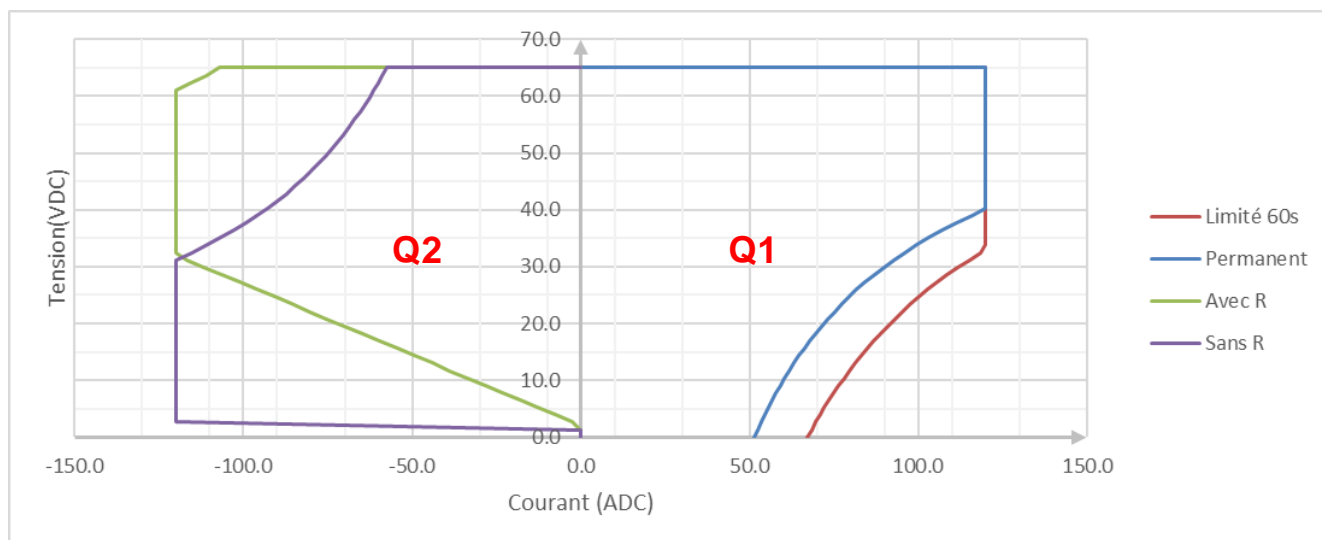
OPERATING DIAGRAMS

This diagram explains the relation entre between voltage and current:

- Quadrant “Q1”: device is used as a source:
 - **Blue trace:** permanent operation
 - **Red trace:** operation limited to 60 s
- Quadrant “Q2”: device is used as a sink:
 - **Green trace:** a resistor of value 0.25 ohms is connected between power blocks and output. Minimal operating voltage is limited by the drop voltage id the resistor (option PS-RC2243-L100)
 - **Purple trace:** without serial resistor, input power is limited by the temperature of the power blocks

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.



LOCAL OR REMOTE CONTROL

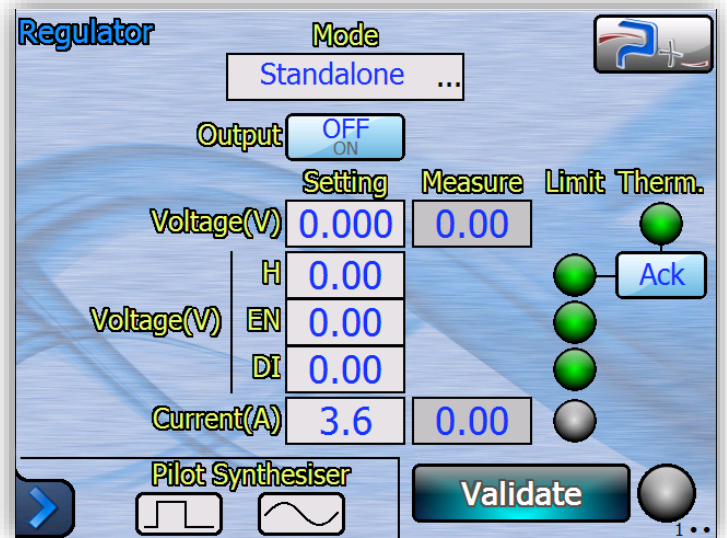
Managed by a Control board, the power supplies have two operating modes:

- **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 or MODBUS TCP Ethernet link and one serial link RS232 for a control through a remote PC.

TOUCH SCREEN USING LOCAL CONTROL

On mains screen are several objects:

- Mode:
 - Standalone (one device)
 - Master or Slave (several devices in parallel)
- Output ON or OFF
- Voltage programming and measure
- Current programming and measure:
 - Positive = source
 - Negative = sink
- Maximal and minimal operating voltage:
 - If voltage > H: output is disabled
 - If voltage > EN, output is enabled
 - If voltage < DI, output is disabled
- Display voltage status and overheating.



Example of main screen

The analogic "Pilot Input" is used to program the current using an external voltage reference of 0~±10 V and the formula:

$$\text{Current} = \text{Programmed current} \times \text{Pilot Input} / 10V$$

If user connects the analogic "Pilot Input" to the analogic "Pilot output", the current will be:
Current = Programmed current

FEATURES

OUTPUT: POWER	
Power	
Rated power	7800 VA
Only one range	65V-120A
Voltage and current in SOURCE	
Output voltage	0 to 65 VDC
Output current	0 to 120 ADC (1)
Voltage and current in SINK	
Input voltage	2,0 (min) to 65 VDC
Input current	0 to 120 ADC (2)
Voltage regulation	
Accuracy	0.05% of full scale + 0.05% of programmed value
Resolution	12 bits
Current limitation	
Accuracy	0.05% of full scale + 0.05% 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 current variation of 0 to 100%	
Max	< 0.1% of rated voltage
Noise	
Max RMS	0.02% of rated voltage
Max peak to peak	0.3% of rated voltage
Variation regarding temperature	
Typical	50 ppm/°C
Max	100 ppm/°C
Stability after 15 mn	
Max	< 0.05% of rated voltage
Insulation of output versus case ground	
Measured at 500 VDC	> 100 MΩ

Notes:

- (1) Inside limits of part "Q1" of operating diagram on page 2.
- (2) Inside limits of part "Q2" of operating diagram on page 2.

OUTPUT: TIME AND FREQUENCY

Measurements on full scale	
Rise time 10% / 90%	< 1500 μ s
Fall time 10% / 90%	< 1500 μ s
Transfer time	< 10 μ s
Transition from Q1 to Q4	< 10 μ s

OUTPUT: IMAGES AND MEASURES

Images outputs (3)	
Number	2
Type	± 10 V crête
Scale factor in voltage	9.4 V for 65 V
Scale factor in current	9.4 V for 120 A
Insulation measured at 500 VDC	> 100 M Ω
Connecting	BNC sockets
Typical accuracy of measurements on touch screen	
Voltage measurement	0.1% of full scale + 0.1% of measure
Current measurement	0.1% of full scale + 0.1% of measure

Note:

- (3) The analogic outputs "Image" are insulated of power output.

PILOT INPUT AND OUTPUT: AMPLITUDE (4)

Input signal from an external device	
Insulation (5)	> 10 M Ω
Scale factor in source	+10V for 100% of full scale
Scale factor in sink	-10V for 100% of full scale
Input impedance	10 k Ω
Connecting	BNC socket

Note:

- (4) The analogic "Pilot output" is used to program current value.
 (5) "Pilot" input and output are insulated from power output.

“INHIBITION” INPUT	
To enable or disable output	
Type	Dry contact
Max current to switch	1 ADC under 24 VDC
Insulation measured at 500 VDC	> 100 MΩ

“INHIBITION” input acts directly on output relay command. Un contact normally open must be closed between the two pins of this input to allow generation or absorption.

MAINS	
Mains network	
Type	Three-Phase + earth without Neutral
Voltage	400 VRMS ±10%
Frequency	47 - 63 Hz
Mains current	
Max at full output power	17 ARMS
Protection	Magneto thermal breaker
Inrush current	Limited to 2 x max current
Dielectric strength mains versus output connected to case ground	
Measured at 2500 VRMS / 50Hz	Current < 10 mA

MECANICAL ET ENVIRONMENTAL	
Material and surface treatment	
Front panel	Aluminum painted RAL7021
Rear panel	Aluminum anodized black
Dimensions and weight	
Width	483 mm (19")
Depth	600 mm
Height	355 mm (8U)
Weight	120 kg
Temperature and humidity	
Stockage temperature	-10°C to +85°C
Operation temperature	+0°C to +40°C
Humidity	10% - 90% non-condensing
Noise (fans at full speed)	
Measured at 1 m	< 70 dBA
Marking	
Marking	CE
Protection	IP20

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.

Inhibition input: output cannot be switched on

A link must be set between two pins of an auxiliary socket to allow generation or absorption.

COMMERCIAL REFERENCE

PS-7800-DC-65V-120A-ABOS

DC power supply 7800 W, max voltage 65VDC, max current ± 120 ADC

PS-RC2243-L100: serial resistor inserted between power supply and user output. It allows to reach the green trace described on page 2. This option includes installation of power supply in a cabinet height 29U (1570 mm).

DELIVERIES

Power supply is delivered with its User Manual, its performances list (acceptance test report) Its UE certificates.

Specification may change without notice