

SPS

10 kVA - 200 kVA



HIGHLIGHTS

- **Compatible with On-grid and Off-grid systems**
- **Quality power supply to loads with the integration of photovoltaic energy**
- **PV plants integration with Aros inverters**

Sirio Power Supply is a device that can both increase the functionality of an On Grid photovoltaic system with AROS Solar Technology inverters as well as create an Off-grid system. In fact, thanks to energy storage which is suitably sized based on the desired load characteristics and battery life, the system can store energy produced from a renewable source which can then be used later or when there is no radiation, in addition to making the system independent of the existence of electricity distribution grid. Hence this solution allows the self-consumption of the energy produced by the centre's photovoltaic system to

be managed in the best possible manner. The battery charging is done from the photovoltaic inverter or the electric grid/generating set. The generous dimensions of the main internal components allows a higher output value to be obtained and, to guarantee the system performance, the presence of the inverter's output transformer ensures the galvanic separation between the load and the batteries.

Battery Care System

The monitoring and management of the accumulators is transferred to the Battery Care System program which can safeguard the efficiency and reliability of the batteries with following services:

- absence of ripple current with charged battery;
- charging at two voltage levels to optimise the charging current and reduce the capacity recovery times;
- compensation of the charging voltage depending on the temperature and protection against deep discharge, to reduce the phenomena of ageing and prolong battery life;
- monitor the maximum charge time to reduce the consumption of the electrolyte and further prolong battery life;
- Battery tests to diagnose performance impairment or accumulator breakdowns in time;
- Management of the discharge cycles depending on the charge state of the battery.

The device is compatible with the most common batteries used for photovoltaic applications characterised by a high number of charge and discharge cycles. To further optimise the performances, the Battery Care System also allows the manual setting of the voltage, current and charge duration parameters in case open-vented or NiCd batteries are used.

Applications

The SPS devices are best installed both in places that have a grid as well as in geographically remote, rural or isolated areas that have a heavy energy demand but with unreliable grid power or power which is provided through generating sets; thus in cases where energy needs to be stored—preferably from economical sources such as the sun. Let us look at some examples in detail:

Areas where the grid is available and there is the option of net metering ⁽¹⁾

Thanks to the batteries, the system optimises the self-consumption of the energy produced from the photovoltaic field and supplies only the grid power that is not used to supply the load or charge the battery.

Advantages:

- meets the needs of current peaks by using the energy from the battery and not the grid
- uses energy produced when the distribution grid tariffs are most expensive
- feeding energy into the grid when the tariffs are more convenient
- optimise the self-consumption period and hence reduce the TCO of the PV plants

(1): Check if this operating condition is legally permitted in the country of installation.

Areas where the grid is available without net metering

In the areas where the energy cannot be fed into the grid, the entire production of the photovoltaic field can be used to supply the load and charge the battery. Thanks to the batteries, this system allows the self-consumption of the energy produced by the photovoltaic field to be optimised.

Advantages:

- meets the needs of current peaks by using the energy from the battery and not the grid
- increase the self-consumption level of the energy produced
- reduce the TCO of the system

Areas where the grid is not available (Off-grid)

Thanks to photovoltaic energy, this system allows electric current to be brought to areas where electricity is not available and such is produced only by generating sets.

Advantages:

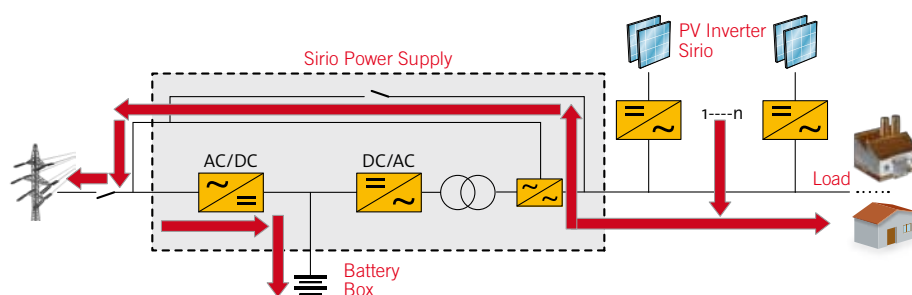
- meet the needs of current peaks by using the energy from the battery and not the generating sets
- reduce the use of the generating sets to the minimum
- lower fuel consumption and hence lower operational costs
- lesser expenses and inconvenience relating to transport of fuel to remote areas

ON-GRID SYSTEM WITH OPTION OF NET METERING

Condition no. 1

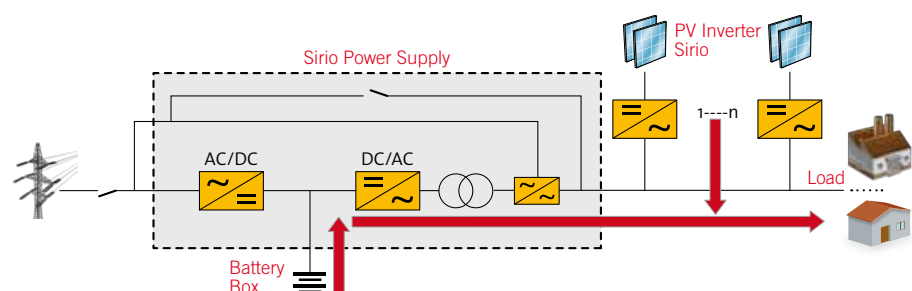
In case of sufficient sunlight, the system supplies the load and charges the battery; the grid must be available. The battery charge level is given by the formula:

$$\text{kW (PV Inverter)} - \text{kW (load)} = \text{kW (battery charge)}$$



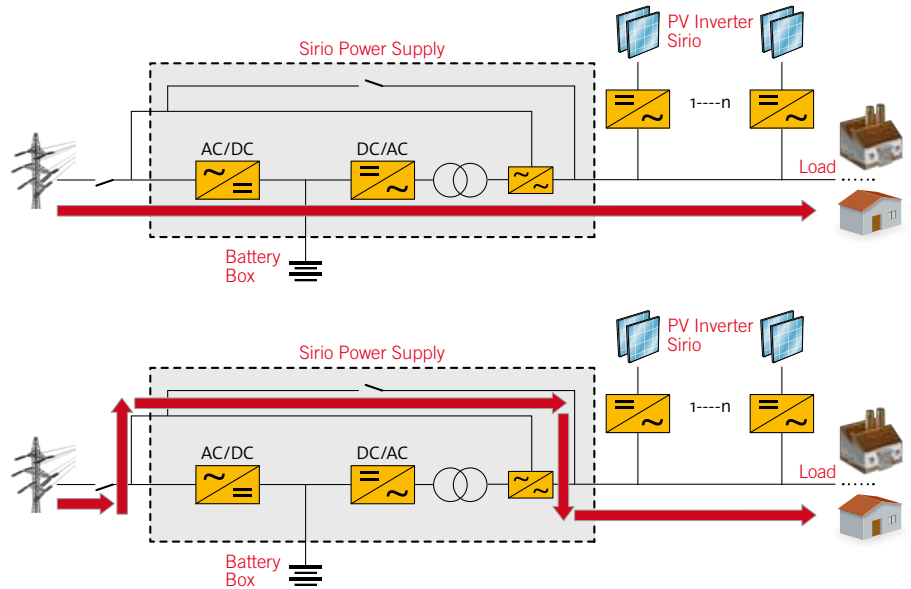
Condition no. 2

In case of insufficient sunlight, the load is supplied by the PV inverter with the aid of the battery.



Condition no. 3

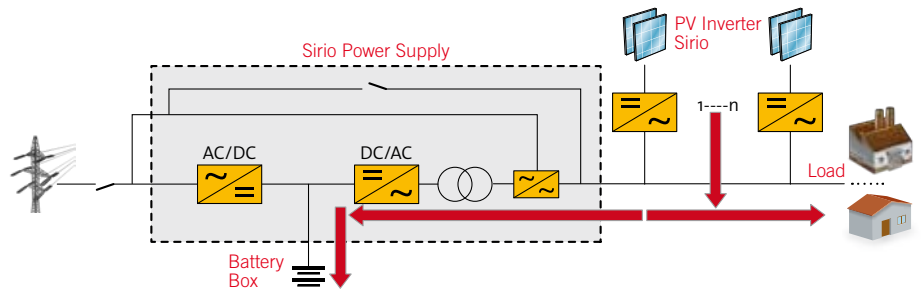
In case of insufficient sunlight and a discharged (or inhibited) battery, the load is powered by the grid through the inverter or the bypass (energy saving mode).



ON-GRID SYSTEM WITHOUT OPTION OF NET METERING

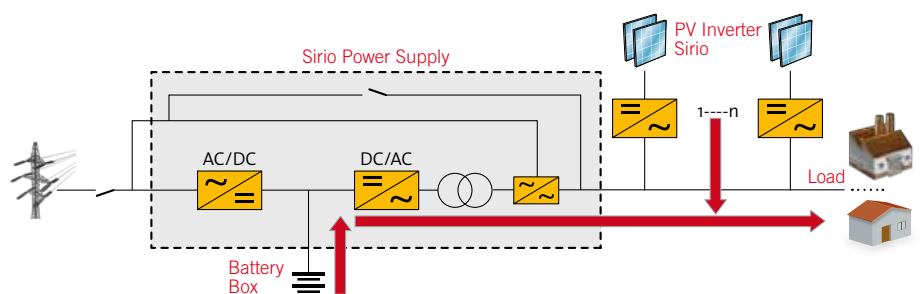
Condition no 1

In case of sufficient sunlight, the FV inverters supply the load and charges the battery from the SPS output; thus even if the mains supply is not available. If the load is transferred to the bypass due to a malfunction in the SPS or a current spike that is above permitted levels, the FV inverters are immediately switched off. This prevents even a small amount of energy from being transferred to the grid.



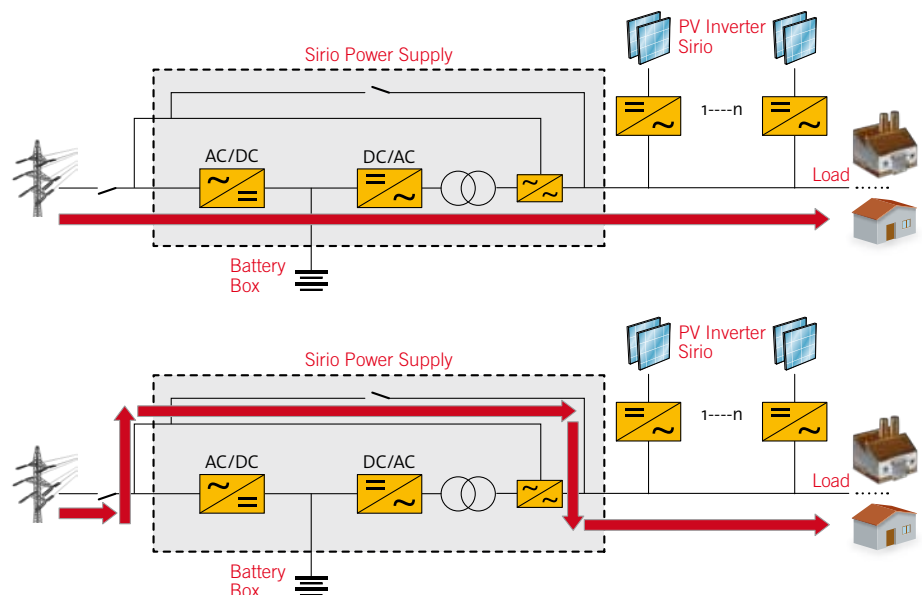
Condition no. 2

In case of insufficient sunlight, the load is supplied by the FV inverter with the aid of the battery.



Condition no. 3

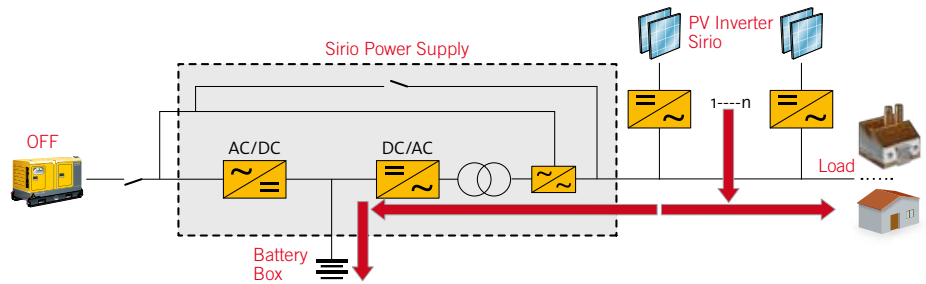
In case of insufficient sunlight and a discharged (or inhibited) battery, the load is supplied by the grid through the inverter or the bypass (energy saving mode).



OFF-GRID SYSTEM WITH GENERATING SETS OR EQUIVALENT

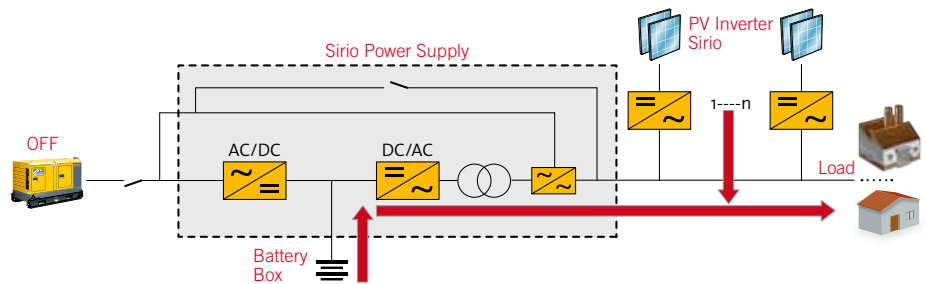
Condition no. 1

In case of sufficient sunlight, the FV inverters supply the load and charges the battery from the SPS output; thus the generating sets can be switched off.



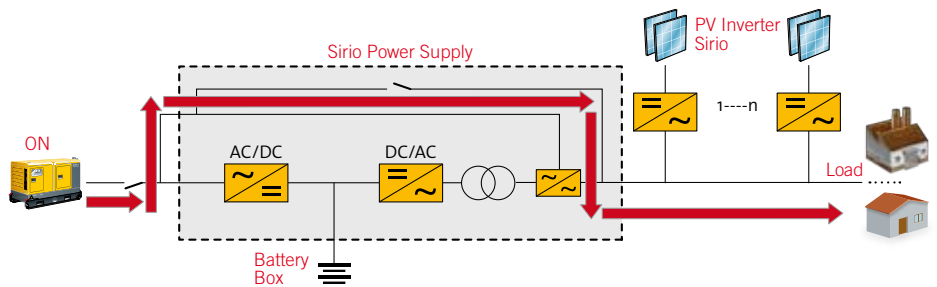
Condition no. 2

In case of insufficient sunlight, the load is supplied by the FV inverter with the aid of the battery. For optimum use of generating sets, the battery discharge level can be set.



Condition no. 3

In case of lack of sunlight, the FV inverters are switched off and the battery discharged; the load is supplied by the generating set.



MODEL	SPS 10		SPS 15		SPS 20		SPS 30		SPS 40	
INPUT										
Rated voltage	400 Vac 3Ph									
Voltage tolerance	+ 20% / - 25 %									
Frequency	45 to 65 Hz									
Soft start	0 to 100 % in 125 sec (presettable)									
BY-PASS										
Rated voltage	400 V 3Ph + N (± 20 %, presettable)									
Frequency	50 o 60 Hz									
OUTPUT										
Rated power (kVA)	10	15	20	30	40					
Active power (kW)	9	13.5	18	27	36					
Rated voltage	400 V 3Ph ± 20 % (presettable)									
Frequency	50 o 60 Hz									
Static stability	± 1%									
Dinamic stability	± 5%									
Voltage distorsion with linear load	1 % typ, 2 % Max									
Crest factor (Ipeak/Irms) – EN62040-3	3:1									
Voltage distorsion with non-linear load	< 3 %									
Overload	110 % for 60 min, 125 % for 10 min, 150 % for 1 min									
BATTERIES										
Type	VLRA AGM /GEL; NiCd for PV applications									
Rated voltage	384 Vdc									
Voltage residual ripple	± 1%									
Maximum charge current from SPS Output (PV Inverter)	25A	38A	50A	75A	100A					
SYSTEM										
Dimensions (WxDxH)	555x740x1400									
Weight (kg)	200	220	275	315	340					
Environment operating temperature	da 0 a 40°C									
RH	< 95 % non-condensing									
Colour	RAL 7035									
Protection level	IP20									
Standards	Safety IEC EN 62040-1; EMC IEC EN 62040-2; Performances IEC EN 62040-3									

MODEL	SPS 60	SPS 80	SPS 100	SPS 120	SPS 160	SPS 200
INPUT						
Rated voltage	400 Vac 3Ph					
Voltage tolerance	+ 20% / - 25 %					
Frequency	45 to 65 Hz					
Soft start	0 to 100 % in 125 sec (presettable)					
BY-PASS						
Rated voltage	400 V 3Ph + N (± 20 %, presettable)					
Frequency	50 o 60 Hz					
OUTPUT						
Rated power (kVA)	60	80	100	120	160	200
Active power (kW)	54	72	90	108	144	180
Rated voltage	400 V 3Ph ± 20 % (presettable)					
Frequency	50 o 60 Hz					
Static stability	± 1%					
Dinamic stability	± 5%					
Voltage distorsion with linear load	1 % typ, 2 % Max					
Crest factor (Ipeak/Irms) – EN62040-3	3:1					
Voltage distorsion with non-linear load	< 3 %					
Overload	110 % for 60 min, 125 % for 10 min, 150 % for 1 min					
BATTERIES						
Type	VLRA AGM /GEL; NiCd for PV applications					
Rated voltage	384 Vdc		396 Vdc			
Voltage residual ripple	± 1%					
Maximum charge current from SPS Output (PV Inverter)	150A	200A	247A	296A	395A	494A
SYSTEM						
Dimensions (WxDxH)	800x740x1400		800x800x1900			
Weight (kg)	440	520	620	650	730	830
Environment operating temperature	da 0 a 40°C					
RH	< 95 % non-condensing					
Colour	RAL 7035					
Protection level	IP20					
Standards	Safety IEC EN 62040-1; EMC IEC EN 62040-2; Performances IEC EN 62040-3					