



# RS Hybrid single-phase



## HIGHLIGHTS

- **Plug & play installation**
- **Max PV power overload 150%**
- **LV lithium ion phosphate batteries**
- **Connection of up to 6 battery modules for a total capacity of 30 kWh**
- **Large discharge capacity**
- **Suitable for AC side retrofitting**
- **Integrated backup module up to Max rated power**
- **IP65**
- **Natural ventilation**
- **Can be paralleled up to 3 units**

### **Riello Solartech presents the evolution of its range of hybrid inverters**

integrated with an Energy Storage system for residential applications. RS Hybrid 3.6 and 6.0 single-phase, combined with lithium-ion battery modules, allow you to expand the functions of an On Grid photovoltaic system and at the same time create a backup with the possibility of dedicating a preferential line to certain loads in the event of a power failure. With an attractive design, simple plug & play installation, and energy accumulation (storage) scalable up to 6 modules of 5.12 kWh in parallel configuration, the system allows you to store the energy produced by the photovoltaic system and not self-consumed, to be able to use it in the evening or in periods of low solar radiation. The system is thus independent from the electricity distribution network and

promotes energy savings. The single-phase RS Hybrid inverters, as in the previous generation, are available in 3.6 and 6 kW power ratings, are equipped with DC and battery side disconnectors, have category 2 surge arresters for immediate plug & play installation (which does not require additional field cadres) and recharge the batteries themselves.

To always ensure maximum configuration flexibility, efficiency optimization and extended energy production time, the RS Hybrid inverters are characterized by 2 PV inputs which converge on 2 MPPT trackers. The MMPPT trackers are independent and equipped with a self-learning technology with a wide range and input voltage and a low delivery threshold towards the network. The ventilation is natural with a large and efficient heat sink to ensure maximum heat exchange and total silence during operation.



Finally, the inverters are equipped with an integrated backup module which, in the event of a mains failure, supports the load until the battery returns (tripping time less than 10ms).

To optimize the backup it is possible to define a line that supports the full rated power of the inverter.

Management of the inverter is simple and intuitive: there are 6 LEDs on the front which allow you to quickly identify its operating status or signal the presence of any alarms. There are many communication

possibilities including: Bluetooth, RS485 (ModBus), optional Wi-Fi and Ethernet (optional): all can interface with the configuration APP and the monitoring software for viewing and checking the system status in real time (APP and WEB supervision portal).

**IP65**

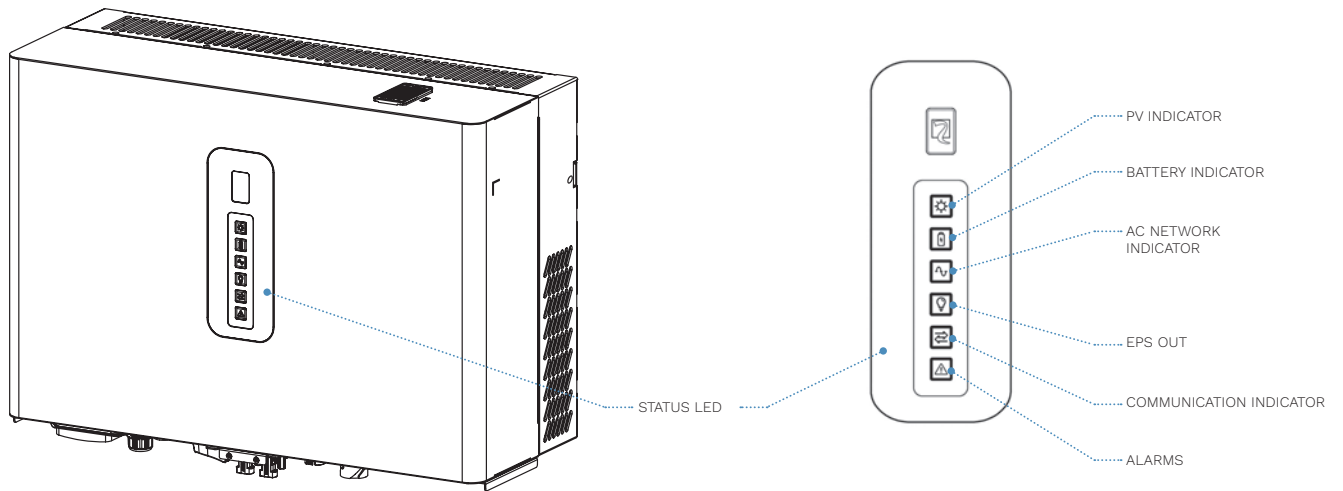
The RS Hybrid inverters have an IP65 system protection rating which makes them suitable for outdoor installation.

**LITHIUM-ION-PHOSPHATE BATTERIES**

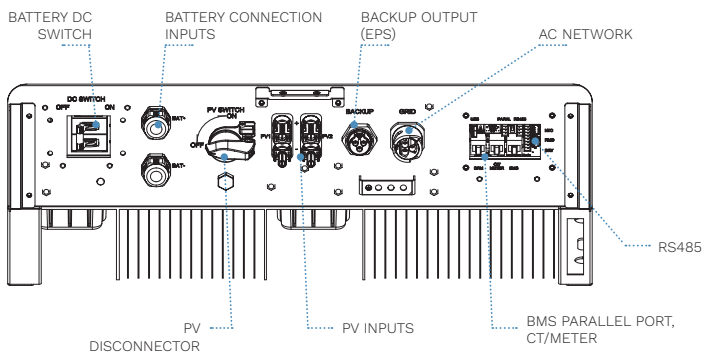
The lithium-ion-phosphate batteries for the RS Hybrid storage system are available in isolated low voltage modules (51.2 Vdc) for greater safety in residential settings, with a capacity of 100 Ah (5120 Wh). The system manages scalability of up to six battery modules connected in parallel and the BMS (Battery Management System) is integrated in each individual battery module; this technological choice avoids the risk of a total lack of use of the system in the event of problems on a single battery module. The BMS also includes overload, overcurrent and overtemperature protection. The batteries have a high discharge capacity and an operating temperature between -20°C and 55°C. The whole system is safe and guarantees 100% protection for the end user thanks to the detection of possible deterioration of the cells and/or other components.



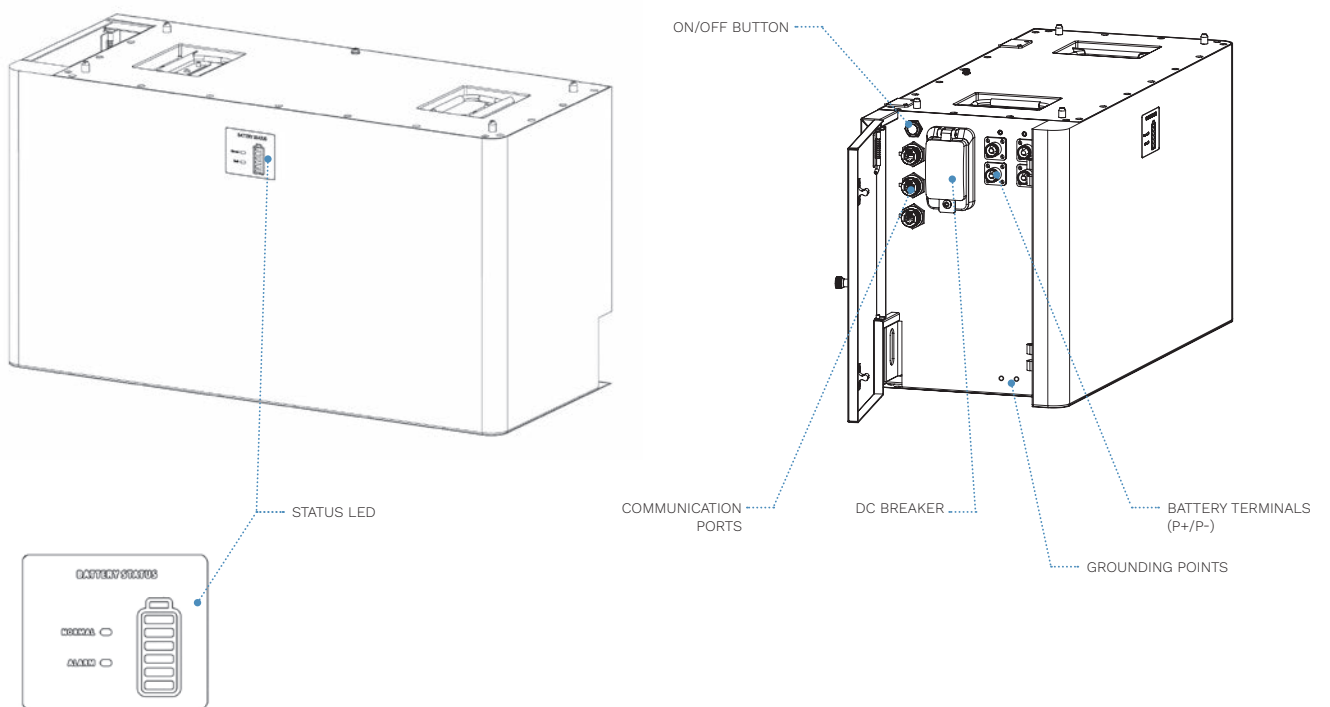
## INVERTER MODULE



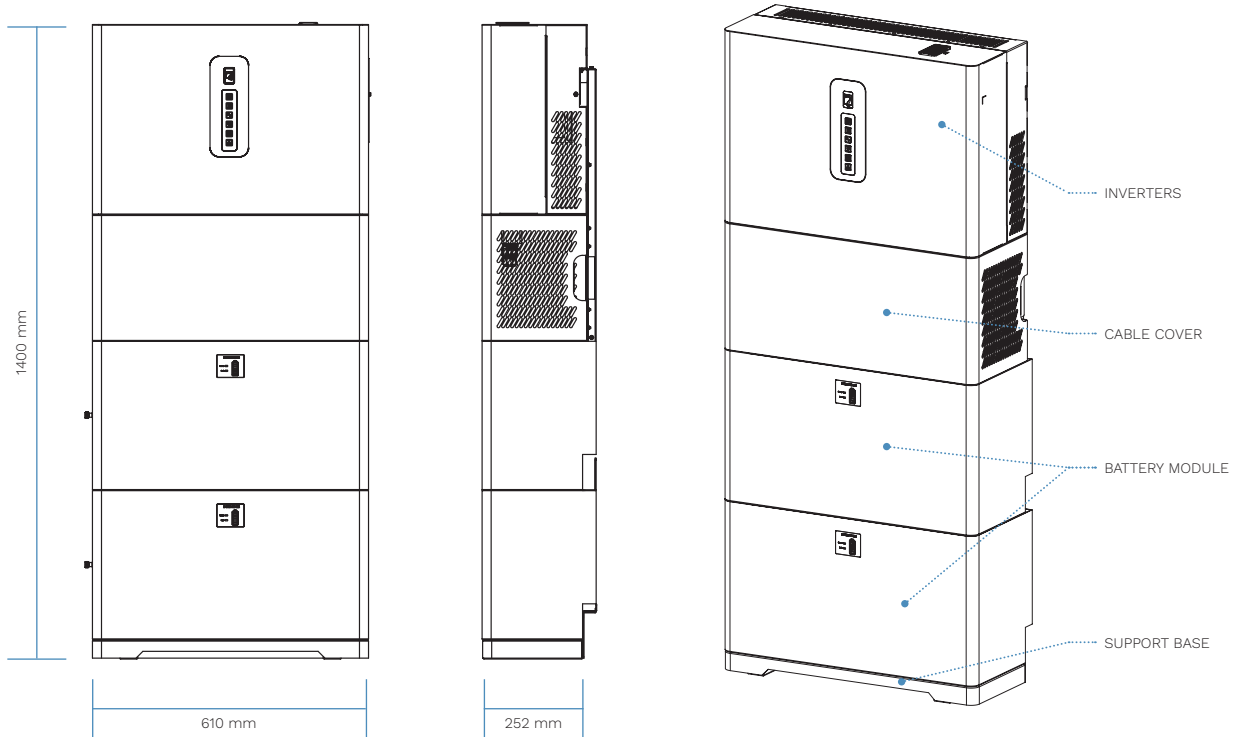
### Bottom view



## BATTERY MODULE

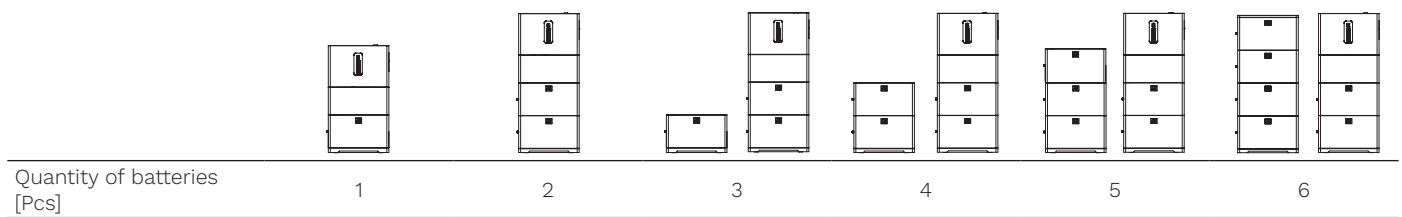


## EXAMPLE FOR A TYPICAL SYSTEM WITH 2 PARALLEL BATTERIES AND INVERTER



## CONFIGURATION AND BATTERY CAPACITY

One or more battery modules (RS BATLIO 5120) can be stacked to expand the overall system capacity. Each battery has its own power control module. The system supports up to six battery modules in parallel, with the following capacities and characteristics:



SYSTEM CONFIGURATIONS	1 battery	2 batteries	3 batteries	4 batteries	5 batteries	6 batteries
Inverter type	Hybrid inverter					
Rated output power (W)	3600/6000					
Battery type	LFP (LiFePO4)					
Quantity of batteries [Pcs]	1	2	3	4	5	6
Battery total energy [kWh]	5.12	10.24	15.36	20.48	25.6	30.72
Usable battery energy [kWh]	4.91 (96% DoD)	10.24 (100% DoD)	15.36 (100% DoD)	20.48 (100% DoD)	25.60 (100% DoD)	30.72 (100% DoD)
Degree of protection	IP65					
Weight [kg]	79.2 (3.6) 84.3 (6.0)	131.8 (3.6) 136.9 (6.0)	184.4 (3.6) 189.5 (6.0)	238.0 (3.6) 242.1 (6.0)	289.6 (3.6) 294.7 (6.0)	342.2 (3.6) 347.3 (6.0)
Dimension (WxHxD) [mm]	610x1072x252	610x1402x252	610x1402x252 610x372x252	610x1402x252 610x702x252	610x1402x252 610x1032x252	610x1402x252 610x1362x252

## INVERTER MODULE

MODEL	RS 3.6 HYBRID	RS 6.0 HYBRID
<b>EFFICIENCY</b>		
Maximum efficiency [%] (PV to Grid)	95.7	96.6
Maximum efficiency (AC to BAT) [%]	92.3	92.7
Maximum efficiency (BAT to AC) [%]	92.6	92.8
Rated battery voltage [V]	51.2	
Allowable battery voltage range [V]	40 - 60	
Maximum charge/discharge current [A]	60 / 60	120 / 120
<b>INPUT</b>		
Maximum PV input power [W]	9000 (4500/4500)	
Maximum PV input voltage [V]	550	
Minimum PV input voltage [V]	70	
Rated PV Input Voltage [V]	360	
Maximum input current (input A/ input B) [A]	15 / 15	
Maximum short circuit current (input A/input B) [A]	20 / 20	
Starting operating voltage [V]	90	
MPPT operating voltage range [V]	90 ÷ 520	
Number of MPPT trackers	2	
String per MPP tracker	1	
<b>OUTPUT</b>		
Rated AC output power [W]	3600	6000
Maximum apparent AC power [VA]	3960	6000
Maximum active AC power (PF=1) [W]	3600	6000
Maximum current AC output [A]	18	27.2
Nominal output voltage [V]	230	
Output voltage range [V]	230 ±5%	
Grid voltage range (V)	176 ÷ 264 (according to local standard)	
Rated Grid Frequency [Hz]	50 / 60	
Grid frequency range [Hz]	45-55 / 55-65	
Current Harmonic Distorsion (THDi) [%]	<5 (nominal power)	
Direct current injection [%]	<0.5 In	
Power factor	1 @ rated power (adjustable 0.8 inductive – 0.8 capacitive)	
<b>BACKUP</b>		
Nominal output voltage [V]	230	
Output voltage range [V]	230 ±5%	
Nominal output frequency [Hz]	50 / 60	
Output frequency range [Hz]	50 / 60 (±0.2 %)	
Nominal output power [VA]	3600	6000
Nominal output power [W]	2800 @ 51.2 V battery voltage	5500 @ 51.2 V battery voltage
Nominal output current [A]	15.6	26
Output voltage DC component [mV]	≤200	
Output overload capacity [%]	≥105 for 1 s	
Transfer time [ms]	10 (typical), 20 (maximum)	
THDV	<3% (Rated R Load)	
<b>OVERALL SPECIFICATION</b>		
Type	Transformer-free	
Protection level	IP65	

MODEL	RS 3.6 HYBRID	RS 6.0 HYBRID
Overvoltage category battery input	I	
Overvoltage category PV input	II	
Overvoltage category AC output	II	
Protection class	I	
Battery overcurrent protection	DC Circuit Breaker	
Pollution degree	PDIII acc. IEC60664-1 (internal reduced to PDII)	
Cooling	Natural cooling	
Operating temperature range [°C]	-25 ÷ 60 (up to 40 °C without derating)	
Storage temperature range [°C]	-30 ÷ 65	
Relative humidity range [%]	0 ÷ 95	
Maximum operating altitude [m]	4000 (up to 2000 without derating)	
Noise level [dB] (@ 1m)	<30	
Dimensions (WxDxH) [mm]	610x232x458	
Weight [Kg]	26.6	31.7
Weight (packed) [kg]	46	49
PV connection	MC4 / H4	
Battery connection	Connettore CC dedicato	
AC connection way (grid & back up)	Connettore CA dedicato	

## BATTERY MODULE

MODEL	RS BATLIO 5120
Battery type	LFP (LiFePO4)
Rated battery voltage [V]	51.2
Battery voltage range [V]	44.8 ÷ 58.4
Battery module energy [kWh]	5.12
Maximum charge/discharge current [A]	100 / 100
Maximum modules in parallel [Pcs]	6
Operating temperature range for charge [C°]	0 ÷ 45
Operating temperature range for discharge [C°]	-20 ÷ 55
Number of cycles	≥4.000
Dimensions (WxDxH) [mm]	610x252x330
Weight (net) [kg]	54.5
Overcurrent protection	DC Circuit Breaker
Communication protocol	CAN
Certification	IEC 62619:2017; EN 62619:2017; IEC 61000-6/2/4:2019; UN 38.3: Rev.7
<b>COMMUNICATION</b>	
Display	APP + LED
Communication	RS485 / Bluetooth / WI-FI/ Ethernet (optional)
<b>CERTIFICATES</b>	
Grid	CEIO-21:2022; NTS Type A 2.0 (UNE 217002:2020; RD647:2020), UNE 217001: 2020/RD244: 2019
Safety	IEC/EN 62109-1: 2010; IEC/EN 62109-2: 2011; IEC 62040-1:2017
EMC	IEC 61000-6-1/2/4: 2019; IEC 61000-6-3: 2021