RS Hybrid Three-phase

PHOTOVOLTAIC STORAGE

HIGHLIGHTS

- **Plug & play installation**
- **Maximization of self-consumption**
- **Natural convention**
- **Maximum DC power 150% overload**
- **2 MPPTs and up to 3 strings**
- **Parallel inverter up to 9 units**
- **Integrated backup module**
- **Remote monitoring with APP and WEB portal**
- **Batteries can be installed in series from 4 to 10 for inverter, max total capacity of 53 kWh**

The RS Hybrid Three-phase storage solution with Riello Solartech lithium iron phosphate batteries combines intelligent management, storage and monitoring of the energy produced by photovoltaic systems in a single product.

Every day more and **more companies are convinced that, for their business, optimizing self-consumption is the best solution for energy saving.**
Riello Solartech, with RS Hybrid Three-phase and LFP (LiFePO4) batteries, offers an ESS (Energy Storage System) solution for commercial and industrial sectors which guarantees continuous energy supply. Storage systems are fundamental for a photovoltaic system, because they allow you to store energy produced by solar panels and reuse it at a later time when it is no longer needed without taking it from the national grid. The new RS Hybrid Three-phase inverters cover a power range of 5 kW, 6 kW, 8 kW and 10 kW and are ideal for systems with a storage system, but can also be used on photovoltaic systems without a battery, which could be installed at a later stage. With these inverters, Riello Solartech offers a design that combines **aesthetics with safety and ease of installation and maintenance.** They are lightweight, compact and versatile inverters that can be used to power a three-phase load from solar panels, batteries, external grid or a combination of these sources. These inverters, made with the latest technological advances, **reach a European efficiency of 97.4%.**
If used in combination with batteries, they optimize self-consumption by

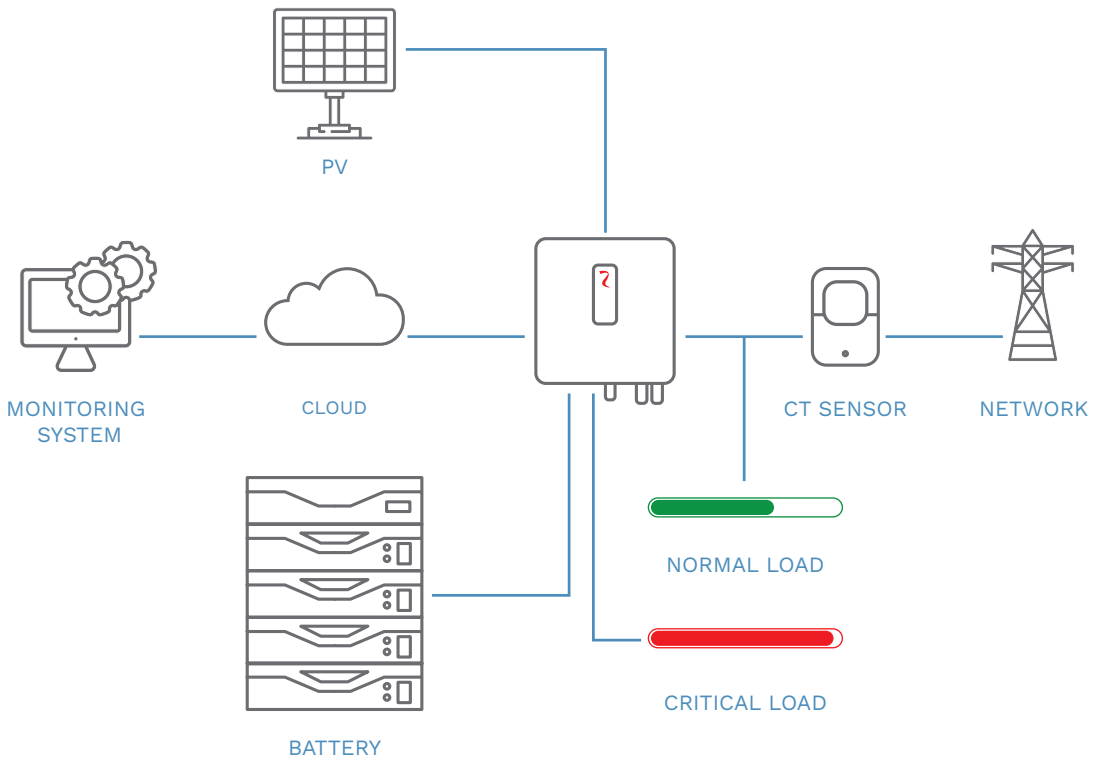
minimizing the withdrawal from the network and at the same time guarantee economic savings in a short time with an improvement in the degree of autonomy from the network operator. From an environmental **sustainability** perspective, maximizing the potential of the equipment means reducing energy withdrawals from traditional fuels to a minimum, consequently reducing CO_2 emissions. A convenient LED panel combines **multiple advanced communication modes**: integrated Bluetooth, Wi-Fi (supplied), BMS (CAN/RS485), RS485 and Ethernet (optional); CT sensors supplied as standard. The inverter is easy to configure but, at the same time, it is possible to proceed with **advanced management thanks to the Cloud Inverter platform**. The tools provided by the Riello Solartech cloud platform can effectively reduce costs and simplify maintenance, improving the efficiency of the system as a whole. It is possible to connect up to 9 inverters in parallel; each inverter can manage up to 10 battery modules equipped with an advanced management system (BMS - Battery Management System).
All configurations are carried out via the APP which can be downloaded for free from the Android or Apple stores.

INVERTER FEATURES AND EQUIPMENT

- IP65 protection rating which makes them suitable for indoor or outdoor installations;
- Characterized by a wide **operating PV voltage range of 160-950 Vdc**, the new RS Hybrid three-phase inverters have **2 trackers (MPPT)**; the **5 and 6 kW models accept 2 strings** while on the 8 and 10 kW models it is possible to connect 3 strings. The entire range allows a **DC overload (photovoltaic side) of 150%** and has a **nominal input current of 15 or 20** (depending on the model);
- Inverters ready for Smart Grids (intelligent networks);
- Possible operation in zero injection mode (Zero Injection);
- Suitable for new installations or for retrofits on existing systems, because they allow you to manage the photovoltaic system, batteries and energy consumption with a single inverter.

BACKUP MANAGEMENT

The **backup function is integrated inside the inverter**: when the grid is not available, the critical load is supported by the inverter (typical intervention time 10 ms).



Application of Hybrid Inverters.

SIMPLE INSTALLATION AND USE

The inverters of the RS Hybrid Three-phase range combine high power with ease of installation.

- Simple and immediate activation and commissioning with APP;
- Wall/rail mounting for zero surface waste and for installations in all conditions, even the most unfavorable environments;
- During installation, no special equipment is required because it is supplied in small, lightweight boxes that are easy to transport and handle;
- LED indication panel on the front of the inverter which facilitates reading the status of the inverter.

RS Batlio 5300T battery.

BATTERIES

Riello Solartech, with the RS BATLIO 5300T batteries for the RS Hybrid Three-phase inverters, offers a complete solution for photovoltaic storage and the optimization of energy independence.

Main features:

- 5.3 kWh and 51.2 Vdc batteries;
- Simple and intuitive installation (communication wiring, power and battery connections always included);
- Compact dimensions;
- Possibility of installing them on the ground (stackable one on top of the other),
- Maximum storage capacity for each battery module 5.3 kWh;
- Possibility of increasing the storage power as the system grows;
- From a minimum of 4 to a maximum of 10 battery modules that can be installed for each inverter, for a maximum overall capacity of 53 kWh;
- Batteries with LFP (Lithium-Iron-Phosphate) Lithium Ion technology;
- Batteries monitorable via BMS.

Riello Solartech batteries self-configure automatically, without the need for particular and complex manual settings.

The LFP (Lithium-Iron-Phosphate) Lithium Ion technology allows for optimal use even with high discharge depths (when and if necessary), allowing for optimization of energy storage and reuse.

Top useful life and ease of installation make them advantageous and convenient.

Each battery measures 580x474x170 mm (WxHxD) and weighs 51 kg, has a nominal power of 5.3 kWh and a nominal voltage of 51.2 V. IP20 protection rating.

The batteries require the HV-RS BOX management unit for optimal charging management and coordination of energy to and from the inverter.

OPERATING MODE

SELF-CONSUMPTION: in self-consumption mode, the energy produced by the panels has priority: Load > Battery > Grid; in this case the energy produced by the photovoltaic has the load as priority, the excess energy is used to charge the batteries, and finally the remainder is fed into the grid.

FEEDING INTO THE GRID: in the feed-into-grid mode, the energy produced by the panels has priority: Load > Grid > Battery; in this case, the energy produced that exceeds the load requests is fed into the grid and the remaining energy is stored in the battery.

TIME CONTROL: in this mode, the user can control the charging and discharging of the inverter independently.

BACKUP: in this mode, the energy produced by the panels has Battery > Load > Mains as its priority. This mode has the purpose of quickly charging the battery and therefore charging from the AC mains can also be enabled. In Backup mode, two types of operation are therefore available: “Loading from the network prohibited” and “Loading from the network allowed”.

OFF-GRID: in this mode only the critical loads are powered to allow them to continue working even if the mains power supply is not present. In Off-Grid mode the inverter cannot operate without the battery.

INTELLIGENT AND CONTINUOUS MONITORING

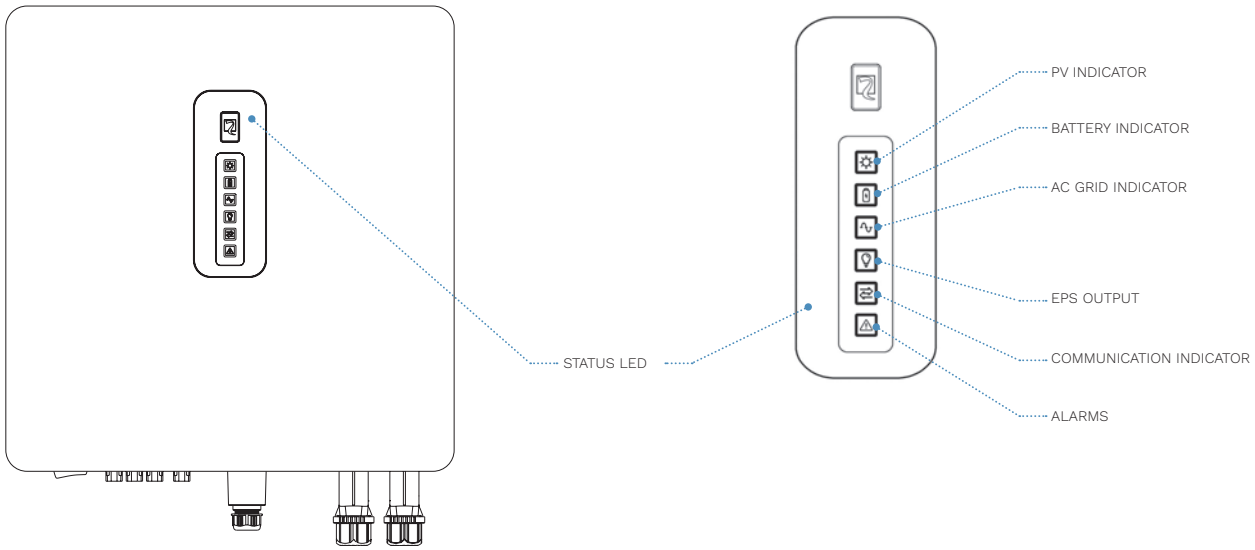
The Cloud Inverter monitoring platform allows users to access the production data of their system to verify correct functionality and/or the presence of alarms or notifications of any anomalous conditions. The user can access from a PC or smartphone using the Riello PV and Cloud Inverter APPs, which can be downloaded free of charge from online stores.

For installers it is possible to create a single environment to monitor all installed systems.

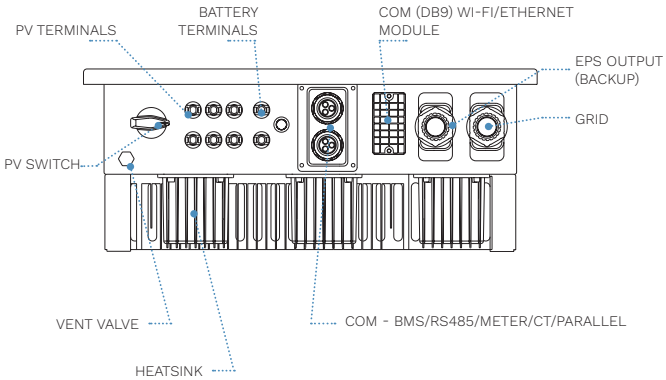
HV-RS BOX

INVERTER DETAILS

Front view

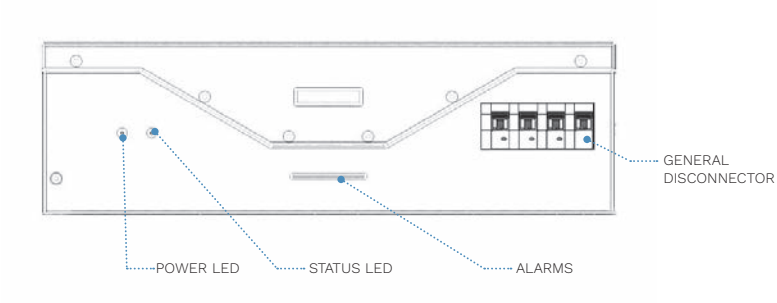


Bottom view

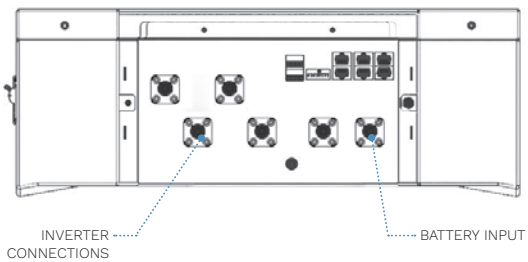


HV-RS BOX DETAILS

Front view

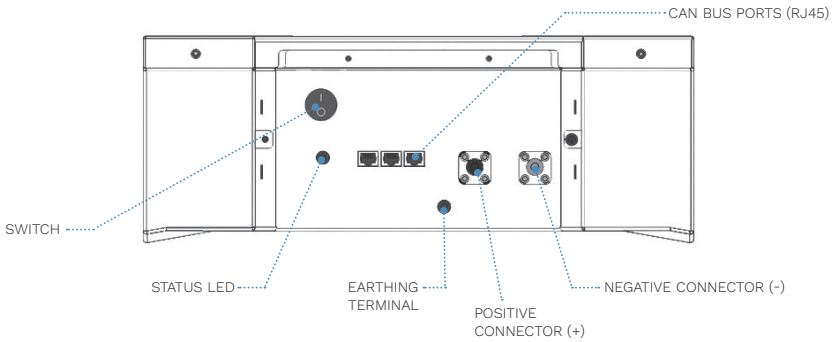


Side view

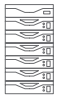
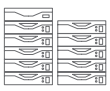


BATTERY DETAILS

Side view



CONFIGURATIONS

	HV-RS BOX + 4 BATTERIES	HV-RS BOX + 5 BATTERIES	HV-RS BOX + 6 BATTERIES	HV-RS BOX + 7 BATTERIES	HV-RS BOX + 8 BATTERIES	HV-RS BOX + 9 BATTERIES	HV-RS BOX + 10 BATTERIES
No. of battery modules	4	5	6	7	8 (max stackable number)	9 (2 towers)	10 (2 towers)
Battery system capacity [kWh]	21.2	26.5	31.8	37.1	42.4	47.7	53
Recommended voltage [V]	min 182 max 233.6	min 227.5 max 292.4	min 273 max 350.8	min 318.5 max 409.2	min 364 max 467.6	min 409.5 max 526	min 455 max 584.4
Configuration							
Dimensions (WxDxH) [mm]	580x474x900	580x474x1070	580x474x1240	580x474x1410	580x474x1580	580x474x900 + 580x474x900	580x474x900 + 580x474x1070
Weight [kg]	222	273	324	375	426	477 (222+255)	528 (273+255)

INVERTER MODEL	5 kW	6 kW	8 kW	10 kW
EFFICIENCY				
Maximum efficiency [%] (PV to grid)	97,1	97.1	97.4	97.4
Maximum charge/discharge efficiency [%]	96.5	96.6	96.8	96.8
PV INPUT				
Maximum input voltage [V]	1000			
Maximum DC power [W]	9000		15000	
Maximum input current [A]	15 / 15		20 / 30	
Maximum short-circuit current [A]	20 / 20		30 / 40	
MPPT operating voltage range [V]	160 ÷ 950			
Maximum number of PV strings	2 (1/1)		3 (1/2)	
Number of MPPTs	2			
BATTERY INPUT				
Compatible battery type	Lithium-ion			
Nominal battery voltage [V]	250-600			
Accepted battery voltage range [A]	150-600			
Maximum charge/discharge current [A]	25 / 25		50 / 50	
Maximum charge/discharge power [W]	9000 / 5800	9000 /7 000	15000 / 9300	15000 / 10500
NETWORK SIDE OUTPUT (On Grid)				
AC active power (nominal) [W]	5000	6000	8000	10000
Maximum AC apparent power [VA]	5500	6600	8800	11000
Maximum active power AC (PF=1) [W]	5500	6600	8800	11000
Maximum current AC output [A]	3*8.3	3*10	3*13.3	3*16.7
Nominal AC voltage [V]	380 / 400 / 415V, 3W+N+PE			
Nominal grid frequency [Hz]	50 / 60			
Mains frequency range [Hz]	45-55 / 55-65			
Harmonic distortion (THDi) [%]	<5 (nominal power)			
Power factor	>0.99 nominal power (adjustable 0.8 inductive – 0.8 capacitive)			
EPS OUTPUT (Backup)				
AC active power (nominal) [W]	5000	6000	8000	10000
Maximum power [VA]	5500	6600	8800	11000
Maximum power [VA] (10 sec.)	7500	9000	12000	15000
Intervention time [msec.]	10 (typical), 20 (maximum)			
Nominal AC voltage [V]	380 / 400, 3W+N+PE			
Harmonic distortion (THDi) [%]	< 3 (R Load), 8 (RCD Load)			
PROTECTIONS				
PV disconnect switch	Support			
Anti-islanding protection	Support			
AC overcurrent protection	Support			
AC short circuit protection	Support			
AC overvoltage protection	Support			
Surge Protection Type (SPD)	DC Type II , AC Type III			
Differential Protection (GFCI)	Support			
Insulation detection (R-ISO)	Support			
GENERAL				
Typology	Transformer-free			
Degree of protection	IP65			
Cooling down	Natural cooling			
Operating temperature range [°C]	-25 ÷ 60			
Relative humidity range [%]	0 ÷ 100			
Maximum operating altitude [m]	4000 (> 2000 derating)			
Noise [dB] (@ 1m)	< 30			
Dimensions (WxDxH) [mm]	550x212x530			
Weight [kg]	30		32	
COMMUNICATION				
Display	APP (Bluetooth) + LED			
Communication	Wi-Fi; BMS (CAN/RS485); sensori CT; RS485; Ethernet (optional); METER (optional)			
Monitoring	APP, Supervision portal			
CERTIFICATIONS				
Safety	IEC/EN 62109-1: 2010 IEC/EN 62109-2: 2011			
EMC	EN IEC 61000-6-1/2/3/4			
Network connection regulations	CEI 0-21:2022; CEI 0-16:2022; UNE 217002: 2020/RD647:2020/RD244:2019/RD1699: 2011/ RD661: 2017/RD413: 2014; NTS Version 2.1/UNE 217001: 2020			
Warranty	5 years / 10 years (optional)			

RS BATLIO 5300T BATTERY	
ELECTRICAL CHARACTERISTICS	
Battery Type	LFP (LiFePO4)
Nominal battery voltage [Vdc]	51.2
Minimum battery voltage [Vdc]	45.5
Maximum battery voltage [Vdc]	58.4
Battery module energy [kWh]	5.3
Battery module capacity [Ah]	105
Usable battery capacity [Ah]	100
Maximum number of batteries in series [Pcs]	10
Maximum charging current [A]	100 (150 for 30 sec.)
Maximum discharge current [A]	100 (150 for 30 sec., 200 for 5 sec.)
LIFE CHARACTERISTICS	
Life cycles	>8000 (@ 80% DoD, 25°C)
Depth of Discharge (DoD)	Up to 100%
Self-discharge percentage	1% month (@ STC 25°C) <3% month (@ STC -10°C/+45°C)
Maximum lifespan	10 years (@25°C, periodic checks)
CONNECTION	
Communication protocol with HV-RS BOX	CAN, RS232 (reserved)
SAFETY	
Functionality	Pre-charge, HV fuse, Multi firmware management of the BMS, Automatic contactor (contactor).
Certifications	EN IEC 61000-6-1:2019, EN IEC 61000-6-2:2019, EN IEC 61000-6-3:2021, EN IEC 61000-6-4:2019 (EMC), IEC 62619 (CB), CE, UN38.3
GENERAL	
Weight [kg]	51
Dimensions (WxDxH) [mm]	580x474x170
IP protection grade	IP20 (indoor use only)

HV-RS BOX	
CHARACTERISTICS	
Operating voltage [Vdc]	80-750
Number of entries	1+1
Maximum input current [A]	100 (50 per canale)
Maximum discharge current [A]	100
Active safety protection [A]	150
Passive safety protection	Fusibile 200 A - 750 Vds
Manual mains disconnect switch	125 A / 1000 Vdc
Temperature range	0 - 45 °C
Storage temperature	-10 °C / +55 °C
Maximum number of batteries	10
Communication protocols	CAN, Wi-Fi, Bluetooth, RS232
Weight [Kg]	18
Dimensions (WxDxH) [mm]	580 x 474 x 170
IP protection grade	IP20 (uindoor use only)
Certifications	EN IEC 61000-6-1:2019, EN IEC 61000-6-2:2019, EN IEC 61000-6-3:2021, EN IEC 61000-6-4:2019, EN IEC 62368, CE

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