
RIELLO ELETTRONICA
riello
solar
tech

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A world without energy is unthinkable. In our advanced societies, virtually everything depends on energy. Disruption caused by any interruption in the supply of power, including a complete mains failure, demonstrates just how fundamental energy is to our daily lives.
Riello Elettronica is the holding company for a network of organizations whose core business is providing solutions that ensure quality power for business continuity. The Group - with the brand Riello UPS - is permanently ranked among the top 5 players worldwide. However, power is not the only priority; the Group has a strong presence in the home automation and security markets, as well as in the real estate field.

riello ups

Leader in power continuity thanks to a comprehensive range of professional UPS (Uninterruptible Power Supplies).

riello solar tech

Photovoltaic Inverters (PV) to cover every need, from small domestic systems to solar power plants.

AVS electronics

Electronic security systems and fire alarms for smart homes.

gamma system

Products for the safety of workers in dangerous areas.

cardin
riello elettronica group

A wide range of automation systems for access control.

CEIMU

Hydraulic plants, lubrication and automation installations for a wide variety of industrial applications.

Power
Automation & Security
Real Estate

Technology and innovation have always been the hallmarks of Riello Elettronica. Since its incorporation they are the drivers behind our success and the outward expression of the entrepreneurial legacy that has its roots in Verona and its surrounding areas.
Continuing growth and successful results; this is Riello Elettronica, the expression of its entrepreneurial tradition towards innovation, global challenges, and the development of 'Made in Italy' technology for international markets.

300 MILLION € TURNOVER

1100 EMPLOYEES

85 BUSINESS COUNTRIES

30 COMPANIES

7 PRODUCTION SITES

Aros Solar Technology has created Riello Solartech, which has always been at the heart of photovoltaics. We convert solar energy into electricity with the best technologies. Today, as always, we provide services and support to customers and users. Even as the market becomes increasingly competitive, leaving no room for improvised manufacturers and occasional distributors, we remain a reliable anchor. We are Riello Elettronica, the guarantee of an Italian company with a worldwide presence.

UTION

2006
from AROS the first inverters for single-phase residential use **SIRIO range.**

2011
new brand **AROS Solar Technology.**

2020
new Riello Solartech brand new **RS T** three-phase inverter range.

www.riello-solartech.com

Research and the environment

RESEARCH AND DEVELOPMENT
Continuous attention to quality

The size of a company and its appetite for growth is measured in the extent of its efforts in research. The Riello Solartech Research and Development department, which grows each year in terms of investments and personnel, is our beating heart.

It's where custom and specialized components and solutions are designed, making Riello Solartech a byword for innovation. It's where ambitious and passionate people spend every day solving real user problems, seeking the key to create better-performing inverters.

Using environment simulators. sophisticated analysis tools and CAD systems, the Riello Solartech Research and Development department creates the technologies of the future, designing a new way of living, of relating to the environment, of growing together.

ENVIRONMENT
Natural attention

The commitment to design, produce and distribute products and solutions with a low environmental impact, paying attention to the natural environment and its protection are proven not only by certifications such as ISO 14001:2004, but also by verified procedures such as the management and recycling of waste electrical and electronic equipment in compliance with EU guidelines (WEEE).

Riello Solartech's commitment to the environment is an integral part of its mission: choosing a sector such as renewable energy, which is crucial for the future of us all, is the clearest demonstration of the awareness of Riello Solartech, which does not use hazardous substances in the products it sells (RoHS), but with every product it attempts to find the most attentive response for a high-efficiency future in an environment that needs to be safeguarded and protected.

Service excellence and certifications

SERVICE
The value of being a partner

In a company like Riello Solartech, support for customers and company employees alike forms part of an ongoing quest for quality and excellence, representing the starting point for building a partnership with customers, which is becoming stronger every day.

That's why the Control Centre, the feather in the cap of a system built around the real needs of those who use Riello Solartech products and solutions, is able to read the status of the appliances in real-time across the network, and call on immediate intervention in the event of an emergency. Ongoing training for technical and commercial operators at the main Riello Solartech site or at its customers' sites ensures high problem solving expertise and very short response times. Riello Solartech's success therefore goes beyond national borders.

CERTIFICATIONS
The basis of a solid relationship

We do this be obtaining prestigious accreditations such as the Quality System certification (issued by DNV) and ISO EN 9001:2008 certification for the design, production, sale, and aftersale service of products. Those who, like Riello Solartech, provide state-of-the-art technology solutions, must be subjected to ongoing, strict controls of their business processes and must safeguard and protect their employees and customers. To continue to believe in quality and pursue excellence.

Overview

Transformerless String Inverter

RS SINGLE-PHASE SERIES

RS 1.5

RS 2.0

RS 3.0

RS 4.0

RS 5.0

RS 6.0

RS THREE-PHASE SERIES

RS 6.0 T

RS 10.0 T

RS 15.0 T

RS 20.0 T

RS 25.0 T

RS 30.0 T

Central Inverters

SIRIO THREE-PHASE SERIES

K64
K64 HV

K80
K80 HV

K100
K100 HV

K200
K200 HV

K250 HV

Overview

Central Inverters HV-MT and HHV-MT

SIRIO THREE-PHASE SERIES

K100 HV-MT

K200 HV-MT

K250 HV-MT

K330 HV-MT
K330 HHV-MT

K500 HV-MT
K500 HHV-MT

K800 HV-MT
K800 HHV-MT

DC/AC Conversion and LV/MV Transformation Substations

SIRIO CENTRAL STATION SERIES

SCS 500

SCS 660

SCS 1000

Energy Storage Systems

SIRIO POWER SUPPLY SERIES

SPS 10
SPS 15
SPS 20
SPS 30
SPS 40

SPS 60
SPS 80
SPS 100
SPS 120
SPS 160
SPS 200

SPS HE 100
SPS HE 120
SPS HE 160
SPS HE 200
SPS HE 250
SPS HE 300
SPS HE 400

SPS HE 500
SPS HE 600
SPS HE 800

RS single-phase

HIGHLIGHTS

- **Cooling technology with natural convection**
- **Maximum efficiency 97.6%**
- **European efficiency 97.1%**
- **Wide MPPT range**
- **Threshold voltage for grid supply very low**
- **Built-in dual channel Wi-Fi**
- **Smart Autotest and self-learning via the App**
- **Night-time consultation**

Riello Elettronica is strengthening its presence on the market of electrical conversion with the new range of PV inverters, totally dedicated to the residential sector, under the Riello Solartech brand.
The inverters in the RS range implement innovative technologies, have high-quality components, and are sized with a wide margin for normal operations and can provide for routine machine maintenance without compromising on the wide-ranging operational flexibility.
The innovative digital control for all power stages guarantees low susceptibility to power disruptions, avoiding undesired disconnection due to variations or micro-interruptions.

The RS models integrate input and output surge protection and have control devices and redundancy protection—especially in the output stage—to guarantee operability and continuous operation.

INNOVATION

Unique, innovative, light and compact design. The die-cast aluminium case makes it particularly lightweight and ensures an optimum real IP65 protection level, even for outdoor applications.
The materials chosen are high-quality, to ensure maximum reliability.
Thanks to the wide voltage range, the inverter can be perfectly integrated into the various operating conditions of the electricity grid and is particularly suited for the typical low voltage of rural areas.

- Cooling technology with natural convection to ensure a period of reliable use in high temperature situations.
- Smart Autotest with self-learning via the app.
- Multiple remote monitoring for operation and maintenance.

EFFICIENCY

- High efficiency and higher efficiency rate.
- Maximum efficiency 97.6%.
- European efficiency 97.1%.
- MPPT self-learning technology to optimize the efficiency of each module.
- Wide MPPT range.
- Threshold voltage for grid supply very low.

TOTAL FLEXIBILITY

- Simple installation, smart operation and maintenance.
- User-friendly communication interface with built-in dual channel Wi-Fi.
- AC/DC connectors that can be plugged in for immediate connection.
- App/Web for remote system control and firmware updates, smart operations and maintenance.
- Light and extremely compact for easy installation.

Attractive design, lightweight, compact, easy to install and configure; these are the special features of the RS series, particularly well-suited for residential and small-scale commercial installations. Thanks to the wide range of input current and voltage, they are found to be extremely well-adapted to plants with size limitations. The innovative digital control of all the power states –which ensures low sensitivity to mains interference, combined with the IP65 protection level – which means the inverter can be positioned outside near the generator, simplify the wiring on the DC side, reducing leakage, helping to limit installation costs and greatly improve system reliability. The multi-string technology for 5 and 6 kWp models also enables strings with different orientations and inclinations to be managed, to work better with any type of photovoltaic module, even if partially in the shade; making the inverter more flexible and assisting the installer in different configurations.
The integrated DC switch disconnector means the inverter can be rapidly and securely isolated in the event of an emergency or non-routine maintenance.

A series of LED icons on the front of the case immediately identify the operating status of the inverter while an LCD display shows the instantaneous power produced or an alarm code, if any.

COMMUNICATION INTERFACE

Built-in dual channel Wi-Fi.
1CH) used for local connection with dedicated app (RS Connect):

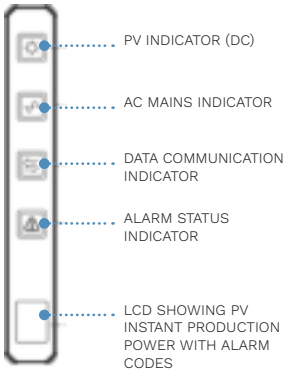
- For direct connection to the inverter and local configuration and installation (self-test and threshold setting
- Local consultation
- Night-time consultation

2CH) for the router connection and data management in the CLOUD; viewing with the RS Monitoring supervisory portal.

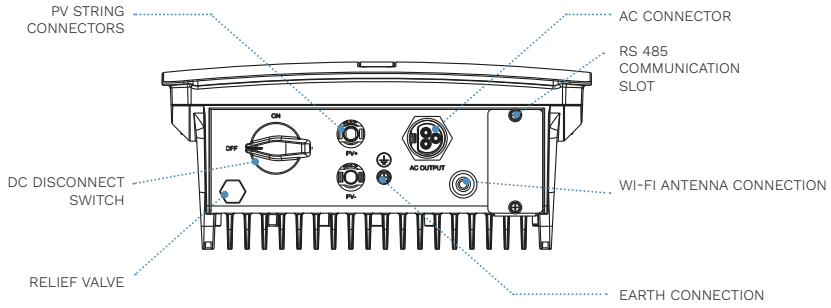
DB9 expansion slot used for optional communication cards, such as RS485.

INTERFACE PANEL

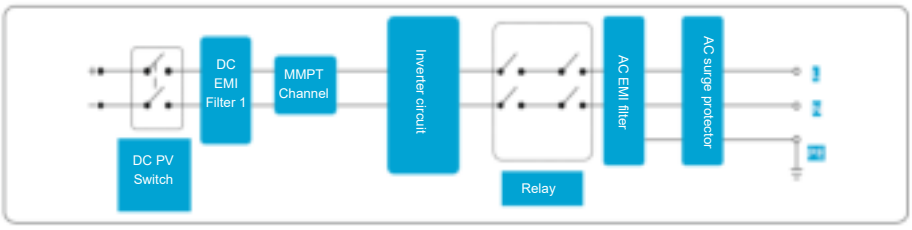
Panel with LED status indicators and LCD display showing instant production power.



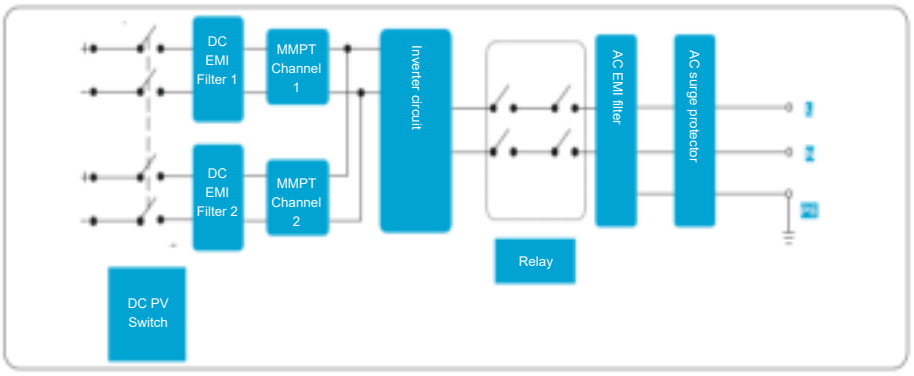
INVERTER



The RS 1.5-2.0-3.0 inverter with a single MPPT input receives signals from a single string of PV panels. RS 4.0-5.0-6.0 inverters with a dual MPPT input receive signals from two strings of PV panels.
The inputs are then grouped into one or two independent MPPT channels within the inverter to track the maximum power point of the PV panels. The MPPT power is then converted in the DC bus and the DC voltage is then converted to AC voltage via an inverter circuit. The AC voltage is then fed into the mains. An EMI filter is used on the DC and AC sides to reduce electromagnetic interference; there is power surge protection on the AC side.



RS 1.5-2.0-3.0 inverter circuit with single MPPT input



RS 4.0-5.0-6.0 inverter circuit with dual MPPT input

MODEL	RS 1.5	RS 2.0	RS 3.0	RS 4.0	RS 5.0	RS 6.0
PRODUCT CODE	**6PS11K5B**	**6PS12K0B**	**6PS13K0B**	**6PS14K0B**	**6PS15K0B**	**6PS16K0B**
EFFICIENCY						
Maximum efficiency	97.6%	97.6%	97.5%	97.4%	97.4%	97.1%
European efficiency	96.1%	96.6%	96.8%	96.9%	96.9%	97.1%
INPUT						
Minimum DC power [W]	1000	1600	2400	3200	4000	4800
Maximum DC power [W]	1700	2300	3500	4600	5800	7000
Maximum input voltage [V]	600					
Nominal input voltage [V]	360					
Maximum input current [A]	13			26 (13 for MPPT)		
Maximum short circuit current [A]	15			30 (15 for MPPT)		
Starting voltage / minimum operating voltage [V]	90 / 70					
MPPT operating voltage range [V]	90–580					
MPPT operating voltage range (full load) [V]	130–520	170–520	240–520	240–520		300–520
Maximum number of PV strings	1			2 (1/1)		
MPPT number	1			2		
OUTPUT						
AC active power (nominal) [W]	1500	2000	3000	4000	5000	6000
Active power max. AC (PF = 1) [W]	1500	2000	3000	4400	5000	6000
Max current AC output [A]	7.2	9.5	14.3	19.1	23.8	28.6
Nominal voltage AC [V]	220 / 230 L+N+PE					
AC voltage range [V]	160–300					
Nominal mains frequency [Hz]	50 / 60					
Grid frequency range [Hz]	45-55 / 55-65					
Current Harmonic Distortion (THDi)	<3% (nominal power)					
Direct current injection	<0.5% In					
Power factor	(selectable 0.8 lead - 0.8 lag)					
PROTECTIONS						
DC disconnect switch	Yes					
Anti-islanding protection	Yes					
AC overcurrent protection	Yes					
Short circuit protection	Yes					
DC pole inversion control	Yes					
Surge arrester (VDR)	DC type II / AC type III					
Ground fault detection	Yes					
Current leakage protection	Yes					
OVERALL SPECIFICATION						
Type	Transformer-free					
Protection level	IP65					
Night self-consumption [W]	<5					
Natural	Cooling					
Operating temperature range	-25 °C – 60 °C					
Relative humidity range	0% – 100%					
Maximum operating altitude [m]	4000 (>2000 derating)					
Noise level [dB]	<30 (measured at 1 m)					
Dimensions (WxDxH) [mm]	298x130x377			367x135x467		
Weight [kg]	9.3			12.9		
COMMUNICATIONS						
Display	LCD + LED					
Communications	Integrated Wi-Fi (dual channel), RS485 (optional)					
Monitoring	App (RS Connect), Supervisory portal (RS Monitoring)					
CERTIFICATIONS						
Safety	IEC62109-I, IEC62109-2					
EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4					
Regulations	CEI 0-21					
Warranty	5 years (with possibility of extending to 10)					

RS three-phase

HIGHLIGHTS

- **Maximum efficiency 98.2%**
- **European efficiency 97.7%**
- **Forced ventilation at regulated speed**
- **Wide MPPT operating voltage range**
- **DC and AC type II surge arresters**
- **Dual MPPT**
- **IP65 Protection level**
- **Built-in Wi-Fi and datalogger data management**
- **LCD display divided into multiple sections and multi-LED status indicator**

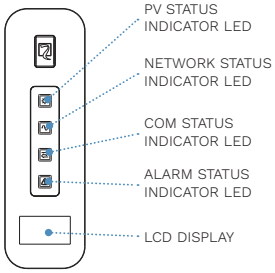
The evolution of Riello Solartech continues: the new range of high-performance transformerless three-phase inverters. Riello Solartech, a brand of the Italian Riello Elettronica Group, presents the market with the new series of three-phase photovoltaic inverters, implementing the range of residential single-phase inverters. Extremely compact and lightweight, the new RS three-phase inverters from Riello Solartech are available with power ranging from 6 to 30 kW and benefit from a brand new technology with high quality components, the result of the work of the company's R&D team, that guarantee the utmost product reliability allowing them to achieve high efficiency under all working conditions.

TOP TECHNOLOGY

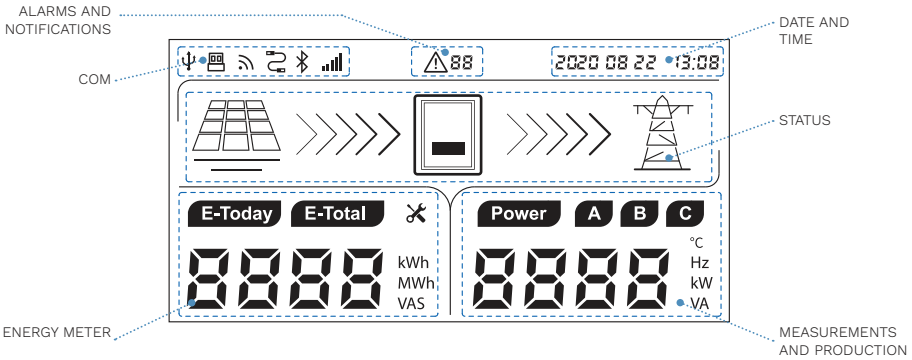
Other outstanding features of the new Riello Solartech RS T three-phase inverters include the DC-side disconnector, type II DC and AC surge arresters, and multiple inputs for maximum optimization of the strings that converge on the two independent MPPT trackers characterised by a wide voltage range; all of this ensures maximum configuration flexibility, efficiency optimization and prolonged energy production.
The RS T models incorporate natural ventilation (up to 15 kW) with adequate heat sinks to ensure maximum heat exchange or forced ventilation (for 20 to 30 kW models) with controlled speed extraction fans in relation to the operating conditions, to minimize leakage.

The innovative digital control for all power stages guarantees low susceptibility to power disruptions, avoiding undesired disconnection due to variations or micro-interruptions.
Connected via the app or the Cloud, the Riello Solartech RS T inverters feature a unique and innovative design.
The aluminium case makes them strong yet lightweight and ensures a real IP65 protection level, meaning it's well-suited even for outdoor applications.
The user interface on the front panel has LEDs for indicating DC and AC side status and communications; in addition, there is an LCD display divided into several sections that shows: date, time, alarms (if any), type of connection, operating diagram, MPPT1 and MPPT2 voltage/current, E-Day, E-Total, power and all instantaneous network parameters.
The inverters also interface via the Wi-Fi built into the RS Connect smartphone app, enabling users to manage the configuration and self-test.
Again via Wi-Fi or an Ethernet card (optional), the inverters can be connected to the Internet for data management on the RS Monitoring supervisory portal, where it is possible to remotely monitor the strings in detail and to view the installation's performance.
Finally, through the integrated BUS 485 interface it is possible to connect several inverters to a dedicated datalogger to manage the connection to the portal of the whole plant via Ethernet, with the option of connecting energy meters and environmental sensors.

INTERFACE PANEL



LCD DISPLAY



MODELS	RS 6.0 T	RS 10.0 T	RS 15.0 T
PRODUCT CODE	**6PS36K0B**	**6PS310KB**	**6PS315KB**
EFFICIENCY			
Maximum efficiency	97.9%	98.0%	98%
European efficiency	97.3%	97.4%	97.5%
INPUT			
Maximum input voltage [V]	1000		
Nominal input voltage [V]	620		
Maximum input current [A]	26 (2x13)		39 (13 + 26)
Maximum short circuit current [A]	30 (2x15)		45 (15 + 30)
Starting voltage / Minimum operating voltage [V]	200 / 160		
MPPT OPERATING VOLTAGE RANGE [V]	160–950		
MPPT operating voltage range (full load) [V]	300–800	470–800	
Maximum number of PV strings	2 (1/1)		3 (1/2)
MPPT number	2		
OUTPUT			
AC active power (nominal) [W]	6000	10000	15000
Maximum apparent AC power [VA]	6600	11000	16500
Active power max. AC (PF = 1) [W]	6600	11000	16500
Max current AC output [A]	3x10	3x16	3x23
Nominal voltage AC [V]	380 / 400 3L+N+PE		
AC voltage range [V]	277– 520 (configurable)		
Nominal mains frequency [Hz]	50/60		
Grid frequency range [Hz]	45-55 / 55-65		
Harmonic Distortion (THDi)	<3% (nominal power)		
Direct current injection	<0.5% In		
Power factor	> 0.99 nominal power (selectable 0.8 inductive – 0.8 capacitive)		
PROTECTIONS			
DC disconnect switch	YES		
Anti-islanding protection	YES		
AC overcurrent protection	YES		
Short circuit protection	YES		
DC pole inversion control	YES		
Surge arresters (VDR)	DC type II / AC type II		
Ground fault detection	YES		
Current leakage protection	YES		
OVERALL SPECIFICATION			
Type	Transformer-free		
Protection level	IP65		
Night self-consumption [W]	<1		
Natural	cooling		
Operating temperature range	-25 °C – 60 °C		
Relative humidity range	0–100%		
Maximum operating altitude [m]	4000 (>2000 derating)		
Noise level [dB]	<30 (measured at 1 m)		
Dimensions (WXDXH) [mm]	422x187x520		
Weight [kg]	21.5		23.5
COMMUNICATIONS			
Display	LCD + LED		
Communications	Integrated Wi-Fi, integrated RS485, Ethernet (optional)		
Monitoring	APP, Supervisory Portal		
CERTIFICATIONS			
Safety	IEC62109-I, IEC62109-2		
EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4		
Regulations	CEI 0-21, CEI 0-16, IEC62727, IEC62116		
Warranty	5 years (with possibility of extending to 10 years)		

MODELS	RS 20.0 T	RS 25.0 T	RS 30.0 T
PRODUCT CODE	**6PS320KA**	**6PS325KA**	**6PS330KA**
EFFICIENCY			
Maximum efficiency	98.2%	98.2%	98.2%
European efficiency	97.7%	97.7%	97.7%
INPUT			
Maximum input voltage [V]	1000		
Nominal input voltage [V]	620		
Maximum input current [A]	2x25	2x37.5	
Maximum short circuit current [A]	60 (2x30)	90 (2x45)	
Starting voltage / minimum operating voltage [V]	250 / 180		
MPPT operating voltage range [V]	180–960		
MPPT operating voltage range (full load) [V]	480–800		
Maximum number of PV strings	4 (2/2)	6 (3/3)	
MPPT number	2		
OUTPUT			
AC active power (nominal) [W]	20000	25000	30000
Maximum apparent AC power [VA]	22000	27500	33000
Active power max. AC (PF = 1) [W]	22000	27500	33000
Max current AC output [A]	3x33.5	3x40	3x48
Nominal voltage AC [V]	380 / 400 3L+N+PE		
AC voltage range [V]	277– 520 (configurable)		
Nominal mains frequency [Hz]	50 / 60		
Grid frequency range [Hz]	45-55 /55-65		
Harmonic Distortion (THDi)	<3% (nominal power)		
Direct current injection	<0.5% In		
Power factor	> 0.99 nominal power (selectable 0.8 inductive – 0.8 capacitive)		
PROTECTIONS			
DC disconnect switch	YES		
Anti-islanding protection	YES		
AC overcurrent protection	YES		
Short circuit protection	YES		
DC pole inversion control	YES		
Surge arresters (VDR)	DC type II / AC type II		
Ground fault detection	YES		
Current leakage protection	YES		
OVERALL SPECIFICATION			
Type	transformer-free		
Protection level	IP65		
Night self-consumption [W]	<1		
Forced	cooling with fans at controlled speed		
Operating temperature range	-25 °C – 60 °C		
Relative humidity range	0–100%		
Maximum operating altitude [m]	4000 (>2000 derating)		
Noise level [dB]	<30 (measured at 1 m)		
Dimensions (WxDxH) [mm]	577x270x445		
Weight [kg]	37	41.5	
COMMUNICATIONS			
Display	LCD + LED		
Communications	Integrated Wi-Fi, integrated RS485, Ethernet (optional)		
Monitoring	APP, Supervisory Portal		
CERTIFICATIONS			
Safety	IEC62109-I, IEC62109-2		
EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4		
Regulations	CEI 0-21, CEI 0-16, IEC62727, IEC62116		
Warranty	5 years (with possibility of extending to 10 years)		

CONTROL YOUR PLANT ANY TIME, WHEREVER YOU ARE

With the inverters in the RS range, Riello Solartech guarantees flexible and complete solutions, offering its customers accurate monitoring of PV production and performance as well as the status of the inverter, via smartphone or tablet (with Android/iOS operating systems), via the app (RS Connect) or with web browser access via the supervisory portal (RS Monitoring).

With the built-in dual-channel Wi-Fi connection to the inverter, it is possible to make a local connection to the system using the inverter as an access point (channel 1) and to perform pre-configuration tasks, such as self-testing performance parameters and analysing instantaneous and periodic production measurements.

The second Wi-Fi channel enables configuration to connect with the home router to transmit data to the cloud, displayed graphically via the RS Monitoring supervisory web portal.

RS DATALOGGER

RS Datalogger provides a simple and cost-effective solution to achieve the following objectives:

- A datalogger for simply monitoring the inverters in a plant.
- A datalogger for monitoring the inverters of a plant with the function of a power limiter (a digital multimeter is required for this application).

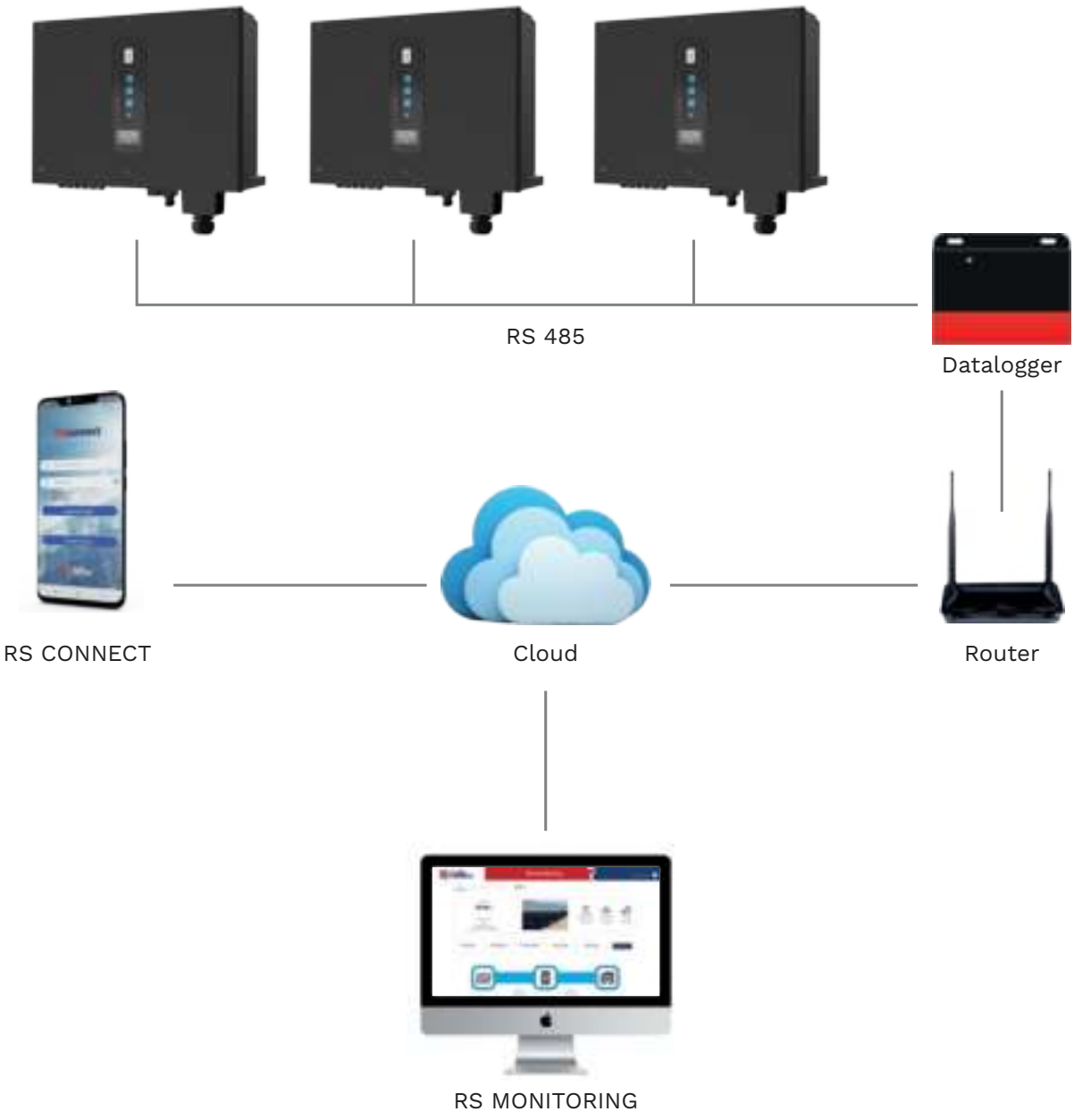
The following diagram shows an example of a system for monitoring inverters via both RS Datalogger RS485-1 and RS485-2 communication ports. A maximum of 20 inverters can be connected to each port.

An external sensor can also be connected to the system to measure the radiation and external temperature of the panels. The RS485-2 port must be configured in “Inverter” mode.

Default configuration

In the following cases, no changes to the datalogger settings are required:

- The system is intended to monitor up to 20 inverters.
- The system is also used to monitor the radiation and temperature of the panels.
- The datalogger's default Modbus parameters are used for communications with inverters via the RS485-1 port:
  - Address: 1-20.
  - Baudrate: 9600bps.
- The datalogger is connected to a LAN that supports DHCP for automatic IP address assignment.



RS CONNECT

The Riello Solartech Inverter App is available as a free download from Google Play and the App Store. This application enables Riello Solartech users to monitor the production of their solar power plant via smartphone and tablet.

With a simple, user-friendly graphic interface, the app makes it possible to configure the system, manage the self-test and analyse the plant's operating conditions.
In addition, the monitoring and cloud login pages can be accessed directly from the homepage.

RS Connect becomes essential for automatically running the self-test, issuing a report, and for configuring the IP address needed for the Wi-Fi connection with your router. In addition, all DC parameters (inverter input voltage and current) and inverter output AC parameters (voltage and current, power factor, frequency, active power and reactive power) can be displayed, both instantaneously and for specific historical reference periods.
The following menus can be accessed from the Start mode:
History / Production / Maintenance / Settings / Self-Test / Power Limiter.

- **History**: production and graphs day/ month/year and configurable time periods.

- **Production**: instantaneous electrical operating parameters of each inverter; efficiency at a given time; daily, monthly and annual aggregate production.

- **Maintenance**: menu dedicated to technical support. To access this menu, you need to change the available user in the setup menu and log in with an administrator password.

- **Settings**: basic settings: date and time – IP address – Wi-Fi settings – RS485 parameters
  User settings: Change user – Change password and/or administrator access (for Riello Solartech Technical Support Service use only)
  Performance Parameters: Insulation measurement – Measurement of Curr. Leakage – RS485 Termination Resistance – Local Control – Self-Test Reset – Network connection standard – Reactive Power – Power derating – Power factor – all Level 1, Level 2 frequency and voltage protection parameters – Power Limiter (optional).

- **Self-test**: starts the self-test process at the end of which you can download the results. A file called Autotest(date time).csv [Self-test(date time).csv] will be saved directly to the mobile device's main memory for email forwarding.

RS MONITORING

RS Monitoring is the supervisory portal for Riello Solartech inverters.
It is a professional monitoring system that closely monitors every type of photovoltaic plant and the environment where it is located, using local weather reports.
Such a tool is useful for small plants, but absolutely necessary for medium and large plants, RS Monitoring communicates data and information in real time both to the operators who carry out the monitoring and to the specialised technicians in charge, thus making it possible to carry out targeted, timely and preventive maintenance work.

By registering at www.riello-rsmonitoring.com, you can monitor the production and consumption trends of one or more photovoltaic plants, gaining access with a single account. In addition, users can activate failure alarms and generation messages.

The messages are alert emails.
Users can modify the references of the email addresses to which the messages and other alerts are delivered, also choosing the degree of priority.

The system enables real-time monitoring of the plant's performance and, via the Wi-Fi connection built into the inverter, sends the data to the central calculation unit (Cloud) over a secure SNMP Protocol.
The processing of these data, in addition to those sent by weather stations, allows us to keep the plants monitored, to guarantee the highest performance ratio and ensure a service even more oriented to the satisfaction of our customers.

The platform provides for managing an ordered, summary dashboard of all the monitored photovoltaic fields for each customer with related indications on the operating status (alarm signalling and error list) and on the production of the plant.

A second level accesses the detailed information of the selected plant.
Meters always provide the values of energy produced and the economic income generated, also calculating the reduction in CO_2 emissions and the equivalent in trees planted, without neglecting the energy values of daily, weekly, monthly, annual and total production, also with the aid of appropriate graphical reports.

The new export routine to text format allows using the data in various software applications for subsequent statistical analysis.
A report page enables the upload / download of event logs, even for a specific period as selected.

Finally, if the plant has SMARTSTRING, it will be possible to receive detailed information on the performance of the plant on the DC side, with a comparison between the producible power of a string and the actual power.

Register for the portal on the website:
www.riello-rsmonitoring.com

ALERT SERVICE AND ALARM MANAGEMENT

Thanks to the Smart Dashboard, customers and maintenance engineers of a photovoltaic field will always have real-time access to all the information related to the DC and AC side power values, daily, weekly, monthly, annual, and total energy, and the status of the devices (there may be a notification next to the alarms icon).

From the dashboard, we will have information on the user and on the field, with the date of installation, the size of the field location, the current time inherent to the place where the plant is located, logo and image (default or entered by the user during the configuration phase) and legal information related to earnings (calculated on the basis of the user-defined incentive rate for their own system), trees planted and CO_2 savings.

In addition, there will be information on the energies related to the entire plant and a button to select the graph to be displayed in the third box (field level or single inverter); this graph will show the instantaneous DC and AC power values both at the inverter level (for each individual inverter) and at the field level (intended as the sum of all the inverters that are part of the field).
The RS Monitoring system is equipped with an ALERT Service, to always stay up to date on any anomalies and malfunctions of the plant, in detail and configurable by sending an email.

MANAGEMENT

Alarm management is divided into the following groups:

- GROUP 1 – No communication: this error is generated when no packets are sent by an inverter for more than 8 hours, after which an alarm email is sent to the customer and the error is reported on the portal. This check is carried out 24 hours a day.
- GROUP 2 – Zero power generation: this error is generated when for 8 consecutive hours the packages of the inverter in question have a zero power parameter, after which an alarm email is sent to the customer and the error is reported on the portal. This check is only performed during daylight hours (sunrise-sunset)
- GROUP 3 – Alarms generated by inverters: these errors, sent by the inverters, are handled according to defined specifications.

Central inverters

64-250 kW

HIGHLIGHTS

- **Low frequency isolation transformer**
- **Full nominal power up to 45°C**
- **Colour LCD touch screen display with datalogger functions**
- **Made for operation with modules that require grounding a pole**

Sirio Central inverters provide a direct connection to the low voltage grid, ensuring their galvanic separation from the direct current plant. The generous dimensions of the transformer and the other components of the inverter provides high conversion efficiency and guarantees one of the highest efficiencies among machines of the same category.

ENERGY AND SAFETY AT THE HIGHEST LEVEL

The Maximum Power Point Tracking (MPPT) algorithm implemented in the control system of Sirio Central inverters enables full use of the photovoltaic generator in any radiation and temperature conditions, making the plant work constantly at maximum efficiency. In the absence of solar radiation, the converter goes on standby and resumes normal operation when there is radiation again. This feature reduces self-consumption to a minimum and maximises energy efficiency.

The use of speed-controlled fans helps to optimise the overall efficiency of the inverter. Temperature-linked fan operation also increases the expected lifespan and reduces costs incurred for non-routine maintenance. All these design features, the careful choice of components and guaranteed quality of production according to ISO9001 standards make the Sirio three-phase central inverters extremely efficient and reliable, helping to guarantee maximum energy production.

THERMAL DERATING

Derating depending on temperature is aimed at safeguarding against overheating inverter semiconductors in environments where the temperature exceeds installation specifications or for forced ventilation faults, without causing a complete shutdown of the inverter itself. Sirio Central models ensure a nominal power output at up to 45°C ambient. If this threshold is exceeded, the inverter gradually decreases the power fed into the network, so as to maintain heat sink temperature within the maximum limit. Once back in the thermal range of normal operation, the inverter restores the optimal working point, again ensuring maximum power transfer.

EASY INSTALLATION AND MAINTENANCE

The overall dimensions are greatly reduced; indeed, it is not necessary to provide for any space at the sides of the equipment for maintenance, since the electronics and the power components have complete front access. Fully automatic operation ensures ease of use and facilitates installation, reducing the likelihood of configuration errors, which could lead to failures or reduced plant productivity.

CUSTOMISED SOLUTIONS

On request, Riello Solartech can supply Sirio central inverters configured according to the customer's needs.
Available options include the pole/earth connection kit (positive or negative) required for some kinds of photovoltaic modules.

USER INTERFACE

Sirio Central inverters are fitted as standard with a new user interface consisting of a colour LCD touchscreen in a convenient 7" format. The millions of colours and quantity of features greatly enrich the user's experience of interaction with the solar inverter.
Intuitive icons and brief messages in the set language guide users through the simple menu structure, providing them with access to all reference, configuration and inverter control features. In particular, it is possible to view a daily energy production graph and the instantaneous value of power produced, verify module temperatures and the measurements of any installed analogue sensors.
The archive section provides a view and analysis of historical data, cross-checking measurements as desired (no longer two variables at a time). By scrolling a finger along the screen, users can query values recorded on previous days, including in monthly or annual intervals, and the graphs displayed can be sent via e-mail. Internal storage enables the archiving of about 5 years of data (however, if necessary, it is possible to delete previous years by means of a special function). Historical data produced by the inverter and the system card can be saved on a USB flash drive.
The device also enables users to change the €/kWh ratio, adjust display brightness, change the system date and time, assign an identification and label to the plant it belongs to, configure and customise up to 4 external analogue sensors. It also enables the sending of e-mails (the frequency of which can be set) with production data and graphs and, in the case of abnormalities, any malfunction or ignition failure alarms.
Finally, via special counters in the Info section, users can consult data on total produced energy, overall hours of operation, economic return of the plant and other technical parameters, including the amount of memory used for historical data. The graphic interface is available in Italian, English, French, Spanish and German.

NETWORK ACCESS

The touchscreen device offers many communication possibilities when connected to a local network. The inverter is compatible both with the PVSER proprietary protocol on the network and with ModBUS/TCP, thus offering easy addition to any management BMS or data analysis via an Ethernet network.
The display software can be updated easily and very quickly. Moreover, with a freeware program (VNC), users can remotely view the inverter screen or interact with it from their computer or mobile device.

COMMUNICATIONS

DISPLAY
Colour LCD touchscreen
COMMUNICATION INTERFACE
Ethernet, USB, 2xRS232, 2 inputs for remote controls (inverter trip and EPO) and 3 operating status signal relays. RS485 optional (slot version)
PROTOCOL
Universal rails for installation in rack cabinets

MODEL	SIRIO K64	SIRIO K80	SIRIO K100	SIRIO K200
Alternating current nominal power [kVA]	64	80	100	200
Alternating current maximum power [kW]	64 (cosφ=1)	80 (cosφ=1)	100 (cosφ=1)	200 (cosφ=1)
INPUT				
Maximum DC voltage in an open circuit [V DC]	800			
MPPT at full rating range [V DC]	330–700			
Operating range [V DC]	330–700			
Maximum input current [A DC]	205	260	320	650
Threshold voltage for grid supply [V DC]	390			
Ripple voltage	<1%			
Number of inputs	1			
MPPT number	1			
DC connectors	Bar			
OUTPUT				
Operating voltage [V AC]	400			
Operating range [V AC]	340–460 [1]			
Maximum power range [V AC]	340–460			
Frequency range [Hz]	47.5–51.5 [1]			
Settable frequency range [Hz]	47–53			
Nominal current [A AC]	92	115	145	289
Maximum current [A AC]	117	146	182	364
Short circuit current contribution [A AC]	175	219	274	546
Harmonic distortion (THDi)	<3%			
Power factor	from 0.9 ind. to 0.9 cap. [1]			
Galvanic separation	LF transformer			
AC connectors	Bar			
SYSTEM				
Maximum efficiency	96.1%			96.2%
European efficiency	95%		95.1%	95.2%
Stand-by consumption [W]	<32			
Overnight consumption [W]	<32			
Internal protections	AC-side thermal magnetic CB - DC-side disconnect switch			
Island operation protection	Yes			
Ground fault detection	Yes			
Heat dissipation	controlled fans			
Operating temperature	-20°C–45°C (without derating)			
Storage temperature	-20 °C – 70 °C			
Humidity	5–95% non-condensing			
Dimensions (WxDxH) [mm]	800x800x1900			1600x1000x1900
Weight [kg]	600	650	720	1580
COMPLIANCE WITH STANDARDS				
EMC	EN61000-6-3, EN61000-6-2, EN61000-3-11, EN61000-3-12			
Safety	EN62109-1, EN62109-2			
Directives	Low Voltage Directive: 2006/95/EC, EMC Directive: 2004/108/EC			
Network supervision	CEI 0-21, CEI 0-16, A70, VDE 0126-1-1, G59/2, Royal Decree 413/2014, PO12.3			CEI 0-21, CEI 0-16, A70, Royal Decree 413/2014, PO12.3

[1] *These values may vary according to the regulations of the country of installation.*

MODEL	SIRIO K64 HV	SIRIO K80 HV	SIRIO K100 HV	SIRIO K200 HV	SIRIO K250 HV
Alternating current nominal power [kVA]	64	80	100	200	250
Alternating current maximum power [kW]	64 (cosφ=1)	80 (cosφ=1)	100 (cosφ=1)	200 (cosφ=1)	250 (cosφ=1)
INPUT					
Maximum DC voltage in an open circuit [V DC]	880				
MPPT at full rating range [V DC]	450–760				
Operating range [V DC]	450–760				
Maximum input current [A DC]	157	196	245	500	590
Threshold voltage for grid supply [V DC]	540				
Ripple voltage	<1%				
Number of inputs	1				
MPPT number	1				
DC connectors	Bar				
OUTPUT					
Operating voltage [V AC]	400				
Operating range [V AC]	340–460 [1]				
Maximum power range [V AC]	340–460				
Frequency range [Hz]	47.5–51.5 [1]				
Settable frequency range [Hz]	47–53				
Nominal current [A AC]	92	115	145	289	361
Maximum current [A AC]	117	146	182	364	420
Short circuit current contribution [A AC]	175	219	274	546	630
Harmonic distortion (THDi)	<3%				
Power factor	from 0.9 ind. to 0.9 cap. [1]				
Galvanic separation	LF transformer				
AC connectors	Bar				
SYSTEM					
Maximum efficiency	96.1%	96.1%	96.1%	96.3%	
European efficiency	94.9%	95%	95.1%	95.2%	95.3%
Stand-by consumption [W]	<32				
Overnight consumption [W]	<32				
Internal protections	AC-side thermal magnetic CB - DC-side disconnect switch				
Island operation protection	Yes				
Ground fault detection	Yes				
Heat dissipation	controlled fans				
Operating temperature	-20°C–45°C (without derating)				
Storage temperature	-20 °C – 70 °C				
Humidity	5–95% non-condensing				
Dimensions (WxDxH) [mm]	800x800x1900			1600x1000x1900	
Weight [kg]	600	650	720	1580	1750
COMPLIANCE WITH STANDARDS					
EMC	EN61000-6-3, EN61000-6-2, EN61000-3-11, EN61000-3-12				
Safety	EN62109-1, EN62109-2				
Directives	Low Voltage Directive: 2006/95/EC, EMC Directive: 2004/108/EC				
Network supervision	CEI 0-21, CEI 0-16, A70, VDE 0126-1-1, G59/2, Royal Decree 413/2014, PO12.3			CEI 0-16, A70, Royal Decree 413/2014, PO12.3	

[1] *These values may vary according to the regulations of the country of installation.*

Central inverters HV/HHV MT

100-800 kW

HIGHLIGHTS

- **Made for direct connection to LV/MV transformers**
- **High conversion efficiency**
- **Full nominal power up to 45°C**
- **Colour LCD touch screen display with datalogger functions**

To increase overall plant efficiency, the Sirio HV-MT Central inverters do not include a built-in transformer. This feature and the meticulous design make them ideal for use in medium-high power plants connected to a medium voltage grid.

ENERGY AND SAFETY AT THE HIGHEST LEVEL

The Maximum Power Point Tracking (MPPT) algorithm implemented in the control system of Sirio inverters enables full use of the photovoltaic generator in any radiation and temperature conditions, making the plant work constantly at maximum efficiency. In the absence of solar radiation, the converter goes on standby and resumes normal operation when there is radiation again. This feature reduces self-consumption to a minimum and maximises energy efficiency. The use of speed-controlled fans helps to optimise the overall efficiency of the inverter.
To ensure higher standards of safety and fire prevention in case of a internal fault in the converter, the Sirio K330, 500 and 800 HV-MT units are fitted as standard with a motorised cut-off switch on the DC side with undervoltage protection. Moreover, the presence of 8 or 16 inputs, protected by fuses placed on both poles, ensures the protection of the lines coming from field switchboards; this arrangement allows avoiding secondary level switchboards (DC-Boxes) during the design phase, with consequent cost

savings. Temperature-linked fan operation also increases the expected lifespan and reduces costs incurred for non-routine maintenance. All these design features, the careful choice of components and guaranteed quality of production according to ISO9001 standards make the Sirio three-phase inverters extremely efficient and reliable and guarantees maximum energy production.

THERMAL DERATING

Derating depending on temperature is aimed at safeguarding against overheating inverter semiconductors in environments where the temperature exceeds installation specifications or for forced ventilation faults, without causing a complete shutdown of the inverter itself.
Sirio Central models ensure a nominal power output at up to 45°C ambient. If this threshold is exceeded, the inverter gradually decreases the power fed into the network, so as to maintain heat sink temperature within the maximum limit. Once back in the thermal range of normal operation, the inverter restores the optimal working point, again ensuring maximum power transfer.

USER INTERFACE

Sirio Central inverters are fitted as standard with a new user interface consisting of a colour LCD touchscreen in a convenient 7" format. The millions of colours and quantity of features greatly enrich the user's experience of interaction with the solar inverter. For more information, see the dedicated section on page 17.

EASY INSTALLATION AND MAINTENANCE

The greatly reduced overall dimensions for this power class mean it is not necessary to provide for any space at the side or back of the equipment for maintenance, since the electronics and the power components have complete front access.
Fully automatic operation ensures ease of use and facilitates installation, thus avoiding installation and configuration errors, which could lead to failures or reduced productivity of the plant.

CUSTOMISED SOLUTIONS

On request, Riello Solartech can supply Sirio HV-MT central inverters configured according to the customer's needs. Available options include the pole/earth connection kit (positive or negative) required for some kinds of photovoltaic modules.

COMMUNICATIONS

DISPLAY
Colour LCD touchscreen
COMMUNICATION INTERFACE
Ethernet, USB, 2xRS232, 2 inputs for remote controls (inverter trip and EPO) and 3 operating status signal relays. RS485 optional (slot version)
PROTOCOL
ModBUS and ModBUS/TCP

MODEL	SIRIO K100 HV-MT	SIRIO K200 HV-MT	SIRIO K250 HV-MT
Alternating current nominal power [kVA]	100	200	250
Alternating current maximum power [kW]	100 ($\cos\phi$=1)	200 ($\cos\phi$=1)	250 ($\cos\phi$=1)
INPUT			
Maximum DC voltage in an open circuit [V DC]		880	
MPPT at full rating range [V DC]		450–760	
Operating range [V DC]		450–760	
Maximum input current [A DC]	245	500	590 AC
Threshold voltage for grid supply [V DC]		540	
Ripple voltage		<1%	
Number of inputs		1	
MPPT number		1	
DC connectors		Bar	
OUTPUT			
Operating voltage [V AC]		270	
Operating range [V AC]		245–300 [1]	
Maximum power range [V AC]		245–300	
Frequency range [Hz]		47.5–51.5 [1]	
Settable frequency range [Hz]		47–53	
Nominal current [A AC]	214	428	535
Maximum current [A AC]	277	554	630
Harmonic distortion (THDi)		<3%	
Power factor		from 0.9 ind. to 0.9 cap. [1]	
Galvanic separation		No	
AC connectors		Bar	
SYSTEM			
Maximum efficiency		98.1%	
European efficiency		97.5%	
Stand-by consumption [W]		<32	
Overnight consumption [W]		<32	
Internal protections		AC-side thermal magnetic CB - DC-side disconnect switch	
Island operation protection		Yes	
Ground fault detection		Yes	
Heat dissipation		controlled fans	
Operating temperature		-20°C–45°C (without derating)	
Storage temperature		-20 °C – 70 °C	
Humidity		5–95% non-condensing	
Dimensions (WxDxH) [mm]	800x800x1900	1600x1000x1900	
Weight [kg]	420	1000	1050
COMPLIANCE WITH STANDARDS			
EMC		EN61000-6-4, EN61000-6-2, EN61000-3-11, EN61000-3-12	
Safety		EN62109-1, EN62109-2	
Directives		Low Voltage Directive: 2006/95/EC, EMC Directive: 2004/108/EC	
Network supervision		CEI 0-16, A70, PO12.3	

[1] *These values may vary according to the regulations of the country of installation*

MODEL	SIRIO K330 HV-MT	SIRIO K500 HV-MT
Alternating current nominal power [kVA]	330	500
Alternating current maximum power [kW]	330 ($cos\phi$=1)	500 ($cos\phi$=1)
INPUT		
Maximum DC voltage in an open circuit [V DC]	880	
MPPT at full rating range	450–760	
Operating range [V DC]	450–760	
Maximum input current [A DC]	780	1180
Threshold voltage for grid supply [V DC]	540	
Ripple voltage	<1%	
Number of inputs	8	
MPPT number	1	
DC connectors	Bar	
OUTPUT		
Operating voltage [V AC]	270	
Operating range [V AC]	245–300 [1]	
Maximum power range [V AC]	245–300	
Frequency range [Hz]	47.5–51.5 [1]	
Settable frequency range [Hz]	47–53	
Nominal current [A AC]	713	1070
Maximum current [A AC]	832	1260
Harmonic distortion (THDi)	<3%	
Power factor	from 0.9 ind. to 0.9 cap. [1]	
Galvanic separation	No	
AC connectors	Bar	
SYSTEM		
Maximum efficiency	98.1%	
European efficiency	97.5%	
Stand-by consumption [W]	<32	
Overnight consumption [W]	<32	
Internal protections	AC-side thermal magnetic CB - DC-side disconnect switch	
Island operation protection	Yes	
Ground fault detection	Yes	
Heat dissipation	controlled fans	
Operating temperature	-20°C–45°C (without derating)	
Storage temperature	-20 °C – 70 °C	
Humidity	5–95% non-condensing	
Dimensions (WxDxH) [mm]	1500x1000x1900	
Weight [kg]	1250	1320
COMPLIANCE WITH STANDARDS		
EMC	EN61000-6-4, EN61000-6-2, EN61000-3-11, EN61000-3-12	
Safety	EN62109-1, EN62109-2	
Directives	Low Voltage Directive: 2006/95/EC, EMC Directive: 2004/108/EC	
Network supervision	CEI 0-16, A70, PO12.3	

[1] *These values may vary according to the regulations of the country of installation*

MODEL	SIRIO K330 HHV-MT	SIRIO K500 HHV-MT	SIRIO K800 HV-MT
Alternating current nominal power [kVA]	330	500	800
Alternating current maximum power [kW]	330 (cosφ=1)	500 (cosφ=1)	800 (cosφ=1)
INPUT			
Maximum DC voltage in an open circuit [V DC]	1000		
MPPT at full rating range [V DC]	530–820		
Operating range [V DC]	530–820		
Maximum input current [A DC]	662	1000	1600
Threshold voltage for grid supply [V DC]	540		600
Ripple voltage	<1%		
Number of inputs	8		12
MPPT number	1		
DC connectors	Bar		
OUTPUT			
Operating voltage [V AC]	320 V AC		
Operating range [V AC]	288–350 [1]		
Maximum power range [V AC]	288–350		
Frequency range [Hz]	47.5–51.5 [1]		
Settable frequency range [Hz]	47–53		
Nominal current [A AC]	596	903	1450
Maximum current [A AC]	700	1060	1600
Harmonic distortion (THDi)	<3%		
Power factor	from 0.9 ind. to 0.9 cap. [1]		
Galvanic separation	No		
AC connectors	Bar		
SYSTEM			
Maximum efficiency	98.1%		
European efficiency	97.5%		
Stand-by consumption [W]	<32		
Overnight consumption [W]	<32		
Internal protections	AC-side thermal magnetic CB - DC-side disconnect switch		
Island operation protection	Yes		
Ground fault detection	Yes		
Heat dissipation	controlled fans		
Operating temperature	-20°C–45°C (without derating)		
Storage temperature	-20 °C – 70 °C		
Humidity	5–95% non-condensing		
Dimensions (WxDxH) [mm]	1500x1000x1900		1500x1000x1900 + 600x1000x1900 DC BOX
Weight [kg]	1000	1400	1380 + 200 (DC box)
COMPLIANCE WITH STANDARDS			
EMC	EN61000-6-4, EN61000-6-2, EN61000-3-11, EN61000-3-12		
Safety	EN62109-1, EN62109-2		
Directives	Low Voltage Directive: 2006/95/EC, EMC Directive: 2004/108/EC		
Network supervision	CEI 0-16, A70, PO12.3		

[1] *These values may vary according to the regulations of the country of installation*

SCS

200 kW-1 MW

HIGHLIGHTS

- **Complete, safe and high-performance “Plug & Play” solution**
- **No air conditioning system required**
- **AC transformer station with measurement**
- **Possibility of masonry or shelter construction**

Increase the overall efficiency of the conversion system and cut installation costs. This objective can be achieved by using a Sirio Central Station (SCS) system with Sirio Central HV-MT inverters connected to a high-efficiency medium-voltage transformer and installed in concrete stations to prolong their useful life, improve thermal insulation and to provide resistance to atmospheric agents and the most unfavourable environmental conditions.

THE COMPLETE SYSTEM FOR LARGE PLANTS

Sirio Central Station solutions are available in versions ranging from 200 kW to 1 MW, offering a complete, safe and high-performance “Plug & Play” solution. The modular system, which uses inverters housed in separate stations, each with its own MV/LV transformer, provides the inverters with a barycentric position within the photovoltaic field, to optimise installation.

The logic of having separate stations cuts production losses caused by failures and during routine and non-routine maintenance operations.

The stations are made of vibrated reinforced concrete, in accordance with the IEC 0-16 standards currently in force, with the Guide for Connections to the Enel Distribuzione Power Grid Ed. 1 December 2008 and with the Enel DG 2092 Construction Specifications Ed. 1 December 2008. The structures are particularly resistant to atmospheric agents since they are treated with special plastic and waterproofing coatings, which protect against the formation of cracks and seepages.

The external walls are coated with a quartz/rubber paint with a textured finish, to provide optimal resistance to atmospheric agents, even in marine, mountain, industrial or highly polluted environments.
The normal operating conditions of the installed equipment are guaranteed by a natural ventilation system using air vents, thus avoiding recourse to air conditioning systems.

The whole structure is assembled entirely using electromechanical equipment in the factory in accordance with the IEC EN 62271-202 standard, and electrical equipment where applicable, ready to be placed on site for subsequent start-up.

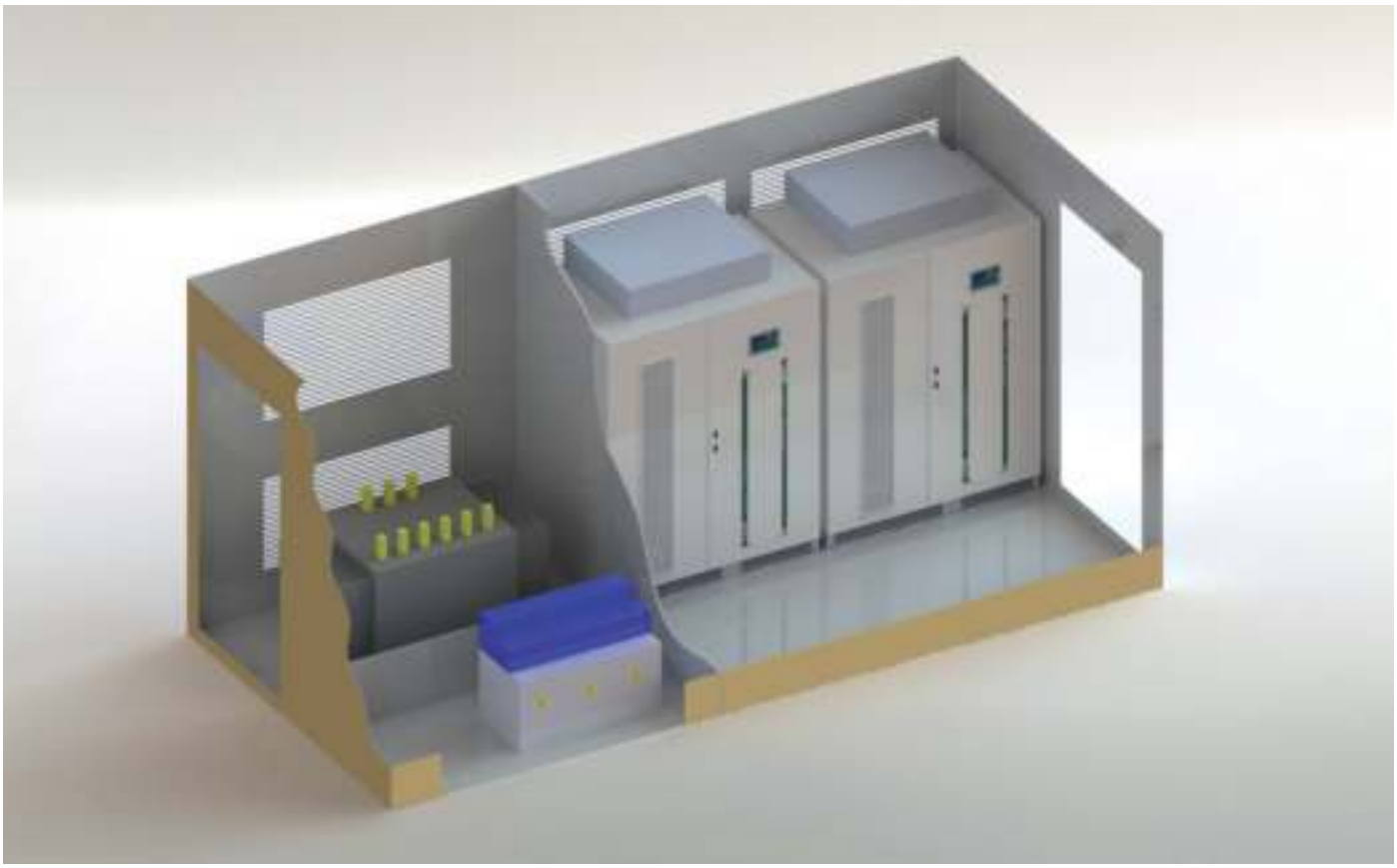
OPTIONAL SOLUTIONS

Riello Solartech can also offer pre-assembled solutions for:

- user stations with interface and general device protection in compliance with CEI 0-16 requirements;
- public utility cabins implemented in compliance with ENEL unification standards DG 2092 Rev.2 with the measurement unit where the electricity distribution utility takes its readings;
- intermediate configurations from 200kW are available in addition to the versions present in the catalogue;
- shelter constructions.

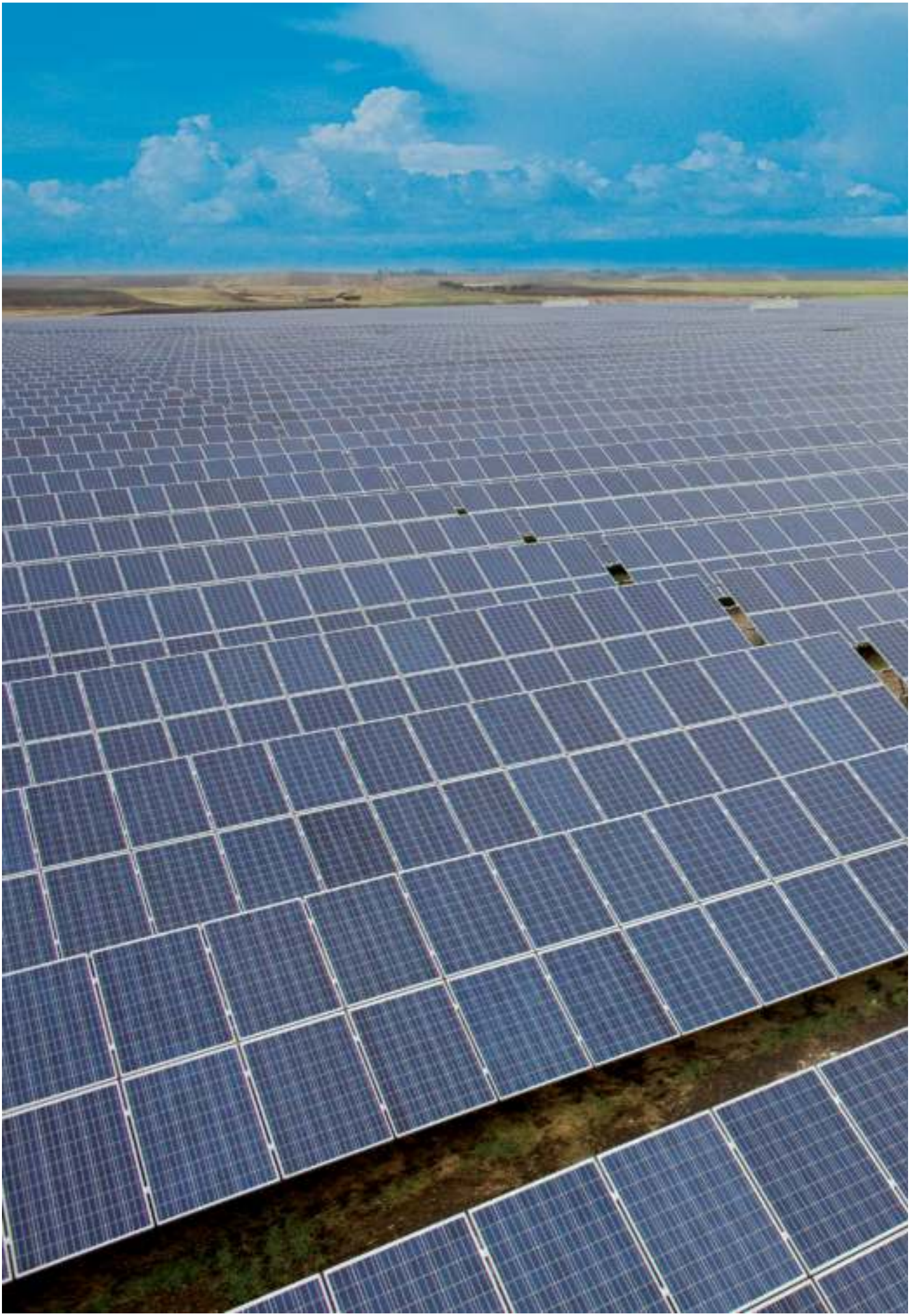
PRACTICAL AND COMPLETE

The SCS solutions can be defined as “All-in-One”, as they tend to reduce the normal design phases, cut transport and installation times and come already equipped with everything needed for system start-up.
The significantly lower costs, the excellent efficiency of the whole system (due to the inverters and transformers used) and the time saving in the start-up phase make the Sirio Central Station an attractive choice to optimise return on investment.



MODEL	SCS 500	SCS 660	SCS 1000
Alternating current nominal power [kVA]	500	660	1000
Alternating current maximum power [kW]	500 ($\cos\phi$=1)	660 ($\cos\phi$=1)	1000 ($\cos\phi$=1)
INPUT			
Max. DC voltage in an open circuit [V DC]		1000	
MPPT at full rating range [V DC]		530–820	
Maximum input current [A DC]	2x590	2x780	2x1180
Number of inputs	2	16	16
MPPT number	2	2	2
DC connectors		Bar	
OUTPUT			
Operating voltage [kV]		20 [1]	
Frequency range [Hz]		47.5–51.5 [(2)]	
Settable frequency range [Hz]		47–53	
Nominal current (at 20 kV) [A AC]	14.45	19	28.90
Harmonic distortion (THDi)		<3%	
Power factor		from 0.9 ind. to 0.9 cap. [(2)]	
SYSTEM			
Maximum efficiency		97.3% (values including inverter auxiliaries and LV/MV transformer)	
European efficiency		96.7% (values including inverter auxiliaries and LV/MV transformer)	
Operating temperature		-20°C–45°C (without derating)	
Humidity		0–95% non-condensing	
CABIN FEATURES			
Materials		Mono-block structure with reinforced concrete, class Rck-250 kg/cm^2, with added superfluidifying and waterproofing agents	
Structure		comprising electric welded mesh and iron rod reinforcement, with improved adherence, both in Feb44k	
Walls		water-resistant plastic plasters painted with quartz/rubber paint with a textured finish	
Cooling		natural ventilation through metal ducting	
Dimensions (WxDxH) [mm]		5440x2500x2550	
Weight [kg]		22000	
Lighting		fluorescent lamps 2x18W of which 1x18W in an emergency for each prefabricated structure	
Standard equipment		2 ENEL-approved meters, GSM remote reading system, fire extinguisher	
Compliance with specifications		CEI 0-16 ed.2 July 2008; ENEL Grid connections guide ed.1 December 2008	
TRANSFORMER FEATURES			
Construction		resin or oil bath seal	
Primary nominal power	500 kVA	1 MVA	1 MVA
Secondary nominal power [kVA]	2x250	2x500	2x500
In/Out voltage [V]		2x(270)/20000[1]	

[1] The MV level can vary depending on Utility Administrator requirements.
[2] These values may vary according to the regulations of the country of installation.



SPS
SPS HE

10 kVA-800 kVA

HIGHLIGHTS

- **Compatible with On grid and Off grid systems**
- **Hybrid energy storage system: grid + renewable**
- **Quality power supply to loads with the integration of photovoltaic energy**
- **Integration in plants with Solar Technology and Riello Solartech inverters**
- **Peak shaving and load management**

Sirio Power Supply is a device that can both increase the functionality of an On grid photovoltaic system equipped with Riello Solartech inverters, as well as create an Off grid plant. In fact, thanks to energy storage suitably dimensioned based on the desired load characteristics and battery life, the system can store energy produced from a renewable source, which can then be used at night or when there is no radiation, in addition to making the system independent of the electricity distribution grid.
This solution therefore provides for the best possible management of self-consumption of the energy produced by the photovoltaic system. The battery is charged by the photovoltaic inverter or the electricity grid/generator set.
The generous dimensions of the main internal components result in higher efficiency and, to guarantee system performance, the presence of the inverter's output transformer ensures 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 the following services:

- no 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;
- monitoring of the maximum charge time to reduce the consumption of 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 state of charge 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 optimise performance, the Battery Care System also provides for manual setting of 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 connected to the grid and in geographically remote, rural or isolated areas with heavy energy demand but with unreliable grid power or power provided via generator sets; thus in cases where energy needs to be stored – preferably from energy sources such as the sun. Let's look at a few 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;
- feeds energy into the grid when the tariffs are more convenient;
- optimises the self-consumption periods and hence reduces the plant's TCO.

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

AREAS WHERE THE GRID IS AVAILABLE WITHOUT NET METERING

In 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;
- increases the self-consumption level of the energy produced;
- reduces the TCO of the plant.

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 is therefore only produced by generator sets.

Advantages:
- meets the needs of current peaks by using the energy from the battery and not from generator sets;
- minimises generator set operation;
- lower fuel consumption and hence lower operational costs;
- less expense and inconvenience relating to transport of fuel to remote areas.

SPS APPLICATION AREAS

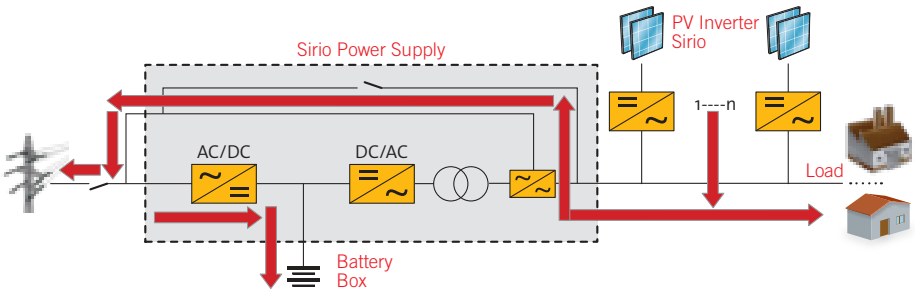
- **Building/Industry**: Hotels, Shopping malls, Production facilities;
- **E-mobility**: power supply to electric car charging posts;
- **Utility**: grid support services
- **Rental**: hybrid systems with generator sets.

ON-GRID SYSTEM WITH OPTION OF NET METERING

CONDITION NO. 1

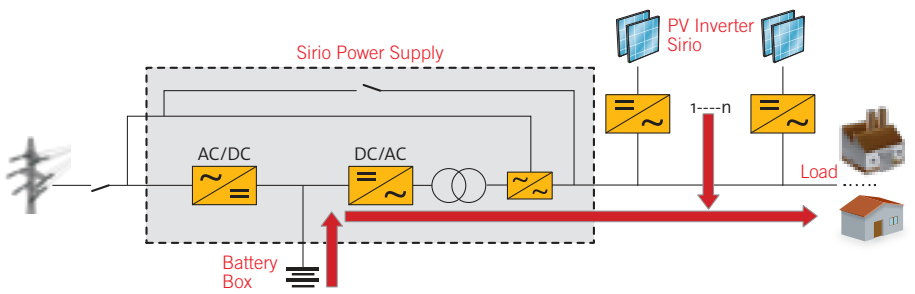
In case of sufficient sunlight, the system supplies the load and charges the battery; the grid must be available. The battery charge level is given by the formula:

kW (PV Inverter) – kW (load) = kW (battery charge)



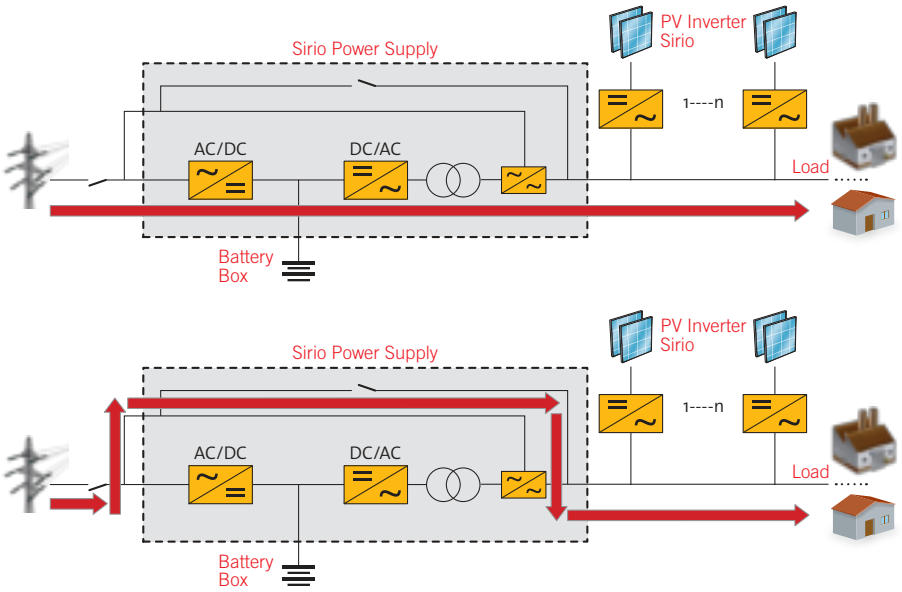
CONDITION NO. 2

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



CONDITION NO. 3

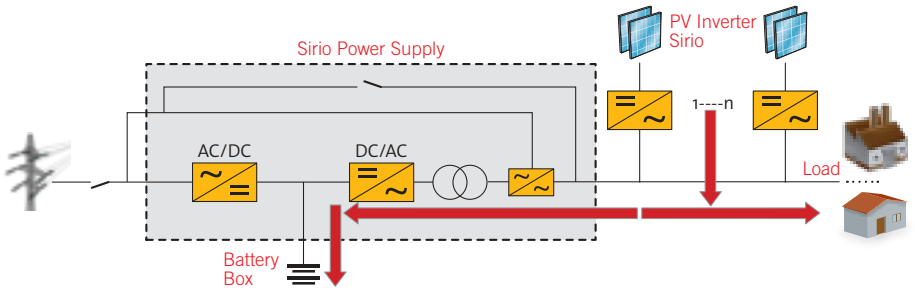
In case of insufficient sunlight and a discharged (or inhibited) battery, the load is powered by the grid through the inverter or the bypass (energy saving mode).



ON-GRID SYSTEM WITHOUT OPTION OF NET METERING

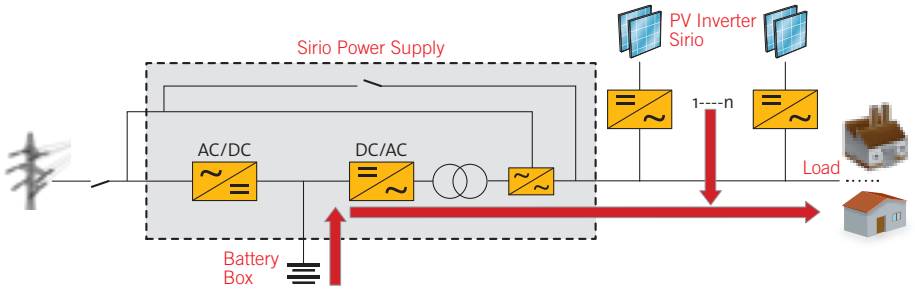
CONDITION NO. 1

In case of sufficient sunlight, the PV 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 PV inverters are immediately switched off. This prevents even a small amount of energy from being transferred to the grid.



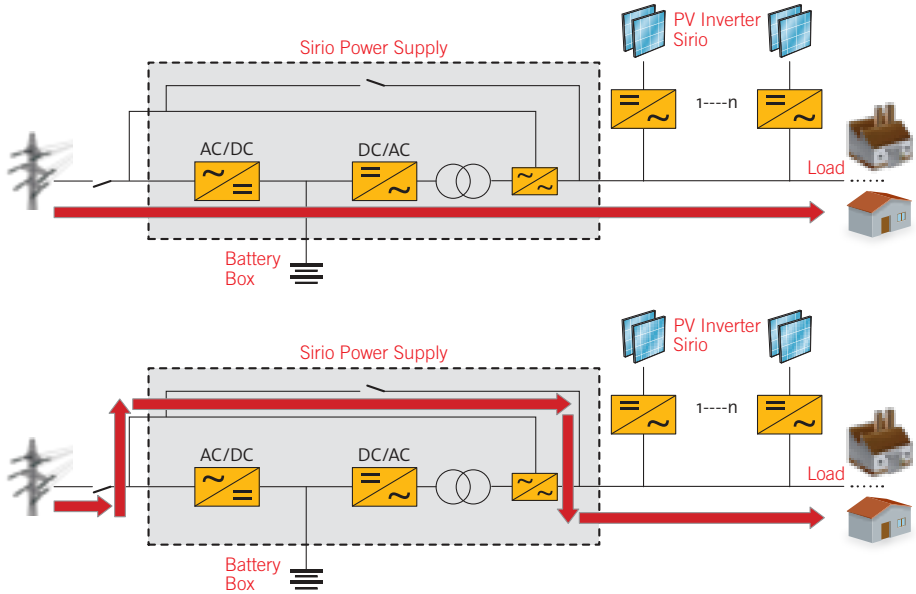
CONDITION NO. 2

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



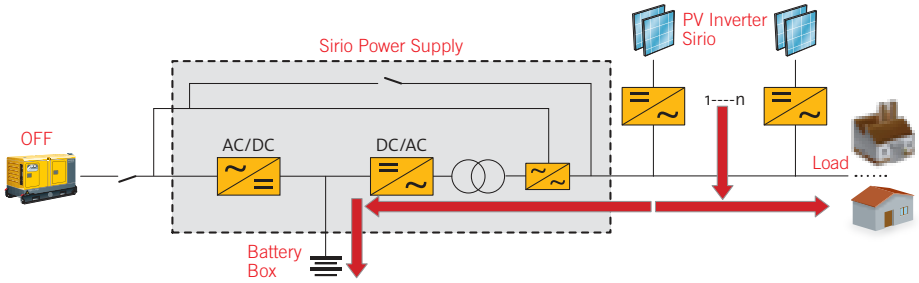
CONDITION NO. 3

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).



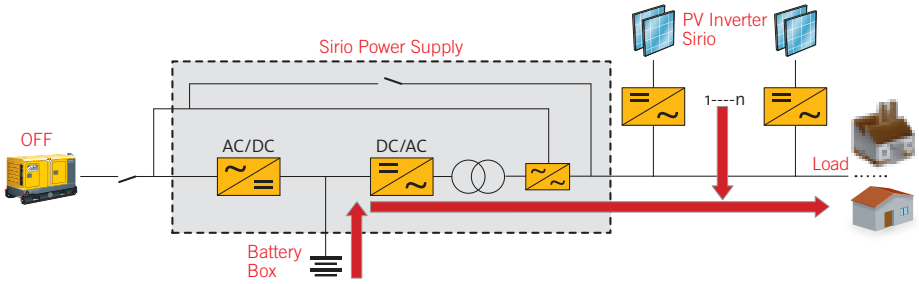
CONDITION NO. 1

In case of sufficient sunlight, the PV inverters supply the load and charge the battery from the SPS output; thus the generator set can be switched off.



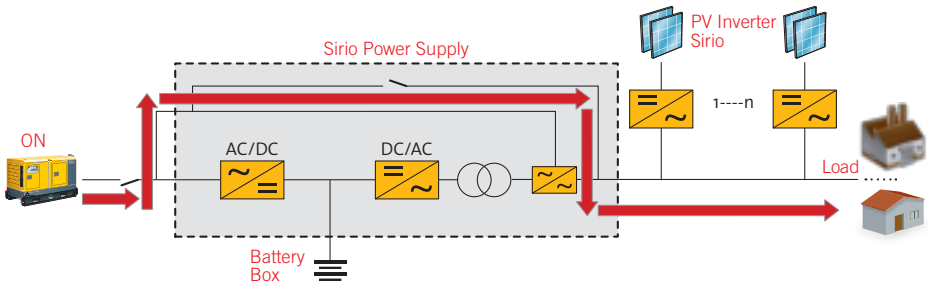
CONDITION NO. 2

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



CONDITION NO. 3

In case of lack of sunlight, PV inverters switched off and battery discharged, the load is supplied by the generator set.



MODELS	SPS 10	SPS 15	SPS 20	SPS 30	SPS 40	SPS 60	SPS 80
INPUT							
Nominal voltage [V]	380 / 400 / 415 three-phase						
Voltage tolerance [V]	400 +20% -25% at full load[1]						
Frequency [Hz]	45 - 65						
Soft start	0 - 100% in 120 sec (selectable)						
Allowed frequency tolerance	±2% (selectable from ±1% to ±5% from front panel)						
Standard equipment	Back-feed protection; detachable bypass line						
BYPASS							
Nominal voltage [V]	380 / 400 / 415 three-phase + N						
Nominal frequency [Hz]	50 or 60 (selectable)						
OUTPUT							
Nominal power [kVA]	10	15	20	30	40	60	80
Active power [kW]	9	13.5	18	27	36	54	72
Number of phases	3 + N						
Nominal voltage [V]	380 / 400 / 415 three-phase + N (selectable)						
Static stability	±1%						
Dynamic stability	±5% in 10 msec.						
Voltage distortion	<1% with linear load / <3% with non-linear load						
Crest factor [lpeak/lrms]	3:1						
Frequency stability on battery	0.05%						
Frequency [Hz]	50 or 60 (selectable)						
Overload	110% for 60 min.; 125% for 10 min.; 150% for 1 min.						
BATTERIES							
Type	VRLA AGM / GEL; NiCd; Supercaps; Li-ion						
Residual ripple voltage	<1%						
Compensation for charging current	-0.11% x V x °C						
Maximum charging current from SPS output (PV Inverter) [A]	25	38	50	75	100	150	200
Typical charging current	0.2 x C10						
GENERAL SPECIFICATIONS							
Weight without batteries [kg]	228	241	256	315	335	460	520
Dimensions (WxDxH) [mm]	555x740x1400					800x740x1400	
Remote signals	voltage-free contacts						
Remote controls	ESD and bypass						
Communications	Dual RS232 + voltage-free contacts + 2 slots for communication interface						
Ambient temperature	From 0 °C to +40 °C						
Relative humidity range	5–95% non-condensing						
Colour	Light grey RAL 7035						
Noise level at 1 m (ECO mode) [dBA]	60				62		
IP class	IP20						
Regulations	European Directives: L V 2014/35/EU Low Voltage Directive EMC 2014/30/EU Electromagnetic Compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2; RoHS compliant Classification according to IEC 62040-3 (Voltage Frequency Independent) VFI - SS - 111						
Classification according to EN 62040-3	(Voltage Frequency Independent) VFI - SS - 111						
UPS handling	Pallet truck						

[1] *Additional conditions apply for greater tolerances.*

MODELS	SPS 100	SPS 120	SPS 160	SPS 200
INPUT				
Nominal voltage [V]	380 / 400 / 415 three-phase			
Voltage tolerance [V]	400 +20% -25% at full load[1]			
Frequency [Hz]	45 - 65			
Soft start	0 - 100% in 120 sec (selectable)			
Allowed frequency tolerance	±2% (selectable from ±1% to ±5% from front panel)			
Standard equipment	Back-feed protection; detachable bypass line			
BYPASS				
Nominal voltage [V]	380 / 400 / 415 three-phase + N			
Nominal frequency [Hz]	50 or 60 (selectable)			
OUTPUT				
Nominal power [kVA]	100	120	160	200
Active power [kW]	90	108	144	180
Number of phases	3 + N			
Nominal voltage [V]	380 / 400 / 415 three-phase + N (selectable)			
Static stability	±1%			
Dynamic stability	±5% in 10 msec.			
Voltage distortion	<1% with linear load / <3% with non-linear load			
Crest factor [lpeak/lrms]	3:1			
Frequency stability on battery	0.05%			
Frequency [Hz]	50 or 60 (selectable)			
Overload	110% for 60 min.; 125% for 10 min.; 150% for 1 min.			
BATTERIES				
Type	VRLA AGM / GEL; NiCd; Supercaps; Li-ion			
Residual ripple voltage	<1%			
Compensation for charging current	-0.11% x V x °C			
Maximum charging current from SPS output (PV Inverter) [A]	247	296	395	494
Typical charging current	0.2 x C10			
GENERAL SPECIFICATIONS				
Weight [kg]	620	640	700	800
Dimensions (WxDxH) [mm]	800x800x1900			
Remote signals	voltage-free contacts			
Remote controls	ESD and bypass			
Communications	Dual RS232 + voltage-free contacts + 2 slots for communication interface			
Ambient temperature	From 0 °C to +40 °C			
Relative humidity range	5–95% non-condensing			
Colour	Light grey RAL 7035			
Noise level at 1 m (ECO mode) [dBA]	65	68		
IP class	IP20			
Regulations	European Directives: L V 2014/35/EU Low Voltage Directive EMC 2014/30/EU Electromagnetic Compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2; RoHS compliant Classification according to IEC 62040-3 (Voltage Frequency Independent) VFI - SS - 111			
Classification according to EN 62040-3	(Voltage Frequency Independent) VFI - SS - 111			
UPS handling	Pallet truck			

[1] *Additional conditions apply for greater tolerances.*

MODELS	SPS HE 100	SPS HE 120	SPS HE 160	SPS HE 200	SPS HE 250	SPS HE 300	SPS HE 400	SPS HE 500	SPS HE 600	SPS HE 800
INPUT										
Nominal voltage [V]	380 / 400 / 415 three-phase									
Voltage tolerance [V]	400 ±20% at full load[1]									
Frequency [Hz]	45 - 65									
Power factor	>0.99									
Harmonic current distortion (THDi)	<3%									
Soft start	0 - 100% in 120 sec (selectable)									
Frequency tolerance	±2% (selectable from ±1% to ±5% from front panel)									
Standard equipment	Back-feed protection; detachable bypass line									
BYPASS										
Nominal voltage [V]	380 / 400 / 415 three-phase + N									
Frequency [Hz]	50 or 60 selectable									
OUTPUT										
Nominal power [kVA]	100	120	160	200	250	300	400	500	600	800
Active power [kW]	100	120	160	200	250	300	400	500	600	800
Number of phases	3 + N									
Nominal voltage [V]	380 / 400 / 415 three-phase + N (selectable)									
Static stability	±1%									
Dynamic stability	±5% in 10 msec.									
Voltage distortion	<1% with linear load / <3% with non-linear load									
Crest factor [lpeak/lrms]	3:1									
Frequency stability On battery	0.05%									
Frequency [Hz]	50 or 60 (selectable)									
Overload	110% for 60 min.; 125% for 10 min.; 150% for 1 min.									
BATTERIES										
Type	VRLA AGM / GEL; NiCd; Supercaps; Li-ion									
Ripple current	Zero									
Maximum charging current from SPS output (PV Inverter) [A]	198	238	317	396	495	594	792	990	1188	1583
Compensation for charging current	-0.11% x V x °C									
GENERAL SPECIFICATIONS										
Weight [kg]	850	850	1015	1070	1300	1680	2050	3026	3080	4004
Dimensions (WxDxH) [mm]	800x850x1900		1000x850x1900			1500x1000x1900		2100x1000x1900		3200x 1000x 1900
Remote signals	Voltage-free contacts (configurable)									
Remote controls	ESD and bypass (configurable)									
Communications	Dual RS232 + remote contacts + 2 slots for communication interface									
Ambient temperature	From 0 °C to +40 °C									
Relative humidity range	5–95% non-condensing									
Colour	Light grey RAL 7035									
Noise level (at 1 m) [dBA]	63 - 68					70 - 72				
Protection level	IP20 (others available on request)									
Double conversion efficiency	Up to 95.5%									
Regulations	Safety: EN 62040-1 (Directive 2006/95/EC); EMC: EN 62040-2 (Directive 2004/108/EC)									
Classification according to IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111									

[1] *Additional conditions apply for greater tolerances.*

Monitoring and configuration solutions

Sirio Data Control

MONITORING PROGRAM

Sirio Data Control was developed with the aim of simplifying the configuration of controlled devices as much as possible without compromising the main function – supervising and monitoring devices on an LAN or over the Internet with up to a maximum of 300 inverters.

The Sirio Data Control graphical user interface has been designed to be as simple and intuitive as possible, showing all the available measurements and all the historical data of each inverter at the same time. Unlike the SunVision 2, the Sirio Data Control recovers any missing historical data from the equipment without the limitation of having the software always running on a dedicated PC.

Sirio Data Control also enables the user to remotely send control commands (like switching on/off, management of the active and reactive power, soft starts) to the inverter in the field.

NOTE: Compatibility is guaranteed with central inverters running firmware version 1.2.5 or later and with SPS systems equipped with a NetMan 204 Solar network card.

MAIN FEATURES

- Monitoring Riello Solartech inverters both on an LAN and over the Internet;
- Sending control commands to a single inverter or to the entire plant;
- Optionally displaying the plant's production data in full screen mode (for example for large monitors in large-scale installations or public administrations);
- Simple and self-explanatory push-buttons;
- Scanning the LAN and automatically adding inverters without user intervention;
- Assigning the addresses without using the DHCP server;
- Real-time measurement of each inverter;
- Synchronising the inverter's date/time with the pc.

SUPPORTED OPERATING SYSTEMS

- Microsoft Windows
- Linux
- Mac OS X

Accessories

String Box

A field switchboard able to monitor the string currents and promptly diagnose any faults.
It has a general circuit breaker, type ABB T1D 160PV, specific to photovoltaic applications and also allows for the addition of a release coil to disconnect the photovoltaic field from the inverter.
The casing is made of UV-resistant polyester resin with an IP65 protection level and enables the connection of up to 16 strings (with a maximum input current per string of 12A).
As it is compatible with the Sirio Data Control monitoring software, it can display currents and send signals and alarms in the event of current faults according to the thresholds set at configuration.
Communication solutions include an RS485 and an RS232 port (supplied as standard), a slot for an optional NetMan Plus PV Ethernet card, digital and analogue inputs for the connection of environmental sensors (temperature, radiation and wind).

MAIN FEATURES

- parallel connection of up to 16 strings of 12A each (8 measurement channels);
- local and remote indication of status and alarm conditions;
- RS232 and RS485 connections supplied as standard;
- one slot connection for expanding communication (e.g. with Ethernet board);
- proprietary communication protocol and MODBUS RTU, both available on all the communication ports;
- wide configurability of the monitoring parameters using the available software;
- local history log of alarms;
- protection fuses for each input with 1000 V DC fuses on the positive and negative pole;
- for each input it is possible to connect wires up to 16mm^2;
- output disconnect switch, with optional release coil, used for disconnecting the inverter;
- monitored discharger, used against overvoltage situations, protected against over-currents and easy to restore thanks to removable cartridges;
- direct power supply from the photovoltaic field or from auxiliary voltage;
- insulated digital inputs for local monitoring;
- insulated analogue inputs for environmental sensors (2xPT100, 0-10V, 4-20mA);
- configurable digital outputs with voltage-free contacts;
- polyester box for outdoor use with IP65 protection level.

String Box Setup

The String Box Setup application is used to set up the String Box according to the features of the plant and the user's requirements. The items that can be set are the analogue inputs, digital inputs and outputs, read channels and alarm thresholds.

MAIN FEATURES

- via the Time Windows function, time windows can be set for each of the 8 inputs necessary to avoid false alarms (e.g. in case of systematic shading in certain periods and at certain times of the year);
- configuration of the relays present on the device depending on the status of the alarms;
- configuration of the two inputs 4/20 mA and 0/10 V;
- full management of the minimum alarm threshold parameters;
- management and download of the events log.

Power Reducer Kit

SELF-CONSUMPTION SOLUTION

In some cases, the mains supply cannot accept the power generated by the photovoltaic stations, but the user wishes to reduce his energy costs by installing a PV field with the intention of using all the energy produced.
To adhere to contractual limitations and not supply energy to the grid, Riello Solartech recommends adding the "Power Reducer" Kit which forces the inverter to produce only the power required to supply the connected loads.

MAIN FEATURES

- Compatible with RS and Sirio Central inverters
- Kit consisting of:
  - RS485 card (only for central and Sirio Easy Inverters, not required for Sirio EVO)
  - Power meter (modular digital multimeter with multilingual graphic LCD and RS485 output port)
  - Current transformer rated based on the load.

NetMan 204 Solar

NETWORK AGENT

The NetMan 204 Solar board allows managing the String Box connected directly over a 10/100 Mb LAN with standard network protocols (TCP /IP, HTTP HTTPS, SSH, SNMPv1 and SNMPv3).

MAIN FEATURES

- 32-bit RISC processor;
- 10/100 Mbps Ethernet and IPv4/6 compatible;
- Compatible with Sirio Data Control;
- ModBUS TCP/IP;
- Datalogger for storing events for approximately 30 years;
- Wake on LAN management for TCP /IP network computer start-up;
- Other protocols: DHCP, DNS, FTP, NTP, ICMP, IGMP;
- Firmware update through network;
- Micro USB port.

Note: Accessory not required on Central Inverters

RS485

COMMUNICATION ADAPTER

The RS485 card enables the creation of a BUS to connect multiple inverters, displaying all the parameters via connection to a PC equipped with SunVision software.

MAIN FEATURES

- Plug & Play installation;
- Data transfer up to 9.6k baud.

Note: Accessory compatible with Sirio EASY and Central series.

Energy Manager

COMMUNICATION ADAPTER

In storage systems, the Energy Manager card enables managing static and dynamic Peak Shaving and communication with lithium batteries via BMS.

MAIN FEATURES

- Compatible with 10/100 Mbps Ethernet interface;
- RS485 port;
- ModBus/TCP;
- IP address (DHCP) with dynamic or manual assignment;
- Operating system: MAC OS, Windows.

Note: Accessory compatible with Sirio Power Supply (SPS).

ModCOM PV

MODBUS PROTOCOL CONVERTER

MODBUS is an open-source and royalty-free serial communication protocol, which has become an industry standard in recent years thanks to its ease of use and implementation. The ModCOM PV device makes it possible to monitor Riello Solartech photovoltaic inverters via the MODBUS RTU protocol over half-duplex RS-485 serial cable.

MAIN FEATURES

- ModBUS/JBUS port can be configured as RS232 or RS485;
- RJ-45 connector for connecting to the MODBUS network;
- can be integrated with the main BMS management programs;
- LED signals for communication activity;
- firmware upgradeable through serial port.

Note: For Central series, needed for ModBUS/RTU (standard for ModBUS/TCP).

SunGuard Monitoring Solutions

Every day, more and more photovoltaic systems, both civil and industrial, are installed without providing for adequate maintenance.
When undergoing significant development, technological systems require routine and non-routine maintenance operations to be carried out by specialised technicians. However, this does not guarantee the complete and constant efficiency of the photovoltaic system and, even less, preventive interventions in the case of imminent energy loss or malfunction due to exogenous and/or endogenous causes. That's why SunGuard has been developed.

It's a professional system that closely monitors every type of photovoltaic plant, as well as the environment where it is installed. Useful for smaller installations, necessary for medium to large plants. SunGuard communicates data and information in real time both to the operators who perform the monitoring and to the specialised technicians, thereby allowing for targeted, timely and preventive interventions. SunGuard provides for the real-time monitoring of the system's performance and, via the SunGuard Box interface, sends the data to the central calculation unit over an SNMP Protocol. The elaboration of this data, in addition to those received from weather stations, pyranometers, toroids and video cameras positioned on the plant, provides for the constant supervision of our systems and enables us to offer a service even more oriented towards maximum customer satisfaction.

TECHNICAL FEATURES SUMMARY

- Remote web-based management through UMTS, GPRS, LAN network and Wi-Fi connectivity;
- Monitoring of each single inverter;
- Connection to every type of environmental sensor;
- Numerical and graphical display of the periodic data and reports regarding the plant's production;
- Notifications sent by email and SMS;
- Pro-active management of maintenance interventions;
- Web-based plant management for the installers, maintenance personnel, technical assistance, help desk and end customer, through dedicated administration panels.

MAIN FUNCTIONS

- Centralised multi-system management
- Multi-user functionality with various access levels
- Data storage in SQL databases
- Advanced formula editor
- Events and actions management
- Reporting system
- Performance analysis
- Graphics management
- Integrated video camera management
- SNMP standard for extended monitoring
- Access to collected data.

SunGuard Box Uno

DATALOGGER FOR PLANTS UP TO 20 KWP

Datalogger for plants up to 20kWp

MAIN FEATURES

- Plant compatibility: 1–20kWp
- Mounting: on DIN rail
- Power supply unit: 24VDC included
- Consumption: 20W max
- Operating range: 0–70°C
- CPU: Quad-Core, 1.2 GHz
- Memory: 1024 MB
- Storage: 4 GB
- LAN: 10/100 Mbps Ethernet controller, Wi-Fi
- Communication interfaces: 1 RS232, 2 RS485 opto-isolated

The SunGuard Box Family datalogger, via the Ethernet port connected to an ADSL router/modem or via the 3G HSPA Modem Router, sends data to the SunGuard Server Web, which generates automatic notifications of faults or malfunctions.
Via any web browser and with an internet connection, you can access your own private interface and monitor and analyse all the photovoltaic plants equipped with a SunGuard datalogger.
It has two RS232 serial ports so that it can be connected to an unlimited number of inverters for plants up to 20kWp.
SWSUNGUARD2 software is pre-installed on a 4GB Compact Flash card.

SunGuard Box Small

DATALOGGER FOR PLANTS UP TO 100KWP

MAIN FEATURES

- Plant compatibility: 1–100kWp
- Mounting: on DIN rail
- Power supply unit: 24VDC included
- Consumption: 20W max
- Operating range: 0–70°C
- CPU: Quad-Core, 1.2 GHz
- Memory: 1024 MB
- Storage: 4 GB
- LAN: 10/100 Mbps Ethernet controller, Wi-Fi
- Communication interfaces: 1 RS232, 3 RS485 opto-isolated

A robust data ogger made of ABS and built to be used in medium-sized PV plants with demanding assembly requirements.
The SunGuard Small datalogger detects the data provided by the devices (inverters and other compatible communication devices) to which it is connected and, via the Ethernet port connected to an ADSL router/modem or via the 3G HSPA Modem Router, sends data to the SunGuard Server Web, which generates automatic notifications of faults or malfunctions.

Via any web browser and with an internet connection, you can access your own private interface and monitor and analyse all the photovoltaic plants equipped with a SunGuard datalogger.
It has as many as four communication ports to monitor 4 different types of device (for example: inverter, fiscal meter, one or more SunGuard Sensor Boxes, and SunGuard field switchboards from 4 to 24 strings). SWSUNGUARD2 software is pre-installed on a 4GB Compact Flash card.

SunGuard Box Professional

DATALOGGER FOR PLANTS UP TO 500KWP

MAIN FEATURES

- Plant compatibility: 1–500kWp
- Mounting: on DIN rail
- Power supply unit: 24VDC included
- Consumption: 20W max
- Operating range: 0–70°C
- CPU: Quad-Core, 1.2 GHz
- Memory: 1024 MB
- Storage: 4 GB
- LAN: 10/100 Mbps Ethernet controller, Wi-Fi
- Communication interfaces: 1 RS232, 5 RS485 opto-isolated

The SunGuard Professional datalogger detects the data provided by the devices (inverters and other compatible communication devices) to which it is connected and, via the Ethernet port connected to an ADSL router/modem or via the 3G HSPA Modem Router, sends data to the SunGuard Server Web, which generates automatic notifications of faults or malfunctions.
Via any web browser and with an internet connection, you can access your own private interface and monitor and analyse all the photovoltaic plants equipped with a SunGuard Box datalogger.

It has as many as four communication ports to monitor 4 different types of device (for example: inverter, fiscal meter, one or more SunGuard Sensor Boxes, and SunGuard field switchboards from 4 to 24 strings). SWSUNGUARD2 software is pre-installed on a 4GB Compact Flash card.

SunGuard Box Business

DATALOGGER FOR PLANTS OVER 500KWP

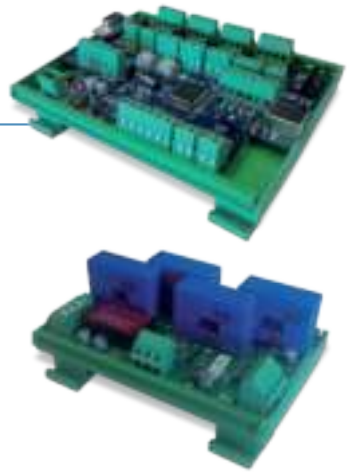
MAIN FEATURES

- Plant compatibility: >500kWp
- Mounting: on DIN rail
- Power supply unit: 24VDC included
- Consumption: 20W max
- Operating range: 0–70°C
- CPU: Quad-Core, 1.2 GHz
- Memory: 1024 MB
- Storage: 4 GB
- LAN: 10/100 Mbps Ethernet controller, Wi-Fi
- Communication interfaces: 1 RS232, 7 RS485 opto-isolated

The datalogger for photovoltaic systems that makes it possible to monitor every communication device: inverters, DC field switchboards, fiscal meters, voltage-free contacts of disconnectors and dischargers, one or more SunGuard Sensor Boxes and more besides. It features an unrivalled speed of calculation in the renewable energy sector. A datalogger created for industrial environments, equipped with as many as 8 available serial ports.
The SunGuard Business datalogger detects the data provided by the devices (inverters and other compatible communication devices) to which it is connected and, via the Ethernet port connected to an ADSL router/modem or via the Sunguard ready 3G/UMTS Router/Modem, sends data to the SunGuard Server Web, which generates automatic notifications of faults or malfunctions. Via any web browser and with an internet connection, you can access your own private interface and monitor and analyse all the photovoltaic plants equipped with a SunGuard Box datalogger.
It has as many as eight communication ports to monitor 8 different types of device (for example: inverter, fiscal meter, one or more SunGuard Sensor Boxes, SunGuard field switchboards from 4 to 24 strings, and module for voltage-free contacts). SWSUNGUARD2 software is pre-installed on a 4GB Compact Flash card.

SunGuard String Control Kit

CURRENT MONITOR



AVAILABLE VERSIONS

- SGK-16 for 16 strings
- SGK-12 for 12 strings
- SGK-8 for 8 strings
- SGK-4 for 4 strings

MAIN FEATURES

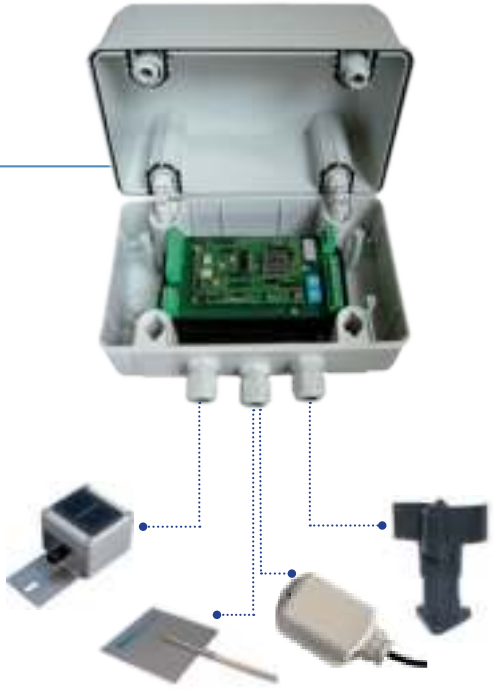
- Monitoring from 1 to 1016 strings
- From 0 to 50 amps per string
- ModBUS communication
- RS485 connection
- 24V DC power supply

The kit consists of a master card to which the following monitoring equipment can be connected:

- from 1 to 4 slave cards with 4 Hall effect sensors for a total of 16 channels;
- up to two 0-100mV radiation sensors supplied with calibration certificates;
- up to four 2-4 string PT100 or PT1000 temperature sensors;
- an anemometer to monitor wind speed.

SunGuard Sensor Kit

ENVIRONMENTAL SENSOR



AVAILABLE VERSIONS

- SensorKit-A
- SensorKit-B

MAIN FEATURES

- Kit-A: module temperature and radiation sensor
- Kit-B: radiation sensor, module temperature, ambient temperature and anemometer
- Power supply: 24VDC from SunGuard Box
- ModBUS communication
- RS485 connection

Radiation sensor

ENVIRONMENTAL SENSOR

Compatible with String Box too

MAIN FEATURES

- Measurement range: 0–1500 W/m²
- Sensor type: monocrystalline cell (33mm / 50mm)
- Sensor accuracy: ± 5% yearly average
- Electrical output: 4–20 mA or 0–10 V or 0–3.125 V or 0–150 mV
- Consumption: C. 30 mW
- Connection type: Connection terminals, 1.5 mm²
- Dimensions: 150x80x60 mm (WxDxH)
- Weight: 700 g

PV module temperature sensor

ENVIRONMENTAL SENSOR

Compatible with String Box too

MAIN FEATURES

- Measurement range: -20–150°C
- Sensor type: platinum resistance wire
- Electrical output: PT100
- Cable: 3 m, connection with 3 conductors
- Mounting: Adhesive Tape (included)
- Dimensions: 50x50x1 mm (WxDxH)

Anemometer

ENVIRONMENTAL SENSOR

MAIN FEATURES

- Measurement range: 2–200 Km/h
- Sensor accuracy: ±2%
- Cable: 15 m
- Mounting: steel bracket included
- Dimensions: 123x138.5 mm (DxH)

Environment temperature sensor PT100

ENVIRONMENTAL SENSOR

MAIN FEATURES

- Measurement range: -35 °C – 90 °C
- Protection level: IP66
- Electrical output: PT100
- Dimensions: 50x52x35 mm (WxDxH)

Environment temperature sensor PT1000

ENVIRONMENTAL SENSOR

MAIN FEATURES

- Measurement range: -20–200°C
- Sensor type: platinum resistance wire
- Electrical output: PT1000
- Cable: 2.5 m connection with 2 conductors
- Mounting: hole for mounting with screw included
- Dimensions: 52x50x32 mm (WxDxH)

3G HSPA Modem Router

MAIN FEATURES

- 3G Wireless Router
- HSPA+ 21.6Mbps Download, 5.76Mbps Upload
- UMTS 2100MHz, GSM 850/900/1800/1900MHz
- Wireless 802.11n 300Mbps at 2.4GHz
- 4 ports LAN RJ45 10/100Mbps
- 1 port RJ11, 1 port USB 2.0, 1 slot for USIM

Note: For the device to work properly, the client must provide a DATA SIM from a selected telephone operator, which is required for it to work properly.

LED display

FOR OUTDOOR USE

AVAILABLE VERSIONS

- LED display
- LED display with network analyser

MAIN FEATURES

- Display: 2 lines of 16 alphanumeric characters
- Type: pages or scrolling (max. 512 scrolling characters)
- Management: via RS485 to the network analyser or Ethernet LAN
- Power supply: 220 V / 50 Hz
- Dimensions: 1500x75x700 mm (WxDxH)
- Weight: 15 kg

SunGuard Video Display

SIGNAL SPLITTER FOR VIDEO SYSTEMS

AVAILABLE VERSIONS

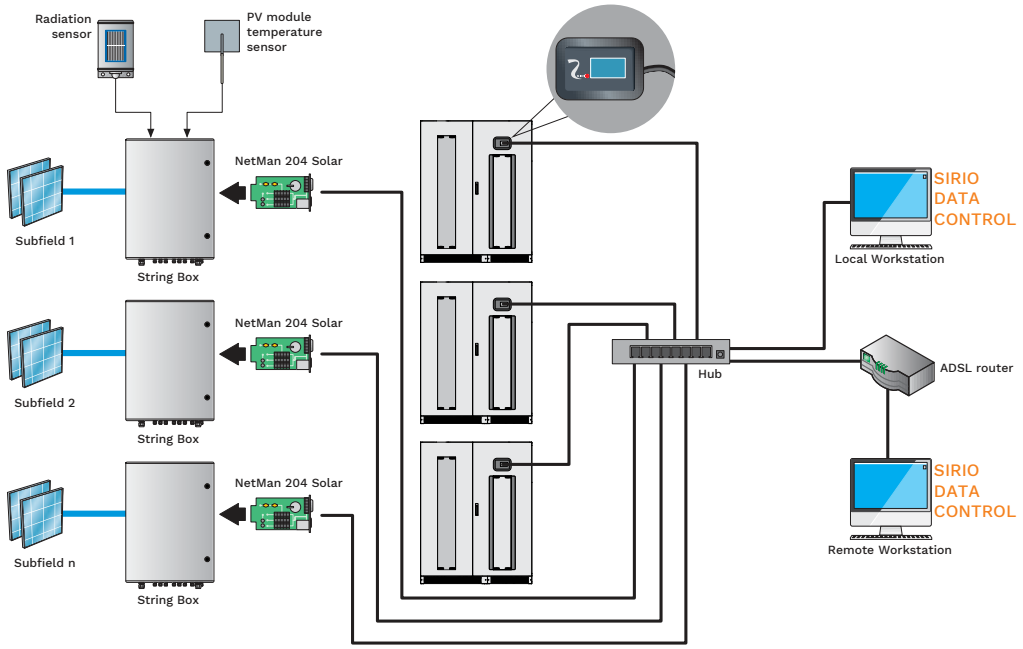
- SunGuard Video Display
- SunGuard Video Display Wi-Fi

The SG-VIDEO-DISPLAY is connected to a monitor with a HDMI port and to the internet. In cycles of about 5 seconds, it displays the various slides related to the performance of one or more photovoltaic plants monitored with the SunGuard monitoring system. It displays the following data: daily production, total production, saved trees, equivalent barrels of petroleum, weekly production, monthly production, avoided CO_2 emissions, instantaneous power.

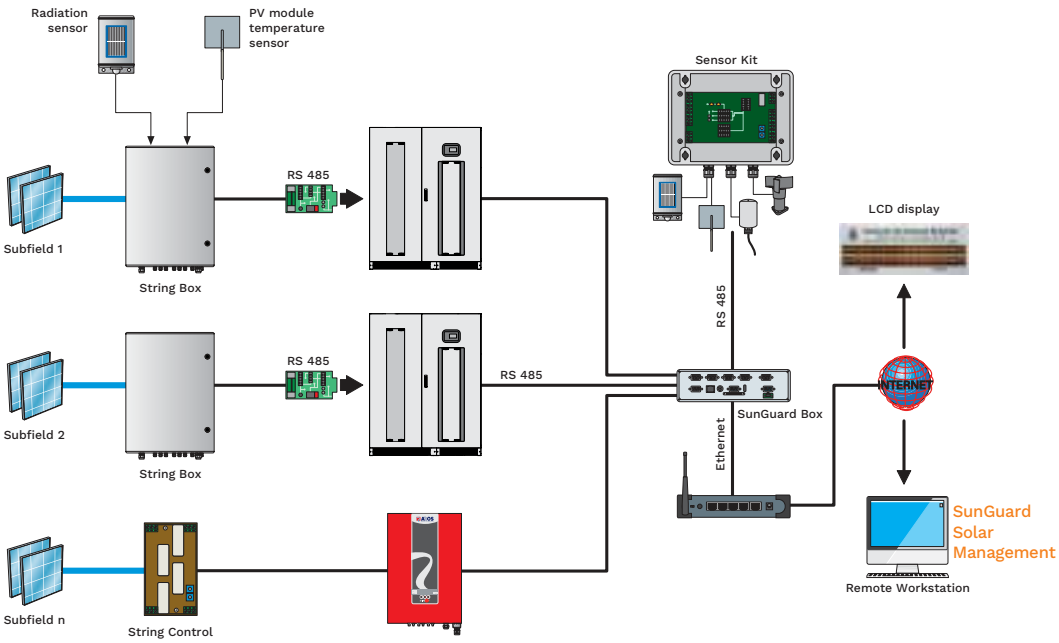
MAIN FEATURES

- Power supply: 5VDC/10W wall mount included
- Operating range: 5 °C – 50 °C
- Communication interfaces: 1 RJ45 Ethernet, HDMI

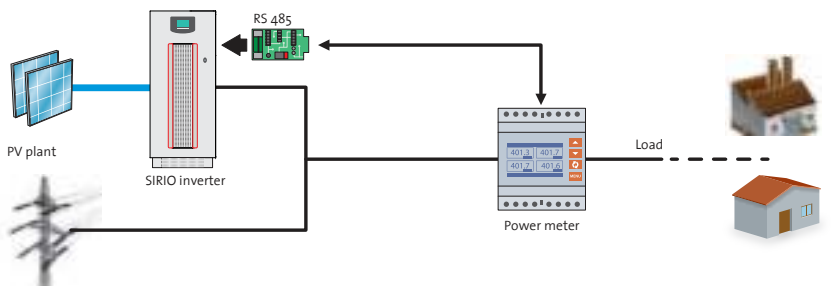
MONITORING OVER LAN



SUNGUARD SOLAR MANAGEMENT MONITORING



POWER REDUCER KIT



Support

The reliability of the components that make up a photovoltaic plant plays a major role in the return on investment.
An inverter failure would cause damaging downtime, while even unoptimized operations can lead to economic losses, significant ones for large plants.

An optimal support service is therefore a key factor when choosing a product on today's market. This service is the best insurance on your investment because it is provided by those who designed and built your machine, providing you with valuable advice to manage your plant, including during extensions and refurbishment.
Here are 10 simple reasons for relying on Technical Support Services for your equipment's maintenance:

1. EXPERIENCE
To ensure the fullest effectiveness of the service, Riello Solartech provides the synergy of its competence in design, construction and maintenance.

2. AVAILABILITY
Riello Solartech is able to ensure the prompt availability and perfect compatibility of new spare parts and guarantees that all the replaced parts comply with the specifications.

3. COMPETENCE
The work is carried out by technicians trained in the range of products they work on. Their technical know-how is kept constantly up to date with training courses.

4. PERFORMANCE
Riello Solartech designs and implements integrated solutions geared to improving the performance of your installations.

5. WARRANTY
Riello Solartech provides all the guarantees you have the right to expect (hardware and/or software updates, genuine spare parts, technical support, etc.).

6. CONTROL
We are a comprehensive organization that provides an integral, proactive and preventive service to avoid any risk of disruption.

7. SUPERVISION
The solutions provided ensure remote supervision, preventing and anticipating potential risks and ensuring prompt intervention.

8. WIDESPREAD SERVICE
Riello Solartech benefits from skilled human resources and an excellent mastery of logistics to ensure, throughout the country, a rapid and effective return to operation through a service in line with your needs.

9. ENVIRONMENTAL PROTECTION
Waste treatment in accordance with the regulations and through accredited operators.

10. BENEFITS
The maintenance carried out by Riello Solartech enables the overall cost to be optimised, through:
- Limiting technical interventions
- Short repair times
- Maintaining system performance
- Plant reliability over time
- Analysis and consulting

A direct line to our call centre provides you with expert personnel at your disposal for every need, able to assist you with:
- operational analysis and troubleshooting
- replacement service
- configuration and use of monitoring and communication devices
- commissioning

Warranty

TERMS OF WARRANTY
Riello Solartech / AROS Solar Technology guarantees the good quality and construction of its products, undertaking, during the warranty period, to repair or replace parts that prove to be defective free of charge. All warranty shall cease if the malfunctions are caused by the customer's incompetence or negligence, by act of God or force majeure or if the materials are installed in conditions other than those set out in writing. After the warranty period, the support service will only be carried out after acceptance of the work and repair cost estimate.
The standard warranty for the RS and RS T inverter range is 5 years and covers the repair or complete replacement of the equipment in the event of a fault or malfunction; please note that the replacement work is to be done by the customer.
The Sirio Central and Sirio Power Supply (SPS) ranges have a standard warranty of 2 years. In the event of a fault or malfunction, they will provide for the on-site intervention of expert technical personnel. If the equipment is replaced during the warranty period, the remaining duration will be transferred.

LIMITATION OF LIABILITY
Any entitlement to compensation for damages is waived except where the claim is determined by malicious conduct or gross negligence on the part of Riello Solartech or its staff. The liability provided for under the manufacturer's liability act is excepted.
There shall be no liability for:
- claims made by third parties against the customer for loss or damage;
- loss or damage to customer drawings or data or costs incurred in reacquiring such data;
- consequential economic damage (including loss of earnings or savings) or ancillary damage, even if we were advised of this possibility.

Riello Solartech shall also not be held liable for any incidental, indirect, special, consequential or other damage of any kind (including, without limitation, damage related to loss of profit, interruption of business, loss of commercial information or any other loss) due to the use of the equipment or in any way in relation to it, claimed by contract, compensation for damages, negligence, objective or other liability, even if Riello Solartech has been advised in advance of such a possibility. This exclusion also concerns civil liability arising from claims made by third parties against the first purchaser.

EXTENSIONS OF WARRANTY
- RS and RS T
By subscribing, within the first 12 months of purchase, to the warranty extension of +5, +10 or +15 years, warranty can be extended to from 5 to 20 years.
- Sirio Central
By subscribing to the purchase of the standard 5-year warranty extension with the BASIC formula for 5 (+ 3) years, you are also entitled to the commissioning of the equipment or, as an alternative, at any time you can enter into an annual maintenance and warranty contract with the SILVER or GOLD formulas.

The SILVER warranty extension and maintenance includes:
- One annual maintenance visit
- Labour and travel costs included
- Spare parts with a dedicated price list
- Unlimited number of interventions

The GOLD warranty extension and maintenance includes:
- One annual maintenance visit
- Labour and travel costs included
- Spare parts included
- Unlimited number of interventions
- Remote support (only if our monitoring systems are installed)

Spare parts and all travel expenses are included in the contract. Nothing else shall be acknowledged by Riello Solartech, except for malfunctions due to external causes, negligence or incompetence and as listed in the "Exclusions" section of the contract.

THE ANNUAL MAINTENANCE VISIT INCLUDES:
General tasks
- Cleaning equipment
- Cleaning control logic boards
- Checking mechanical tightening and electrical connections
- Checking operation of signals and alarms
- Checking the suitability of the rooms (cleaning, ambient temperature, water infiltration, etc.)

Functional tasks
- Calibrating voltmeters with sample instrumentation
- Checking the power supply voltage parameters
- Checking the reference of the voltage and current reactions on the inverter logic board
- Checking the inverter output waveform
- Checking output voltage
- Checking output frequency
- Checking fan operation
- Checking and if necessary replacing fans

CHECKS AND ADJUSTMENTS
- Inverter in/out parameter check
- Final operational tests - Inverter on

HOW TO SUBSCRIBE TO EXTENDED WARRANTY CONTRACTS:
To request a warranty extension, simply send a message to the fax number +39 (0)2.66327.336 or to service@riello-solartech.com with the following mandatory information:
1. Inverter model (code and description)
2. Date of purchase (certified by a copy of the purchase document)
3. Serial number (shown on the equipment nameplate)
4. Location of the plant (full address)
5. Telephone numbers of the plant manager
6. Billing Information (VAT No. or Tax Code, Business Name, address, etc.)

Riello Solartech will send the customer the "warranty extension" contract form to be returned signed. It will then issue an invoice.

On the website www.riello-solartech.it, the customer can activate the purchased warranty extension and receive the corresponding certificate via e-mail.

SUPPORT SERVICE
Riello Solartech has over 20 support centres all over Italy, where more than 60 expert technicians work to provide the finest technical support at any time and location. This service is indispensable to guarantee Riello Solartech customers the certainty of their plant's remuneration.

EVOLUTION

ENERGY
BEYOND THE SUN,
DESIGN
FOR THE EYES

The new PV INVERTERS in the **R**iello **S**olartech range dedicated to the residential, commercial and industrial sector (from 1.5 to 30 kWp) implement innovative technologies and high-quality components, sized with a wide margin compared to the normal conditions of use for great operating flexibility.

Innovative design, light, compact, efficient, full connectivity: the ADVANCED INVERTER.

RIELLO ELETTRONICA riello solar tech

www.riello-solartech.com