

Quick Installation guide

Single-phase Grid-tied PV String Inverter:

RS 1.5 / 2.0 / 3.0 / 4.0 / 5.0 / 6.0

This PV inverters series is equipped with **integrated Wi-Fi**



For installation and configuration settings use the dedicated APP **RS Connect**

For inverter energy production monitoring use APP **RS Connect** or register to the cloud portal **Riello RS Monitoring** www.riello-rsmonitoring.com. Please refer to relative APP and Cloud portal user manuals for details.



RS Connect



Complete user manual is available for download from: www.riello-solartech.com

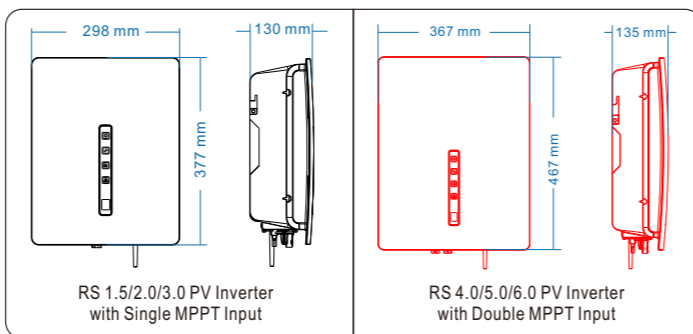
Safety Instructions

	<p>Risk of electric shock The device contains high voltages, both alternating and direct, and high leakage currents may be generated during operation. To avoid risk of electric shock during maintenance or installation, make sure that all DC and AC connection terminals are disconnected. First connect the grounding wire to grounding and disconnect it last for maintenance. Check proper phase and neutral connection. If the unit is used without following the specifications of the manufacturer, the protection provided by the equipment may be impaired.</p> <p>Disconnect the inverter from the grid and from the photovoltaic generator before cleaning photovoltaic modules: an unexpected capacitive current from the surface of the modules may surprise operators and cause them to fall from the roof.</p>
	<p>Handling the photovoltaic inverter The photovoltaic inverter must only be handled by qualified service personnel. When the photovoltaic generator is exposed to sufficient light intensity, it generates a DC voltage and, when connected to the device, it charges the bulk capacitor. After having disconnected the photovoltaic inverter from the grid and the photovoltaic generator, an electric charge may remain in the bulk capacitor. Please wait at least 10 minutes after disconnecting from the grid before handling.</p>
	<p>Exclusively for the grid The PV inverter is designed for the sole purpose of converting energy from PV modules and injecting it into the grid. This inverter is not designed to be powered by sources of primary energy other than PV modules or to be connected to different loads other than the public grid.</p>
	<p>Hot surfaces Although it has been designed in accordance with international safety standards, the photovoltaic inverter may become hot during operation.</p>

Guarantee

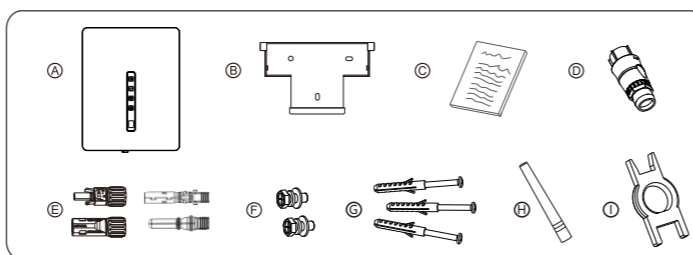
Guarantee conditions are available on the website: www.riello-solartech.com

Outline and Dimensions



Installation

Package contents



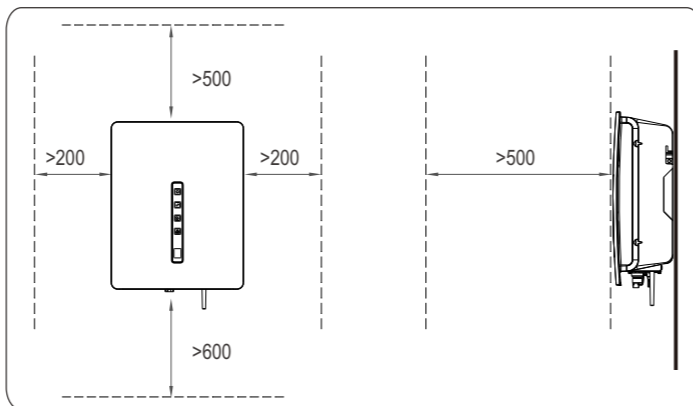
ITEM	DESCRIPTION
A	PV Inverter
B	Rear panel
C	Manuals
D	AC output connector
E	DC terminal connector group
F	Screws
G	Expansion plugs kit (reserved for tightening the rear panel)
H	Wi-fi Antenna
I	Removal tool for DC connectors

Determining the Installation Position

The inverter must be installed in a place free from direct exposure to sunlight, rain, and snow in order to extend its service life.

Installation Space Requirements

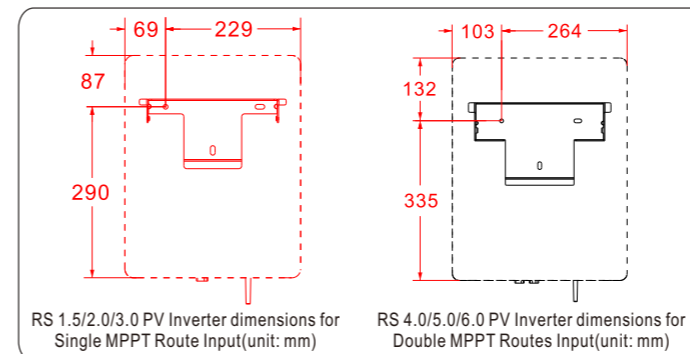
Reserve enough clearance around the inverter to ensure sufficient space for installation and heat dissipation, as shown in figure below. When installing multiple inverters, ensure 200mm distance between inverters' lateral sides, 500mm-600mm between inverters' top and/or bottom sides, and 500mm clearance between inverters' front sides.



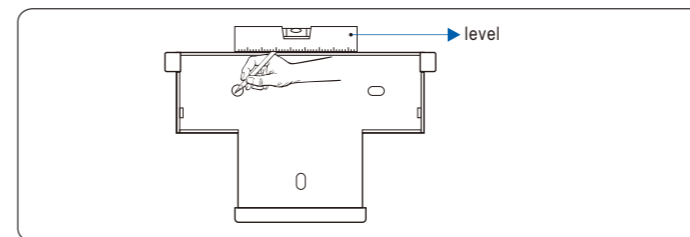
Inverter fixing

Step 1 Take out the rear panel from the packing case.

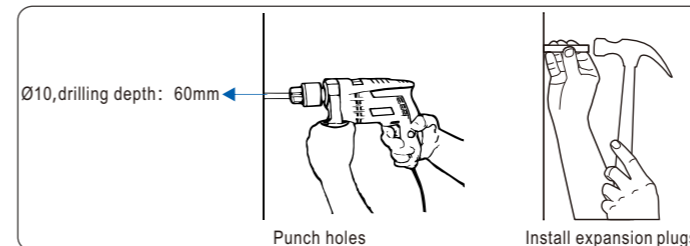
Step 2 Determine the positions for drilling holes using the rear panel.



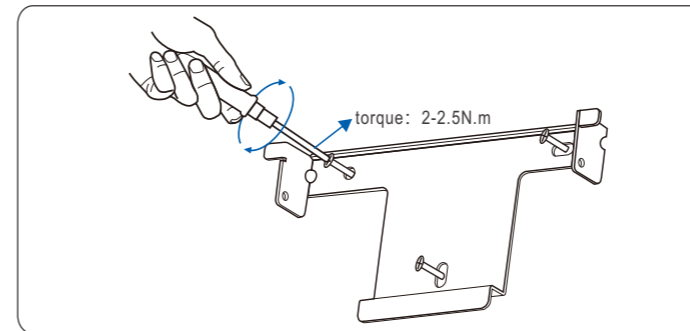
Step 3 Level the hole positions using a level, and mark the hole positions using a marker.



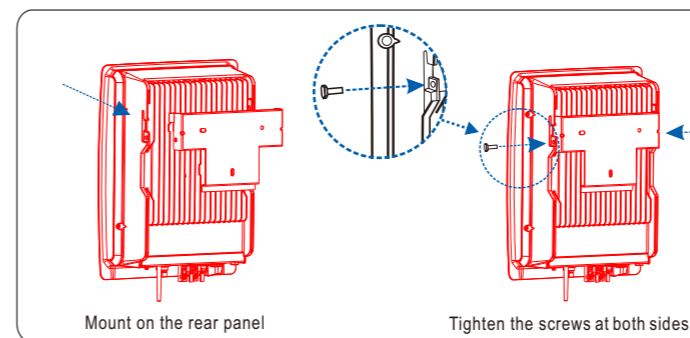
Step 4 Drill a hole in the marked positions using a hammer drill, then tighten and knock the expansion plugs completely into the hole using a rubber mallet.



Step 5 Install the rear panel.



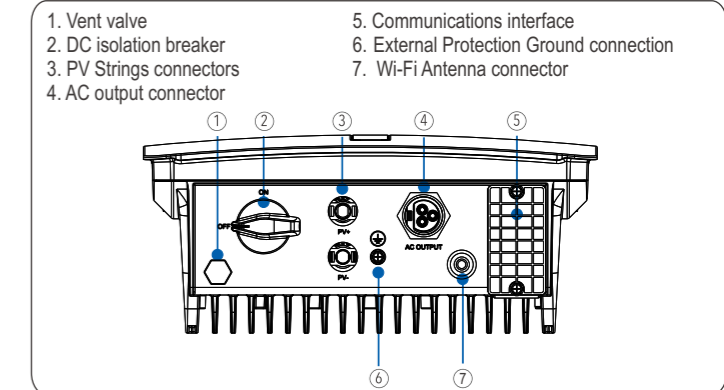
Step 6 Mount the inverter on the rear panel and tighten the screws at both sides.



Installation Self-check

1. Ensure that the supporting points (on the rear side of the inverter) align with the holes of the rear panel
2. Ensure that the inverter is well fixed
3. Ensure that the inverter is locked on the rear panel

Preparation before wiring



Wi-Fi antenna installation

Fasten Wi-Fi antenna (H) (included in the box) to the inverter, screwing it to the relative connector (I)

Electrical Connections

	DANGER	Before performing any electrical connections, ensure that both DC and AC switches are OFF. Otherwise, fatal injury can occur due to the high voltage present in AC and DC cables.
	CAUTION	Grounding the PV Strings needs below prerequisites.

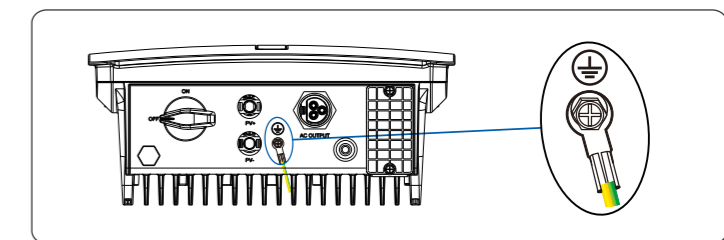
If an isolation transformer need to be installed on the AC side of each inverter, ensure that the neutral wire of the isolation transformer must be disconnected from the PGND cable. One isolation transformer is with one PV inverter: do not install a single isolation transformer for multiple inverters; otherwise, circulating current generated by the inverters will lead to operation failure.

Cable specifications (recommended)

Cable	Cable type	Cross-sectional Area (sqmm)		Cable Outer Diameter (mm)
		Range	Recommended Value	
AC cable	multi-core outdoor cable	4~6	6	10~14
DC cable	common PV cables in the industry (model: PV1-F)	4~6	4	5~8
External PGND cable	outdoor cable	4~6	6	NA

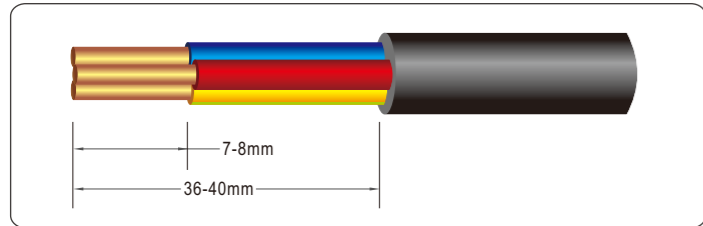
Cable installation

Step 1 Connect External Protection Ground (PGND) cable.

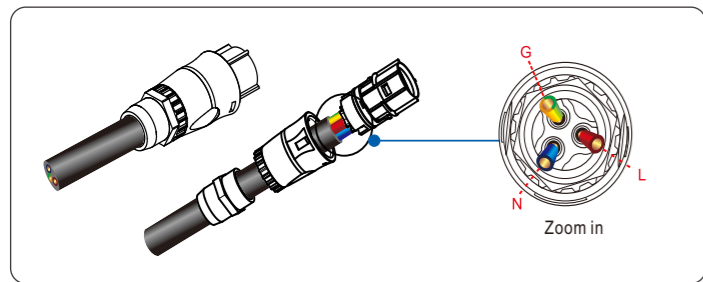


NOTICE Connecting External Protection Ground (PGND) cables cannot substitute the PE of connecting the AC power cables. Ensure that both connections are grounding well; otherwise, warranty or liability will be void if damage is caused by electrical connection faults.

Step 2 Remove an appropriate length of the jacket and insulation layer from the AC output cable.

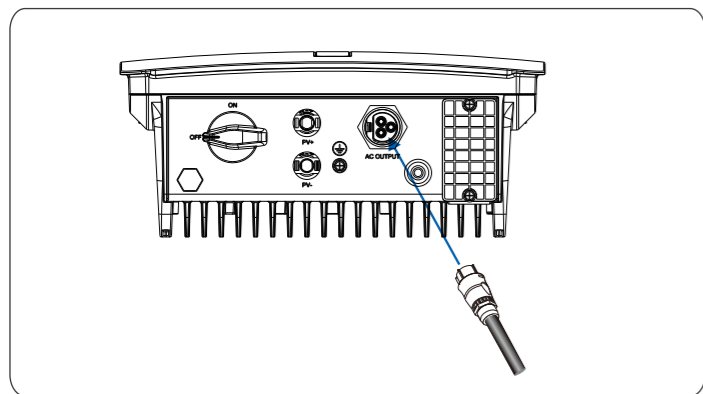


Step 3 Connect AC wires to AC connector: Earth wire to G terminal of AC connector, neutral wire to N terminal, line wire to L terminal.

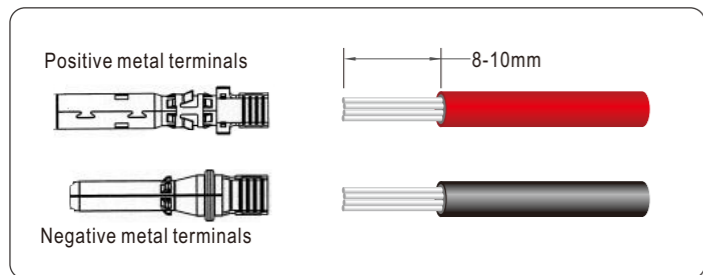


NOTICE Earth, neutral, and line wires must correspond to G, N, and L terminals of AC connectors respectively. Otherwise, the connection faulty will lead to the inverter performance failure.

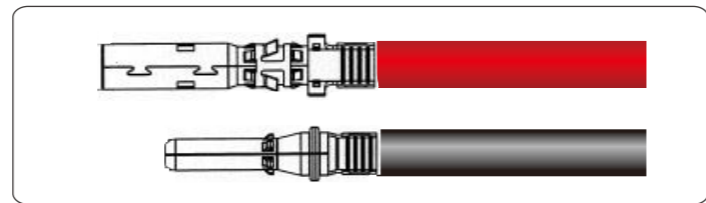
Step 4 After AC wiring, insert the AC connector into the AC terminal of the PV inverter.



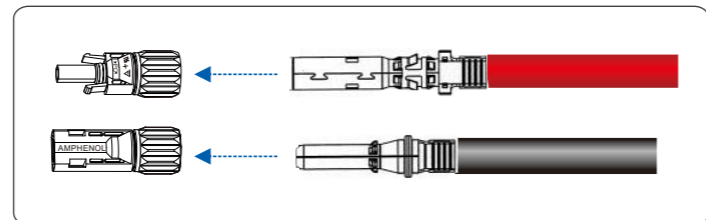
Step 5 Remove an appropriate length of the insulation layer from the PV Strings power cables.



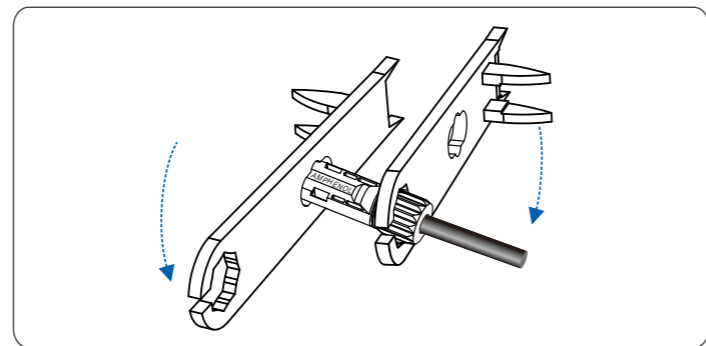
Step 6 Insert the exposed areas of the positive and negative power cables into the metal terminals of the positive and negative connectors respectively and crimp them using a crimping tool. (Connect the red wire to the positive metal terminal, and the black to the negative.)



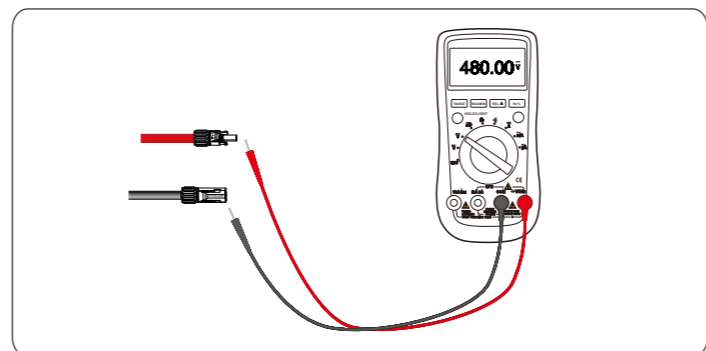
Step 7 Insert the crimped positive and negative power cables into the corresponding positive and negative connectors until a "click" sound is heard.



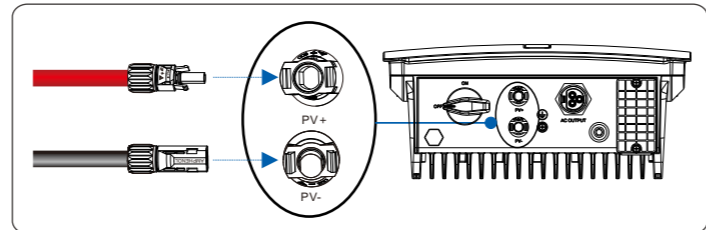
Step 8 Tighten the locking nuts on the positive and negative connectors using a specific wrench (not included).



Step 9 Measure the voltage of every route Strings using a multimeter, and check that the polarities of the DC input power cables are correct.



Step 10 Insert the positive and negative connectors into the corresponding connector terminals of the inverter until a "click" sound is heard.



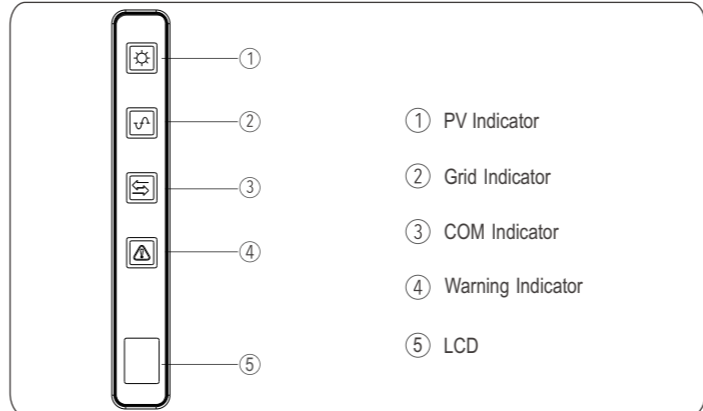
NOTE To prevent corrosion, apply silica gel or fireproof mud to the terminal or interface after connecting external PGND cables.

System Operation

Switch ON the AC circuit breaker and set the DC SWITCH of the inverter to ON. Check statuses of grid-connecting lights on the inverter, and if the lights display that the inverter has entered grid connecting, it means the inverter is operating properly. To power OFF the Inverter, switch off the circuit breaker at AC terminal, and set the DC SWITCH to OFF.

WARNING After the inverter power is off, the remaining electricity and heat may still cause electrical shock and body burns. Please only begin servicing the inverter ten minutes after the power-off.

Interface



LED/LCD Status and Warning code

	LCD Display	PV indicator	Grid indicator	COM indicator	Warning indicator
Normal status (with Wi-Fi internet connection OK)	Instant generated power	●	●	●	○
Starting up (inverter tries to connect to grid)	0.0 KW	●	★F	○	○
Wi-Fi connection Router OK - Internet OK	○	○	○	●	○
Wi-Fi connection Router OK - Internet Fail	○	○	○	★S	○
Wi-Fi connection Router Fail - Internet Fail	○	○	○	○	○
WiFi/RS485 communication during data trasmission	○	○	○	★F	○
PV normal	○	●	○	○	○
PV absent	○	○	○	○	○
Grid normal (inverter connected to grid)	○	●	●	○	○
Grid normal (not connected to grid) except starting up phase	○	○	★VS	○	○
Grid absent	R2	○	○	○	○
Grid over voltage	R0				
Grid under voltage	R1				
Grid over frequency	R3	○	★S	○	○
Grid under frequency	R4				
PV over voltage	b0	★S	○	○	○

Inverter over temperature	C5	○	○	○	★S
Fan lock	C8				
Insulation resistance abnormal	b1				
Leakage current abnormal	b2				
output DC over current	C2				
Inverter relay abnormal	C3				
Leakage current HCT abnormal	C6				
BUS over voltage	CR	○	○	○	●
Internal communication fault	Cb				
Software incompatibility	Cc				
EEPROM error	Cd				
Consistent warning	Ce				
Boost circuit abnormal	Cc				
Firmware update in progress	off	●	●	●	●

Note: ● light on ○ light off ○ keep original status
 ★VS light blinks very slow (every 5s) ★S light blinks slow (every 2s)
 ★F light blinks fast (every 0.5s)

Maintenance

Check periodically that the heat sink (in the rear of inverter) is free from dust and blockage. If necessary, clean periodically the heat sink to ensure its good heat dissipation.

The Inverter Troubleshooting

If any abnormal phenomena occur, refer to below table for trouble shooting. If the problem persists, call your dealer for help.

Issue	Solution
No display	1. Check DC switch of inverter is on or off 2. If there is PV combiner box, check fuse, terminal, wires
No generation	1. Check AC breaker is on or off 2. Wait stronger sunshine 3. Check the number of PV panel 4. To operate according to inverter's manual
Inverter abnormal	1. Disconnect both AC and DC breakers 2. Wait as less 10 minutes and switch on AC and DC breaker 3. Check whether inverter run normally or not
Power generation is less than expected	1. Ensure that inverter is free from direct sun exposure and good ventilation 2. Check that inverter isn't dust clogging, fans run normally 3. Ensure enough installation distance between inverters