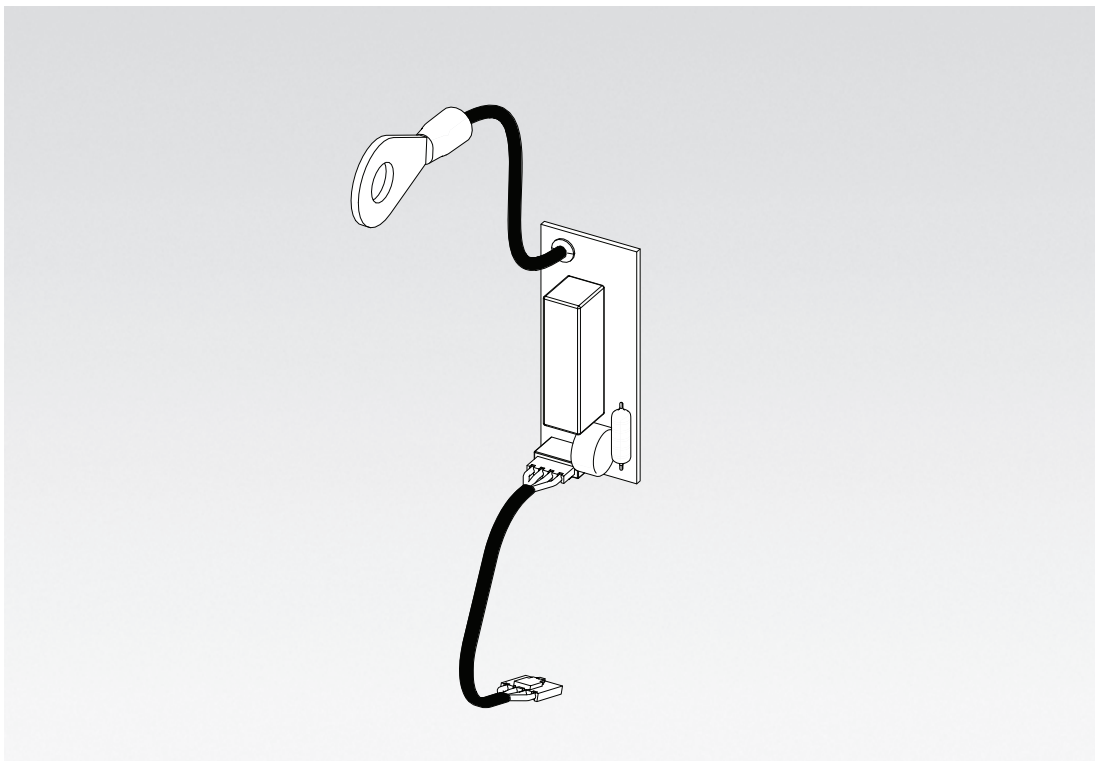
EN

ABB SOLAR INVERTERS

Quick Installation Guide

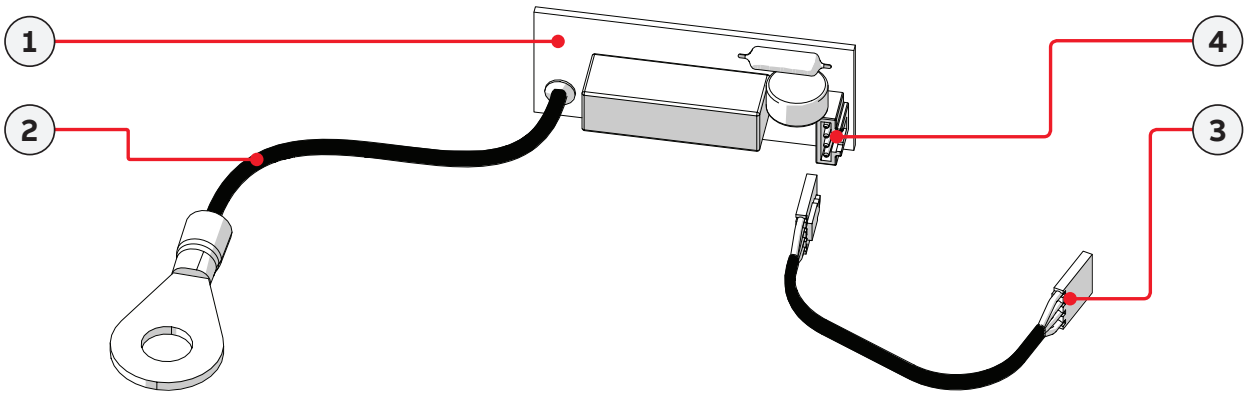
TRIO-50.0/60.0-GROUNDING KIT

(For TRIO-50.0/60.0-TL and TRIO-TM-50.0/60.0)

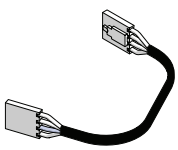
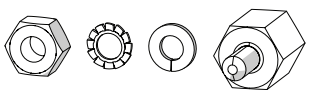


1. Main components

Main components	
1	Negative grounding board
2	Connection cable for negative pole
3	Signals wiring
4	Signals wiring connector



2. Supplied component list

Components available in the kit		Quantity
	Negative grounding board	1
	Signals wiring	1
	Switch installation kit: Nut, threaded washer, cutted washer, metallic support	1+1+1+1
	Installation screw M5x12	1
	Warning label	1
	Technical documentation	

3. Assembly instructions

Access to the zones inside the inverter must be carried out with the equipment disconnected from the network and from the photovoltaic generator.
Isolate the inverter by externally disconnecting the AC voltage and DC voltage as well as any voltage connected to multifunction relays. Opening only the AC/DC switches inside the inverter does not permit to operate in safe way considering that some internal parts may remain at hazardous voltages.

When the TRIO-50.0/60.0-GROUNDING KIT is assembled in one or more inverters connected in parallel to the same transformer winding:

1. the inverters and the PV Array must be installed in Closed Electrical Operating Areas where the access is restricted to instructed persons.
   The above is required because the below listed protections against electrical shock hazard on the PV arrays are not included inside inverter or do not operate when grounding-kit is installed:
   • Array insulation resistance detection for functionally grounded arrays
   • Protection by application of Residual Current Devices
   • Residual current monitoring for sudden changes
   The following forms of shock hazard protections are provided integral to the inverter:
   • Continuous residual current to ground
2. the maximum current flowing to earth, in case of ground fault on the DC side of the plant will be less than Nx500mA (TRIO-50.0) or Nx600mA (TRIO-60.0) where N is the number of inverters connected to the same transformer winding. This current value must be considered to size the wires and to evaluate the risk of fire.

The earth protection circuit (PE) of the PV plant must have the same potential of the earth protection circuit (PE) of the building (in case of roof-top installation).

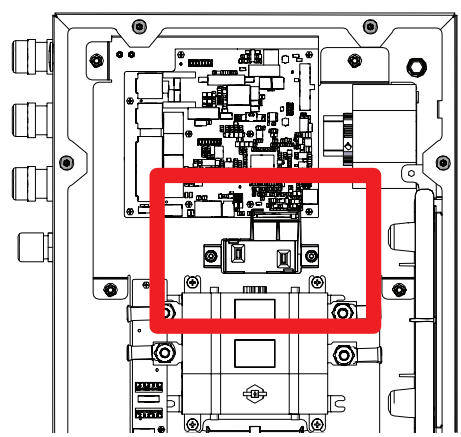
The extraneous conductive parts of the building and the earthed conductive parts of the plant must not be accessible simultaneously.

It is not recommended to use the grounding kit in buildings with high risk of fire.

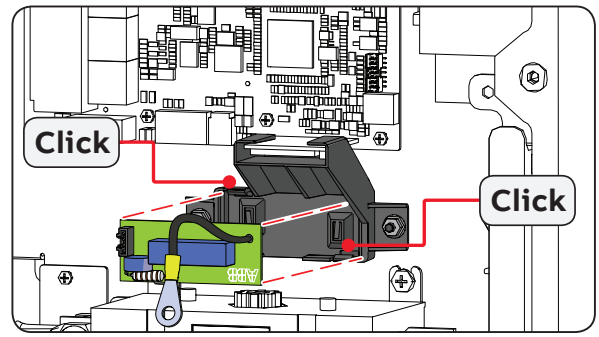
It is not recommended to use the grounding kit in buildings with LPS (lightening protection systems) to avoid potential differences among different earthed conductive parts of the PV plant that people can touch. Restricted access to PV plant reduces this hazard.

The GROUNDING KIT must be installed inside the DC wiring box (DCWB).

- Place the DC disconnect switch to OFF position. In “ON” position, the switch does not allow the removal of the front cover.
- Remove the 8 screws from the front cover of the DC wiring box.
- Install the grounding board on the holder positioned on the lower side of the communication and control card (area highlighted in the figure to the side).



- Press down lightly on both sides of the board until the two holding clips will block the board to the support.



- Connection of the cable for negative pole. It depends by inverter and DCWB models:

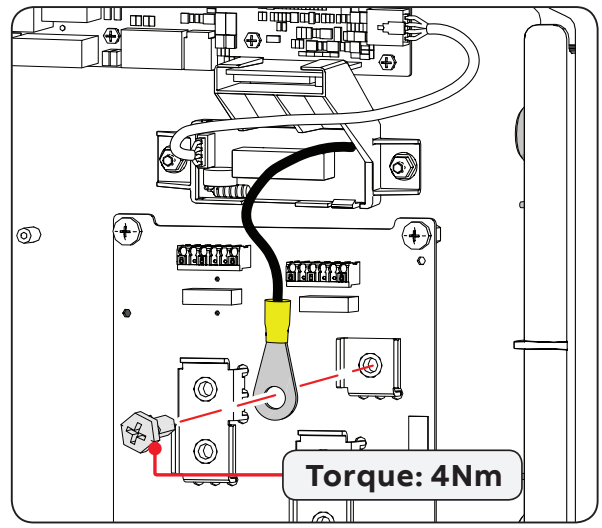


Fig 1. **TRIO-50.0/60.0-TL - DCWB standard** (connection to be done using “Installation screw”).

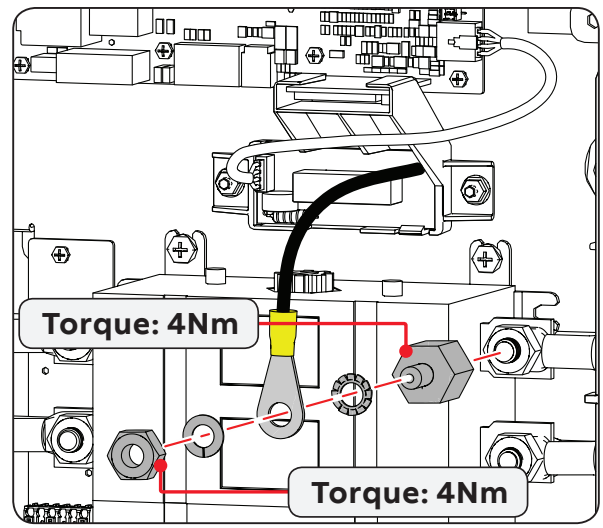


Fig 2. **TRIO-50.0/60.0-TL - DCWB -S, -SX and -SY** (connection to be done using “Switch installation kit”).

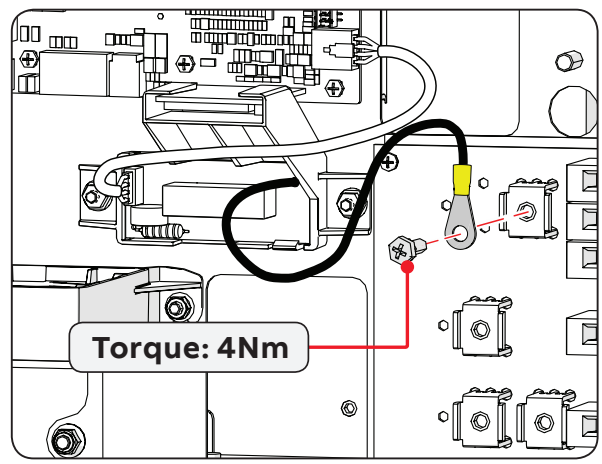


Fig 3. **TRIO-TM-50.0/60.0 - DCWB standard, -S, -SX and -SX2** (connection to be done using “Installation screw”).

- Connect the signals wiring between the grounding board and the communication and control board. One side of the signals wiring must be connected to the J13 connector on the grounding board; the other end must be connected to J1 connector present on the communication and control board.

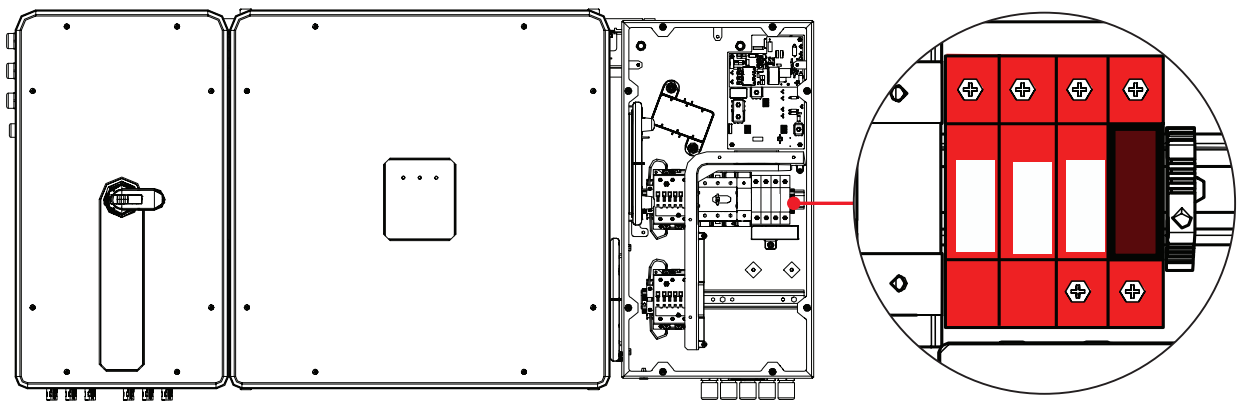
In -SX versions of the Wiring Box AC (ACWB), the NEUTRAL SPD cartridge must be removed from housing (as below described).

NEUTRAL SPD cartridge removal procedure:

- Place the AC disconnect switch to position OFF.
  In position “ON”, the switch does not allow the removal of the front cover.

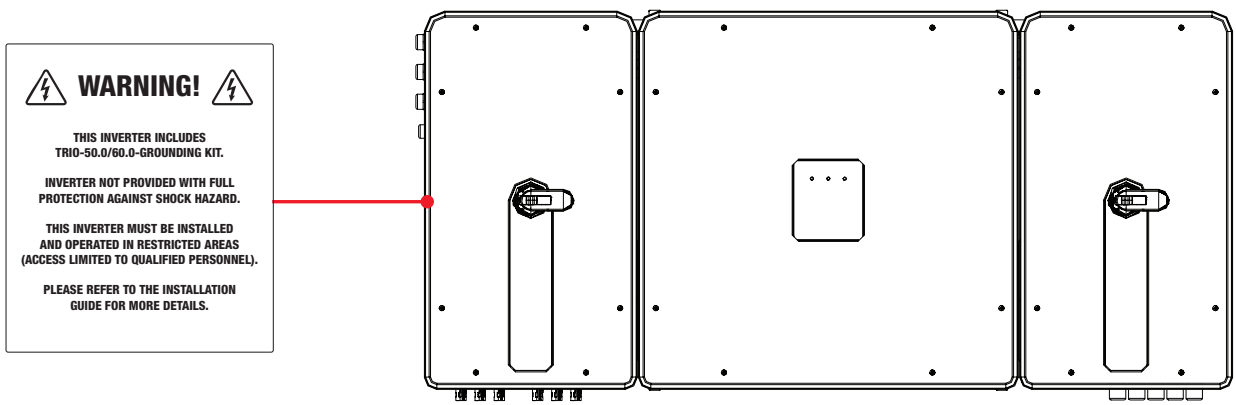
- Remove the 8 screws from the front cover of the AC wiring box (ACWB).

- Remove the first cartridge in the right from the AC discharger.



- Reinstall the cover of the AC wiring box cover using the 8 fixing screws (tightening torque 2.4Nm).

- At the end of installation phase, apply the supplied “Warning label” near the Regulatory label of the DCWB (left side of the inverter).

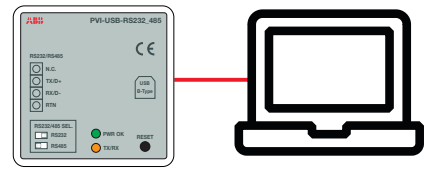


4. Aurora Manager Lite configurations

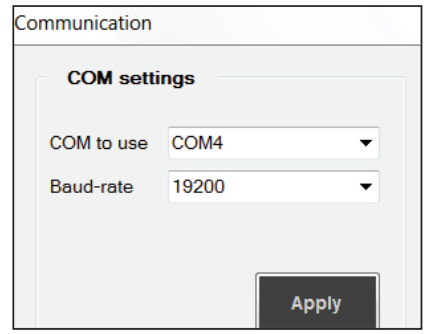
After installing the GROUNDING KIT, it is required to connect a PC to the inverter via a signal converter PVI-USB-RS232_485 in order to perform the necessary software configurations for the proper functioning of the system.

- Download the Aurora Manager LITE software, which allows to do the inverter configurations available on the following website: http://new.abb.com/power-converters-inverters/solar/string/three-phase/trio-50-0kw in the section Download > Software.
- Check the presence of the RS485 serial line, to which the signal converter PVI-USB-RS232_485 will be connected. Otherwise, connect a signals wiring to the terminals of the J7 connector on the communication and control board:
  - J7 terminal 1 → -T/R serial line RS485-1
  - J7 terminal 2 → +T/R serial line RS485-1
  - J7 terminal 7 → -T/R serial line RS485-2
  - J7 terminal 8 → +T/R serial line RS485-2
  - J7 terminal 6 → RTN signal common to two serial lines

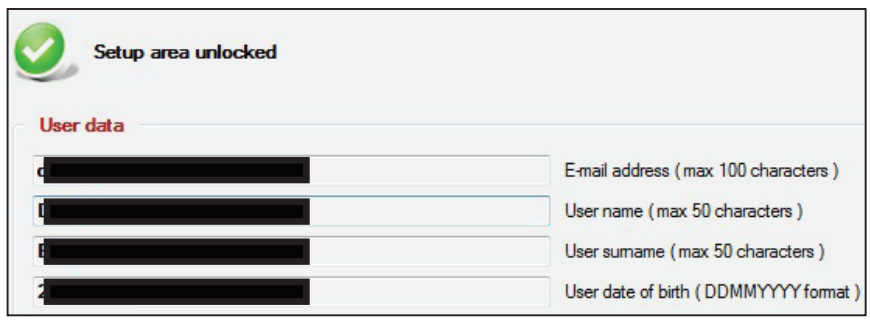
  The cable must be passed inside the DC wiring box using the cable glands placed on the left side of the external machine.
- Connect the serial wiring to the signal converter PVI-USB-RS232_485 following the connection of the signals performed on the communication and control board.
- Connect a USB cable (Type B) between the signal converter PVI-USB-RS232_485 and PC.



- Reinstall the cover of the DC wiring box using the 8 fixing screws (torque 2.4Nm).
- Place the DC disconnect switch to position ON.
- Open the Aurora Manager LITE software.
- Set the COM port, to which the converter is connected on the Communication>COM settings menu
- Access the advanced functions (INSTALLER) on the menu Configuration> Setup area access.
  The personal information and password to be entered are the same as those used during the registration on the website https://registration.abbsolarinverters.com/
  After entering your personal data, press ENTER. Aurora Manager LITE will allow you to do the advanced configuration of the inverter.



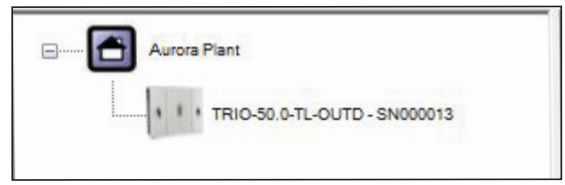
- To get the password, register on the site https://registration.abbsolarinverters.com/, where, entering your personal data, you will receive an email with your login credentials.



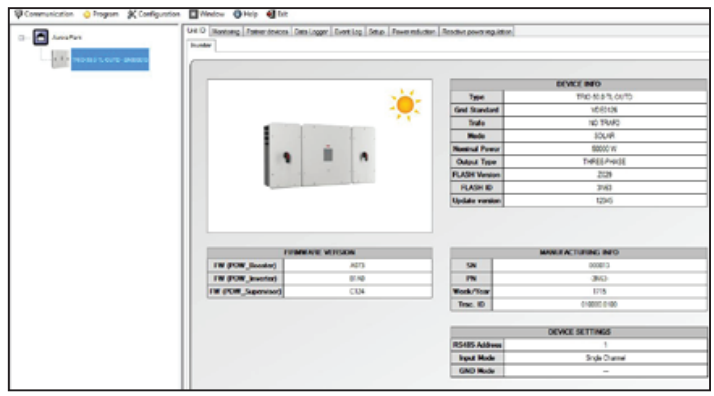
- Scan the RS485 bus using the “Refresh” button.

Once the scanning will be completed, the inverters detected are displayed in the system tree.

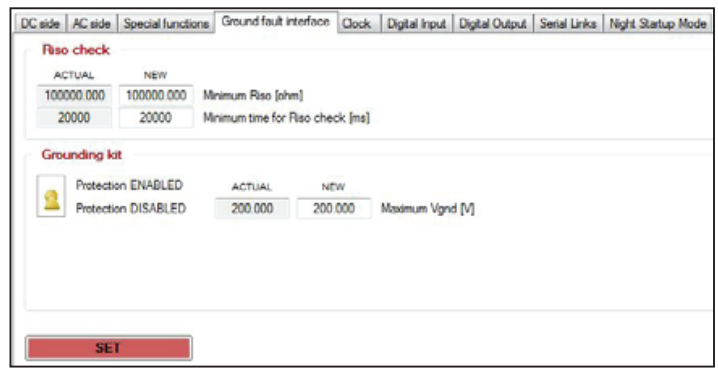
- Select one inverter of the plant.
  The functions will be available in the working place related to the inverter.



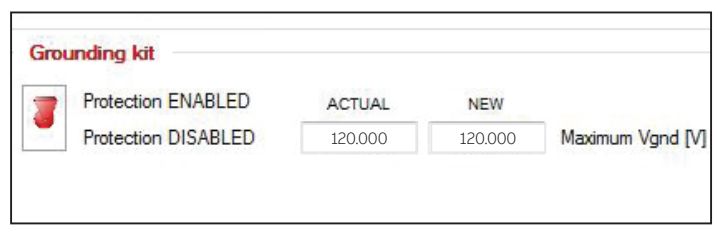
- Access the “Setup” tab and then the section of “Ground fault interface”



- Enable the function by moving the selector to "protection ENABLED"



- Set the maximum protection threshold voltage between the negative pole and the earth (120Vdc is the recommended value).
  Voltages above the setted threshold, as consequence of panels ground fault, will turn on the "protection of Ground Fault" (E037)



5. Technical data

Grounding kit	
Compatibility	Three-phase inverter models: TRIO-50.0/60.0-TL TRIO-TM-50.0/60.0
Type of grounding	Resistive
Pole that can be connected to the earth	Negative
System requirements	
Isolating transformer	Mandatory [1)]
Configuration of the isolating transformer	IT System (delta or wye configuration inverter side can be used but transformer poles included star point winding cannot be connected/referred to ground)
Configuration of the photovoltaic strings	If the system has multiple inverters connected to the same transformer, all strings must be made of the same type, number of panels in series and orientation.

Maximum number of inverters that can be connected in parallel on a single winding of transformer:

Nominal power of the transformer	1000 kVA	1250 kVA	1600 kVA	2000 kVA	2500 kVA
Maximum number of TRIO-50.0	20	25	32	40	N.A.
Maximum number of TRIO-60.0	17	21	27	33	40

1. NOT SUITABLE for mono- or multi-inverter systems that are directly connected to low voltage network.

The features that are not specifically mentioned in this data sheet are not included in the product