

FIMER



Solar Inverter **PVS-60-TL-US**

Quick Installation Guide

In addition to what is explained in this quick installation guide, the safety and installation information provided in the product manual must be read and followed. The technical documentation for the product is available at the website.
The device must be used in the manner described in the manual. If this is not the case the safety devices guaranteed by the inverter might be ineffective.

1. Labels and Symbols

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS -- KEEP IN A SAFE PLACE!

The installer must read this document in its entirety before installing or commissioning this equipment.

READ THE MANUAL – For more detailed information regarding proper installation and use of this product, refer to the product manual located at www.fimer.com.

The labels on the inverter carry the markings, main technical data and identification of the equipment and manufacturer. The technical data shown in this quick installation guide does not replace that shown on the labels attached to the equipment.

Symbols used in the guide and on the products

	Nationally recognized test laboratory marks showing certification to UL 1741 and CSA-C22 No. 107.1-01
	Hazardous voltage
	Risk of electric shock. The discharge time (quantified in the figure by the number XX) of the stored energy after de-energizing of the Inverter from both DC side and AC side.
	Positive and negative of the input voltage
	Always refer to instruction manual
	General warning
	Important safety information
	System earth conductor (main grounding protective earth, PE) and Equipment Grounding Conductor (EGC)
	Phase
	Direct and alternating currents, respectively
	Hot surfaces
	Bonding Conductor
	Without insulation transformer

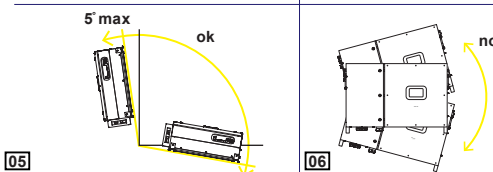
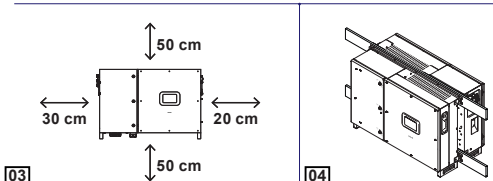
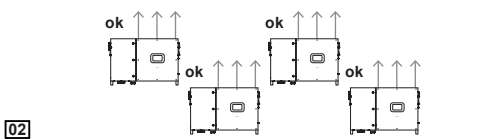
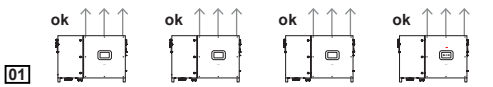
READ THE MANUAL – This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
 (1) this device may not cause harmful interference.
 (2) this device must accept any interference received, including interference that may cause undesired operation.

- Provide sufficient working space in front of the inverter that allows to make connections on the wiring box.
 - If possible, install at eye-level so that the status LEDs can be seen easily.
 - Install at a height which takes into consideration the weight of the appliance and in a position which is suitable for servicing, unless suitable means are provided to carry out the operation.
 - Final installation of the device must not compromise access to any disconnection devices that may be located externally.
 - Respect the minimum distances from objects around the inverter that could prevent the inverter installation and restrict or block the air flow (FIG. 03).
 - In case of multiple installation position the inverters side by side keeping the minimum distances (measured from the outer edge of the inverter) for each inverter (FIG. 01 and 03). If the space available does not allow this arrangement, position the inverters in a staggered arrangement as shown in the FIG. 02 so that heat dissipation is not affected by other inverters below.
 - The vertical installation is also permitted on a structure which must be composed of a support for the attachment of the bracket and one for the support of the rear pins (FIG. 04).
 - The vertical installation of two inverters positioned back to back is also permitted on a structure which must be composed of 2 supports for the attachment of the brackets (FIG. 04).
 - The inverter operates normally up to 2000 meters; between 2000 and 4000 meters the inverter works in derating (to verify curve derating), above 4000 meters the installations are forbidden.
 - Never open the inverter in the case of rain, snow or a level of humidity >95%.
- ATTENTION** – Final installation of the inverter must not compromise access to any externally located disconnection devices.

2.1 Wireless signal environmental checks

The inverter can be commissioned and monitored using the wireless communication channel. The WLAN board of the inverter uses radio waves to transmit and receive data, it is therefore important to find a position for the router considering the different materials which the radio signal will have to pass through:

Material	Relative signal reduction
Open field	0% (strength of approximately 40 meters)
Wood / Glass	From 0 to 10%
Stone / Plywood	From 10 to 40%
Reinforced concrete	From 60 to 90%
Metal	Up to 100 %



2. Installation site and position

- Consult technical data to confirm the environmental specifications will be met.
- Installation of the unit in a location exposed to direct sunlight is acceptable.
- Do not install in closed spaces where air does not freely circulate.
- Always ensure that the flow of air around the inverter is not blocked, so as to prevent overheating.
- Do not install near flammable substances (minimum distance: 3 m).
- Do not install on wooden walls or near flammable surfaces.
- Install on a wall or strong structure suitable to bear the weight.
- Do not install in rooms where the people live or where the prolonged presence of people or animals is expected.
- Installation of these models can be carried out vertically or horizontally with a maximum inclination as indicated in the FIG. 05 and 06.
- Hardware and software maintenance on device entails opening the front door. Check that the correct installation safety distances are observed in order to allow routine check and maintenance operations.

3. Inverter models and components

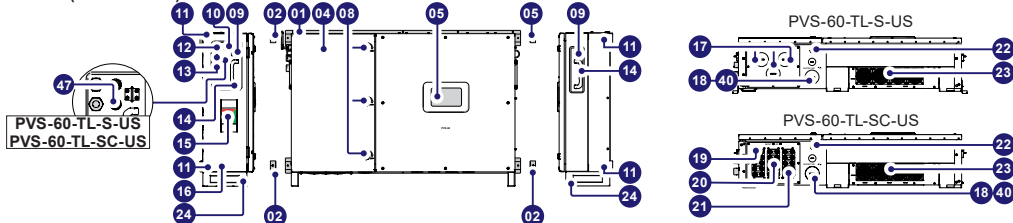
The inverter model should be chosen by a specialized technician who has a good knowledge of the installation conditions, the devices that will be installed externally, and whether it will eventually be integrated into an existing system. The following models of inverter are available:

Inverter model	Input channel	DC switch	DC SPD	DC connection	String fuses	AC SPD	RSD Compatibility
PVS-60-TL-S-US	3 (1 if paralleled)	Yes	Class II	15 pairs fuse holder	Positive and negative	Class II	No
PVS-60-TL-SC-US	3 (1 if paralleled)	Yes	Class II	15 pairs quick fit connectors	Positive and negative	Class II	No
PVS-60-TL-R-US	1	Yes	Class II	Screw terminal blocks	No	Class II	Yes
PVS-60-TL-S-R-US	3 (1 if paralleled)	Yes	Class II	15 pairs fuse holder	Positive and negative	Class II	Yes
PVS-60-TL-SC-R-US	3 (1 if paralleled)	Yes	Class II	15 pairs quick fit connectors	Positive and negative	Class II	Yes

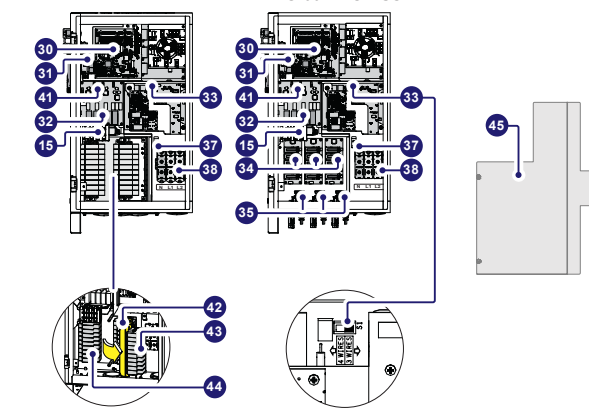
Main components

1 Mounting bracket	22 Anti-condensation valve	47 AFD reset button
2 Locking brackets	23 Cooling section	50 Interposer board
3 Inverter/bracket anchor points	24 Lower support	51 ALARM (multifunction relay) terminal block
4 Wiring box front door	30 Communication and control board	52 AUX (multifunction relay) terminal block
5 LED panel	31 Grounding kit (optional kit)	53 RS485-1 and RS485-2 lines, R1ON/OFF and R2ON/OFF (remote ON/OFF) and 5V auxiliary lines terminal block
8 Keylock	32 DC overvoltage surge arresters	54 RS485-1 line 120Ohm termination resistor switch
9 Lifting ring	33 3/4 wire selection switch	55 RS485-1 communication card housing
10 Wi-Fi antenna connector	34 Negative (-) side string fuses	56 RS485-1 line connection on RJ45 connector
11 Locking brackets attachment point	35 Positive (+) side string fuses	57 RS485-2 line connection on RJ45 connector
12 Ethernet cable gland	36 AC overvoltage surge arresters	58 RS485-2 line 120Ohm termination resistor switch
13 Service cable gland (PG21)	37 Protective earth connection point	59 RS485-2 communication card housing
14 Handle	38 AC output screw terminal block	60 RS485-Main terminal block (J5)
15 DC disconnect switch	39 DC input screw terminal block	61 Battery housing
16 EGC connection point	40 Adapter ring	62 SD card housing
17 DC conduit opening 2"	41 Parallel MPPT connection points	63 Grounding kit connector (optional kit)
18 AC conduit opening 2"	42 Fuse holders IN1	64 Inverter data memory card housing
19 Input quick fit connectors CH1	43 Fuse holders IN2	65 Ethernet connector
20 Input quick fit connectors CH2	44 Fuse holders IN3	
21 Input quick fit connectors CH3	45 Plastic protection	

Inverter (external view)



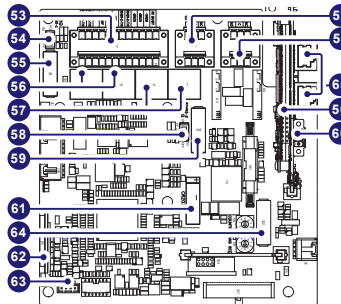
PVS-60-TL-S-US PVS-60-TL-SC-US



Communication and control board (30)

READ THE MANUAL – See the manual for details on the connections and functions available on the communication and control board.

The illustration shows the main components and connections available on the communication and control board (30). Each connection cable reaches the communication board through service cable glands (13) and Ethernet cable gland (12).



4. Lifting and transporting

4.1 Transport and Handling

Transport of the equipment especially by road, must be carried out with means for protecting the components (in particular, the electronic components) from violent shock, humidity, vibration etc. During handling, do not make any sudden or fast movements that can create dangerous swinging.

4.2 Lifting

FIMER usually stores and protects individual components by suitable means to make their transport and subsequent handling easier, but as a rule, it is necessary to utilize the experience of specialized staff in change of loading and unloading the components.

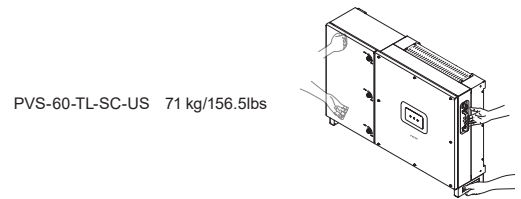
In order to lift the inverter easily are present two handle (14) and two lifting rings (09).

⚠ ATTENTION – Do not lift several units or parts of the equipment at the same time unless otherwise indicated. The ropes and equipment used for lifting must be suitable for bearing the weight of the equipment.

4.3 Unpacking and Checking

The packaging components must be removed and disposed of according to all applicable laws and regulations of the country where the equipment is being installed. When you open the package, check that the equipment is not damaged and make sure all components are present. If you notice any defects or damage, stop unpacking and contact the carrier, and also promptly inform the FIMER Service department.

Model	Weight (kg)	Lifting points
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5. List of supplied components

Components available for all inverter models Q.ty

	Mounting bracket (01) + screws for bracket mounting	1+6
	Locking brackets (02) + screws for the locking bracket mounting	4+8
	Control and communication signals (53) and multifunction relay connectors (51) (52)	2+2
	RS485-main connector (60)	1
	Two-hole gasket for PG 21 signal cable glands (13) + cap	1+1

Components available for all inverter models Q.ty

	M6 screw and toothed washer for securing the protective earth terminal (external) (16)	1+2
	WiFi antenna	1
	Configuration bar for paralleled input channels and M5x12 screws (with plain and split washers)	1+3
	Key for front door key-lock (08)	1
	Technical documentation	

6. Installation planning

6.1 Sizing the ground cable(s)

- ⚠ ATTENTION** – Size the cable(s) in accordance with NEC and any local codes.
- ⚠ ATTENTION** – The wire must be large enough to handle the maximum ground fault current (92 A) that the PV system might experience.
- ⚠ ATTENTION** – The warranty is void if the inverter isn't connected to ground through the appropriate terminals.

Follow site wiring diagrams and grounding plans. At a minimum expect this to include:

- A PV array equipment ground conductor (EGC), to be landed on the EGC connection point (16) located on the left external side of the inverter.
- A protective earth (PE) conductor, to be landed on the protective earth connection point (37). The terminal accept a ring cable lug, suitable for a M6 size threaded insert (Torque to 11Nm / 8 ft-lb).

6.2 AC overcurrent protection

To reduce the risk of fire, connect only to a circuit provided with an overcurrent protection in accordance with the NEC (ANSI/NFPA 70). The inverter must be connected only to a dedicated branch circuit provided with the maximum branch overcurrent protection device (OCPD):

PVS-60-TL-US	
Type	Typical installations use a 3-pole/600V rated bi-directional thermalmagnetic circuit breaker, UL489 or equivalent.
Maximum Current/Voltage	100 A / 600 V

- Verify that the PV module is listed for use in 1000Vdc systems in accordance with local electrical codes.
- It is installer's responsibility to provide external disconnect switches and OCPD as required by NEC and other prevailing regulations.
- The inverter is designed without an isolation transformer and must be installed per NFPA 70, 690.35 with an ungrounded PV array.

6.3 String Fuse sizing (-S and -SC models only)

The correct sizing of the positive side (+) and negative side (-) string fuses to be used to protect from "return currents" is very important because it reduces the risk of fire and damage to the PV array. Fuses must be sized for each single string in the PV array.

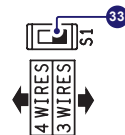
The fuse rating (Irated) must be based on the string current and on the sizing guidelines provided by the fuse manufacturer to avoid untimely tripping. As a general guideline, the photovoltaic modules' short circuit current (Isc) and the following formula give an estimate of the fuse rating:

$I_{rated} > (1.4 \approx 1.5) \cdot I_{sc}$
 Fuses must be chosen from among the standard commercially available ratings, selecting the size that is closest to the calculated value.
 The maximum string fuse size is 20A.

6.4 Choice of grid output connection type (AC side)

The medium voltage transformer, i.e. the grid (distribution system), must face the inverter as a grounded WYE, whose Neutral may or may not be brought to the inverter. Set the switch (S1) based on the configuration of the output connections:

- 3WIRES position (lines 1, 2, 3 + GND).
 In this case, the inverter creates its own "virtual" neutral.
 The DIP switch S1 on the AC Filter board must be set for "3 WIRES" before the inverter is commissioned.
- 4WIRES position (lines 1, 2, 3, Neutral + GND).
 The DIP switch S1 on the AC Filter board must be set for "4 WIRES" before the inverter is commissioned.




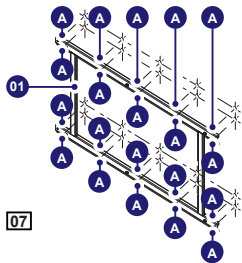
7. Mounting instructions

The mounting bracket (01) can be used to install the inverter on a vertical or horizontal support

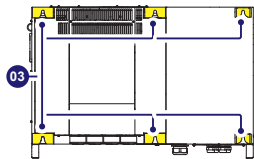
- Position the bracket (01) perfectly level on the support and use it as a drilling template. (FIG. 07)

ATTENTION – It is the installer's responsibility to choose an appropriate number and distribution of attachment points. The choice must be based on the type of support (wall, frame or other support), the type of anchors to be used and their ability to support 4 times the inverter's weight (4 x 71 kg (156.5lb)=284 kg (626lb) for all models). Attach the bracket to the wall with at least 10 attachment screws.

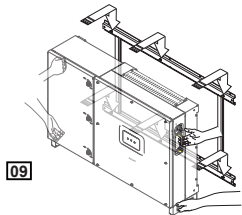
- Depending on the type of anchor chosen, drill the required 10 holes (A) to mount the bracket. Put at least four screws in the upper side and at least four in the lower side.
- Fix the bracket to the support.
- Lift the inverter using the handles (14), or another appropriate lifting device. The inverter is pre-equipped with lower support (24) which allow it to be temporarily put vertically on the floor to make it easier the lifting.
- Insert the heads of six anchor point (03), present on the bracket into the slots  on the rear of the inverter. (FIG. 08 and 09)
- Install the 4 fixing bracket (02) on the 4 corner of the inverter (using 8 screws). (FIG. 10)
- Remove the protective cover from the connector of the wireless antenna located on the left side of the inverter. Install the wireless antenna by screwing it into the specific connector (10). (FIG. 11)
- Open the wiring box front door (04) turning the 3 key-lock (08) in "OPEN" position and proceed with the wiring and connections depending on the model.
- Install a cable conduit on the AC opening (18):
 - remove the plug and preserve the adapter ring (40)
 - install the adapter ring (40) on the conduit (FIG. 12)
 - install the conduit on the AC opening (18)
- Remove the plugs on the DC openings (17) and install the conduits on it (PVS-60-TL-US-S model).



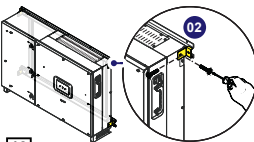
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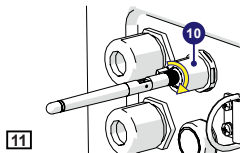
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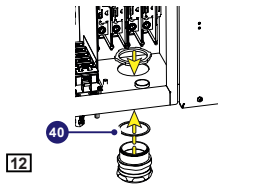
09



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11



12

8. Grid output connection

WARNING – To avoid risks of electrical shock, all wiring operations must be carried out with the disconnect switch downstream of the inverter (grid side) opened and applying LOTO procedure on it. Be careful not to change round one of the phases with neutral!

ATTENTION – Caution! Connect the ground before starting the grid connections.

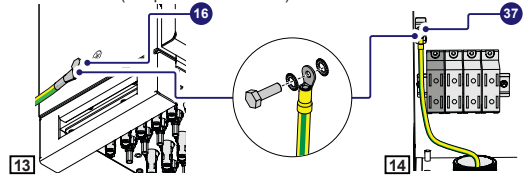
ATTENTION – Keep the resistance of the wires to a minimum between the OCPD and the AC terminals, to ensure the correct work of the protective devices.

ATTENTION – Size conductors per NEC Article 310 -- use 90°C wire only; conductors must be sized according to operating temperature range and continuous current ratings.

ATTENTION – AC output wire must be UL listed wire rated minimum 600V.

8.1 Installing the ground cable(s):

- Attach the DC side ground cable(s) to the equipment grounding conductor connection point (16).
 - Attach the AC side ground cable to the protective earth (PE) connection point (37).
- Both above connection point accept a ring cable lug, suitable for a M6 size threaded insert (Torque to 11Nm / 8ft-lb)



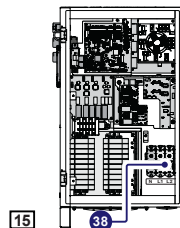
8.2 Grid output connection (AC side)

The medium voltage transformer, i.e. the grid (distribution system), must face the inverter as a grounded WYE, whose Neutral may or may not be brought to the inverter:
 Lines 1,2,3, Neutral + GND ("four-wire") OR Lines 1, 2,3 + GND ("three-wire," and in this case, the inverter creates its own "virtual" neutral).

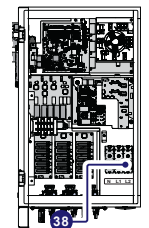
- Confirm the size of grid conductors 4AWG to 4/0AWG (copper or aluminum).
- Confirm the right setting of the switch on the AC filter board (in the ACWB) for the neutral connection to the grid:
 - 3WIRES → WYE connections with no neutral (R+S+T+GND)
 - 4WIRES → WYE configurations with neutral (R+S+T+N+GND).
- Run the AC cable through the conduit openings (18).
- Connect the grid conductors (R, S, T, Neutral) to the respective terminals on the AC output terminal block (38) (FIG. 15 and 16).
- Torque to 14Nm /10.3ft-lb.
- Give each wire a pull test to confirm the connection is secure.

PVS-60-TL-US-S

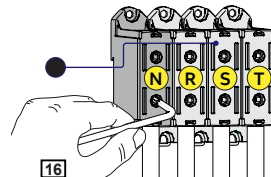
PVS-60-TL-US-SC



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16



16

9. Input connection (DC)

⚠ ATTENTION – Do not place objects of any kind on the inverter during operation!

⚠ ATTENTION – Do not touch the heatsink while the inverter is operating! Some parts may be very hot and cause burns.

⚠ WARNING – To avoid risks of electrical shock, all wiring operations must be carried out with the DC disconnect switch internal and external (applying LOTO procedures on it) to OFF position and with the external AC disconnect switch to OFF position (applying LOTO procedures on it).

⚠ WARNING – The DC disconnect switch disconnects the DC current from the PV panels in the “OFF” position. The inverter will stop producing power, but DOES NOT disconnect the AC from the grid.

⚠ WARNING – In case of presence of internal DC disconnect switch only, there will be live parts internal to the inverter with a consequent risk of electrical shock.

⚠ WARNING – Confirm the PV array’s input polarity is correct.

⚠ WARNING – Confirm the PV array has no ground leakage current.

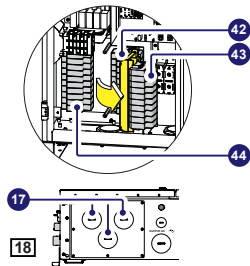
⚠ WARNING – The transformerless design of the inverter requires that the PV array to be floating with respect to ground per NEC 690.35.

⚠ WARNING – Per NEC 690.35, wires from the PV array must be UL-listed, 1000V minimum rating, 90°C minimum temperature rating.

9.1.2 PVS-60-TL-US-S Model

Input string connection

- Confirm the DC cables are 12 AWG to 3 AWG.
- Confirm that strings are not paralleled in the PV array.
- Confirm that the string fuse size is $\leq 20A$.
- Insert the DC conductors through the opening.
- Connect each string to the appropriate fuse holders (+ and -) following site wiring diagrams. The input fuse holder are divided into 3 groups (one group for each input channel) consisting of 5 pairs of quick fit connectors. See the label near to each fuse holders group to identify the strings connection number (+ and - poles). The fuse holders group of the input channel 1 (42) is reachable after have to rotate the fuse holders group of the input channel 2 (43). Remove the two screws and rotate the fuse holders group IN2 (FIG. 18).
- Torque screws to 3.4Nm (30 in-lb).
- When finished, go back and confirm the polarity is correct for each string.
- Give each wire a pull test to confirm the connection is secure.



⚠ ATTENTION – Conduit must be attached using liquid tight fittings to maintain Type 4 enclosure integrity.

DC-side connections may vary depending on the inverter model:

9.1 PVS-60-TL-US-S and PVS-60-TL-US-SC Models

9.1.1 Preliminary operation

These inverter versions have three input channels which work independently of one another, which can be paralleled by leveraging a single MPPT.

The independent configuration of the input channels (MPPT) is set at the factory. This means that the parallel bar (supplied) is not be installed on the parallel MPPT connection points (41), and that the software setting “Independent channel mode” is performed on the inverter.

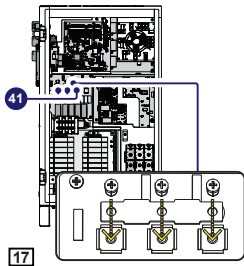
If is necessary to put the 3 input channels in parallel, the parallel bar (supplied) must be installed on the parallel MPPT connection points (41) (FIG. 17), and that the software setting “parallel channel mode” should be performed on the inverter; this setting can be done by different way:

- During the commissioning wizard phase (STEP 4).
- In the dedicated section of the internal webserver “Setup section > Setup DC side > Input mode”

To install the parallel bar follow the procedure below:

- Place the parallel bar (supplied) on the connection points (FIG. 18).
 - Install the 3 screws with washers supplied (torque 4Nm / 3.0 ft-lb).
- These inverter versions have 15 string inputs (5 for each channel). Each input string is protected by fuses (+ and -).

⚠ WARNING – Fuses are sized for single-string currents only. Strings may be not paralleled in the PV array.



9.1.3 PVS-60-TL-US-SC Model

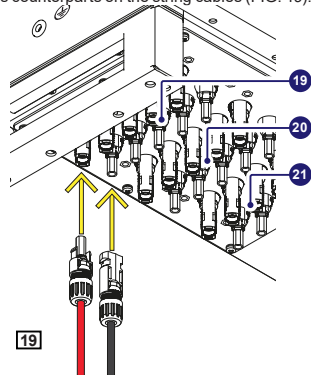
Input string connection

- Confirm the cross section of DC cables is appropriate to the quick fit connectors used.

⚠ WARNING – Depending on the model of the connector of the inverter, it is necessary to use the same model and the respective counterpart. Refer to the document “String inverter – Product Manual appendix” available at www.fimer.com to know the brand and the model of the quick fit connector.

⚠ WARNING – Using corresponding parts that are not compliant with the quick fit connector models on the inverter could cause serious damage to the unit and void of the warranty.

- Confirm that strings are not paralleled in the PV array.
- Confirm that the string fuse size is $\leq 20A$.
- Install the quick fit connectors counterparts on the string cables (FIG. 19).
- Connect each string to the quick fit connectors located on the bottom of the inverter, following site wiring diagrams. The input connectors are divided into 3 groups (one group for each input channel) consisting of 5 pairs of quick fit connectors. See the silkscreen near to each connector to identify the strings connection number (+ and - poles).
- When finished, go back and confirm the polarity is correct for each string.
- Give each wire a pull test to confirm the connection is secure.



10. Instruments

Description of the LEDs on the inverter cover:

POWER led	GREEN On, if the inverter operates correctly. Flashes in the network control phase or if the sunlight is not enough.
ALARM led	YELLOW The inverter has detected a fault. For inverters with a display, the error/warning message appears on the display.
GFI led	RED Ground fault of the PV array, DC side. For inverters with a display, the error message appears on the display.

READ THE MANUAL – Refer to the product manual for a description of error/warning codes appearing on the display, for inverters with a display.

11. Commissioning

ATTENTION – Before starting the inverter commissioning procedure, ensure that all the checks indicated in the previous sections of this Quick Installation Guide have been correctly performed and also that the front door 4 have been correctly closed! Make sure irradiation is stable and adequate for the inverter commissioning procedure to be completed.

Commissioning could be carried out in two different ways:

- Via "Installer for Solar Inverters" mobile APP - Recommended mobile APP for commissioning single inverter as well as multi inverter solar plant.
- Via Web UI (access point wireless network) - Integrated Web User Interface enabling setting parameters and performing commissioning of a single inverter (multi inverter support is not provided). Recommended as alternative method for performing single inverter commissioning.

11.1 Commissioning via "Installer for solar inverters" mobile app

"Installer for Solar Inverters" is the advanced FIMER mobile APP allows to simplify commissioning, parameter settings and troubleshooting of FIMER string multi-inverters in large scale solar plants.

Even in case of single inverter installation it can be considered the most suitable professional tool to be used. "Installer for Solar Inverters" mobile APP is available for mobile devices with an Android version of 6.0.1 or greater (iOS mobile devices support will come soon) and could be downloaded and installed from Play Store.

Commissioning procedure:

- It's highly recommended to connect the inverters in ethernet daisy chain (with or without ring) before executing the commissioning procedure. Make sure that all the inverter being commissioned features the last firmware version (updating can be executed via Installer for Solar Inverters mobile APP).
- Supply the input voltage from the photovoltaic generator to the inverter.

ATTENTION – Make sure irradiation is stable and adequate for the inverter commissioning procedure to be completed.

The main steps to complete the commissioning procedures are listed below:

- Installer for Solar Inverters mobile APP installed on mobile device.
- Enabled Aurora Vision installer account allowed to use the mobile APP. The account can be created in the mobile APP directly following the dedicated wizard procedure.
- Manual claiming of the inverters to be commissioned.

The claiming process consists of indicating which inverters are to be commissioned.

Claiming process can be executed by scanning the QR codes of all the inverters being worked and putting the selected inverters into the working list. Please insert in the list inverters belonging to the same inverters family; no more than 40 inverters by time can be configured together. As an alternative of QR code scanning, claiming process can be executed by selecting manually the SSIDs associated to the Wi-Fi networks generated by each inverter to commission and inserting Product key when requested. Both QR code and Product key are provided on the Communication identification label stuck onto each inverter. The Communication Identification label is divided in two separate parts by a

dashed line; take the bottom part and apply it on the plant documentation. (It's recommended to create a plant map and apply the Communication Identification label of each inverter in the right position of that map).

NOTE – Above steps are valid for executing any available functionalities of the Installer for Solar Inverters mobile APP.

- In order to launch the installation wizard and so complete the commissioning procedure please click "Commissioning" button. If needed click prevently on "Firmware update" button for aligning the firmware of all the inverters in the list to the last version (internet connection is needed).

READ THE MANUAL – For more details about commissioning and any other functionalities of the Installer for Solar Inverters mobile APP please contact FIMER customer support. For any other specific settings of parameters of single inverters please refer to "Description of the Web User Interface" chapter.

11.2 Commissioning via web UI (Access point wireless network)

The inverter can be commissioned and configured from a wireless device, such as a Smartphone, a tablet or a laptop. The commissioning procedure is as follows:

- Supply the input voltage from the photovoltaic generator to the inverter.
- Enable the wireless functionality on the device you are using for the commissioning of the inverter the network named FIMER-XX-XX-XX-XX-XX-XX, where "X" is a hexadecimal number of the MAC Address (the MAC Address is indicated on the "wireless identification label" on the side of the inverter).
- When prompted, type the "product key" (including the dashes. Example: 1234-1234-1234-1234) as the network password.
- Open your Internet browser (recommended browsers: Chrome from v.55, Firefox from v.50, Safari from V.10.2.1) and enter the default IP Address to access the Configuration Wizard page: 192.168.117.1. This will start the Configuration Wizard:
 - STEP 1 - Set the Admin/User access credentials (at least 8 characters for the password). Username and password are CASE SENSITIVE.
 - STEP 2 (optional) - Enter the required information (IP Address selection mode, SSID, and password) to connect the inverter to the wireless network. A new message will be displayed showing the IP Address assigned by router to access to the internal Web server. TAKE NOTE OF THE LINKS.
 - STEP 3 - Set the Date, Time and Time Zone.
 - STEP 4 - Set the inverter grid standard and configure the input channels.

By clicking "FINISH" the wizard completes the configuration procedure (after the settings are confirmed, the inverter restarts).

ATTENTION – From the moment the grid standard is selected, there will be 24 hours available to make any changes to the grid standard; after this, the "Country Select" feature is blocked and you can make further changes only by resetting the remaining-time timer.

- Supply the grid voltage to the inverter. Once the AC and DC disconnect switches are closed and the Configuration Wizard has completed the configuration procedure, the inverter starts the grid connection sequence. If the outcome of the preliminary checks is positive, the inverter will connect to the grid and start exporting power. The "Power" LED remains solid on, while the "Alarm" and "GFI" LEDs are off.

READ THE MANUAL – For more information about the configuration and use of the internal Web server, refer to the product manual.

12. Arc fault detection

For PVS-60-TL-US-S and PVS-60-TL-US-SC models only, the AFD performs a self-test when the system is started.

If the self-test results are OK, the inverter will continue to AC grid connection.

If a potential problem on the AFD board is detected, the self test will result in error E053.

Refer to the product manual (downloadable as described on the cover page) for troubleshooting suggestions.

During normal operation the input current is continually measured and analyzed.

If a DC arc fault is detected during operation, the inverter is disconnects from AC grid and generates an E050 error code (readable through internal Webserver).

Press and hold the AFD reset button on the left side of the DC wiring box for 3 seconds. This will clear the E050 error and restart the self test.

If self-test results are OK, the inverter will reconnect to the AC grid; if the DC arc fault is still present, the self-test will result in error E053. Refer to the product manual online for solutions. The AFD self-test can be manually started anytime using the following procedure:

1. Turn off the inverter (switching off both DC and AC switches),
2. Turn on both the DC and AC switches and wait for self-test result.

⚠ WARNING – If the AFD trips frequently, it means arcs are occurring. Turn the inverter OFF and request service to do complete check of the system wiring, including all connections and junction boxes, to locate the problem.

13. Grid support functions

The inverter is equipped with advanced grid support functionality that is useful to support reactive loads and also assist in reliable operation of the utility grid in the presence of a large number of distributed energy generation sources. The grid support functions that are equipped on this inverter are described in the following sections.

The internal Webserver can be used to adjust grid parameters. A Wi-Fi connection to the inverter is required to modify settings using the internal Webserver.

📖 READ THE MANUAL – This QIG provides an overview of the available grid support functions. For complete details, refer to the product manual at www.fimer.com.

• Voltage ride-through

This inverter provides parameters to respond to undervoltage and overvoltage events. The inverter is designed to operate normally within the specified operating range. If voltage excursions occur, the inverter is designed to continue operating normally or cease to export power for a specified delay. Beyond this programmed delay, the inverter disconnects from the grid in the event of an abnormal voltage condition.

• Frequency ride-through

This inverter provides parameters to respond to underfrequency and overfrequency events. If frequency excursions occur, the inverter is designed to continue operating normally for a specified delay. Beyond this programmed delay, the inverter disconnects from the grid in the event of an abnormal voltage condition.

• Reactive power control

The inverter provides several modes of operation for reactive power control and are described below:

- Disable: This is the default setting. Under this setting, the inverter exports with a power factor of 1.0.
- Fixed power factor control (Cosφ set): In this mode, the operator can set the output power factor to a fixed value. When enabled, a new value will be set in the inverter.
- Q Fixed (Q Set): Sets the reactive power to a fixed value. When enabled, a new value will be set in the inverter.
- Power factor as function of output power (Watt/Cosφ Settings: Cosφ(P)): In this mode, the inverter reduces the power factor (cos-phi) as a function of the output power at a given operating point. The 4 points of the default curve, where you can set the % of Pmax values and related cos-phi, can be modified using the internal Webserver. When enabled, the curve will be set in the inverter.
- Dynamic Volt/VAR control (Volt/VAR Settings: Q(V)): Under this mode, the level of reactive power exported by the inverter is a function of the operating grid voltage, also known as a Volt/VAR curve. The 4 points of the default curve, where you can set the % of Vnom values and related % of Smax, can be modified using the internal Webserver. When enabled, the curve will be set in the inverter.

• Active Power Control

This inverter offers several modes for active power reduction.

- Active Power Curtailment: Sets a new value of active power as % of Pmax. When enabled, a new value will be set in the inverter.
- CEI Average VGrid Derating (only Italian grid standard): Sets, after a specific threshold, an active power derating based on the average of Vac on 10 minutes as per CEI-021 Italian grid standard.
- Volt/Watt settings: P(V). Under this mode, the level of active power exported by the inverter is a function of the operating grid voltage, also known as a Volt/Watt curve. The 4 points of the default curve, where you can set the % of Vnom values and related % of Pmax, can be modified using the internal Webserver. When enabled, the curve will be set in the inverter.
- Frequency/Watt function (Frequency Control: P(f)): In this mode, the inverter limits the active power as a function of the grid frequency.

• Ramp control

The inverter is designed to control the rate at which output power is increased, either at startup, or after a temporary low power condition on the PV array (such as fast shading). The following ramp controls are provided on this inverter.

- Normal ramp: The normal ramp defines the maximum rate at which the inverter can increase the output power under normal operation. The normal ramp control limits the fluctuations in the output power in order to prevent instabilities on the utility grid.
- Soft start: The soft-start ramp defines the maximum rate at which the inverter can increase the output power when the inverter is first starting up. This startup may occur on a daily basis or when the inverter restarts after an abnormal grid event has ended.

14. Voltage & Frequency trip limits

This inverter has been factory programmed to automatically disconnect from the utility distribution system in compliance with UL 1741 and IEEE 1547-2003 specifications. Default voltage and frequency trip limit and trip time settings to comply with these standards are shown in table below. The internal Webserver can be used to adjust Voltage and Frequency Trip Limit and Trip Time Parameters according to Grid requirements of installation country.

	Utility source Voltage (V)	Utility source Frequency (Hz)	Max. time (sec) at 60Hz before cessation of current
A	< 0.50 Vnom (Fixed)	Rated (60Hz)	0.16 (default)(Adj. Set Points 0.16 to 50s)
B	0.50 Vnom ≤ V < 0.88 Vnom (Adj.)	Rated (60Hz)	2 (Default)(Adj. Set Points 0.16 to 100 sec)
C	1.10 Vnom < V < 1.2 Vnom (Adjustable)	Rated (60Hz)	1 (Default)(Adj. Set Points 0.16 to 100 sec)
D	1.2 Vnom ≤ V (Fixed)	Rated (60Hz)	0.16 (Adj. 0.001 to 0.16s)
E	Rated	f > 60.5Hz (Default)	0.16 (Default) (Adj. Set Points 0.16 to 1000 sec)
F	Rated	f < 59.3 Hz (Default) (Adj. 50.0 to 59.9 Hz)	0.16 (Default) (Adj. Set Points 0.16 to 1000 sec)
G	Rated	f < 57.0 Hz (Default) (Adj. 50.0 to 59.9 Hz)	0.16 (Default) (Adj. Set Points 0.16 to 1000 sec)
H	Rated	f >> 63.0 Hz (Default) (Adj. 60.1 to 66.0 Hz)	0.16 (Default) (Adj. Set Points 0.16 to 1000 sec)

Reconnection 300s (Default) (Adjustable 20s to 1000s)



For more information please contact your local FIMER representative or visit:

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