

FIMER



Solar Inverter

PVS-10/12.5/15-TL

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.

**APPLY HERE
THE COMMUNICATION
IDENTIFICATION LABEL**

1. Inverter models and components

This Quick Installation Guide is related to the following inverter models:

Inverter model	Input MPPTs	DC switch	DC SPD	DC connection	AC SPD	AC connection
PVS-10-TL-SX	2	Yes	Type 2	4 input strings	Type 2	AC quick fit connector
PVS-12.5-TL-SX						
PVS-15-TL-SX						
PVS-10-TL-SY	2	Yes	Type 1+2	4 input strings	Type 2	AC quick fit connector
PVS-12.5-TL-SY						
PVS-15-TL-SY						

The -SX inverter models can be equipped with the following options:

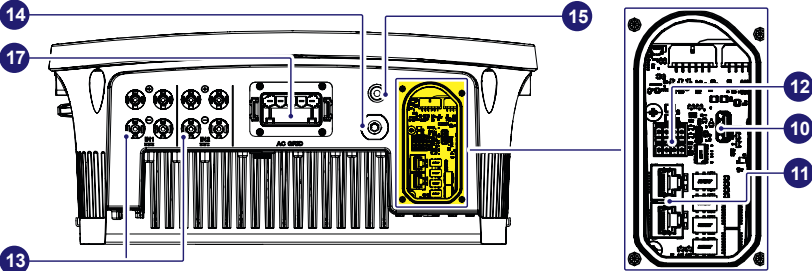
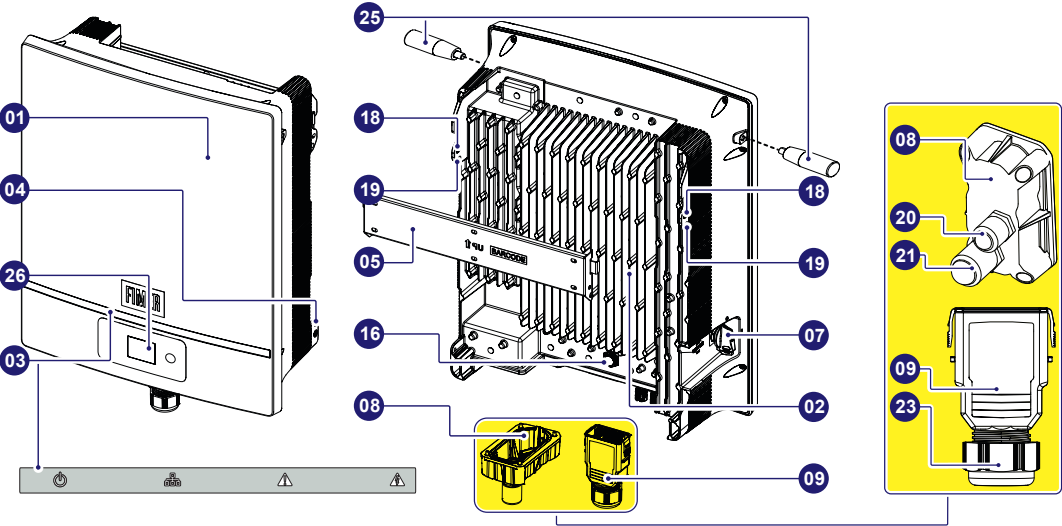
Option	Description
APD inverter model suffix	• Inverter equipped with PID recovery functionality
AFD inverter model suffix	• Inverter equipped with Arc Fault Detection functionality
DISPLAY inverter model suffix	• Inverter equipped with display on the front cover

READ THE MANUAL – For the inverter with “APD”, “AFD” and “DISPLAY” suffixes refer to the manual for settings and safety related information

NOTE – 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.

1.1 Main inverter components

Inverter external view		
01 Inverter	10 USB connector for accessories board	18 Side bracket screws
02 Heatsink	11 Ethernet 1/2 connectors	19 Padlock hole
03 Synoptic (LED icons)	12 Digital input and RS485 connector	20 Digital input and RS485 cable gland (M20)
04 Protective earth (PE) external connection point	13 Quick fit input connectors	21 Ethernet 1/2 cable gland (M25)
05 Mounting bracket	14 Wi-Fi antenna connector	23 AC cable gland
07 DC disconnect switch	15 Smart button	25 Handles (optional)
08 Signals connection box	16 Anti-condensation valve	26 Display
09 AC quick fit connector	17 AC output connector	

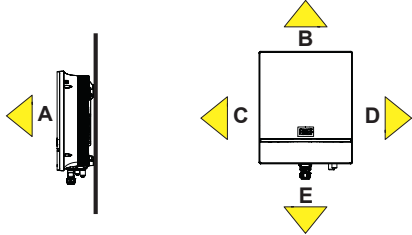


READ THE MANUAL – See the manual for details on the connection of the communication and control signals.

Distances

- Maintenance operations from FIMER service could entails removing the front cover. Always observe the required installation safety distances in order to allow routine check and maintenance operations.
- Provide a sufficient working space in front of the inverter that allows to removing the front cover (FIMER service only) and to allow wiring connections.
- Install at a height which takes into consideration the weight of the unit and in a position which is suitable for servicing, unless suitable means will be provided to carry out these mentioned operations.
- If possible, install at eye-level so to allow to easily check the: - synoptic (03).
- display (26). Only in inverter model with ;DISPLAY suffix.
- Do not install any object (e.g. AC or DC cables) that could be damaged by overheating from outgoing hot air flow coming from top side. In case of this kind of installation needs, please evaluate the installation of a proper air deflector. Always respect the minimum distances required.
- Respect the minimum distances from surrounding objects that could prevent the inverter installation and restrict or block the air flow:

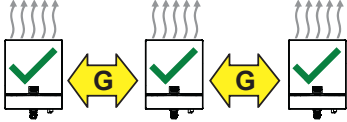
A = 70cm (27")
B = 50cm (20")
C = 20cm (8")
D = 20cm (8")
E = 50cm (20")



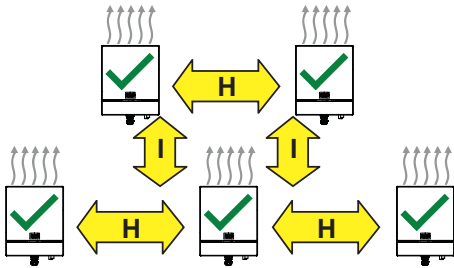
ATTENTION – Please check the manual for some particular scenarios that may vary the minimum clearance distances.

Installation of multiple units

- In case of installation of multiple units in the same place, position the inverter side by side paying attention to keep the minimum clearance distance G of 30cm/12" (measured from the outer edge of units).



If the space available does not allow this arrangement, position the inverters in a staggered arrangement so that heat dissipation is not affected by other inverters below. Respect the following minimum clearance distances H of 100cm/39" and I of 30cm/12".



ATTENTION – Please check the product manual for "Wireless signal environmental checks", "Installations at high altitudes" and "Installations with a high level of humidity".

- NOTE** – The final installation of the inverter must not compromise the access to any disconnection devices located outside.
- NOTE** – Refer to the warranty conditions to evaluate the possible exclusions related to an improper installation.

5. Supplied Component list

Component	Q.ty
Vertical mounting bracket (05)	1
AC quick fit connector (09) + locking clip	1 + 1
Two-hole gasket (6mm Ø) for M20 Digital input and RS485 cable gland (20) and cap	1 + 1
Three-hole gasket (6mm Ø) for M25 Ethernet 1/2 cable gland (21) and caps	1 + 2
Three-hole gasket (7mm Ø) for M25 Ethernet 1/2 cable gland (21) and caps	1 + 2
M6 screw + M6 serrated lock washers to clamp the earth cable on the Protective Earth (PE) external connection point (04)	1 + 2
Eyelet cable lug (16mm² wire) for Protective earth (PE) external connection point (04)	1
Digital input and RS485 counterpart (12)	1
Wireless antenna (14)	1
M5 screws (with washers) for mechanically securing the inverter to the bracket (18)	2
South Africa network standard label	1
Technical documentation	1

6. Assembly instructions

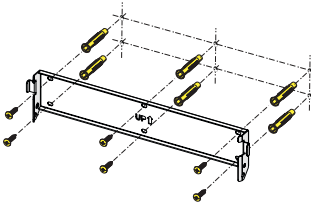
Bracket installation

The mounting bracket can be used to install the inverter on a vertical support.

- Position the mounting bracket (05) perfectly level on the support and use it as drilling template.

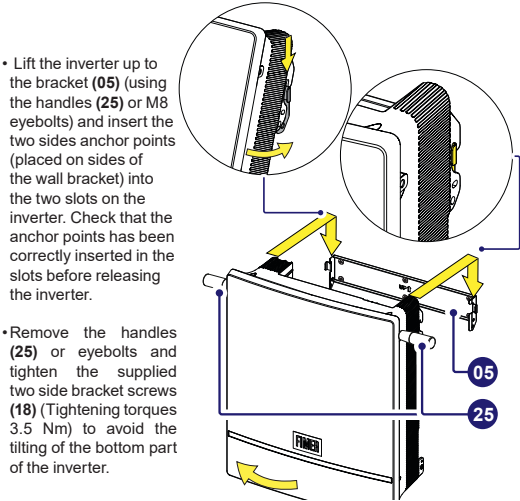
NOTE – It is the installer's responsibility to choose an appropriate number and distribution of attachment points. The choice must be based on the type of support (wall, frame or other support), the type of anchors to be used, and their ability to support 4 times the inverter's weight (4x29.6Kg/65lbs=118.4Kg/260lbs for all models). Depending on the type of anchor chosen, drill the required holes (4 minimum) to mount the bracket. Put at least 2 screws in the upper side and at least 2 in the lower side.

- Attach the bracket (05) to the support.

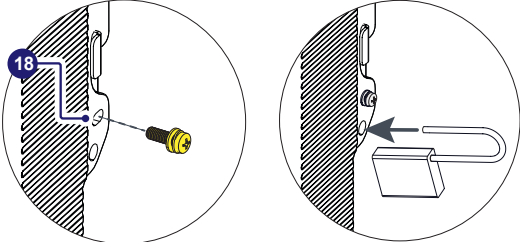


Assemble the Inverter to the bracket

- ATTENTION** – It is recommended to use the handles (that have to be ordered separately) to handle and safely install the inverter.
- ATTENTION** – Risk of injury due to the heavy weight of the equipment. Always consider the center of gravity of the enclosures while lifting.



- A padlock can be installed to lock the inverter to the bracket so that it cannot be disassembled by outsiders.



- Remove the protective cover from the connector of the wireless antenna located on the bottom side of the inverter. Install the wireless antenna by screwing it into the specific connector (14).

ATTENTION – For connection to the network in South Africa: according to NRS097-2-1 requirements, at the end of installation it is mandatory to label the label (supplied with the inverter) near to regulatory label.

7. AC grid output connection

7.1 Characteristics and sizing of the protective grounding cable

ATTENTION – Any failure of the inverter when it is not connected to earth through the appropriate connection point is not covered by the warranty.

- The earth connection can be made:
 - On the Protective Earth (PE) external connection point (04).
- WARNING** – The cross section of the protective earthing conductor must have same cross section as the phases cables and its minimum must be 10 mm² (Copper wire).

- On both Protective Earth (PE) external connection point (04) and on the AC quick fit connector (09) using cables having same cross section as the phases cables.
- ATTENTION** – Installation of a second protective earth cable is also required by regulations in force in certain countries of installation.

7.2 Characteristics and sizing of the line cable

The AC cables must be connected to the AC output connector (17) using the specific AC quick fit connector (09) supplied.

AC conductor cable	
Cable diameter range	• 11...19 mm or 19...26mm based on the type of seals installed
Conductor cross section	• 6mm²...16mm² (with plastic collar ferrule) accepted by the AC quick fit connector.
Conductor material	copper

7.3 Protection switch under load (AC switch) and differential protection

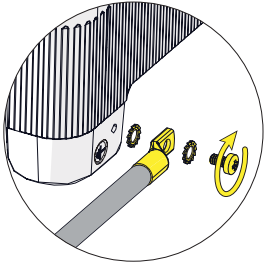
To protect the AC connection line of the inverter, it is recommended to install a protection device against overcurrent and earth leakages with the following features:

Load protection breaker	PVS-10-TL	PVS-12.5-TL	PVS-15-TL
Type	Automatic circuit breaker with thermal-magnetic protection		
Voltage/current rating	400Vac min25A (*)	400Vac min32A (*)	400Vac min32A (*)
Magnetic protection	Magnetic curve B/C		
Number of poles	3W (3 phases without neutral wire) or 4W (3 phases with neutral wire).		
Differential protection type	A/AC		
Differential sensitivity	300 mA		

(*): please consider thermal and other derating when selecting the current rating of the protection equipment for your application.

7.4 Connection on the Protective earth (PE) cable

- Strip the cable.
- Install the supplied M6 cable lug on the earth cable.
- Install the earth wire on the Protective earth (PE) external connection point (04) following the installation sequence (Tightening torque 4 Nm):
 - Serrated washer
 - Earth cable
 - Serrated washer
 - M6 screw

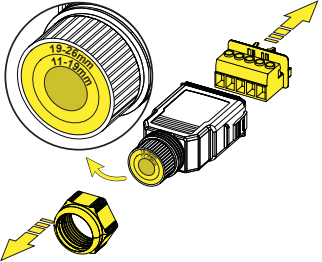


7.5 AC output cables connection

ATTENTION – Before carrying out any operation, check that any external AC switch downstream to the inverter (grid side) is in OFF position applying LOTO procedure on it.

The connection of the AC cable must be made on the AC output connector (17), located on the bottom side of the inverter, using the AC quick fit connector (09).

- Unscrew the AC cable gland (23) installed on the AC quick fit connector (09).



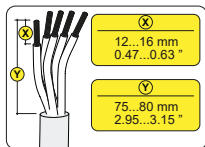
- Remove the internal screw terminal block. Press the 2 retain clips and pull out the screw terminal block.

ATTENTION – On the connector cable gland 2 gasket are installed that can be used in combination to accept a 11...26mm diameter cable.

- Cable diameter 11...19mm. Default configuration (both gasket installed).
- Cable diameter 19...26mm. Remove the reducing clamping range gasket.

- Pass the AC cable through the AC cable gland (23).

- Strip the AC cable and wires



- Install ferrule with plastic collar on the wires.

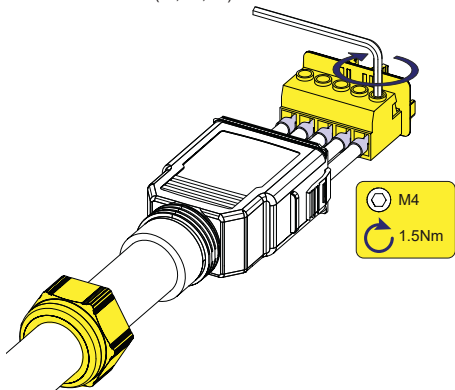
- Install the wires (based on the AC connection type) respecting the connections as indicated on the screw terminal block (L1=R; L2=S; L3=T):

A. Five-cores cable (L1, L2, L3, N and PE).

B. Four-cores cable (L1, L2, L3 and N).

C. Four-cores cable (L1, L2, L3 and PE).

D. Three-cores cable (L1, L2, L3).



⚠ ATTENTION – In case of a wrong phase sequence the inverter will not connect to the grid and it will provide an error state.

- Re-install the screw terminal block inside the AC quick fit connector.

⚠ ATTENTION – Push the screw terminal block till a double “click” will be heard.

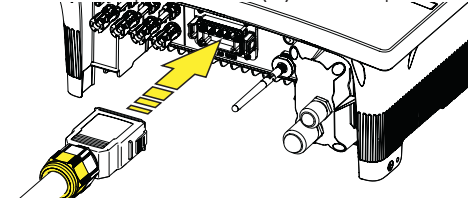
- Tighten the cable gland ring (7.5Nm).

⚠ ATTENTION – Make sure the cable glands are properly sealed to ensure to keep IP65 protection degree.

7.5.1 Connection of AC quick fit connector to the inverter

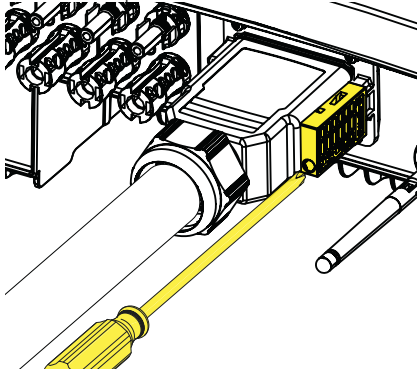
- Pull out the protective cap from the AC output connector (17).

- Connect the AC quick fit connector (09) to the AC output connector (17).



⚠ ATTENTION – Push the connector till a double “click” will be heard.

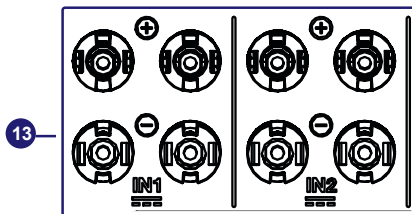
- Secure the AC quick fit connector. Install and screw the holding clip.



⚠ ATTENTION – The AC quick fit connector must not be subject to tensile forces (examples: do not connect weights to the AC cable, do not leave excess cable windings hanging, etc).

8. Input connection (DC)

For the strings connections it is necessary to use the DC quick fit connectors (13), located on the bottom side of the inverter.



The input connectors are divided into 2 groups (one group for each input MPPT). For each MPPT 2 pairs of quick fit connectors are available. Respect the Maximum DC input power for each MPPT as follow:

MPPT	PVS-10-TL	PVS-12.5-TL	PVS-15-TL
IN1	17A / 7.8kW	18A / 8.3kW	22A / 10kW
IN2	17A / 7.8kW	18A / 8.3kW	22A / 10kW

8.1 Preliminary operations to the connection of the PV generator

- Checking the correct polarity of the strings
- Checking of leakage to ground of the photovoltaic generator
- Checking of strings voltage
- Installation of quick-fit connectors

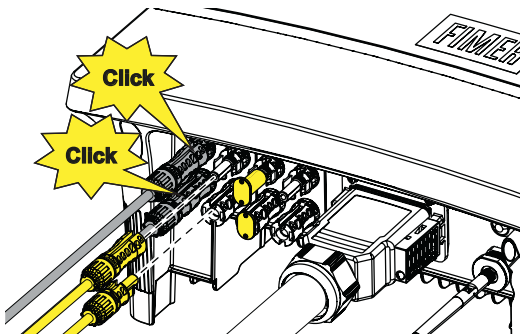
8.2 Connection of the input strings

⚠ WARNING – When the photovoltaic panels are exposed to sunlight they provide continuous DC voltage to the inverter. To avoid risks of electrical shock, all wiring operations must be carried out with the DC disconnect switches (internal (07) and external to the inverter) and external AC disconnect switches OFF.

- Connect all the strings required by the system by pushing the quick fit connectors in the right position.

⚠ ATTENTION – Using coupling parts that are not compliant with the quick fit connector models on the inverter could cause serious damage to the unit and lead to invalidation of the warranty.

ATTENTION – Refer to document "String inverters - Product manual appendix" available at www.fimer.com to find out the manufacturer and model of quick fit connector used on the inverter.



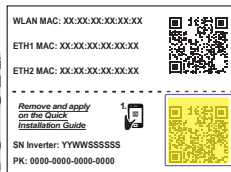
ATTENTION – Check that protective caps are installed on unused connectors. This is necessary for the inverter seal and to avoid any damage to the unused connectors which may be used at a later time.

ATTENTION – The quick fit connectors must be properly installed. After the installation make sure the connectors are correctly locked through the clips.

- Login or Sign-In to Aurora vision account.
- Tap on "Commissioning wizard". A QR code scanner will be opened.
- Scan the QR code on the Communication identification label and connect to inverter network.

NOTE – The name of the Wi-Fi network created by the inverter will be: FIMER-YYWWSSSSSS (10 digit Inverter SN).

NOTE – After this step wait 10 seconds to allow the Wi-Fi connection



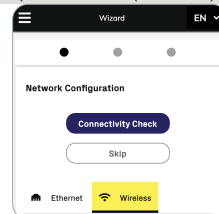
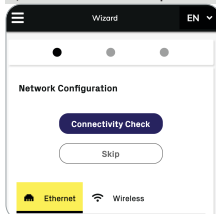
Once connected, the commissioning wizard will start.

10.1 COMMISSIONING WIZARD

10.1.1 Network configuration.

- Choose the connection type (ethernet or wireless) and set the related parameters.

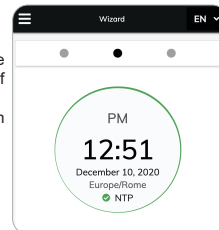
NOTE – This step can be skipped and performed later (via WebUI).



- Once network parameters were setted, tap on "Next".

10.1.2 Date and Time.

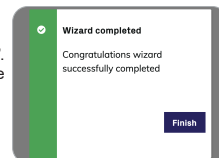
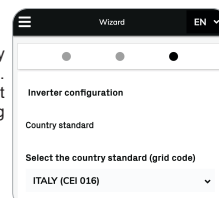
- Set the Date, Time and Time zone (The inverter will propose these fields if connected to internet).
- Once date and time were setted, tap on "Next".



10.1.3 Inverter configuration.

Country standard

- Set the grid standard of the country in which the inverter is installed. Some Country standards have different grid voltage that should be setted during this step.



- Confirm the settings by clicking "Save". The configuration wizard is complete and the inverter will reboot.

- If the outcome of the preliminary checks on the grid parallel is positive, the inverter connects to the grid and starts to export power to the grid. The "Power" LED remains fixed on while the "Alarm" and "GFI" LEDs are off.

NOTE – To address any problems that may occur during the initial stages of operation of the system and to ensure the inverter remains fully functional, you are advised to check for any firmware updates in the download area of the website www.fimer.com or at <https://registration.solar.fimer.com> (instructions for registering on the website and updating the firmware are given in the product manual).

9. Instruments

The synoptic (03) allows to view inverter status conditions to be analyzed in greater depth by consulting the manual.



POWER

Solid when the inverter is working correctly. Flashes when checking the grid or if there is insufficient sunlight.



WLAN

Indicates the status of the Wi-Fi or Ethernet communication lines.



ALARM

The inverter has detected an anomaly. The anomaly is shown on the "EVENTS" section of the internal webserver.



GFI

Ground fault on the DC side of the PV generator. The error is shown on the "EVENTS" section of the internal webserver.

NOTE – The icons, in various combinations, can indicate multiple conditions other than the original single condition; see the various descriptions on the product manual.

10. Commissioning

The inverter can be commissioned in a simple and intuitive way through the Installer for solar inverters APP for mobile devices.

NOTE – The commissioning can be done also via WebUI. Once powered, the inverter will create a Wi-Fi network (SSID: FIMER-YYWWSSSSSS). Connect to this Wi-Fi and use the Product Key as password (digit also the dash "-" characters) and open an internet browser. Enter the IP 192.168.117.1 and the commissioning page will be showed. Subsequently is possible to access the WebUI use the admin password 0010. For complete description refer to product manual at www.fimer.com.

- Supply the inverter with DC input voltage from the photovoltaic generator and via AC grid voltage.

ATTENTION – The inverter configuration can be also performed with only one supply source (DC or AC).

ATTENTION – With DC supply, make sure that the irradiation is stable and adequate for the inverter commissioning procedure to be completed.

- Open the "Installer for solar inverters" APP.

11. Features and Technical Data

	PVS-10-TL	PVS-12.5-TL	PVS-15-TL
Input side			
Absolute maximum DC input voltage (Vmax,abs)		1100 V	
Start-up DC input voltage (Vstart)		250...500V (default 360V)	
Operating DC input voltage range (Vdcmín...Vdcmax)		200...1000 V	
Rated DC input voltage (Vdcr)		620V	
Rated DC input power (Pdcr)	10200 W	12760 W	15300 W
Number of independent MPPT		2	
Recommended maximum PV array power (PPV, max)	14500 Wp	18125 Wp	21750 Wp
Maximum DC input power for each MPPT (PMPPT,max)	7800W	8300W	10000W
MPPT DC voltage range (VMPP,Tmin... VMPP,Tmax) at Pacr		460-850V	
Maximum DC input current (Idcmax) for each MPPT	17A	18A	22A
Maximum input short circuit current for each MPPT		30 A	
Maximum return current (AC side vs DC side)		Negligible in normal operating conditions ⁽⁶⁾	
Number of DC inputs pairs for each MPPT		2	
DC connection type		PV quick fit connector ⁽⁸⁾	
Type of PV panels that can be connected according to IEC 61730		Class A	
Input protection			
Reverse polarity protection		Yes, from current limited source	
Input over voltage protection for each MPPT		SPD type 2 / Type 1+2 (optional)	
Photovoltaic array isolation control		Yes, according to IEC 62109-2 or according to local regulation	
Residual current monitoring Unit (leakage current protection)		Yes, according to IEC 62109-2	
DC switch rating for each MPPT (version with DC switch)		Rating DC-PV1: 50A@600Vdc, 40A@800Vdc, 30A@1000Vdc	
String Fuse		Fuseless	
Input current monitoring		String level	
Output side			
AC Grid connection type		Three phase (3W+PE or 4W+PE)	
Earthing system		TN-S, TN-C, TN-CS, TT	
Rated AC power (Pacr @cosφ=1)	10000 W	12500 W	15000 W
Maximum AC output power (Pacmax @cosφ=1)	10000 W	12500 W	15000 W
Maximum apparent power (Smax)	10000 VA	12500 VA	15000 VA
Rated apparent power (Sr)	10000 VA	12500 VA	15000 VA
Maximum reactive power (Qmax)	6000 VAR	7500 VAR	9000 VAR
Nominal power factor and adjustable range		> 0.995; 0...1 inductive / capacitive	
Rated AC grid voltage (Vac,r)	14.5 A	18.1 A	21.7 A
Rated Output Current (Iac,nom)	16 A	20 A	23 A
Maximum AC output current (Iac,max)		Iac,max x 1,15	
Contributory fault current		50 Hz / 60 Hz	
Rated output frequency (fr)		47...53 Hz / 57...63 Hz ⁽⁸⁾	
Output frequency range (fmin...fmax)		< 0.5% Iac,max	
Max DC Current Injection (% of Iac,max)		16 mm² copper	
Maximum AC cable		AC quick fit connector	
AC connection type			
Output protection			
Anti-islanding Protection		According to local standard	
Maximum external AC overcurrent protection	25 A	32 A	32 A
Output overvoltage protection		SPD Type 2	
Operating performance			
Maximum Efficiency (ηmax)	98.4%	98.5%	98.5%
Weighted Efficiency (EURO)	98.1%	98.2%	98.2%
Environmental			
Operating ambient temperature range		-25...+60°C (-13...140 °F) with derating above 45 °C (113 °F)	
Storage temperature		-40°C...+85°C / -40°F...185°F	
Relative Humidity		4...100 % with condensation	
Sound pressure level, typical	40 dB(A) @ 1m	45 dB(A) @ 1m	45 dB(A) @ 1m
Maximum operating altitude		4000 m (13123 ft) with output power [Pout] linear derating above 2000m (6561 ft) ⁽⁹⁾	
Environmental pollution degree classification for external environments		3	
Environmental class		Outdoor	
Physical			
Inverter typology		Grid connected, Double stage, Transformerless	
Environmental Protection Rating		IP65	
Cooling System		Natural	
Dimension (H x W x D)		H = 568.2 mm / 22.37" (644mm / 25.35" with AC quick fit connector) ; W = 473.6 mm / 18.64" ; D = 207 mm / 8.15"	
Weight		29.6 Kg / 65lb	
Overvoltage rating as per IEC 62109-1		II (DC input) III (AC output)	
Safety			
Safety class		I	
Insulation Level		Transformerless	
Marking		CE ⁽⁴⁾ , RCM	

1. The AC voltage range may vary depending on specific country grid standards.

2. The Frequency range may vary depending on specific country grid standards.

3. Please refer to the document "String inverters – Product manual appendix" available at www.fimer.com

4. Hereby, FIMER S.p.A. declares that the radio equipments (radio module combined with

the inverter) are in compliance with the Directive 2014/53/EU. The full text of the EU Declaration of Conformity is available at the following internet address: www.fimer.com
5. @ 4000m (45° C ambient temperature), the output power (Pout) is reduced by 15%.
6. In the event of a fault, limited by the external protection envisaged on the AC circuit.

Features not specifically mentioned in this data sheet are not included in the product.



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

fimer.com

FIMER_PVS-10_12.5_15-TL_Quick Installation Guide_EN_RevB

27-10-2021

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