

FIMER



Solar Inverter

PVS-166-175-TL-US A.2 Version

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.

⚠ ATTENTION – IMPORTANT SAFETY INSTRUCTIONS

This document contains important safety instructions that must be followed during the installation and maintenance of the equipment.

⚠ ATTENTION – SAVE THESE INSTRUCTIONS

Keep this document in a safe place near the inverter for easy access during installation, operation and maintenance.

⚠ ATTENTION – The installer must read this document in its entirety before installing or commissioning this equipment. In addition to what is explained below, the safety and installation information provided in the product manual must be read and followed. For more detailed information regarding proper installation and use of this product, refer to the product manual located at www.fimer.com.

⚠ ATTENTION – 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.

⚠ ATTENTION – All pictures and illustrations shown in this document are indicative and must be intended as support for installation instruction only. Actual product may vary due to product enhancement. Specifications subject to change without notice. The latest version of this document is available on the FIMER website www.fimer.com.

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1. Reference number index

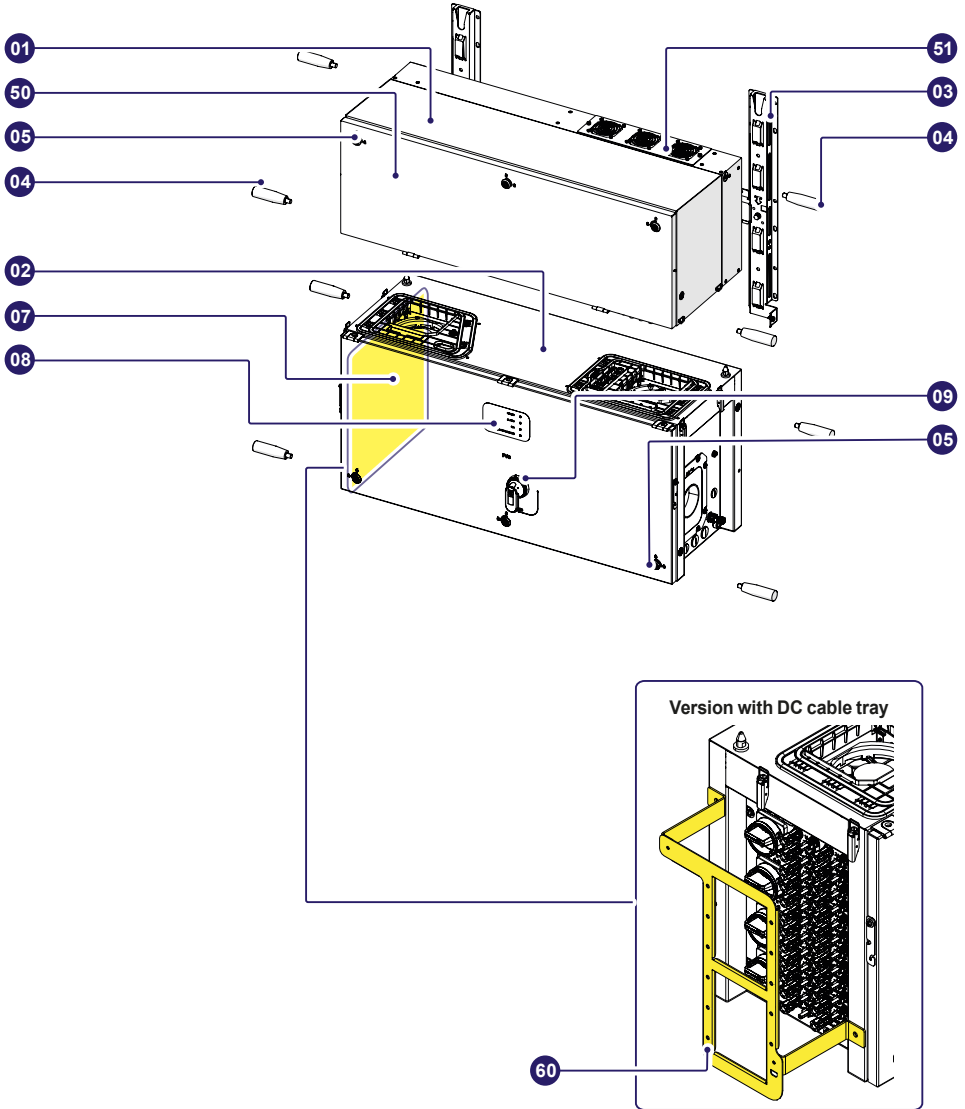
Inverter external view

- 01 Power module
- 02 Wiring box
- 03 Mounting bracket
- 04 Handles
- 05 Cover quarter cam locks
- 06 Side latch
- 07 Wiring box front cover
- 08 LEDs panel
- 09 AC disconnect switch (-SX2 only)
- 10 EGC connection point
- 11 AC opening (size 3" conduit)
- 12 Service opening (size 3/4" conduit)
- 13 Service opening (size 1/2" conduit)
- 14 Rear pins for bracket assembly
- 15 Cover support brackets
- 16 DC disconnect switches
- 17 DC input quick fit connectors
- 18 DC and ARC fault interface cables
- 19 ARC fault connector
- 20 Junction screws
- 21 DC surge arrester plate
- 22 AC connection busbar
- 23 AC overvoltage surge arresters
- 24 Interface signal cables
- 25 AC interface power board
- 26 Interface Protective Earth connection point
- 27 AC protective shield
- 28 Communication and control board

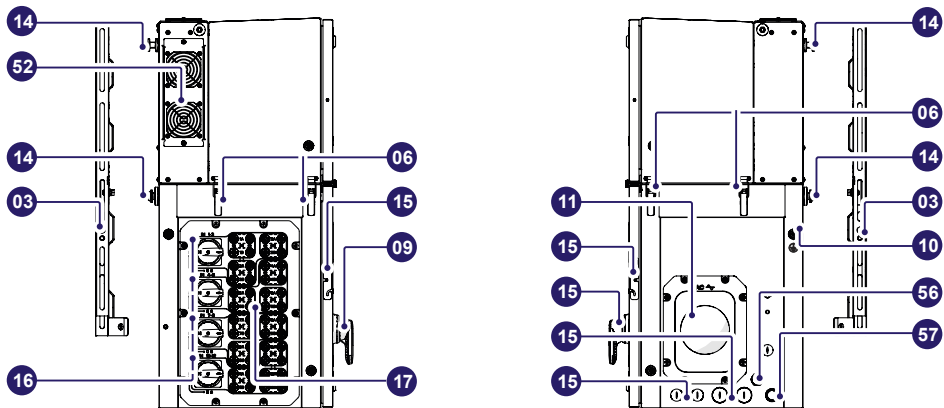
Inverter external view

- 29 DC interface connection point
- 31 Interface signal connector
- 32 AC interface power cable
- 33 Alarm terminal block
- 34 RS485 FIMER service 120Ohm termination res.
- 35 DRM0 activation switch
- 36 RS485 line 120Ohm termination res.
- 37 FIMER RS485 service RJ45 connector (service only)
- 38 Remote ON/OFF terminal block
- 39 RS485 line terminal block
- 40 Ethernet connector 1 (RJ45)
- 41 Ethernet connector 2 (RJ45)
- 42 USB connector
- 44 CR2032 coin battery
- 45 Memory board
- 46 RS485 line communication board
- 50 Power module front cover
- 51 Cooling section (top side)
- 52 Cooling section (left side)
- 53 Internal fan
- 54 Cable duct
- 55 Protective earth connection point
- 56 RS-485&Rem.ON/OFF external connector (Service only)
- 57 AFD reset button
- 58 AC interface connections protective cover
- 59 AFD interface cable
- 60 DC cable tray

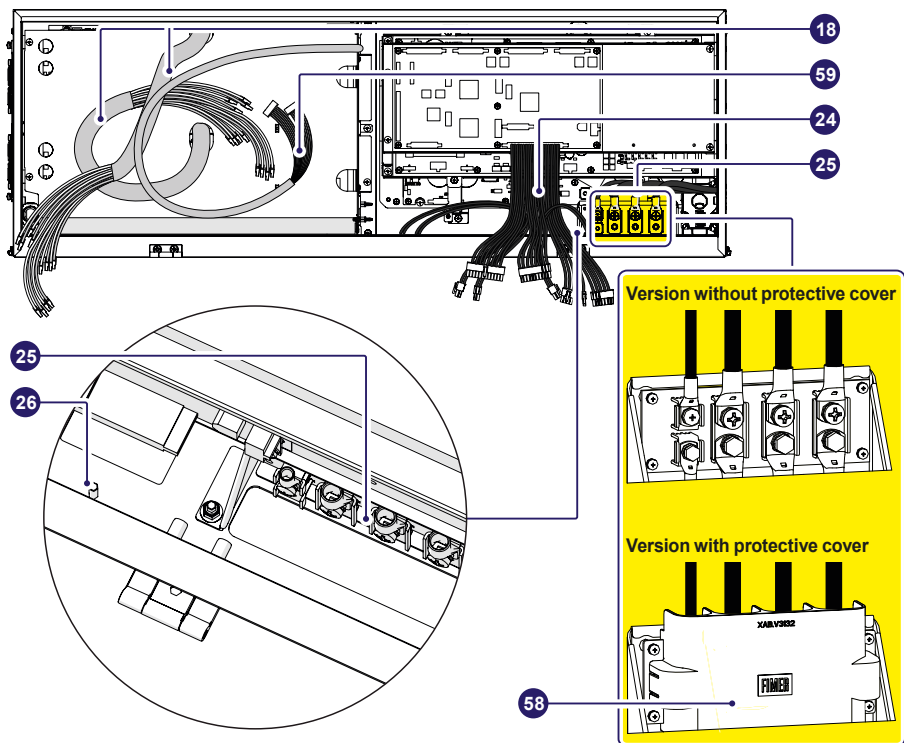
1.1 PVS-166/175-TL-US - External view



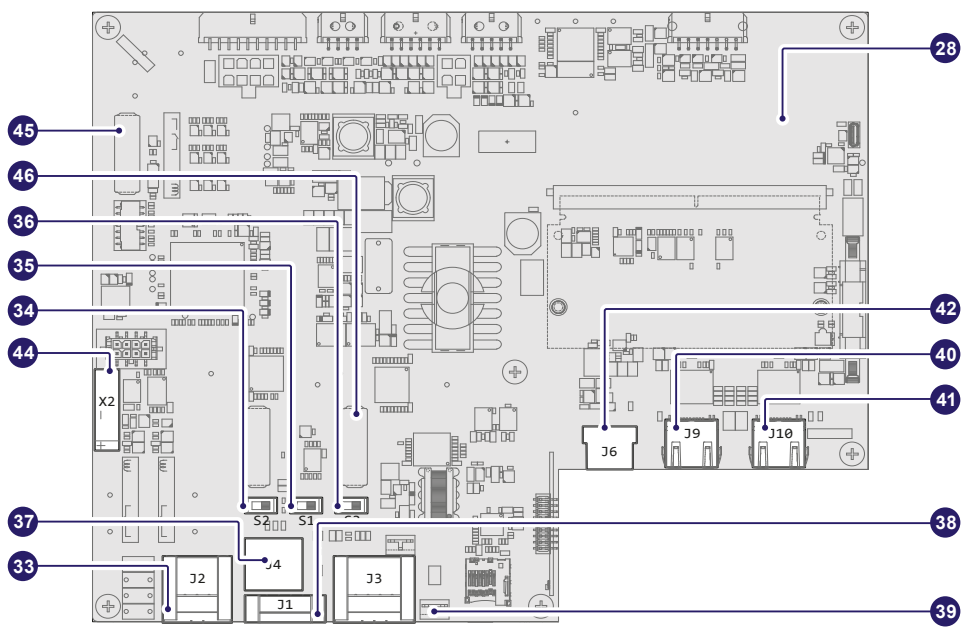
1.2 PVS-166/175-TL-US - External sides view



1.3 PVS-166/175-TL-US Power module - Internal view



1.5 Communication board



2. Labels and Symbols

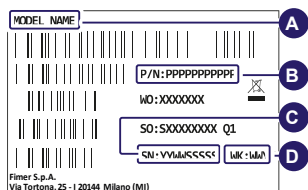
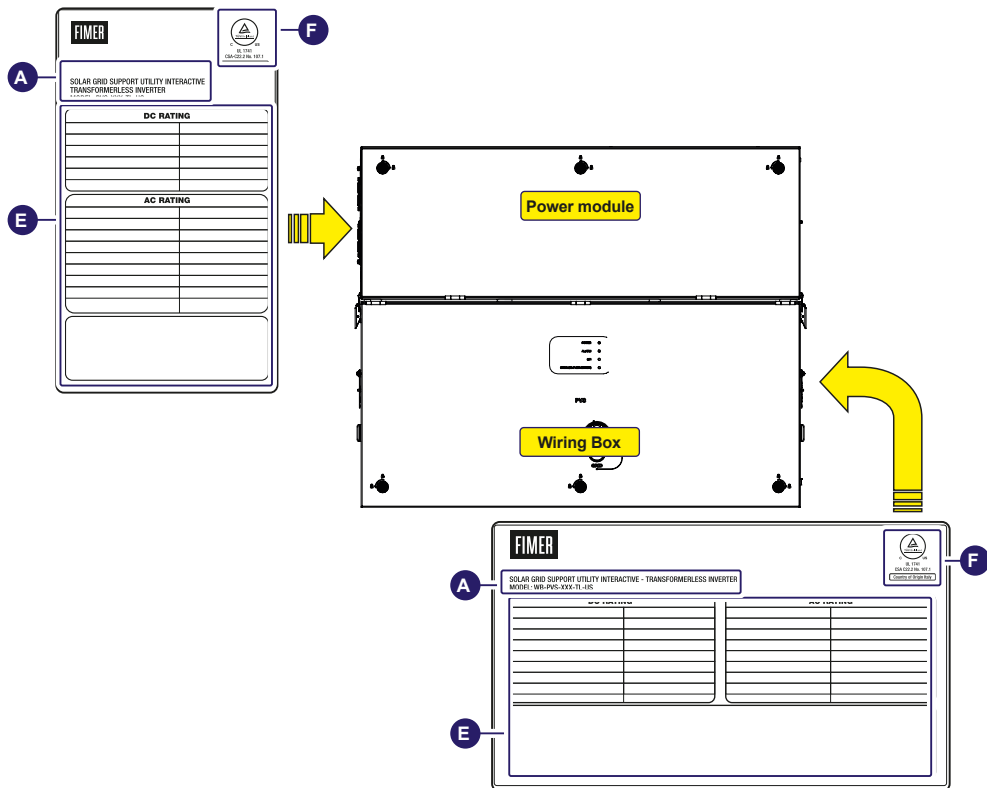
The labels on the inverter and on wiring box have the Agency marking, main technical data and identification of the equipment and manufacturer.

⚠ ATTENTION – The technical data shown in this quick installation guide does not replace that shown on the labels attached to the equipment.

The labels on the power module and on the wiring box have the Agency marking, main technical data and identification of the equipment and manufacture

📄 NOTE – The labels shown below have to be intended as example only.

🚫 FORBIDDEN – The labels affixed to the equipment must NOT be removed, damaged, stained, hidden, etc., for any reason whatsoever.

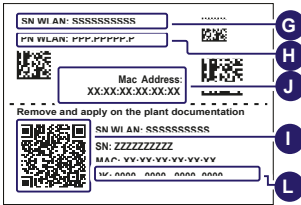


- A. Inverter/wiring box model
- B. Power module/wiring box Part Number
- C. Power module/wiring box Serial Number
- D. Power Week/Year of manufacture
- E. Main technical data
- F. Certification marks

📄 NOTE – An additional PN and SN label of the full system (power module + wiring box) is applied on the external packaging. This label should be stored in plant documentation for reference.

Communication Identification label:

The Communication Identification label (applied on the wiring box) is divided in two separate parts by a dashed line; take the bottom part and apply it on the plant documentation. (FIMER recommend to create a plant map and apply the Communication Identification label on it).



- G. **WLAN embedded board Serial Number**
- H. **WLAN embedded board Part Number**

J. **MAC address:**

- To be used to obtain the SSID of the wireless access point created by the inverter: ABB-XX-XX-XX-XX-XX-XX (where "X" is a hex digit of the MAC address).
- To be used to obtain the "Host Name": http://ABB-XX-XX-XX-XX-XX-XX.local (where "X" is a hex digit of the MAC address).

L. **Product Key:**

- To be used as wireless access point password, or to be used to access to the Web UI as username and password in case of lost credentials, and to commission inverter using FIMER Installer for Solar Inverters.

I. **QR Code:**


- To be used to commission inverter using FIMER Installer for Solar Inverters for claiming process.

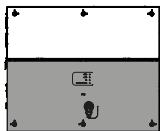
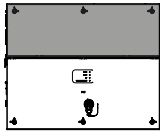

⚠ ATTENTION – The labels attached to the equipment must NOT be removed, damaged, dirtied, hidden, etc...
If the Admin Plus password is requested, the field to be used is the power module serial number -SN: YYWWSSSSSS-

In the manual and/or in some cases on the equipment, the danger or hazard zones are indicated with signs, labels, symbols or icons.

Symbol	Description
	General warning - Important safety information
	General warning - Important safety information
	Hazardous voltage
	Hot parts
	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 pole and negative pole of the input voltage (DC)
	Direct and alternating currents, respectively
	Equipment Grounding Conductor (EGC)
	Phase
	Without isolation transformer
	System earth conductor (main grounding protective earth, PE) and Equipment Grounding Conductor (EGC)
	These are nationally recognized test laboratory marks showing certification to UL 1741 and CSA-C22 No. 107.1-01

3. Models and range of equipment

 **READ THE MANUAL** – The choice of the inverter model must be made by a qualified technician who knows about the installation conditions, the devices that will be installed outside the inverter and possible integration with an existing system.

"Wiring box" Model Number	Description	
	WB-SX-PVS-166-TL-US WB-SX-PVS-175-TL-US	<ul style="list-style-type: none"> • 24 quick fit connector pairs (2 each MPPT) • DC switches • SPD Type 2 Pluggable Cartridges (DC & AC)
	WB-SX2-PVS-166-TL-US WB-SX2-PVS-175-TL-US	<ul style="list-style-type: none"> • 24 quick fit connector pairs (2 each MPPT) • DC switches • AC disconnection switch • SPD Type 2 Pluggable Cartridges (DC & AC)
"Power module" Model Number	Description	
	PVS-166-TL-POWER MODULE	Inverter section / power module with 166kW output power
	PVS-175-TL-POWER MODULE	Inverter section / power module with 175kW output power
"Bracket" Model Number	Description	
	PVS-175-TL-BRACKET	Bracket allowing vertical installation only.

4. Lifting and transport

4.1 Transport and handling

Transportation of the equipment, especially by road, must be carried out using appropriate vehicles and methods to protect the components (particularly electronic components) from violent shocks, humidity, vibration, etc.

-Do not stack inverters during transportation: only a stack of 1 inverter (2 pallets) is acceptable.

-Be sure to secure inverters to side of truck with straps during transportation.

-Be careful not to drop or tip inverter pallets.

-Be careful not to stab inverter packaging with forks of fork lift.

4.2 Unpacking and checking


The components of the packaging must be disposed in accordance with the regulations in force in the country of installation.

When you open the package, check that the equipment is undamaged and make sure all the components are present. If you find any defects or damage, stop unpacking and consult the carrier, and also promptly inform the Customer Service.


Equipment weight

Device	Weight (kg/lb)	Lifting points	Holes for handles (optional) or Eyebolts UNI2947 (not supplied)
Power module	76.5 kg / 168 lbs	4	M8. Kit of handles (04) (to be ordered)
Wiring box	76.8 kg / 169 lbs	4	M8. Kit of handles (04) (to be ordered)

4.3 Lifting

 **LIFTING** – Risk of injury due to the heavy weight of the equipment!

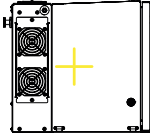
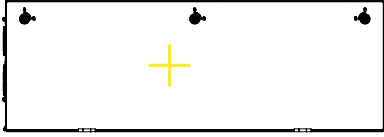
FIMER usually stores and protects individual components by suitable means to make their transport and subsequent handling easier. Nonetheless, as a rule, it is necessary to turn to the experience of specialised staff to take charge of loading and unloading components. The power module and the wiring box must be lifted using the 4 handles **(04)** or alternatively using suitable lifting equipment. The means used for lifting must be suitable to bear the weight of the equipment.

 **LIFTING** – In case of manual lifting the number of required operators necessary to lift the equipment must be in accordance to local regulations relating lifting limits per operator.

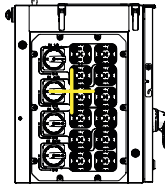
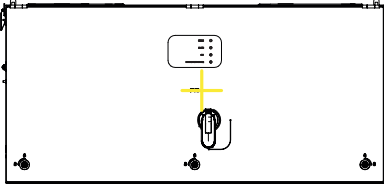
The handles **(04)** must be mounted into the designated holes located on the enclosures; If lifting with ropes, M8 eyebolts must be mounted in the same holes.

⚠ ATTENTION – Always consider the center of gravity of the enclosures while lifting.

Center of gravity (power module)

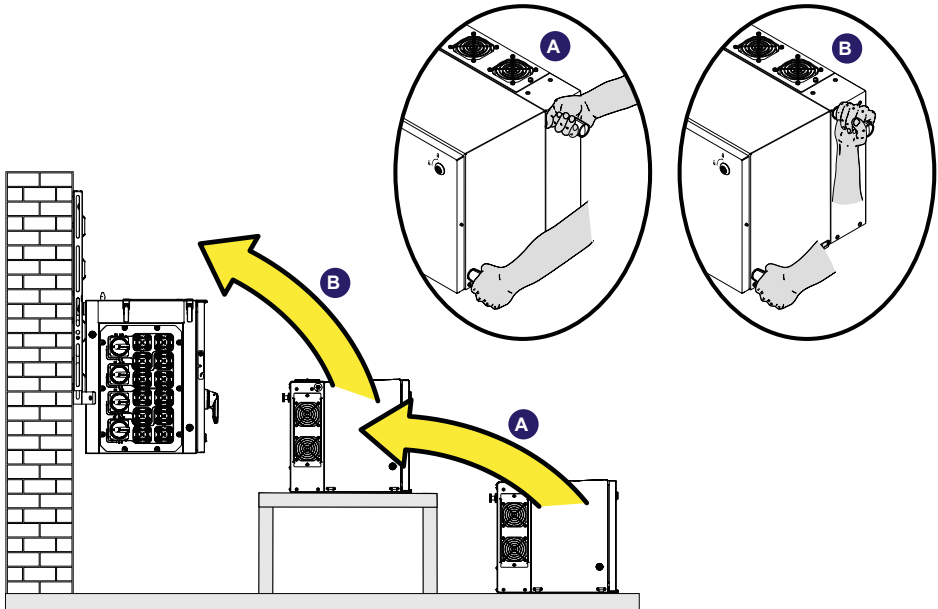


Center of gravity (wiring box)









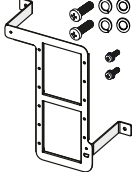





⚠ ATTENTION – In case of manual lifting it's suggested to use a support plan (e.g. a table) to place the equipment during the lifting operation, to allow the change of hands position.

⚠ ATTENTION – Pay attention to completely tight the thread of the handles or eye-bolts.



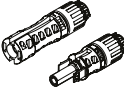
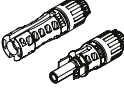
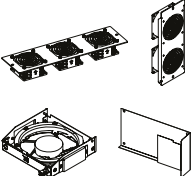


5. List of supplied components

Available components for wiring box		Qty
	Multifunction and aux relay (33) connector (pre-installed on communication board (28))	2
	Remote ON/OFF (38) and RS485 (39) connector (pre-installed on communication board (28))	3
	Key tool for front covers quarter cam-lock (05) Different keys are available based on the cover quarter cam locks (05) installed on the inverter	1 + 1
	M8 bolt and washers for EGC connection point (10)	1 + 1 + 1
	Technical documentation	1
Available components for power module		Qty
	M6 bolts with washers for AC interface connection point (phases)	3
	M5 bolts with washers for AC interface connection point (MID BULK)	1
	M5 nut and washers for Interface protective earth point (26)	1 + 2
	Version with DC cable tray (59) only: DC cable tray (59) + 2xM5 assembly screws + 2xM8 installation screws + 2xM8 flat washers + 2xM8 cut washers	1 + 2 + 2 + 2
	Sheathing for DC interface cables (18)	2
Available components for brackets		Qty
	Mounting Bracket	1
	M8 bolts with washers for mechanically securing the half-brackets	2
	M6 screws for mechanically securing the wiring box to the bracket	2

6. Kit of recommended spare parts

Code	Description	Qty
	Kit of handles (04)	4
	PV quick fit connector (17) disconnection tool	1
PVS-175 INSTALLATION KIT	NEMA4 protection covers protection covers for wiring box openings (long term installation) with screws	2 (with 8 screws)
	Key tool for front covers quarter cam-lock (05) Different keys are available based on the cover quarter cam locks (05) installed on the inverter	1 + 1

Code	Description		Qty
EYEBOLTS KIT	Eyebolts for lifting		4
PVS-175 IP65 COVERS KIT	NEMA4 protection covers protection covers for wiring box openings (long term installation) with screws		2 (with 8 screws)
KIT MC4 EVO mating part (complete)	Quick fit connectors cable mating kit (24 couples)		24 female 24 male
KIT MC4 EVO mating part (single channel)	Quick fit connectors cable mating kit (2 couples)		2 female 2 male
PVS-175 FAN KIT	1 external fan sets for power module (DC/DC), 1 external fan sets for power module (AC/DC), 2 internal air circulating fans for wiring box		2 external fan sets 2 internal wiring box fans

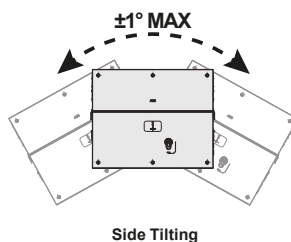
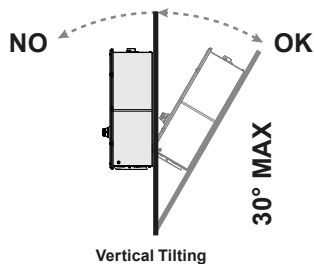
7. Choice of installation location

7.1 General recommendation on installation position

- See characteristics and technical data paragraph to check the required environmental conditions (protection rating, temperature, humidity, altitude, etc.).
- The installation location shall be easily accessible.
- Installation of the unit in a location exposed to direct sunlight is NOT acceptable (add awning in case of direct sunlight installation).
- Installation in open environment subject to snow load is not advised (add awning to prevent excessive snow load).
- Installation on back of module racking structure is recommended
- Final installation of the device must not compromise access to any disconnection devices that may be located externally.
- Do not install in small closed rooms where air cannot circulate freely.
- Always ensure that the flow of air around the inverter is not blocked so as to prevent overheating.
- Do not install in locations where flammable substances or gases may be present (minimum distance 3 m).
- Do not install on wooden walls or other flammable supports.
- Install on a wall or strong structure suitable to bear the weight.
- Do not install in rooms where people live or where the prolonged presence of people or animals is expected, because of the high noise that the inverter produces during operation. The level of the sound emission is heavily influenced by where the appliance is installed (for example: the type of surface around the inverter, the general properties of the room, etc.) and the quality of the electricity supply.
- Never open the inverter in the case of rain (even light rain), snow or a level of humidity >95%. Always carefully seal all unused openings. In case of opening when the unit is wet, avoid any water infiltration inside the unit, either in WB or PM.
- All installations over 6500' (2,000 meters) must be assessed by FIMER Technical Sales to determine the proper datasheet derating.

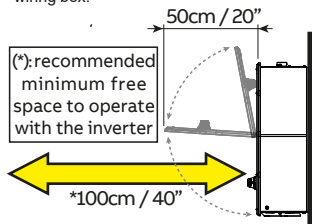
7.2 Tilting allowance

- The installation can be carried out with a maximum inclination as indicated in the figures beside.

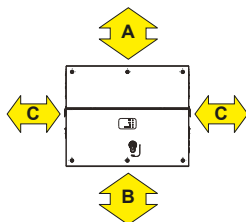


7.3 Distances

- Hardware and software maintenance on device entails removing the front cover. Check that the correct installation safety distances are observed in order to allow routine check and maintenance operations.
- Provide sufficient working space in front of the inverter that allows to open the front covers (06)(07) and to make connections on the wiring box.



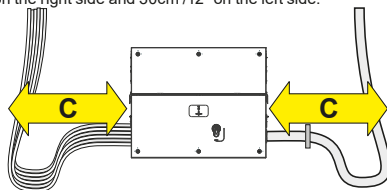
- Install at a height which takes into consideration the weight of the appliance and in a position which is suitable for servicing, unless suitable means are provided to carry out the operation.
- If possible, install at eye-level so that the status LEDs (08) can be seen easily.
- Do not install any object (e.g. AC or DC cables) that could be damaged by overheating from outgoing hot air flow from top and side fan sections ($\Delta T = +15^\circ\text{C}$ compared to ambient temperature). 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 objects around the inverter that could prevent the inverter installation and restrict or block the air flow.



The minimum clearance distances depends from multiple factor:

- Ventilation flow on the top side of the inverter. The upper (A) minimum required free space must be 25 cm / 10".
- Possible flooding or damage during grass cutting. It changes the bottom (B) required free space: If the inverter is installed in a place where there are risks of flooding or there is need to cut the grass growing underneath the unit, the bottom (B) minimum recommended free space is 50cm / 20"; otherwise in case the inverter is installed in a place where there's no risks of flooding or grass cutting, the bottom (B) minimum required free space can be reduced to 15 cm / 6".
- Cables bending radius. Sides (C) minimum required free space may depends from cable type (cable dimension, bending radius, etc.): this evaluation must be done by the installer during the plant design phase (refer to "Cable routing" chapter for more information). In any case minimum required free space for proper ventilation of the unit (near side fans) cannot be under 15 cm / 6"

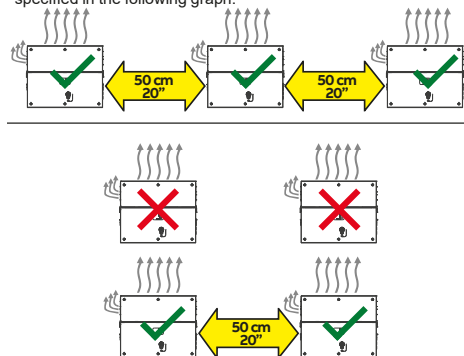
on the right side and 30cm / 12" on the left side.



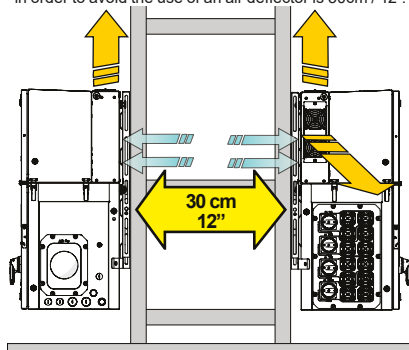
- ⚠ **ATTENTION** – In case of manual installation, using handles (04), consider a free side space to lift the inverter of 60 cm / 24" minimum.
- ⚠ **ATTENTION** – In case of installation with lifting equipments (eyebolts and ropes) the side distances (C) could be reduced at the minimum required but a subsequent manual lifting will no longer be possible: in this case the lifting equipments must remain available on the field for any subsequent operation.

7.4 Installation of multiple units

- When installing multiple units position the inverters side by side paying attention to keep the minimum clearance distances (measured from the outer edge of the inverter) for each inverter specified in the following graph.



- The installation of two inverters positioned back to back is also permitted on a structure which must be composed of 2 or 3 frame supports (refer to "Mounting with a support bracket" chapter). In this case the minimum recommended distance between the units in order to avoid the use of an air deflector is 30cm / 12".



- ⓘ **NOTE** – Please refer to the warranty terms and conditions to evaluate any possible warranty exclusions due to improper installation.

7.5 Wireless signal environmental checks

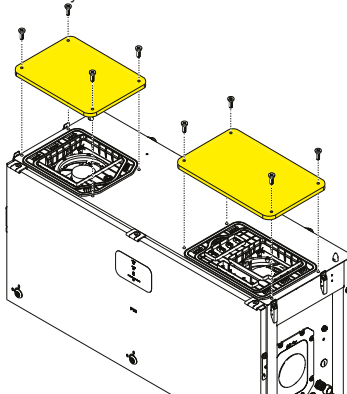
The inverter can be commissioned and monitored using the wireless communication channel. The WLAN board of the inverter uses radio waves to transmit and receive data, it is therefore important to find a new position for the router considering the different materials which the radio signal will have to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

⚠ ATTENTION – Final installation of the inverter must not compromise access to any externally located disconnection devices.

📖 READ THE MANUAL – Please refer to the warranty terms and conditions to evaluate any possible warranty exclusions due to improper installation.

To install the protection covers place them over the wiring box openings and fix it using the 8 x M5 screws provided with the accessory kit.



8. Mounting Instructions

⚠ ATTENTION – The inverter must be correctly installed, in a suitable location, to operate properly and safely.

⚠ ATTENTION – Installers must know and understand applicable NEC requirements and any local codes for photovoltaic systems. Installers must know and understand OSHA and other applicable safety requirements, including lockout/tagout procedures.

⚠ ATTENTION – Remember that when the photovoltaic panels are exposed to sunlight they provide continuous DC voltage to the inverter. Before installation may begin, photovoltaic panels must be shaded or isolated.

⚠ ATTENTION – Before installation may begin, the inverter must be disconnected from the grid (power disconnect switch open and external AC disconnect locked out/tagged out).

⚠ ATTENTION – Limit installation to licensed electricians experienced in PV plant wiring.

⚠ ATTENTION – Obtain approval of the local AHJ before connecting the inverter to the electrical grid.

⚠ ATTENTION – The equipment owner must post the PPE level (per NFPA TDE-2012, Table 13)

8.1 Installations of protection covers for wiring box openings

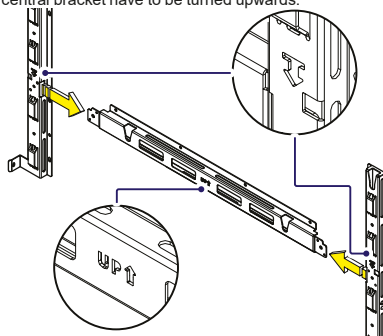
⚠ ATTENTION – The connections can also be made with the wiring box (02) detached from the power module (01) that can be connected later for commissioning. When working with the wiring box (02) detached, pay particular attention to:

- presence of earth connection
- The top of wiring box must always be protected in outdoor installations with proper protection covers (optional accessory content in "PVS-175 INSTALLATION KIT", to be ordered separately). Refer to the dedicated chapter "Installation of protection covers for wiring box openings (long term installation)" for further information about the installation procedures.

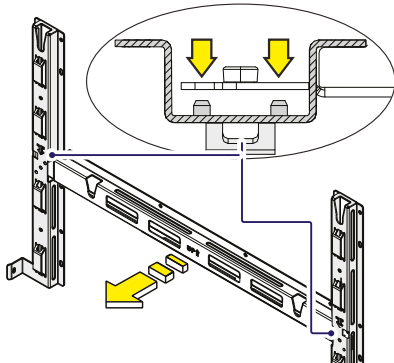
⚠ ATTENTION – Never leave the power module (01) or the wiring box (02) (without protection covers) disassembled on the field.

8.2 Bracket assembly

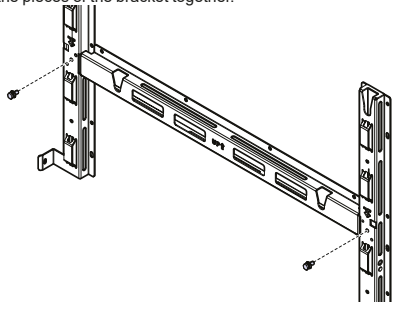
• Assemble the two side bracket pieces together with the central bracket, by sliding it as shown in the picture and paying attention to the orientation of the pieces (refer to arrow and "UP" markings on the brackets): side brackets arrow have to be turned downwards, central bracket have to be turned upwards.



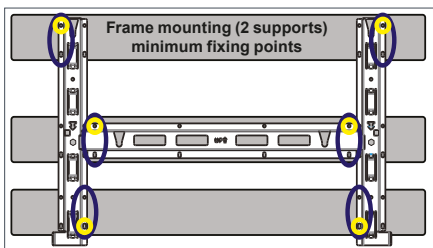
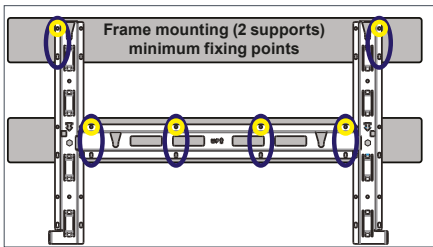
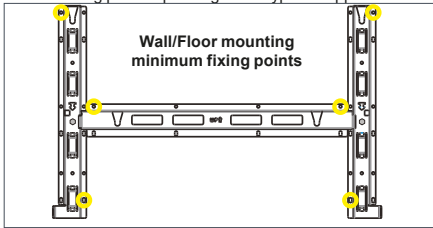
• Slide the central bracket in order to match the two holes with the centering pins of the side brackets.



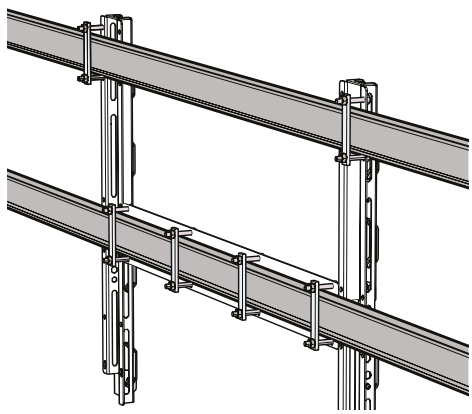
- Use the two M8 screws with flat and spring washers (supplied) to fix the pieces of the bracket together.



- Position the bracket (03) perfectly level on the support and use it as drilling template. Consider the overall dimensions of the power module (01) and the wiring box (02).
- 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 (4x153Kg/338lbs=612Kg/1352lbs for all models).
- Attach the bracket (03) to the support with at least 6 attachment screws (shown in YELLOW) or at least 6 frame fixing bracket for frame mounting (shown in BLUE). Depending on the type of anchor chosen, drill the required holes to mount the bracket (03). The pictures show the recommended minimum fixing point depending to the type of support.



- In case of use of "frame fixing brackets" (see picture below as example) it will be possible to fix the bracket to the frame structure without drill any additional holes.



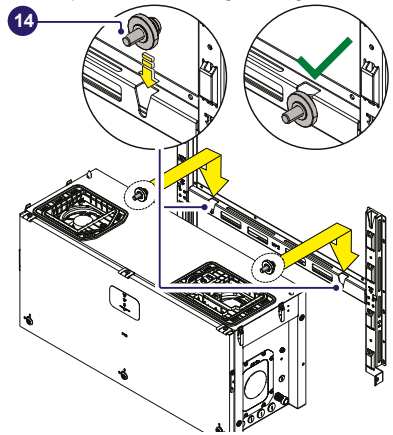
- Fix the bracket (03) to the support.

8.3 Assembly of the Inverterto the bracket

- Lift the wiring box (02) up to the bracket using the optional handles (04) or another appropriate lifting device.


LIFTING – Risk of injury due to the heavy weight of the equipment.

- Insert the heads of the two rear attachment pins (14) (placed on the rear part of the wiring box) into the two slots on the bracket. Check that the pins (14) have been correctly inserted in the slots as shown in the picture before releasing the wiring box.



- Remove the handles (04) or eyebolts.
- Lift the power module (01) up to the bracket (03) and over the wiring box (02), using the handles (04) or another appropriate

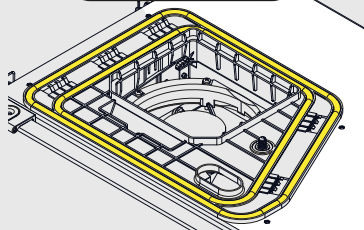
lifting device.

Insert the heads of two rear attachment pins (14) (placed on the rear part of the power module) into the slots  on the bracket (03).

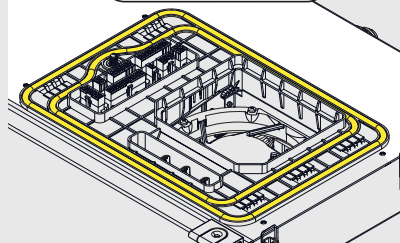
⚠ ATTENTION – Risk of injury due to the heavy weight of the equipment. Always consider the center of gravity of the enclosures while lifting.

⚠ ATTENTION – During this installation phase pay special attention to not damage the gaskets on the AC and DC coupling system.

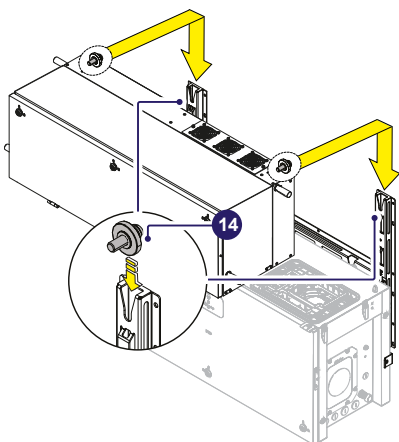
DC gaskets



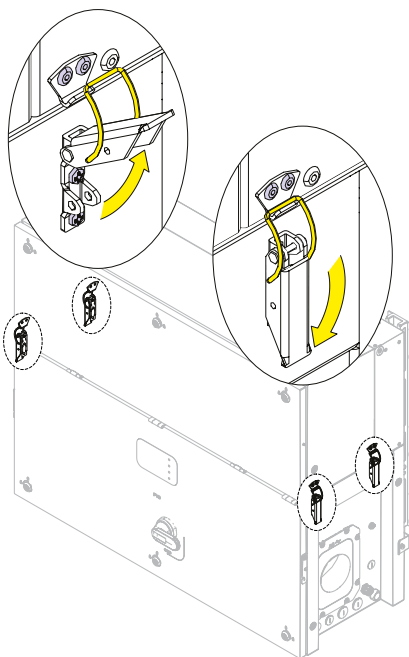
AC gaskets



Any damage on the gaskets could cause serious fault to the unit and will lead to the invalidation of the warranty.



• Fasten all of the four side latches (06) as shown in the pictures.

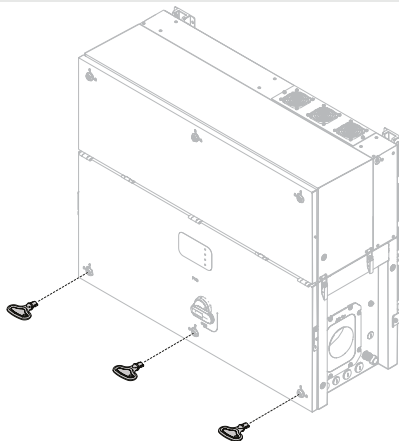


8.4 Opening the Wiring box cover

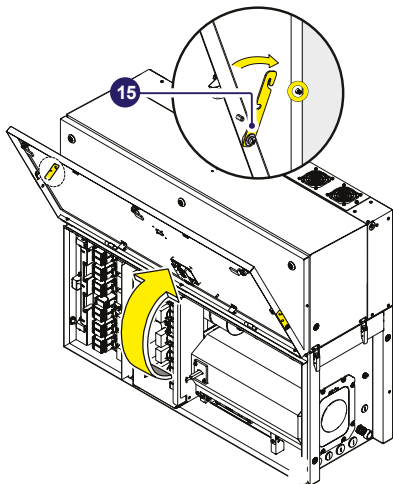
• Using the key tool provided in the kit of supplied components (inside the wiring box package), open the three cover quarter cam locks (05) following the proper ways as shown in the related silkscreens on the Wiring box cover (07).

⚠ ATTENTION – Use the right key (supplied) for the cover quarter cam locks (05).

⚠ ATTENTION – (only for -SX2 version) Set the wiring box AC disconnect switch (09) to OFF position; otherwise it will not be possible to open the Wiring box cover (07).



- Open the Wiring box cover (07) and use the cover support brackets (15) to lock the cover (07) in open position.

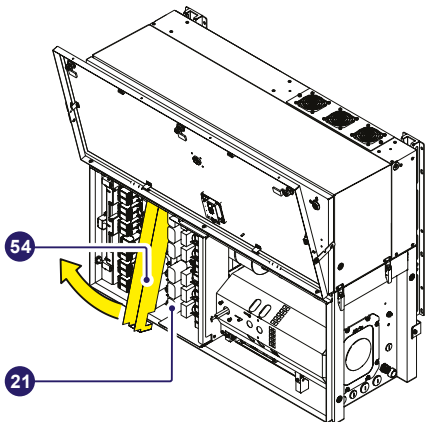


⚠ ATTENTION – Pay attention to properly secure the cover support brackets (15) in order to avoid falling of the cover!

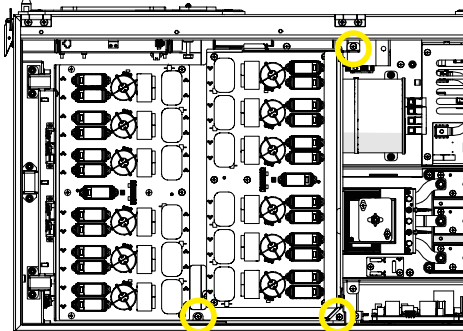
8.5 Final fastening operations

To reach the two junction screws (20) and complete the power module (01) and wiring box (02) mating, the DC surge arrester plate (21) have to be opened as follow:

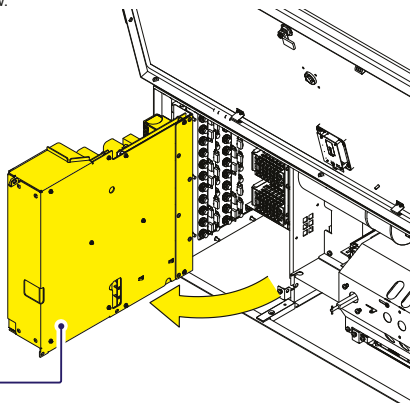
- Remove the cable duct (54) from the DC surge arrester plate (21).



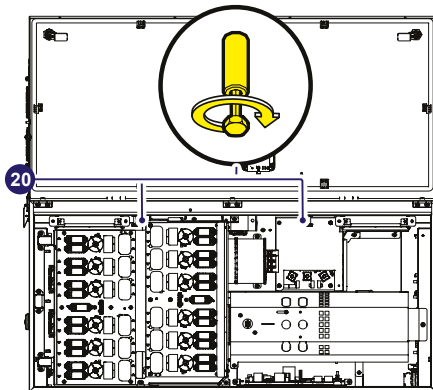
- Remove the three M5 screws from the DC surge arrester plate (21).



- Rotate the DC surge arrester plate (21) as shown in the picture below.

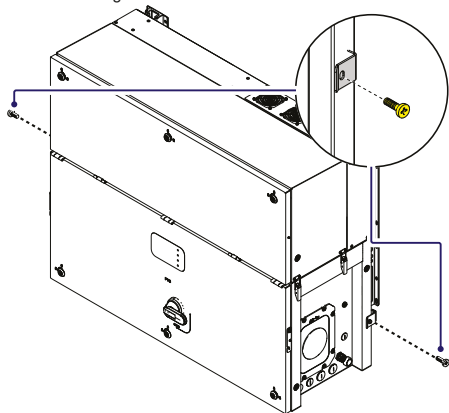


- Tighten the two hexagonal junction screws (20) with a torque of 12Nm (8.85 ft-lb).



- Close the DC surge arrester and install the three M5 screws previously removed.
- Install the cable duct (54) previously removed to the DC surge arrester plate (21).
- Tighten the two side screws (supplied) to torque of 5Nm (3.7 ft-lb), to avoid the tilting of the bottom part of the inverter.

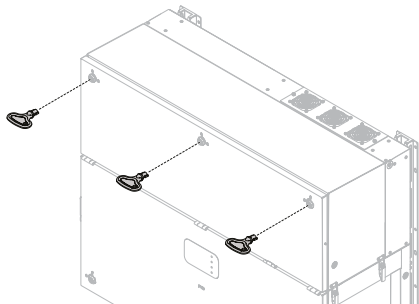
- Close the Wiring box cover.



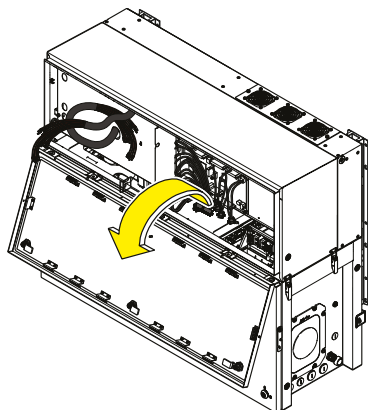
8.6 Opening the power module box cover

- Using the key tool provided in the kit of supplied components (inside the wiring box package), open the three cover quarter cam locks (05) following the proper ways as shown in the related silkscreens on the cover (50).

⚠ **ATTENTION** – Use the right key (supplied) for the cover quarter cam locks (05).

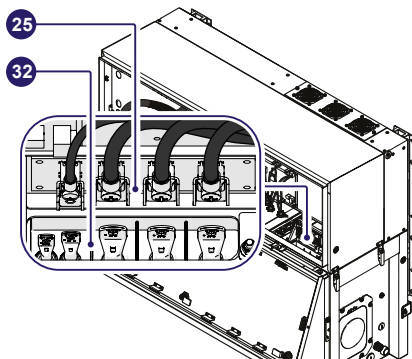


- Open the power module cover (50).

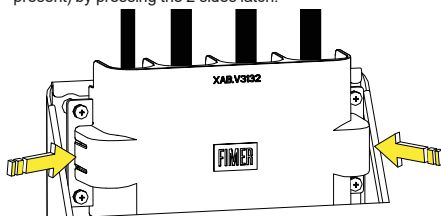


8.7 Connection of the AC interface power cables (25)

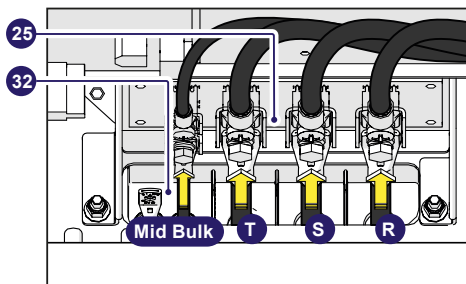
The AC interface power cable (32) (RST phases, PE and MID BULK) are situated into the cable housing on the top side of wiring box (02).



- Remove the AC interface connections protective cover (58) (if present) by pressing the 2 sides latch.



- Install the R, S and T phases and MID BULK cable (coming from the wiring box) to the respective AC interface connection point (25) inside the power module, paying attention to the correspondence of the phases with the labels, using the M6 bolts (for phases) and the M5 bolt (for MID BULK) supplied in the power module installation kit:



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

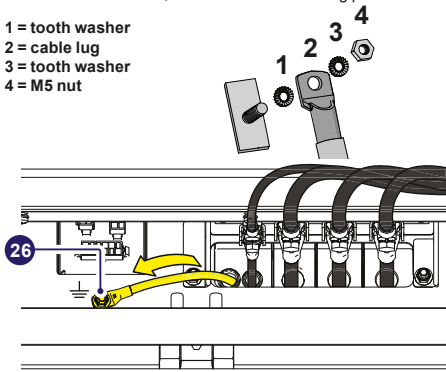
⚠ **ATTENTION** – The cable lugs must be installed with a recommended torque of:

M6 bolt (R, S, T phases) = 4Nm (3 ft-lb)

M5 bolt (MID BULK) = 3Nm (2.2 ft-lb) .

• Install the protective earth cable lug to the protection earth point interface cable (26) situated on the internal bottom side of power module (01), using the bolt with washer supplied in the power module installation kit, as shown in the following picture:

- 1 = tooth washer
- 2 = cable lug
- 3 = tooth washer
- 4 = M5 nut



⚠ ATTENTION – The cable lug must be installed with a recommended torque of 3Nm (2.2 ft-lb).

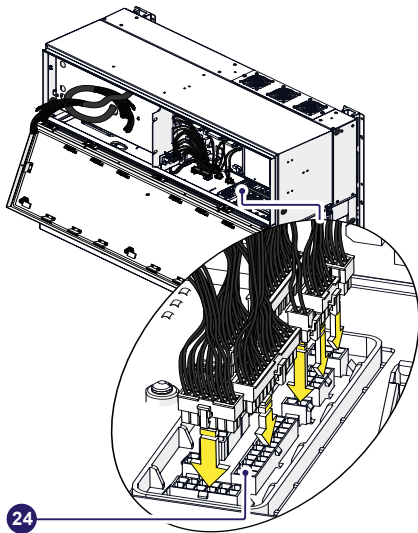
⚠ ATTENTION – Any failure of the inverter when it is not connected to earth through the appropriate connection point is not covered by the warranty.

• Re-install the AC interface connections protective cover (58) (if present).

8.8 Connection of the interface signal connectors

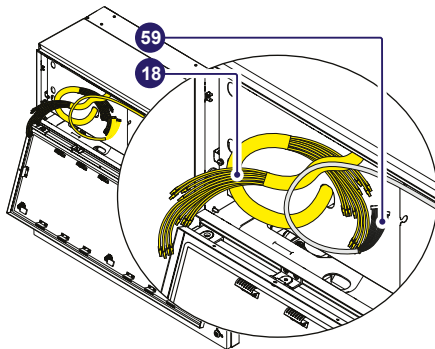
The interface signal cables (24) are situated into right side of power module (01) and they are composed by 8 connectors.

• Connect all the interface signal cables (24) (push the connector until you hear a locking "click"). All connectors have a different pin-out in order to avoid any connection error.

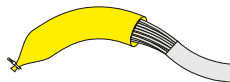


8.9 Connection of the DC and AFD interface cables

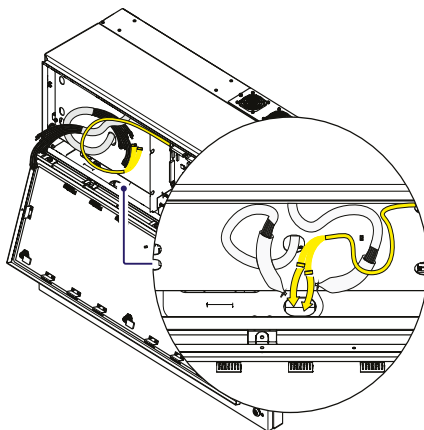
The DC interface cables (18) and AFD interface cables (59) are situated into left side of Power module (01).



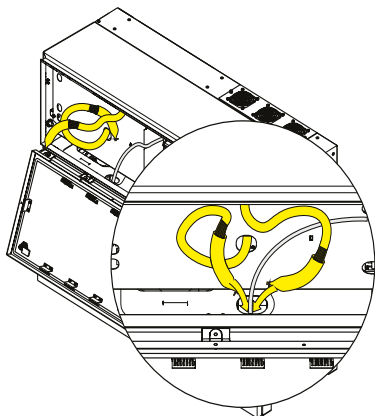
• Wrap the DC interface cables (18) with the two cable sheaths supplied in the wiring box installation kit.



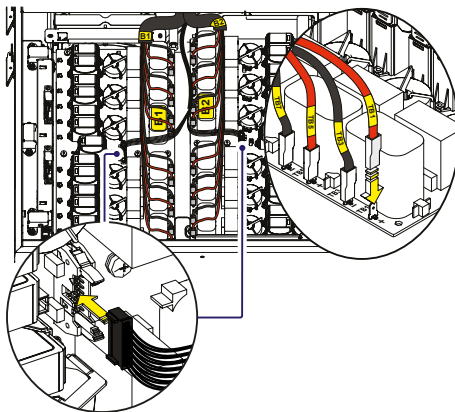
• Remove the cable tie from the AFD interface cables (59) and pass them into the wiring box using the dedicated opening for interface cables.



- Pass the DC interface cables (18) into the same dedicated opening used for the AFD interface cables.

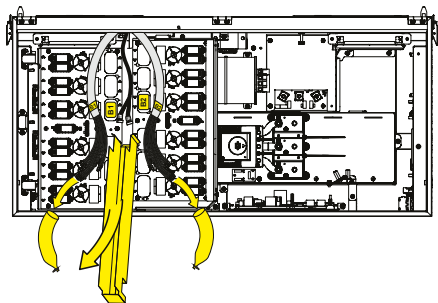


damage. Check polarity before connecting each cable!
Always check correspondence of cables and board FASTON connectors identification!



- Close the power module cover (50) and open the wiring box cover (07).

- Remove the cable sheathing from the DC interface cables (18) and the cable duct (54) from the DC surge arrester plate (21).



- Connect the two AFD interface cables to the related ARC fault connectors (19) located in the DC surge arrester plate.

- Connect all DC interface cables (18) to the related DC interface connection point connectors located in the DC surge arrester plate (21).

The two cable groups are marked with identification label "B1" and "B2" that correspond to the DSP board number label ("B1" and "B2").

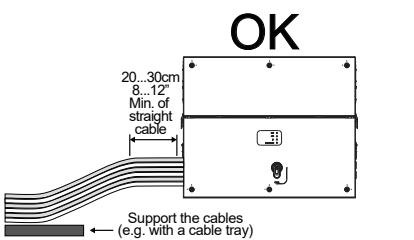
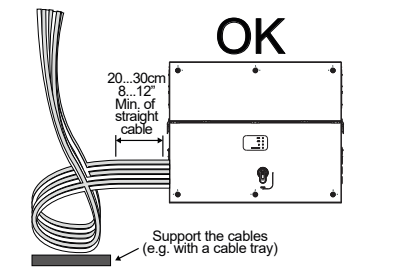
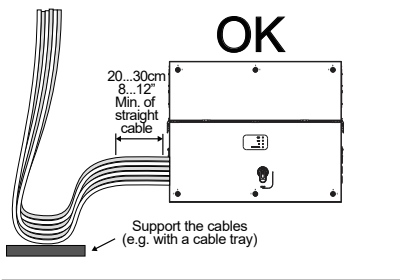
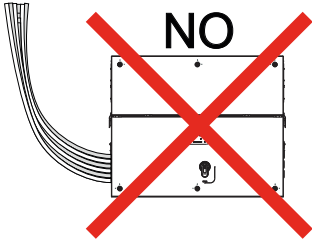
Each single cable DC is marked with a label corresponding to related DC interface FASTON connectors on the DSP boards (E.g. "TB1", "TB3"...).

⚠ ATTENTION – Polarity inversion can cause serious

9. Routing the cable to the inverter

Cables should be routed in a manner which prevents water from dripping on the DC input connectors (16). Especially when coming from the top, the DC cables must be routed in order to create a loop: in this way the water that flows on the cables will be drained. The DC conductors must be anchored or supported in order to prevent loading and mechanical stress on the cable glands and quick fit connectors causing potential damage on the DC plate.

Examples of improper and proper cable routing are shown in the figures:



10. Installation planning

10.1 Characteristics of the protective grounding cable

ATTENTION – Size the cable(s) in accordance with NEC and any local codes. The wire must be large enough to handle the maximum ground fault current that the PV system might experience. 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 (10) located on the external side of the inverter.
- A protective earth (PE) conductor, to be landed on the protective earth connection point (55).

	Protective earth point (ext.) (10)	Protective earth connection point (55)
Cable lug dimensioning	for M8 Bolt	for M10 Stud
	a = 8.4 mm / 0.33" (min)	a = 10.5 mm / 0.42" (min)
	b = all dimension accepted	b = 40mm / 1.57 (max)

10.2 Load protection breaker (AC disconnect switch) and differential protection downstream of the inverter

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-166-TL-US	PVS-175-TL-US
Type	Automatic circuit breaker with thermal-magnetic protection	
Nominal Voltage / Current	800 Vac / 150 A (*)	
Magnetic protection characteristic	Magnetic curve B/C	
Number of poles	3	

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

- 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.

In case of installation of a residual current protection, the device shall meet the following characteristics in order to prevent nuisance tripping due to capacitive leakage current of photovoltaic modules:

	PVS-166-TL-US	PVS-175-TL-US
Type	A / AC	
Sensitivity	2.0 A	

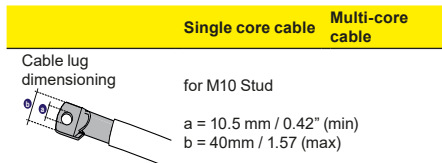
FIMER declares that the FIMER transformerless inverters, in terms of their construction, do not inject continuous earth fault currents and therefore there is no requirement that the differential protection installed downstream of the inverter be type B in accordance with IEC 60755 / A 2.

10.3 Characteristics and sizing of the line cable

The cross-section of the AC line conductor cables must be sized in order to prevent unwanted disconnections of the inverter from the grid due to high impedance of the line that connects the inverter to the power supply; If the impedance is too high it causes an increase in the AC voltage which, on reaching the limit set by the standards in the country of installation, causes the inverter to switch off.

⚠ ATTENTION – The minimum required cross sectional area for the phases conductors is 50mm² / (1/0)AWG.

The AC cables must be connected to the AC connection busbars (22) using a cable lug (not supplied) of a suitable size for installation on the M10 threaded studs used for securing the cable.



⚠ ATTENTION – The AC connection busbars (22) are in copper tin-plated; therefore if aluminum cables are used, the correct coupling with the copper bars must be guaranteed by using appropriate bi-metallic cable lug.

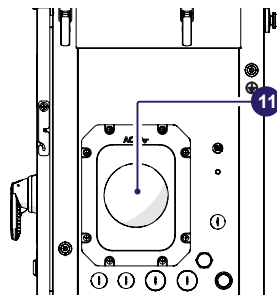
11. Grid output connection (AC side)

⚠ 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.
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.
Size conductors per NEC Article 310 - use 90°C wire only; conductors must be sized according to operating temperature range and continuous current ratings.
AC output wire must be UL listed wire rated minimum 1000V.

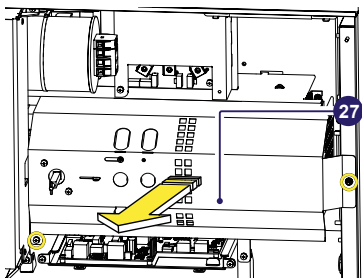
The inverter must be connected to a three-phase TN system with the center of the star connected to ground. To connect the inverter to the grid it is necessary to use a three-wire connection (3 phases) without neutral cable.

• Routing of the AC cables inside the inverter must be carried out through the AC opening (size 3 in conduit) (11) on the right side of the inverter

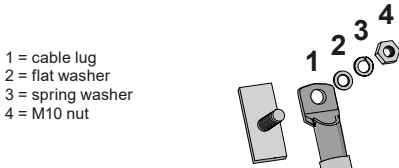


⚠ ATTENTION – Use UL Listed reduction washers in case of smaller conduit used to maintain Type 4 enclosure integrity.

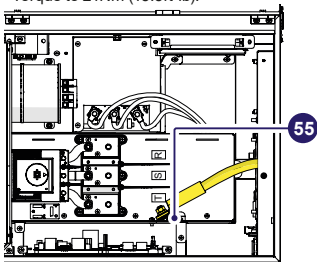
• Open the wiring box front cover (07).
• Remove the AC protective shield (27) by removing the M5 screw.



- Pass the protective earth cable through the AC opening (size 3" conduit) (11) on the AC panel.
- Attach the protective earth cable lug to the protection earth connection point (55) using the washers and bolt pre-installed on the M10 stud:

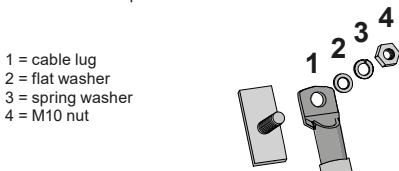


• Torque to 21Nm (15.5ft-lb).

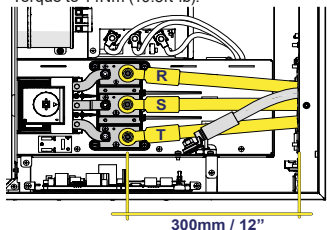


⚠ ATTENTION – Before connecting the inverter to AC sources use a suitable multimeter to test the conductivity of the earth connections between the protection earth connection point (55) and a handles thread (04) on the housing of power module (01).

- Pass the AC cables through the AC opening (size 3 in conduit) (11) on the AC panel. The length of phase cables on the internal side of wiring box needs to be about 300mm / 12" (cable lug included).
- Attach the R, S and T (phase R=L1, S=L2 and T=L3) cable lugs to the AC connection busbars (22), paying attention to the correspondence of the phases with the labels, using the washers and the M10 nuts pre-installed on the busbar:



• Torque to 14Nm (10.3ft-lb).



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

- Give each wire a pull test to confirm the connection is secure.
- Conduit must be attached using rain tight fittings to maintain Type 4 enclosure integrity.

12. Checking the correct polarity of the strings and Input connection (DC)

⊘ FORBIDDEN – Do not place objects of any kind on the inverter during operation!
Do not touch the heatsink while the inverter is operating!
Some parts may be very hot and cause burns.

⚠ ATTENTION – Special care must be taken when performing the first energization on units that have been stored and installed for long periods before usage. When the date of first power-up is later than six (6) months from the date of manufacture of the power module (as indicated on the label), BEFORE CONNECTING ANY PV STRING TO THE INVERTER please contact Fimer Service to receive instructions and specific guidelines for the correct energization and commissioning procedure of the unit!"

⚠ 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). 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.

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. 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. Per NEC 690.35, wires from the PV array must be UL-listed, 1500V minimum rating, 90°C minimum temperature rating.

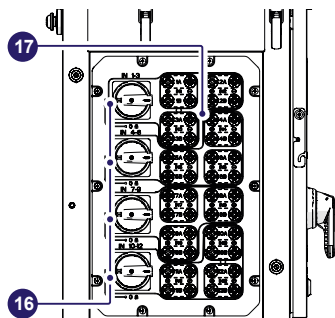
For the string connections it is necessary to use the DC input quick fit connectors (17) located on the left side of the wiring box (02).

- Manufacturer	Technical data
- Model	PN = 32.0087P0001-UR Conductor cross section = 4 - 6 mm ² Ø cable gland = 4.7 - 6.4 mm
- Type	PN = 32.0089P0001-UR Conductor cross section = 4 - 6 mm ² Ø cable gland = 6.4 - 8.4 mm
- Stäubli	PN = 32.0093P0001-UR Conductor cross section = 10 mm ² Ø cable gland = 6.4 - 8.4 mm
- PV-KBT4-EVO 2	PN = 32.0086P0001-UR Conductor cross section = 4 - 6 mm ² Ø cable gland = 4.7 - 6.4 mm
- Male	PN = 32.0088P0001-UR Conductor cross section = 4 - 6 mm ² Ø cable gland = 6.4 - 8.4 mm
- Stäubli	PN = 32.0088P0001-UR Conductor cross section = 4 - 6 mm ² Ø cable gland = 6.4 - 8.4 mm
- PV-KST4-EVO 2	PN = 32.0092P0001-UR Conductor cross section = 10 mm ² Ø cable gland = 6.4 - 8.4 mm
- Female	PN = 32.0092P0001-UR Conductor cross section = 10 mm ² Ø cable gland = 6.4 - 8.4 mm

⚠ ATTENTION – Using mating parts of different type or brand than those specified above could cause serious damage to the unit and will lead to the invalidation of the warranty.

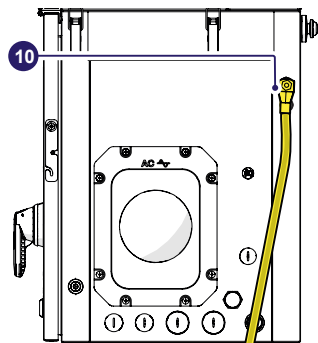
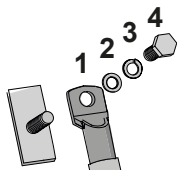
The input connectors are divided into 12 MPPTs consisting of 2 pairs of quick fit connectors (17).

Each DC disconnect switch (16) disconnects a group of 3 MPPTs.



• Attach the DC side ground cable(s) to the equipment grounding conductor connection point (10) (this is the same thread for handles) using the washers and M8 bolt provided in the wiring box installation kit:

- 1 = cable lug
- 2 = flat washer
- 3 = spring washer
- 4 = M8 bolt



• Torque to 15.2 Nm (11.2ft-lb).

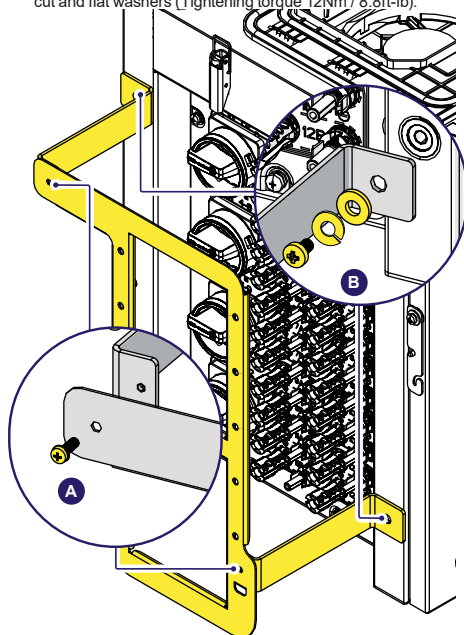
⚠ ATTENTION – Before connecting the inverter to AC or DC sources use a suitable multimeter to test the conductivity of the earth connections between the equipment grounding conductor connection point (10) and a handles thread (04) on the housing of power module (01).¹

12.1 Input connection with DC cable tray (60)

• Install the DC cable tray (only for inverter version where the DC cable tray is supplied).

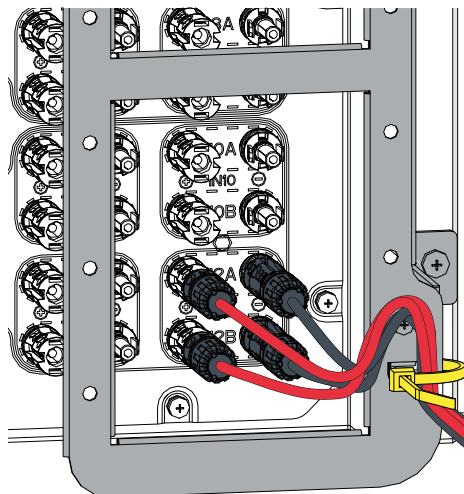
A. Assemble the 2 tray supports using supplied M5 (Tightening torque 3Nm / 2.2ft-lb)

B. Install the DC cable tray to the wiring box using the M8 screws, cut and flat washers (Tightening torque 12Nm / 8.8ft-lb).

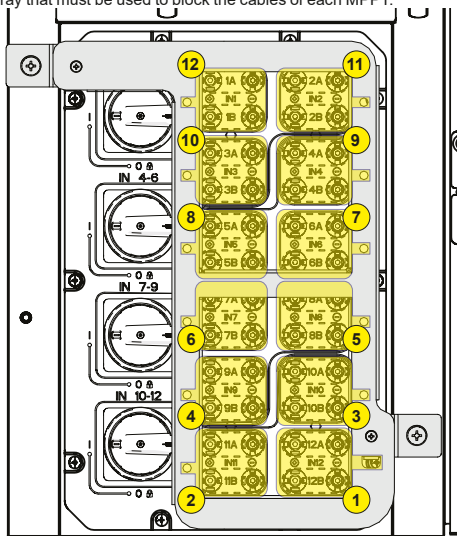


• Connect the strings, starting from IN12 till IN1 (one MPPT at a time), and lock the cables to the DC cable tray (60) using a cable tie.

⚠ ATTENTION – Make a bend on the cables (of each MPPT) before locking them with the cable ties; this is to ensure that the cables are not in tension.



Follow the installation order shown in the figure, to connect the cables neatly. The figure also indicates the right holes on the cable tray that must be used to block the cables of each MPPT.



WARNING – Always checking the seal of the connectors.

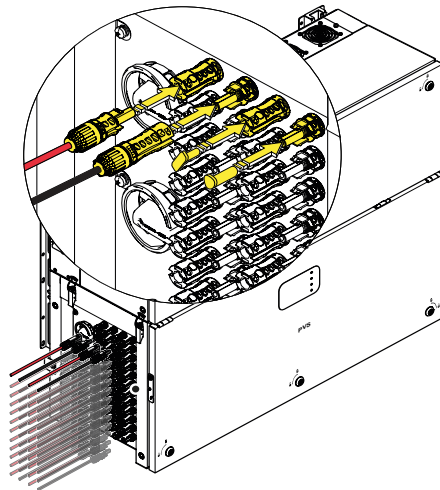
ATTENTION – Make sure to connect at least one string per MPPTs to prevent unbalancing between input channels.

ATTENTION – The MC4 input quick fit connectors must be properly installed. After the installation make sure the connectors are correctly locked through the clips.

ATTENTION – If any string inputs is not required check that protective caps are installed to the relative 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.

12.2 Input connection without DC cable tray (60)

• If the DC cable tray is not supplied proceed to connect all the strings required by the system taking in consideration how indicated in the "Routing the cable to the inverter" paragraph.



WARNING – Always checking the seal of the connectors.

ATTENTION – Make sure to connect at least one string per MPPTs to prevent unbalancing between input channels.

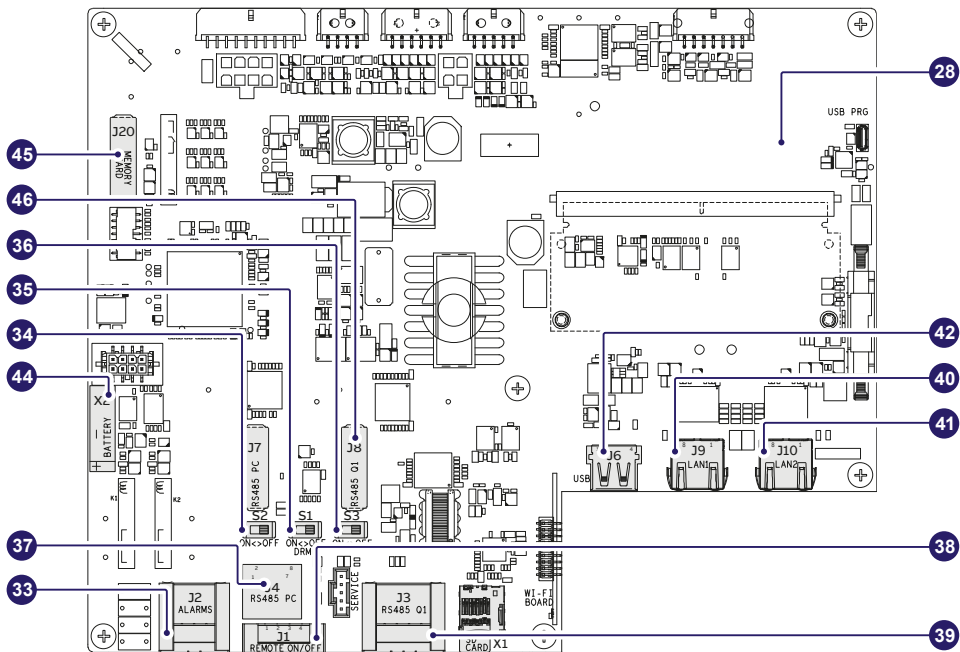
ATTENTION – If any string input is not required, check that protective caps are installed to the relative unused connectors. This is necessary for the inverter seal and to avoid any damage to the unused connectors which may be used at a later time.

ATTENTION – The connections can also be made with the wiring box (02) detached from the power module (01) that can be connected later for commissioning. When working with the wiring box (02) detached, pay particular attention to:

- presence of earth connection
- The top of wiring box must always be protected in outdoor installations with proper protection covers (optional accessory content in "PVS-175 INSTALLATION KIT", to be ordered separately). Refer to the dedicated chapter "Installation of protection covers for wiring box openings (long term installation)" for further information about the installation procedures.

13. Connection of the communication and control signals

13.1 Communication and control board (28) references



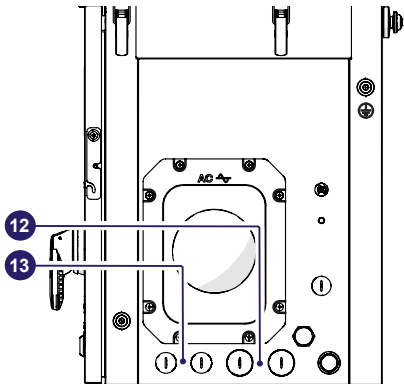
Terminal Name	Terminal Reference	Description of communication and control board (28)
J2	33	Multifunction relay connector (ALARM terminal block)
S2	34	RS485 FIMER service 120Ohm termination resistance selector switch (FIMER service only)
S1	35	DRM0 activation switch
S3	36	RS485 line 120Ohm termination resistance selector switch
J4	37	FIMER RS485 service RJ45 connector (service only)
J1	38	Remote ON/OFF terminal block
J3	39	RS485 line terminal block
J9	40	Ethernet connector 1 (RJ45)
J10	41	Ethernet connector 2 (RJ45)
J6	42	USB connector
X2	44	CR2032 Coin battery
J20	45	Memory board
J8	46	RS485 line communication board

(*) The RS-485 connector (RJ45) (FIMER Service only) (37) and the signal R1 on the Remote ON/OFF terminal block (38) are used to bring the signals on the external connector RS-485&Rem.ON/OFF (Service only) (56).

13.2 Connections to the communication and control board

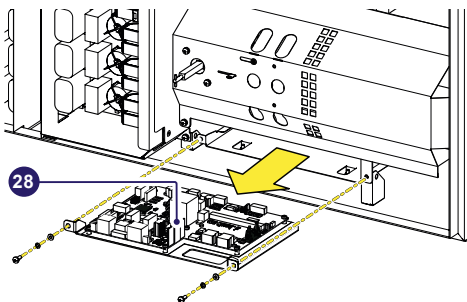
The communication and control signals are connected to the communication and control board inside the DC wiring box. To reach the board, on the right side of the DC wiring box, there are:

- 2x service opening (size 3/4" conduit) (12)
- 2x service opening (size 1/2" conduit) (13)



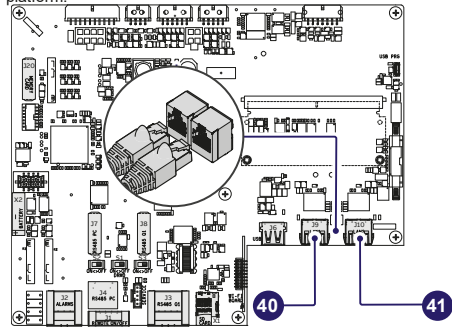
⚠ ATTENTION – Use UL Listed reduction washers in case of smaller conduit used to maintain Type 4 enclosure integrity.

- To connect the signal and communication wirings, the communication and control board (28) have to be extracted by removing the two M5 screws.
- After the connections has been made, re-insert the communication and control board (28) in the board tray and fasten the two M5 screws previously removed.
- Give each wire a pull test to confirm the connection is secure.
- Conduit must be attached using rain tight fittings to maintain Type 4 enclosure integrity.



13.3 Ethernet connection

The Ethernet connection allows a direct data transfer to the FIMER server for monitoring purpose. When the inverter will be powered on, network parameters are automatically set and the inverter starts the transmission of telemetry data to the Aurora Vision® CLOUD platform.



The connection of the Ethernet communication cable must be made on the specific connectors (40)(41) located on the Communication and control board (28).

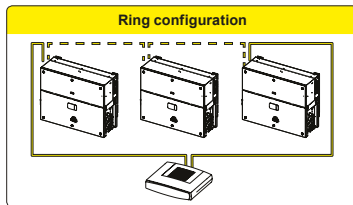
The two RJ45 connectors LAN1 and LAN2 are equivalent to each other and can be used for the input or for the output of the line connecting multiple inverters in a daisy-chain.

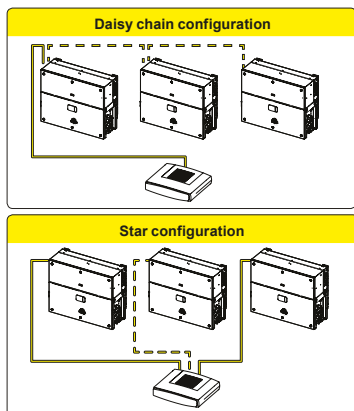
- The cable should be compliant to the following specification:
- Cable type: Patch or Cross type, 100BaseTx, CAT5e (or higher). For outdoor application and/or in presence of strong electromagnetic sources it is advisable to use shielded cables with metallic shielded RJ-45 plug.
 - UV-resistant if used outdoors
 - Type of plug: metallic shielded RJ45.
 - The maximum length that can reach these cables is 100 meters, and it is always advisable not to let them pass by the power cords to avoid interference with data transmission.
 - Maximum allowed quantity of inverters connected over one single daisy chain is 40.

⚠ ATTENTION – For outdoor application and/or in presence of adverse weather/strong electromagnetic events it is advisable to use additional overvoltage protective devices.

⚠ ATTENTION – In order to avoid earth loop (that could create communication issues) the shield of any Ethernet cable must be connected to the RJ45 plug in only one side, the other side of the shield should be leaved floating. This could be guaranteed by crimping the shield or the screen of the ethernet cable to the RJ45 connectors only at one end of each cables.

Three topologies of ethernet connection to the router are available:





The ring configuration is the preferred method to connect multiple units in order to allow reaching inverters also in case of single unit failures.

In case inverters are connected to the networking switch with a ring topology, it is recommended to enable SPT protocol on the switch (Spanning Tree Protocol SPT (IEEE 802.1D) is enabled by default on inverters).

⚠ ATTENTION – On each configuration the maximum length of the cable must be 100m between inverter – inverter – switch. No initial setup is required to start data transmission to Aurora Vision.

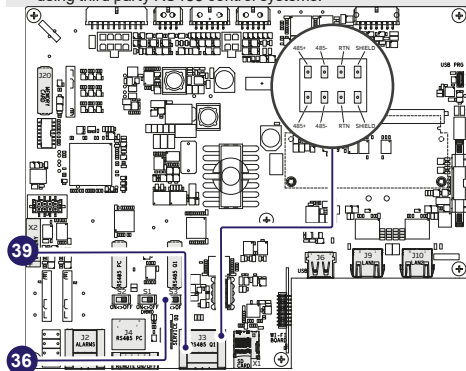
⚠ ATTENTION – Internet connection is required to use all the Aurora Vision remote functionalities.

📖 READ THE MANUAL – Please refer to Aurora Vision documents available on FIMER website for further information how to get an Aurora Vision account for remotely monitoring and managing the installed solar assets.

13.4 Connection of RS-485 serial communication line

⚠ ATTENTION – Please note that automatic settings of network parameters at turning on, embedded logging capability, automatic logger-free transferring of data to Aurora Vision Cloud and remote firmware update are provided over TCP/IP (Ethernet and/or Wi-Fi) bus only.

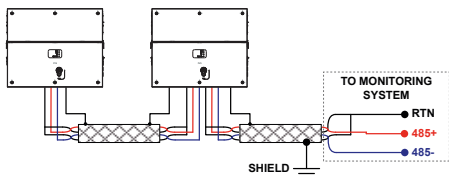
⚠ ATTENTION – The use of the inverters over the RS485 line is recommended in case of monitoring and controlling by using third party RS485 control systems.



13.5 Slave mode

By default the RS485 port is set as Slave mode. In case the port was set as "Master mode" it must be configured through the integrated Web User Interface (refer to chapter "Web User Interface") to use the RS485 as a serial communication line.

The RS-485 port can be used to set up a line of communication which, when connected to a monitoring device, enables the operation of the photovoltaic system to be kept under control. Depending on the device used monitoring can be local or remote.



RS485 line supports Modbus/RTU SUNSPEC compliant Modbus protocol.

•The RS-485 serial communication line is available on the communication and control board (28) with two terminal blocks (39) for each serial line signal (+T/R, -T/R and RTN) so as to be able to make a daisy-chain connection ("in-out") of multiple inverters.

•Connection of the R485 communication line conductors is made using the terminal block connectors (39) (485+, 485-, RTN and SHIELD).

•When connecting a single inverter to the monitoring system, activate the communication line resistance terminal by setting the switch (36) (to the ON position). In case of multiple installation set the switch only on the last inverter of the chain.

📖 READ THE MANUAL – For further information regarding the configuration and use of the RS-485 serial communication line, please refer to the user manual.

13.5.1 Master mode

The RS485 port can either be used for connecting supported accessories (like weather station): in this case data from accessories will be logged and transferred to the cloud by inverter itself (master mode).

This will allow the inverter to serve as a logger for FIMER accessories.

For more information on connecting the accessories to the RS485 terminal block, refer to the accessory product manual or contact FIMER customer support.

The RS-485 serial communication line is available on the communication and control board (28) with two terminal blocks (39) for each serial line signal (+T/R, -T/R and RTN) so as to be able to make a daisy-chain connection ("in-out") of multiple inverters.

•Connection of the R485 communication line conductors is made using the terminal block connectors (39) (485+, 485-, RTN and SHIELD).

•Set the switch of the termination resistance (36) to "ON" position.

•When an accessory is connected it must be added and configured into the "Monitored device" list on the integrated Web User Interface.

📖 READ THE MANUAL – For further information regarding the configuration and use of the RS-485 serial communication line, please refer to the user manual.

13.6 Remote control connection

The connection and disconnection of the inverter to and from the grid can be controlled through an external control.

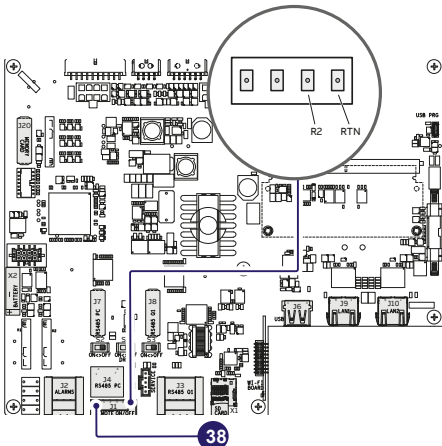
The function must be enabled via web server user interface. If the remote control function is disabled, the switching on of the inverter is dictated by the presence of the normal parameters that allow the inverter to connect to the grid.

If the remote control function is on, besides being dictated by the presence of the normal parameters that allow the inverter to connect to the grid, switching on the inverter also depends on the state of the R2 terminal compared to the RTN terminal present on the (38) terminal block of the communication and control board (28).

When the R2 signal is brought to the same potential as the RTN signal (i.e. by making a short circuit between the two terminals of the connector), this causes the inverter to disconnect from the grid.

Since this is a digital input, there are no requirements to be observed as regards cable cross-section (it only needs to comply with the sizing requirement for passing cables through the cable glands and the terminal connector).

The external switch used for Remote ON/OFF should be rated for DC low voltage, low current application (the minimum switching current capability should be 1mA or lower).

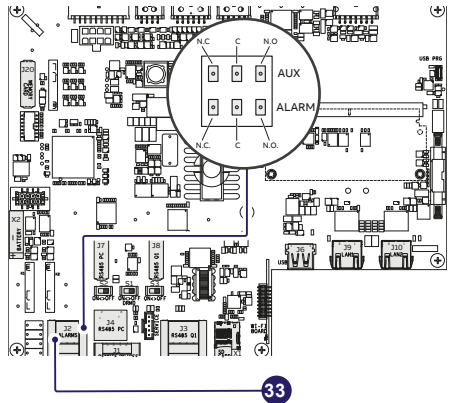


READ THE MANUAL – For further information regarding the configuration and use of the Remote control terminal block, please refer to the user manual.

13.7 Multifunction Relay connection (ALARM and AUX)

The inverter is equipped with 2 multifunction relay terminal blocks (33) with configurable activation. It can be connected with normally open contact (being connected between the NO terminal and the common contact C) and with normally closed contact (being connected between the NC terminal and the common contact C). This contact can be used in different operating configurations that can be selected by accessing the relevant section in the web user Interface "SETTINGS > Digital Outputs".

Different types of devices (light, sound, etc.) can be connected to the relay, provided they comply with the following requirements:

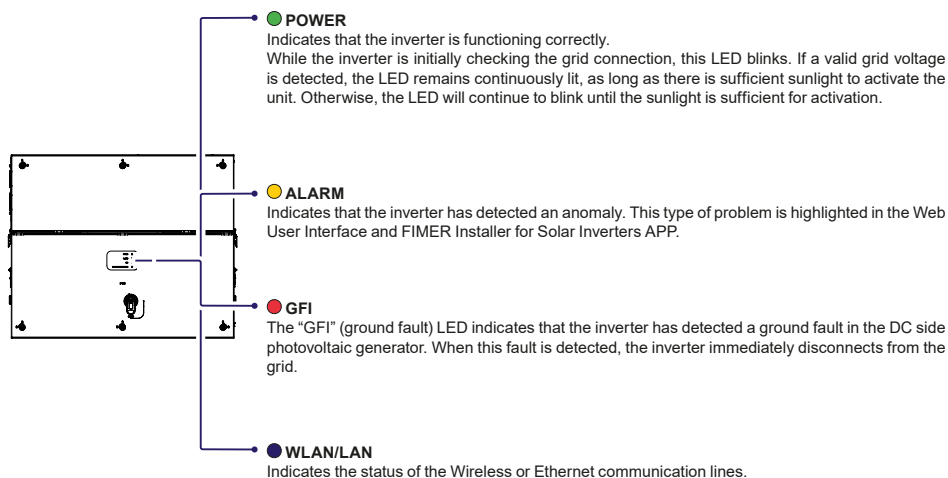


Alarm terminal block requirements

Alternating current	Maximum Voltage: 160 Vac / Maximum Current: 6 A
Direct current	Maximum Voltage: 30 Vdc / Maximum Current: 3 A
Cable requirements	Conductor cross-section: from 0.08 to 1.3 mm ²

READ THE MANUAL – For further information regarding the configuration and use of the multifunction relay terminal blocks, please refer to the user manual.

14. Description of LED panel





















All possible LED activation combinations are shown in the following table. In particular, each LED could behave in one of the following ways:





- = LED on
- ⊗ = LED flashing slow (2 seconds on / 2 seconds off)
- ⊗* = LED flashing fast (0.2 seconds on / 0.2 seconds off)
- = LED off
- ⊗ = Any one of the conditions described above

The following table shows all the possible activation combinations of "Power" "Alarm" and "GFI" LEDs on the LED panel (08) according to the operating status of the inverter.

Led Status	Operating state
green: ⊗ yellow: ⊗ red: ⊗	Firmware programming The inverter firmware is being programmed (never turn off the inverter during this phase).
green: ○ yellow: ○ red: ○	Night mode (inverter automatically switches off) The inverter is in night time switch-off mode (input voltage less than 70% of the set start-up voltage and AC grid is missing).
green: ⊗ yellow: ○ red: ○	Inverter initialization / Waiting Sun This is a transitional state due to verification of the operating conditions. During this stage the inverter checks that the conditions for connecting to the grid are met.
green: ● yellow: ○ red: ○	The inverter is connected and is feeding power into the grid Normal operation. During this stage, the inverter automatically tracks and analyzes the photovoltaic generator's maximum power point (MPP).
green: ⊗ yellow: ● red: ○	Missing grid Indicates lack of grid voltage. This condition does not allow the inverter to connect to the grid.
green: ⊗* yellow: ● red: ○	Warning indication: (W message codes) or Error: (E message codes) Indicates that the inverter control system has detected a warning (W) or error (E). It is possible to identify the type of problem generated in the dedicated section of integrated Web User Interface ("Inverter Log" section).
green: ○ yellow: ● red: ○	Temperature protection trip Indicates that the trip relating to internal temperatures (insufficient or excessive temperature) may have been activated.

Led Status	Operating state
	Ventilation anomaly Indicates an anomaly in the operation of the internal ventilation system that could limit output power at high ambient temperatures.
green: 	Overvoltage surge arresters triggered (where fitted)
yellow: 	Indicates that any class II overvoltage surge arresters installed on the AC or DC side have been triggered
red: 	Internal statistics memory anomaly Indicates an operating anomaly in the internal memory on which the inverter statistics are stored
	Buffer battery discharged The buffer battery is low and the inverter does not maintain the time setting
	Pre-commissioning phase (first start-up of inverter) The commissioning of the inverter must be completed through the Installation wizard steps (Web User Interface) or using the FIMER Installer for Solar Inverters mobile APP
green: 	Initial configuration failure
yellow: 	The inverter is in locked state due to a failure in the initial configuration of the equipment, such as the standard network setting for the country of installation
red: 	Incompatibility of the device firmware versions The firmware versions of the various devices comprising the equipment are incompatible and are being updated (this is an automatic operation)
	Temperature sensor anomaly detected
green: 	Remote OFF activated
yellow: 	The Remote Off command has been activated.
red: 	The unit will not connect to the network until the remote ON command has been activated
green: 	Anomaly in the insulation system of the photovoltaic generator
yellow: 	Indicates that a leakage to earth from the PV generator has been detected, causing the inverter to disconnect from the grid.
red: 	
green: 	DC arc fault detected during operation
yellow: 	If a DC arc fault is detected during operation, the inverter disconnects from AC grid (the error code is readable through internal Webservice).
red: 	
green: 	AFD board self test failure
yellow: 	Potential problem on the AFD board detected during self test phase
red: 	

The following table shows all the possible status of "WLAN/LAN" LED on the LED panel (08) according to the operating status of the wireless or ethernet communication lines.

Led Status	Operating state
Blue: 	Wireless not configured or/and ethernet cable not connected.
Blue: 	Scanning for available wireless networks.
Blue: 	Trying to connect to a wireless network.
Blue: 	Wireless or ethernet network is connected to the inverter and IP address is obtained.

15. Commissioning

⚠ ATTENTION – Do not place objects of any kind on the inverter during operation! Do not touch the heat sink while the inverter is operating! Some parts may be very hot and could cause burns.

⚠ ATTENTION – Before proceeding with commissioning, make sure you have carried out all the following checks:

- 1) Ensure that all the checks indicated in the previous sections of this Quick Installation Guide have been correctly performed.
- 2) Ensure that the front door have been correctly closed.
- 3) Check the correct connection and polarity of the DC inputs, and the correct connection of the AC output and earth cables.
- 4) Check the sealing barrier of the cable ducts and installed quick-fit connectors to prevent accidental disconnections and/or avoid compromising the NEMA4 environmental protection rating.

⚠ ATTENTION – The inverter can be powered with DC sources only; make sure that irradiation is stable and adequate for the inverter commissioning procedure to be completed.

⚠ WARNING – At the first activation of the inverter the firmware version could synchronized between power module and wiring box. During this phase the LEDs "Power" "Alarm" and "GFI" blink together every 1 second. This process is absolutely normal and must be completed without interruption. A switch-off of the system during this process could cause serious damage to the inverter.

Commissioning could be carried out in two different ways:

- Via **FIMER Installer for Solar Inverters APP** (mobile APP for commissioning a single inverter as well as a multi-inverter solar plant)
- Via **Web UI** (Integrated Web User Interface enabling setting parameters and performing commissioning of a single inverter).

📄 NOTE – FIMER Installer for Solar Inverters APP is the recommended method to commission the inverters.

📖 READ THE MANUAL – 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 on the user manual).

15.1 Commissioning via FIMER Installer for Solar Inverters mobile APP

FIMER Installer for Solar Inverters APP is available for Android mobile devices with an Android version of 6.0.1 or greater (for iOS mobile devices will be implemented soon) and may be downloaded and installed from Play Store.

The requirements to complete the procedures are listed below:

- FIMER Installer for Solar Inverters APP installed on mobile device.
- Enabled installer account for FIMER Installer for Solar Inverters APP (The account could 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 performed by:

- taking pictures of the QR codes (**J**) of single inverter units (printed on the Communication identification label) (recommended).
- manual insertion of the MAC address (**H**) and related product keys (**I**) (printed on the Communication identification label) of all the inverters that shall be commissioned.
- scanning and selecting of SSIDs associated to the Wi-Fi networks generated by each inverter to commission.

Follow the procedure below to commission the inverter:

📄 NOTE – This inverter can be powered both with AC or DC sources. In case of DC source is used, make sure that irradiation is stable and adequate for the inverter commissioning procedure to be completed.

- Close the DC disconnect switches (**16**) to supply the inverter with input voltage from the photovoltaic generator. In the pre-commissioning phase the "Alarm" LED keeps quickly flashing, "Power" and "GFI" LEDs are OFF.
- Perform the installation wizard steps with FIMER Installer for Solar Inverters APP enabling the transferring the settings to all the claimed inverters.
- After the commissioning via FIMER Installer for Solar Inverters APP is completed, the inverter changes the behavior of the "Power" and "Alarm" LEDs (**08**), in relation of the input voltage value:

Input voltage	LED Status	Description
$V_{in} < V_{start}$	Power = Flashing Alarm = OFF	The input voltage is not sufficient to enable connection to the grid.
$V_{in} > V_{start}$	Power = Flashing Alarm = ON	The input voltage is sufficient to enable connection to the grid: the inverter waits for the grid voltage to be present to make the connection to the grid.

- Close the AC disconnect switch downstream of the inverter (and AC disconnect switch (**09**) for the -SX2 wiring box version).
- When the input voltage is sufficient to allow the connection to the grid, the inverter will check the grid voltage, measure the isolation resistance of the photovoltaic field with respect to earth and performs other auto-diagnostic checks. During the preliminary checks on the parallel connection with the grid, the "Power" LED keeps flashing, the "Alarm" and "GFI" LEDs are OFF. The inverter will ONLY connect to the grid if all parameters fall within the ranges foreseen by current regulations.
- If the outcome of the preliminary checks to grid synchronization are positive, the inverter connects and starts to export power to the grid. The "Power" LED remains fixed on while the "Alarm" and "GFI" LEDs are OFF.

📄 NOTE – For more details about commissioning and any other functionalities of the Installer for Solar Inverters mobile APP please contact FIMER customer support.

15.2 Commissioning via Web User Interface

Commissioning may be carried out via wireless connection to the inverter's Web User Interface. Initial setup of the system must therefore be carried out via a tablet, notebook or smartphone with a wireless connection.

- Close the DC disconnect switches (16) to supply the inverter with input voltage from the photovoltaic generator. In the pre-commissioning phase the "Alarm" LED keeps quickly flashing, "Power" and "GFI" LEDs are OFF.
- Once powered, the inverter will automatically create a wireless network (approx. 60 seconds after switching-on).



- Enable the wireless connection on the device which is being used for the board setup (tablet, smartphone or PC) and connect it to the Access Point created by the inverter system: the name of the wireless network created by the system that the connection should be established with, will be: ABB-XX-XX-XX-XX-XX-XX where "X" is a hex digit of the wireless MAC address (H) (MAC address can be found on the "Communication Identification Label" placed on the side of the inverter).
- When required enter the PRODUCT KEY (I) (printed on the "Communication Identification label" and applied during the commissioning phase to the plant documentation) as access point password (Note that it's required to digit also the dash "-" characters of the Product Key in the password field).

- Open an internet browser (recommended browser: Chrome versions from v.55, Firefox versions from v.50) and enter the pre-set IP address 192.168.117.1 to access the Web User Interface.
- Follow the step-by-step commissioning wizard to complete the commission of the inverter. 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.

READ THE MANUAL – For further information regarding the commissioning procedure via Web User Interface, please refer to the product manual.

- After the wizard procedure is completed, the inverter changes the behaviour of the "Power" and "Alarm" LEDs (08), in relation of the input voltage value:

Input voltage	LED Status	Description
Vin < Vstart	Power = Flashing Alarm = OFF	The input voltage is not sufficient to enable connection to the grid.
Vin > Vstart	Power = Flashing Alarm = ON	The input voltage is sufficient to enable connection to the grid: the inverter waits for the grid voltage to be present to make the connection to the grid.

- Close the AC switch downstream of the inverter (and AC disconnect switch (09) for the -SX2 wiring box version).
- When the input voltage is sufficient to allow the connection to the grid, the inverter will check the grid voltage, measure the isolation resistance of the photovoltaic field with respect to earth and performs other auto-diagnostic checks. During the preliminary checks on the parallel connection with the grid, the "Power" LED keeps flashing, the "Alarm" and "GFI" LEDs are OFF. The inverter will ONLY connect to the grid if all parameters fall within the ranges foreseen by current regulations.
- If the outcome of the preliminary checks to grid synchronization are positive, the inverter connects and starts to export power to the grid. The "Power" LED remains fixed on while the "Alarm" and "GFI" LEDs are OFF.

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 on the product manual.

READ THE MANUAL – According to CEC requirements, the inverter provides values for measured net generated energy and measured instantaneous power. This information can be accessed by connecting a remote device such as a smart phone, tablet, or PC to the inverter Web User Interface. In addition it is possible to use the mobile App 'FIMER ability Energy Viewer for solar plants' and the FIMER Web portal Aurora Vision (please refer to product manual for further details) to monitor all production data.

16. Arc fault detection

The Arc Fault Circuit Protection required by NFPA 70 Article 690.11 is provided by the inverter.

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.

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

Based on the above conditions, the LEDs behaviour is described in the table below:

	POWER	ALARM	GFI
Arc Fault pending	OFF	ON	ON
Self Test Failed	OFF	ON	Blinking (200ms period)

Press and hold the AFD reset button (57) on the right 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 inverter will result in error E050.

READ THE MANUAL – Refer to the product manual (downloadable on www.fimer.com) for troubleshooting suggestions.

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.

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.

17. Grid support functions and Voltage & Frequency trip limits

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.

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

1. 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.

2. 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.

3. 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 (Cos ϕ 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/Cos ϕ Settings: Cos ϕ (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.

4. 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.

5. 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.

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.

Condition	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 s
C	1.10 Vnom<V<1.2 Vnom (Adj.)	Rated (60Hz)	1 (Default)Adj. Set Points 0.16 to 100 s
D	1.2 Vnom ≤ V(Fixed)	Rated (60Hz)	0.16 (Adj. 0.001 to 0.16s)
E	Rated	f > 60.5Hz (Default)Adj. 60.1 to 66.0 Hz	0.16 (Default) Adj. Set Points 0.16 to 1000 s
F	Rated	f < 59.3 Hz (Default)Adj. 50.0 to 59.9 Hz	0.16 (Default) Adj. Set Points 0.16 to 1000 s
G	Rated	f << 57.0 Hz (Default)Adj. 50.0 to 59.9 Hz	0.16 (Default) Adj. Set Points 0.16 to 1000 s
H	Rated	f >> 63.0 Hz (Default)Adj. 60.1 to 66.0 Hz	0.16 (Default) Adj. Set Points 0.16 to 1000 s

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


18. Characteristics and technical data

18.1 Technical data

	PVS-166-TL US	PVS-175-TL US
Input		
Absolute maximum DC input voltage (V _{max,abs})	1500 V	
Start-up input voltage (V _{start})	750 V (650 - 1000 V)	
Operating DC input voltage range (V _{dcmín...V_{dcmáx}})	0.7 x V _{start} ... 1500 V (min 600 V)	
Rated DC input voltage (V _{dcr})	1100 Vdc	
Rated DC input power (P _{dcr})	169000 W @ 40°C	188 000 W @ 30°C (177 kW @ 40°C)
Number of independent MPPT	12	
MPPT input DC voltage range (V _{MPPTmín...V_{MPPTmáx}}) at Pacr	850..1350 V	
Maximum DC input current for each MPPT (I _{MPPTmáx})	22 A	
Maximum input short circuit current for each MPPT (I _{SCmáx})	30 A	
Number of DC input pairs for each MPPT	2 DC inputs per MPPT	
DC connection type	PV quick fit connector ⁽¹⁾	
Input protection		
DC Series Arc Fault Circuit Interrupter	Type I acc. to UL 1699B with single-MPPT sensing capability	
Reverse polarity protection	Yes, from limited current source	
Input over voltage protection for each MPPT	Type 2 with monitoring	
Photovoltaic array isolation control (Insulation Resistance, R-iso)	Yes (pre start-up R-iso measurement)	
Residual Current Monitoring Unit (leakage current protection)	Yes (dynamic GFDI)	
DC Load Breaking Disconnect Switch (rating for each MPPT)	30A/1500V ; 50A/1000V	
Fuse rating	N/A, No fuses required	
String current monitoring	MPPT-level current sense	
Output side		
AC Grid connection type	Three phase 3W+PE	
Rated AC power (P _{acr} @cosφ=1)	166 500 W @ 40°C	175 000 W @ 40°C
Maximum AC output power (P _{acmáx} @cosφ=1)	166 500 W @ 40°C	185 000 W @ ≤ 30°C
Maximum apparent power (S _{máx})	166 500 VA	185 000 VA
Rated AC grid voltage (V _{ac,r})	800 V	
AC voltage range	552 ..960 V ⁽²⁾	
Maximum AC output current (I _{ac,máx})	134 A	
Rated Output Frequency (fr)	50 Hz / 60 Hz	
Output frequency range (f _{mín...f_{máx}})	45 ..55 Hz / 55 .. 65 Hz ⁽²⁾	
Nominal power factor / adjustable range at S _{máx}	> 0.995 0.75 Lead...0.75 Lag	> 0.995 0.8 Lead...0.8 Lag
Total current harmonic distortion	<3%	
Max DC current injection (% of I _n)	< 0.5%*I _n	
AC wire range	4x1x2/0 AWG to 4x1x400 kcmil, Cu/Al ⁽³⁾	
AC plate	Opening for Trade size 3 conduit	
AC connection type	Copper Busbar for ring terminal lug connections with M10 stud type terminal block (bolts included)	
Output protection		
Anti-islanding Protection	Meets UL1741 / IEEE1547 requirements	
Output overvoltage protection - replaceable surge protection device	Type 2 with monitoring	
Operating performance		
Maximum Efficiency (η _{máx})	98.6%	
Weighted CEC efficiency (η _{CEC})	98.4%	
Communication		

	PVS-166-TL US	PVS-175-TL US
Embedded communication interfaces	Dual port Ethernet, WLAN ⁽⁴⁾ , RS-485	
User interface	4 LEDs, Web User Interface, Mobile APP	
Communication protocol	Modbus RTU/TCP (SunSpec compliant)	
Commissioning tool	Web User Interface, Mobile APP/APP for plant level	
Monitoring	Plant Portfolio Manager, Plant Viewer	
FW update	Remote inverter FW upgrade via Ethernet/WLAN interface locally/ remotely	
Parameter upgrade	Remote inverter parameter upgrade via Ethernet/WLAN according to SunSpec Modbus protocol	
Environmental		
Operating ambient temperature range	-13...+140°F (-25...+60°C) with derating above 104°F (40°C)	
Relative Humidity	0...100% condensing	
Storage conditions (Temperature / Relative Humidity)	0°C...+35°C (32°F...95°F) / 4...75%	
Sound pressure level, typical	<65 dB(A)@ 1m	
Maximum operating altitude without derating	2000 m / 6560 ft	
Physical		
Environmental Protection Rating	Cert. to UL 50E Type 4X – meets or exceeds NEMA 4X	
Cooling	Forced air cooling with variable speed cooling fan	
Dimensions (H x W x D)	867x1086x419 mm / 34.2"x42.7"x16.5" for -SX model 867x1086x458 mm / 34.2"x42.7"x18.0" for -SX2 model	
Weight	~76 kg / 167.5 lbs for power module ; ~77 kg / 169.7 lbs for Wiring box Overall max ~153 kg / 337.2 lbs	
Mounting system	Bracket (included, vertical mounting only)	
Safety		
Insulation Level	Transformer-less (floating array)	
Marking	CTUY ^{US}	
Safety and EMC standard	UL1741, IEEEE1547, IEEEE1547.1, CSA-C22.2 No. 107.1-01, UL1998, UL 1699B, FCC 47 CFR Part 15B Class A Limits	
Grid standard	UL 1741 SA, IEEEE1547, IEEEE 1547a, Rule 21, Rule 14 (HI)	
Optional available		
DC link recharge circuit	Night time operation with restart capability	
Anti-PID ⁽⁶⁾	Based on night time polarization of the array	

1. Multicontact MC4-Evo2. Cable couplers may accept up to 10mm2 (AWG8)
2. The AC voltage and frequency range may vary depending on specific country grid standard
3. Aluminum cable requires bi-metallic compression lug or bi-metallic adapter
4. as per IEEEE 802.11 b/g/n standard, 2.4 GHz
5. Cannot operate simultaneously when installed in conjunction with the DC link recharge circuit

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

ENGLISH



The symbol of the crossed-out wheeled bin identifies electrical and electronic equipment (EEE) placed on the market after 13 August 2005 which should be separately collected in accordance with the Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE).

Users of EEE from private households (consumers) within each European Union country:

Electrical and electronic equipment should be disposed of in appropriate collection facilities as set up by the competent authorities within each Member State or in accordance with that Member State's national regulations regarding WEEE collection and disposal.

Professional users (Companies - Enterprises) within each European Union country: Electrical and electronic equipment should be disposed of in accordance with the Member State's national regulations regarding WEEE collection and disposal. Further information should be obtained from the reseller or local vendor.

Both Private and Professional Users from EEEs outside the European Union: Electrical and electronic equipment should be disposed of in accordance with the Member State's national regulations regarding WEEE collection and disposal. Inappropriate EEE disposal could have a negative environmental impact and hamper human health. Cooperating in the appropriate disposal of this product contributes to product reuse and recycling, while protecting our environment.

ITALIANO



Il simbolo del contenitore di spazzatura su ruote barrato, accompagnato da una barra piena orizzontale, identifica le apparecchiature elettriche ed elettroniche, immesse sul mercato dopo il 13 agosto 2005, oggetto di raccolta separata in conformità alla Direttiva Europea 2012/19/UE (WEEE Directive).

Utenti domestici (privati cittadini) della Comunità Europea:

Lo smaltimento di questa apparecchiatura elettrica ed elettronica deve avvenire presso le isole ecologiche messe a disposizione dagli enti locali o comunque seguendo le indicazioni delle autorità locali per la raccolta differenziata dei rifiuti elettronici.

Utenti professionali (Aziende-Imprese) della Comunità Europea: Lo smaltimento di questa apparecchiatura elettrica ed elettronica deve avvenire in conformità alle legislazioni locali. Contattare il rivenditore o il fornitore locale per ulteriori informazioni.

Utenti domestici e professionali in altri paesi fuori dalla Comunità Europea:

Lo smaltimento di questa apparecchiatura elettrica ed elettronica deve avvenire in conformità alla legislazione locale. Contattare il rivenditore o il fornitore locale per ulteriori informazioni. Collaborando allo smaltimento corretto di questo prodotto, si contribuisce al riutilizzo, al riciclaggio e al recupero del prodotto, e alla protezione del nostro ambiente.

DEUTSCH



Mit dem Symbol der ausgekreuzten Mülltonne werden Elektro- und Elektronikgeräte gekennzeichnet, die nach dem 13. August 2005 auf den Markt gebracht wurden und in Einklang mit der Richtlinie 2012/19/EU des Europäischen Parlaments über Elektro- und Elektronik-Abfälle (WEEE) getrennt zu sammeln sind.

Benutzer von Elektro- und Elektronikgeräten aus privaten Haushalten (Konsumenten) in den Mitgliedstaaten der Europäischen Union: Elektro- und Elektronikgeräte sind bei einer hierfür von den zuständigen Behörden eingerichteten geeigneten Annahmestelle im jeweiligen Mitgliedstaat abzugeben oder in Einklang mit den nationalen Bestimmungen des Mitgliedstaats hinsichtlich der Sammlung und Entsorgung von Elektro- und Elektronikgeräten gemäß der WEEE-Richtlinie zu entsorgen.

Professionelle Benutzer (Unternehmen) in den Mitgliedstaaten der Europäischen Union: Elektro- und Elektronikgeräte sind in Einklang mit den nationalen Bestimmungen des Mitgliedstaats hinsichtlich der Sammlung und Entsorgung von Elektro- und Elektronikgeräten gemäß der WEEE-Richtlinie zu entsorgen. Für nähere Informationen wenden Sie sich bitte an den Wiederverkäufer oder Ihren Händler vor Ort.

Sowohl private als auch professionelle Benutzer in den Mitgliedstaaten der Europäischen Union: Elektro- und Elektronikgeräte sind in Einklang mit den nationalen Bestimmungen des Mitgliedstaats hinsichtlich der Sammlung und Entsorgung von Elektro- und Elektronikgeräten gemäß der WEEE-Richtlinie zu entsorgen. Bei unsachgemäßer Entsorgung besteht das Risiko nachteiliger Auswirkungen auf Umwelt und Gesundheit. Durch Ihre Kooperation zur ordnungsgemäßen Entsorgung fördern Sie das Wiederverwendung und die Recycling des Produkts und tragen zum Umweltschutz bei.

ESPAÑOL



El símbolo del contenedor de basura tachado con un aspa indica aquellos aparatos eléctricos y electrónicos (AEE, EEE por sus siglas en inglés) lanzados al mercado después del 13 de agosto de 2005 que deben recogerse de forma separada de acuerdo con la Directiva 2012/19/UE del Parlamento Europeo y el Consejo Europeo sobre residuos de aparatos eléctricos y electrónicos (RAEE).

Usuarios particulares de AEE (consumidores) en cada uno de los países de la Unión Europea: Los aparatos eléctricos y electrónicos deben eliminarse en los puntos de recolección adecuados establecidos por las autoridades competentes de cada Estado miembro de acuerdo con las normativas nacionales de dicho Estado miembro sobre la recolección y eliminación de RAEE.

Usuarios profesionales (Empresas e instituciones) en cada uno de los países de la Unión Europea: Los aparatos eléctricos y electrónicos deben eliminarse de acuerdo con las normativas nacionales sobre la recolección y eliminación de RAEE. Puede obtener más información en su distribuidor o proveedor local.

Usuarios particulares y profesionales de países no pertenecientes a la Unión Europea: Los aparatos eléctricos y electrónicos deben eliminarse de acuerdo con las normativas nacionales sobre la recolección y eliminación de RAEE. La eliminación inadecuada de un AEE puede tener un impacto negativo en el medio ambiente y perjudicar la salud humana. Su cooperación en la eliminación adecuada de este producto contribuye a su reutilización y reciclado a la vez que protege el medio ambiente.

FRANÇAIS



Le symbole de poubelle interdite identifie les équipements électriques et électroniques (EEE) mis sur le marché après le 13 août 2005 qui doivent être collectés séparément conformément à la Directive 2012/19/UE du Parlement européen et du Conseil relative aux déchets d'équipements électriques et électroniques (DEEE).

Ménages utilisateurs d'EEE (consommateurs) dans chaque pays de l'Union européenne: Les équipements électriques et électroniques doivent être mis au rebut conformément aux réglementations nationales de cet État membre relatives à la collecte et à la mise au rebut des EEE.

Utilisateurs professionnels (sociétés - entreprises) au sein de chaque pays de l'Union européenne: Les équipements électriques et électroniques doivent être mis au rebut conformément aux réglementations nationales de l'État membre relatives à la mise au rebut des EEE. Pour plus d'informations, contactez le revendeur ou le fournisseur local.

Utilisateurs privés et professionnels des pays hors Union européenne: Les équipements électriques et électroniques doivent être mis au rebut conformément aux réglementations nationales de l'État membre relatives à la mise au rebut des EEE. La mise au rebut inappropriée des EEE peut avoir un effet néfaste sur l'environnement et sur la santé humaine. En participant à la mise au rebut appropriée de ce produit, vous contribuez à sa réutilisation et à son recyclage tout en protégeant notre environnement.

PORTUGUÊS



O símbolo do contêntor com uma cruz sobrepõe identifica equipamentos elétricos e eletrônicos (EEE) colocados no mercado após 13 de agosto de 2005, que devem ser recolhidos separadamente de acordo com a Diretiva 2012/19/UE do Parlamento Europeu e do Conselho sobre resíduos de equipamentos elétricos e eletrônicos (WEEE).

Utilizadores de EEE de ambientes domésticos privados (consumidores) dentro de cada país da União Europeia:

Os equipamentos elétricos e eletrônicos deverão ser eliminados em instalações de recolha adequadas, conforme estabelecido pelas autoridades competentes dentro de cada Estado Membro, ou de acordo com os regulamentos nacionais desse Estado Membro sobre a recolha e eliminação de WEEE.

Utilizadores profissionais (Companhias - Empresas) dentro de cada país da União Europeia: Os equipamentos elétricos e eletrônicos deverão ser eliminados de acordo com os regulamentos nacionais dos Estados Membros sobre a recolha e eliminação de WEEE. Informações adicionais deverão ser obtidas junto do revendedor ou do fornecedor local.

Utilizadores privados e profissionais dos países fora da União Europeia: Os equipamentos elétricos e eletrônicos deverão ser eliminados de acordo com os regulamentos nacionais dos Estados Membros sobre a recolha e eliminação de WEEE. A eliminação inadequada de EEE poderá ter um impacto ambiental negativo e afetar a saúde humana. Cooperando com a eliminação adequada destes produtos contribui para a reutilização e reciclagem dos mesmos, protegendo simultaneamente o nosso ambiente.

NEDERLANDS



Het symbool van de doorkruiste afvalbak identificeert elektrische en elektronische apparatuur (EEA) op de markt gebracht na 13 augustus 2005, die apart moet worden verzameld in overeenstemming met de Richtlijn 2012/19/UE van het Europees Parlement en de Raad betreffende afgedankte elektrische en elektronische apparatuur (AEEA).

Gebruikers van EEA uit particuliere huishoudens (consumenten) in elk land van de Europese Unie:

Elektrische en elektronische apparatuur moet worden weggegooid via of daarvoor bestemde voorzieningen zoals opgezet door de bevoegde autoriteiten in elke lidstaat met in overeenstemming met de nationale regelgeving van die lidstaat met betrekking tot de inzameling en verwijdering van AEEA.

Professionele gebruikers (Bedrijven - Ondernemingen) in elk land van de Europese Unie: Elektrische en elektronische apparatuur dient te worden vernietigd in overeenstemming met de nationale voorschriften van de lidstaat met betrekking tot de inzameling en verwijdering van AEEA. Nadere informatie moet worden verkregen van de verkoper of lokale leverancier.

Zowel particuliere als professionele gebruikers uit landen buiten de Europese Unie: Elektrische en elektronische apparatuur dient te worden vernietigd in overeenstemming met de nationale voorschriften van de lidstaat met betrekking tot de inzameling en verwijdering van AEEA. Onjuiste verwijdering van EEA kan een negatieve invloed op het milieu hebben en de menselijke gezondheid schaden. Samenwerking bij de correcte verwijdering van dit product draagt bij aan hergebruik en recycling en beschermt ons milieu.

SVENSKA



Symbolen med en överkryssad sopptuna på hjul identifierar elektrisk och elektronisk utrustning (EEE), som lanserats på marknaden efter 13 augusti 2005 som ska samlas in separat i enlighet med Europaparlamentets och rådets direktiv 2012/19/EU om avfall som utgörs av eller innehåller elektriska eller elektroniska produkter (WEEE).

Användare av EEE i privathusallén (konsumenter) i varje land inom Europeiska unionen:

Elektrisk och elektronisk utrustning ska bortskaffas på lämpliga uppsamlingsanläggningar som inrättats av behöriga myndigheter i varje medlemsstat eller i enlighet med den medlemsstatens nationella bestämmelser gällande uppsamling och bortskaffande av WEEE.

Yrkesmässiga användare (bolag – företag) i varje land inom Europeiska unionen: Elektrisk och elektronisk utrustning ska bortskaffas i enlighet med medlemsstatens nationella bestämmelser gällande uppsamling och bortskaffande av WEEE. Ytterligare information ska erhållas från återförsäljaren eller den lokala säljaren.

Både privata och yrkesmässiga användare från länder utanför Europeiska unionen: Elektrisk och elektronisk utrustning ska bortskaffas på lämpliga uppsamlingsanläggningar som inrättats av behöriga myndigheter i varje medlemsstat eller i enlighet med den medlemsstatens nationella bestämmelser gällande uppsamling och bortskaffande av WEEE. Olämpligt bortskaffande av EEE kan ha en negativ miljöpåverkan och skada människors hälsa i och med att du samarbetar. Våga om att bortskaffa den här produkten på ett lämpligt sätt, bidra till att produkten kan återanvändas och återvinnas, samtidigt som du hjälper till att skydda miljön.

DANSK



Symbolet med den overstregede affaldsspand med hjul angiver, at elektrisk og elektronisk udstyr (EEE), der er markedsført efter d. 13. august 2005, skal indsamles særskilt i henhold til Europa-Parlamentets og Rådets direktiv 2012/19/EU om affald af elektrisk og elektronisk udstyr (WEEE).

Brugere af EEE fra private husholdninger (forbrugere) inden for hvert EU-medlemsland: Elektrisk og elektronisk udstyr skal bortskaffes via passende indsamlingsfaciliteter, der er etableret af de ansvarlige myndigheder i hver medlemsstat, eller i henhold til den pågældende medlemsstats nationale lovgivning vedrørende indsamling og bortskaffelse af WEEE.

Professionelle brugere (virksomheder – firmaer) inden for hvert EU-medlemsland: Elektrisk og elektronisk udstyr skal bortskaffes i henhold til den pågældende medlemsstats nationale lovgivning vedrørende indsamling og bortskaffelse af WEEE. Yderligere oplysninger kan rekrutteres fra forhandleren eller den lokale leverandør.

Både private og professionelle brugere fra lande uden for den Europæiske Union: Elektrisk og elektronisk udstyr skal bortskaffes i henhold til den pågældende medlemsstats nationale lovgivning vedrørende indsamling og bortskaffelse af WEEE. Uheldig genaffaldning af EEE kan have en negativ virkning på miljøet og på menneskers sundhed. Samarbejd i forbindelse med korrekt bortskaffelse af disse produkter bidrager til genanvendelse og genvinning, samtidig med at miljøet beskyttes.

SUOMI



Merkki, jossa on yli rastiin pyyhäläinen jätteenä, viittaa 13.8.2005 jälkeen markkinoille tuotuihin sähkö- ja elektroniikkalaitteisiin, jotka Euroopan parlamentin ja neuvoston sähkö- ja elektroniikkalaiteromusta annetun direktiivin 2012/19/UE (WEEE) mukaisesti on kerättävä erikseen.

Yksityisten kotitalouksien sähkö- ja elektroniikkalaitteiden (kuluttajat) kussakin Euroopan unionin maassa: Sähkö- ja elektroniikkalaitteet on hävitettävä kunkin jäsenvaltion toimivaltuissa viranomaisissa järjestämien keräyspisteiden kautta tai kyseisen jäsenvaltion kansallisten sähkö- ja elektroniikkalaiteromun keräystä ja hävittämistä koskevien määräysten mukaisesti.

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Euroopan unionin ulkopuolisten maiden yksityiset ja ammattikäyttäjät: Sähkö- ja elektroniikkalaitteet on hävitettävä jäsenvaltion kansallisten sähkö- ja elektroniikkalaiteromun keräystä ja hävittämistä koskevien määräysten mukaisesti. Lisätietoja on voitava saada jälleenykäytöstä tai paikalliselta toimitalolta.



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