

Fronius Tauro 50-3
Fronius Tauro Eco 50-3
Fronius Tauro Eco 99-3
Fronius Tauro Eco 100-3



Operating instructions

Grid-connected inverter



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Safety rules

Explanation of safety notices



WARNING!

Indicates a potentially hazardous situation.

- ▶ If not avoided, death or serious injury may result.
-



CAUTION!

Indicates a situation where damage could occur.

- ▶ If not avoided, minor injury and/or damage to property may result.
-

NOTE!

Indicates a risk of flawed results and possible damage to the equipment.

If you see any of the symbols depicted in the "Safety rules" chapter, special care is required.

General

The device is manufactured using state-of-the-art technology and according to recognised safety standards. If used incorrectly or misused, however, it can cause:

- Injury or death to the operator or a third party
 - Damage to the device and other material assets belonging to the operator
-

All persons involved in commissioning, maintaining and servicing the device must

- Be suitably qualified,
 - have knowledge of and experience in dealing with electrical installations and
 - Read and follow these Operating Instructions carefully.
-

In addition to the Operating Instructions, attention must also be paid to any generally applicable and local regulations regarding accident prevention and environmental protection.

All safety and danger notices on the device:

- Must be in a legible state
 - Must not be damaged
 - Must not be removed
 - Must not be covered, pasted or painted over
-

Only operate the device if all of its protection devices are fully functional. If the protection devices are not fully functional, there is a danger of:

- Injury or death to the operator or a third party
 - Damage to the device and other material assets belonging to the operator
-

Any safety devices that are not functioning properly must be repaired by a suitably qualified technician before the device is switched on.

Never bypass or disable protection devices.

For the location of the safety and danger notices on the device, refer to the section headed "Warning notices on the device" in the Operating Instructions for the device.

Before switching on the device, remove any faults that could compromise safety.

Environmental conditions	Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended purpose. The manufacturer accepts no liability for any damage resulting from improper use.
Qualified personnel	<p>The servicing information contained in these operating instructions is intended only for the use of qualified service engineers. An electric shock can be fatal. Do not carry out any actions other than those described in the documentation. This also applies to qualified personnel.</p> <hr/> <p>All cables and leads must be secured, undamaged, insulated and adequately dimensioned. Loose connections, scorched, damaged or inadequately dimensioned cables and leads must be immediately repaired by authorised personnel.</p> <hr/> <p>Maintenance and repair work must only be carried out by an authorised specialist.</p> <hr/> <p>It is impossible to guarantee that bought-in parts are designed and manufactured to meet the demands made on them, or that they satisfy safety requirements. Use only original spare parts (also applies to standard parts).</p> <hr/> <p>Do not carry out any alterations, installations, or modifications to the device without first obtaining the manufacturer's permission.</p> <hr/> <p>Components that are not in perfect condition must be changed immediately.</p>
Safety measures at the installation location	When installing devices with openings for cooling air, ensure that the cooling air can enter and exit unhindered through the air ducts. Only operate the charger in accordance with the degree of protection shown on the rating plate.
Noise emission values	<p>The maximum sound power level of the inverter is specified in the Technical Data.</p> <hr/> <p>The device is cooled as quietly as possible with the aid of an electronic temperature control system; this depends on the amount of converted power, the ambient temperature, the level of soiling of the device, etc.</p> <hr/> <p>It is not possible to provide a workplace-related emission value for this device because the actual sound pressure level is heavily influenced by the installation situation, the power quality, the surrounding walls and the properties of the room in general.</p>
EMC measures	In certain cases, even though a device complies with the standard limit values for emissions, it may affect the application area for which it was designed (e.g. when there is sensitive equipment at the same location, or if the site where the device is installed is close to either radio or television receivers). If this is the case, then the operator is obliged to take appropriate action to rectify the situation.
Data protection	The user is responsible for the safekeeping of any changes made to the factory settings. The manufacturer accepts no liability for any deleted personal settings.
Copyright	Copyright of these operating instructions remains with the manufacturer.

The text and illustrations are all technically correct at the time of printing. We reserve the right to make changes. The contents of the operating instructions shall not provide the basis for any claims whatsoever on the part of the purchaser. If you have any suggestions for improvement, or can point out any mistakes that you have found in the instructions, we will be most grateful for your comments.

Protective Earthing (PE)

Connection of a point in the equipment, system, or installation to earth, for protection against electric shock in case of a fault. When installing the Tauro inverter, the PE connection is mandatory as it is a protection class 1 device. When connecting the PE conductor, make sure that it is secured against unintentional disconnection. All points listed under "Connecting the inverter to the public grid" must be observed, including the use of washers, detaching discs and nuts with the defined torque.

It must be ensured that when using the strain reliefs, the PE conductor will be the last to take the strain in the event of a possible failure. When connecting the PE conductor, the minimum cross section requirements defined by the respective national regulations must be observed. In addition and according to product standard IEC 62109-1, the minimum cross-section of the PE conductor must be at least half the of the phase cross-sections, since a cross-section of minimum 35mm² must be used for the phases (L1 / L2 / L3).

General information

Description of the device

Description of the device

The inverter transforms the direct current generated by the solar modules into alternating current. This alternating current is fed into the public grid synchronously with the grid voltage.

The inverter has been developed exclusively for use in grid-connected photovoltaic systems; it is impossible to generate energy independently of the public grid.

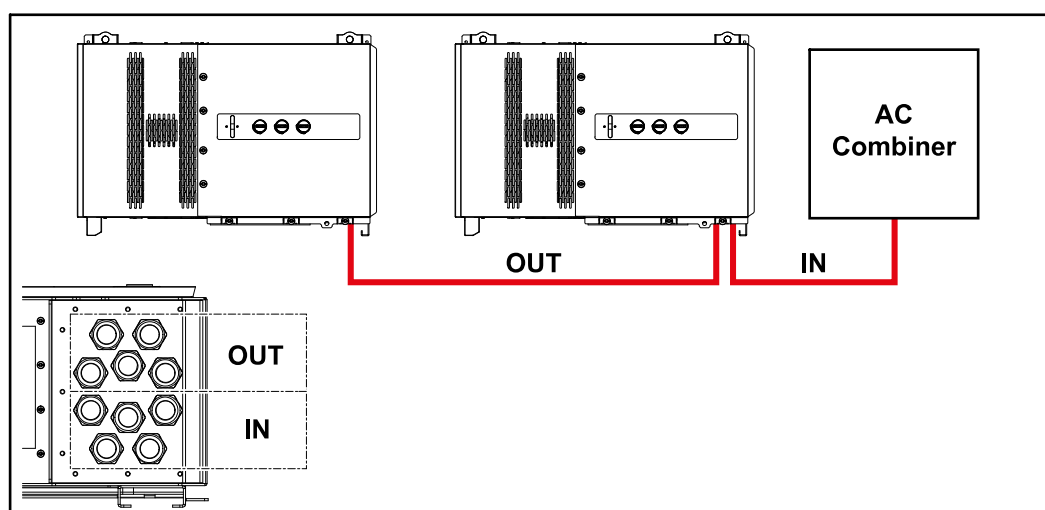
Thanks to its design and the way it works, the inverter is extremely safe both to install and to operate.

The inverter automatically monitors the public grid. In the event of abnormal grid conditions, the inverter ceases operating immediately and stops feeding power into the grid (e.g. if the grid is switched off, if there is an interruption, etc.).

The grid is monitored by monitoring the voltage, frequency and islanding conditions.

AC Daisy Chain

With the "AC Daisy Chain" inverter version, the AC lead can be fed directly from the inverter to another inverter. Several Tauro Eco inverters, up to an output power of max. 200 kW, can be thereby be quickly connected to one another.



String fuses

Only applies to device types Fronius Tauro 50-3-D / Eco 50-3-D / Eco 99-3-D / Eco 100-3-D (direct):

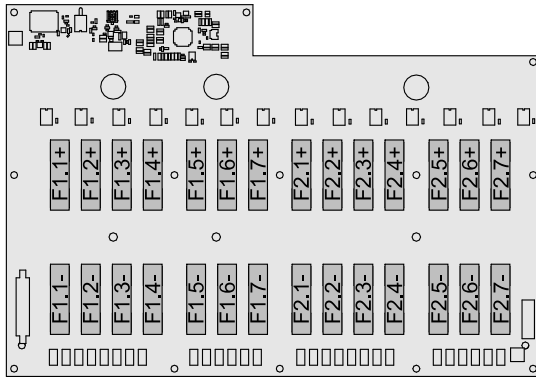
String fuses are used in the Fronius Tauro to provide additional protection for the solar modules.

The maximum short circuit current I_{SC} , the maximum module return current I_R or the maximum string fuse rating specified in the module data sheet of the respective solar module is crucial in affording the solar modules the correct fuse protection.

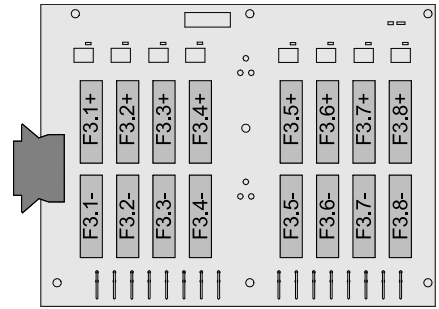
The national regulations regarding fuse protection must be observed. The electrical engineer carrying out the installation is responsible for the correct choice of string fuses.

To replace the string fuses, see chapter [Replacing the string fuses](#) on page 49.

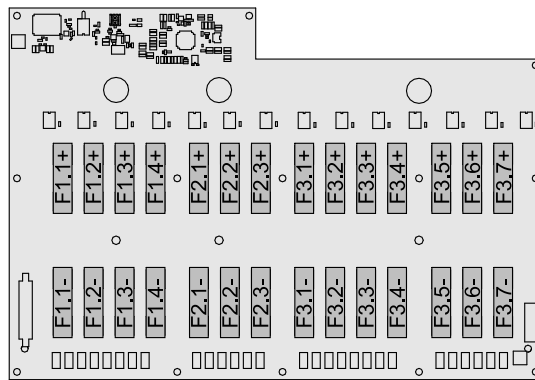
Fronius Tauro Eco 50-3-D
Fronius Tauro Eco 99 / 100-3-D
 F1.1 - F2.7



Fronius Tauro Eco 99 / 100-3-D
 F3.1 - F3.8



Fronius Tauro 50-3-D
 F1.1 - F3.7



Protection of people and equipment

Safety



WARNING!

Danger due to incorrect operation and incorrectly performed work.

This can result in serious injury and damage to property.

- ▶ All the work and functions described in this document must only be carried out by trained and qualified personnel.
- ▶ Read and understand this document.
- ▶ Read and understand all the Operating Instructions for the system components, especially the safety rules.



WARNING!

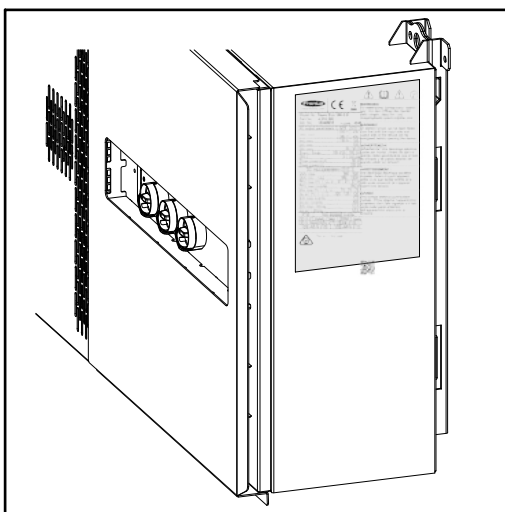
Danger from electromagnetic fields. Electromagnetic fields are generated during operation.

Effects on the health of persons, e.g. those wearing a pacemaker can result.

- ▶ Do not remain closer than 20 cm from the inverter for a prolonged period of time.

Warning notices and rating plate on the device

There are warning notices and safety symbols on and in the inverter. These warning notices and safety symbols must not be removed or painted over. They warn against incorrect operation, as this may result in serious injury and damage.



Safety symbols:



Danger of serious injury and damage due to incorrect operation



Do not use the functions described here until you have fully read and understood the following documents:

- These Operating Instructions
- All the Operating Instructions for the system components of the photovoltaic system, especially the safety rules



Dangerous electrical voltage



Before opening the machine, wait for the capacitors to discharge!



To comply with European Directive 2012/19/EU on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device that you no longer require must be returned to your distributor or disposed of at an approved collection and recycling facility in your area. Ignoring this European Directive may have potentially adverse effects on the environment and your health!



RCM symbol

- The product complies with Australian legislative requirements.

Text of the warning notices:

WARNING!

An electric shock can be fatal. Before opening the device, it must be disconnected at the input and output. Wait for the capacitors to discharge (7 minutes).

WSD (wired shutdown)

The wired shutdown (WSD) interrupts the inverter's grid power feed if the trigger device (switch) has been activated.

If an inverter (slave) fails, it is bypassed and the other inverters continue operating. If a second inverter (slave) or the inverter (master) fails, the operation of the entire WSD chain is interrupted.

For installation, see [WSD \(wired shutdown\)](#) on page [56](#).

Central grid and system protection

The inverter offers the option to use the integrated AC relays as coupling switches in conjunction with a central grid and system protection unit (in accordance with VDE-AR-N 4105:2018:11 §6.4.1). For this purpose, the central trigger device (switch) must be integrated into the WSD chain as described in the chapter "WSD (Wired Shut Down)".

RCMU

The inverter is equipped with a universal current-sensitive residual current monitoring unit (RCMU = Residual Current Monitoring Unit) in accordance with IEC 62109-2. This device monitors residual currents from the PV module to the grid connection of the inverter and disconnects the inverter from the grid in the event of unauthorised residual current.

Surge protective device

The inverter is equipped with an integrated surge protective device on the DC and AC side in accordance with IEC 62109-2. The surge protective device protects the system against damage in the event of an overvoltage.

Proper use

Proper use

The solar inverter is intended exclusively to convert direct current from solar modules into alternating current and to feed this into the public grid.

Utilisation not in accordance with the intended purpose comprises:

- Any use above and beyond this purpose
- Making any modifications to the inverter that have not been expressly approved by Fronius
- Installation of parts that are not distributed or expressly approved by Fronius

The manufacturer shall not be liable for any damage resulting from such use. All warranty claims will be forfeited.

Proper use also includes:

- Following all the instructions contained in the Operating Instructions
 - Performing all stipulated inspection and servicing work
-

Regulations governing the photovoltaic system

The inverter is designed to be connected and used exclusively in conjunction with solar modules.

Use of the inverter with other DC generators (e.g. wind generators) is not permitted.

When designing the photovoltaic system, ensure that all of its components are operated within their permitted operating ranges at all times.

Observe all the measures recommended by the solar module manufacturer to ensure that the solar module retains its properties in the long term.

Functional principle

Functional principle

The inverter operates fully automatically. As soon after sunrise as there is sufficient energy available from the solar modules, the inverter starts checking the PV system (insulation measurement), and the grid (grid voltage and grid frequency). If all values are within the normative scope, automatic connection to the grid and feeding of energy into the grid takes place.

The inverter works in a way that ensures the maximum power possible is obtained from the solar modules. This is known as "Maximum Power Point Tracking" (MPPT). In the event of shading of the solar modules, the function "Dynamic Peak Manager" can be used to obtain the majority of the local maximum output (LMPP) of the PV system.

After dusk, as soon as the power available has fallen below the level at which energy can be fed into the grid, the inverter disconnects the power electronics completely from the grid and stops running. It retains all its settings and stored data.

Cooling of the inverter through forced-air ventilation

Cooling of the inverter is performed by a forced-air ventilation system via temperature-controlled fans. Air is sucked in from the front and fed, via a sealed duct, through the AC and DC heat sink, before passing directly over the inductors and dissipating.

The sealed air duct prevents the electronics compartment from coming into contact with the ambient air. This approach largely prevents any contamination of the electronics compartment.

The fan speed and temperature of the inverter are monitored.

The variable-speed, ball-bearing mounted fans in the inverter permit the following:

- Optimum cooling of the inverter
 - Cooler components, therefore a longer service life
 - Lowest-possible energy consumption
 - High output power including in top temperature range of the inverter
-

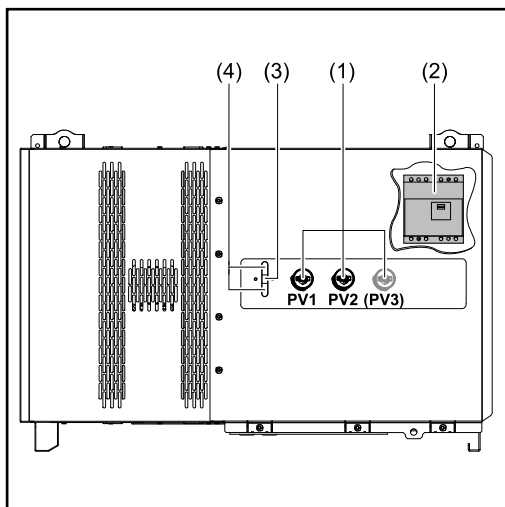
Power derating

If the inverter becomes too hot, it automatically reduces the current output power in order to protect itself. Reasons for the inverter becoming too hot include too high an ambient temperature or inadequate heat dissipation (e.g. when installed in containers without proper heat dissipation measures).

A power derating system restricts the output from the inverter in order to prevent the temperature from exceeding the permissible value.

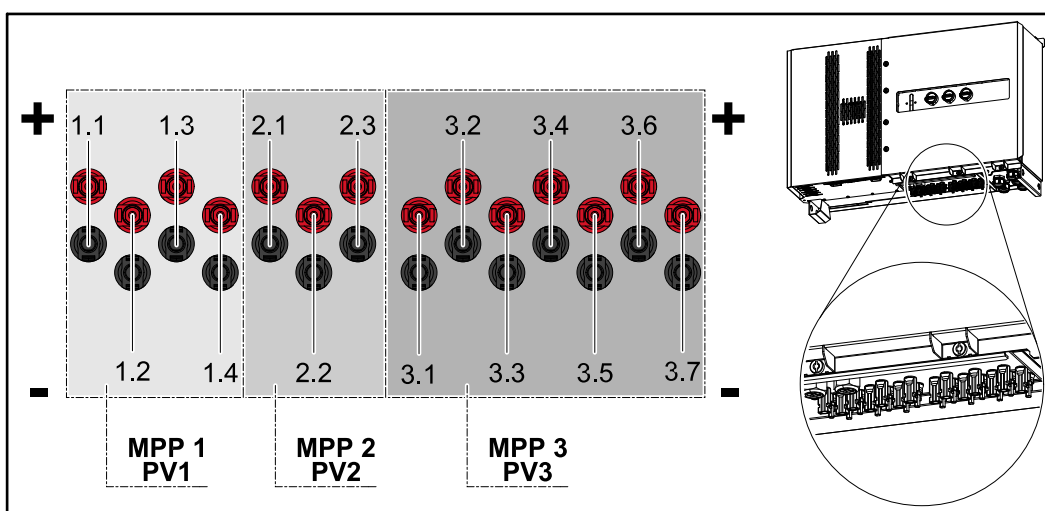
Control elements and connections

Controls and displays

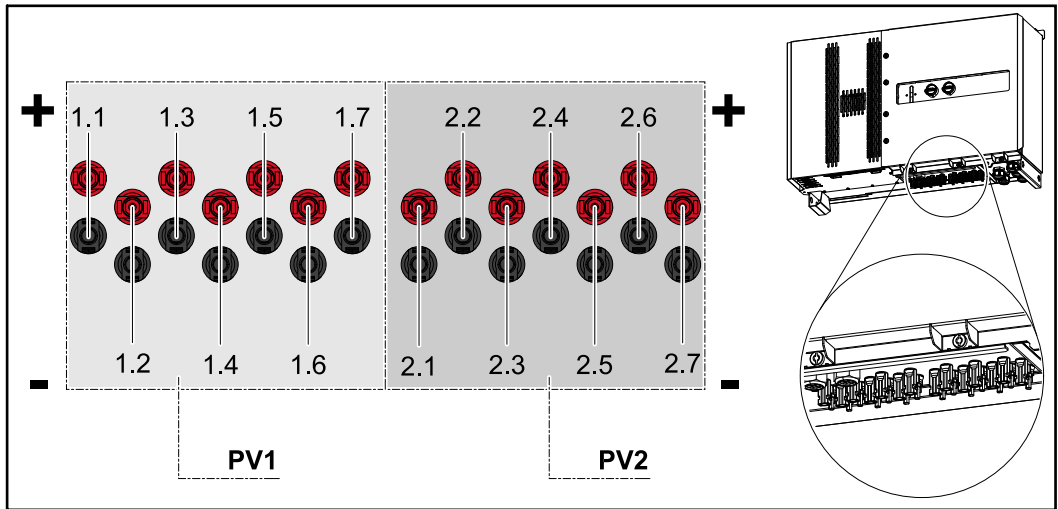


- (1) **DC disconnector**
Breaks the electrical connection from the solar modules to the inverter. Depending on the device type, 2 or 3 DC disconnectors are installed.
The DC disconnectors can be secured against switching on with a padlock.
- (2) **AC disconnecter option**
The optional AC disconnecter breaks the connection from the inverter to the grid
- (3) **Button function**
For further information about the button function, see [Button functions and LED status indicator](#)
- (4) **LED status indicator**
For further information about the LED status indicator, see [Button functions and LED status indicator](#)

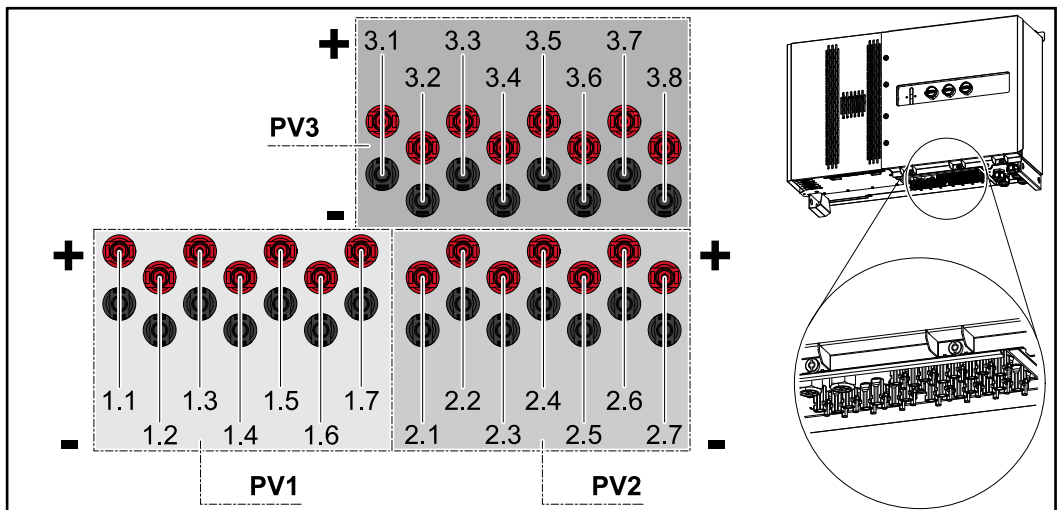
PV connections - Tauro 50 kW direct



**PV connections -
Tauro 50 kW Eco
direct**

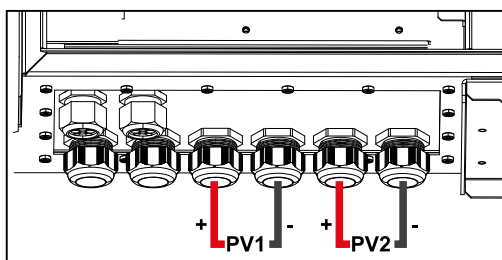


**PV connections -
Tauro 99/100 kW
Eco direct**

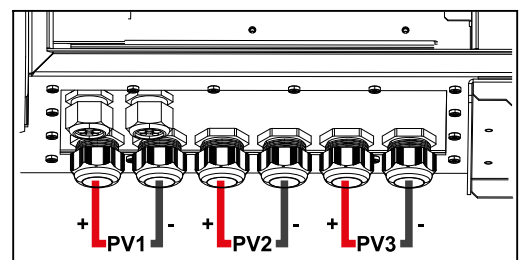


**PV connections -
Tauro pre-com-
bined**

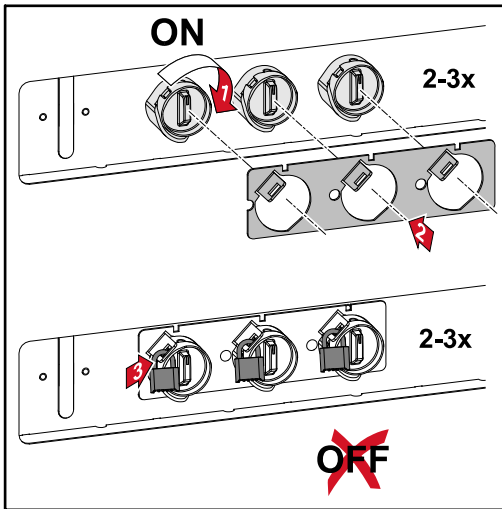
Tauro Eco 50 / 99 / 100 kW



Tauro 50 kW

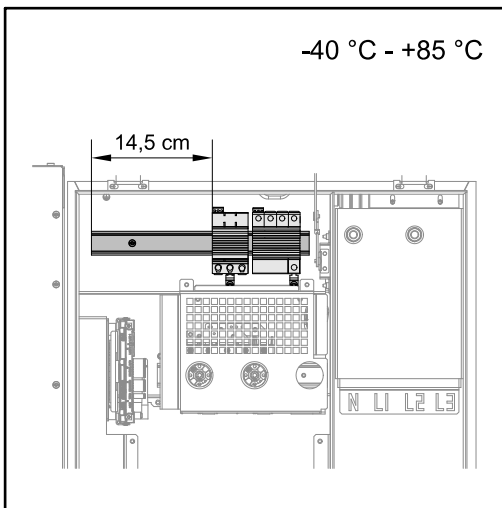


Optional DC disconnector lock



With the optionally available DC disconnector lock, the inverter can be secured against unintentional switching off.

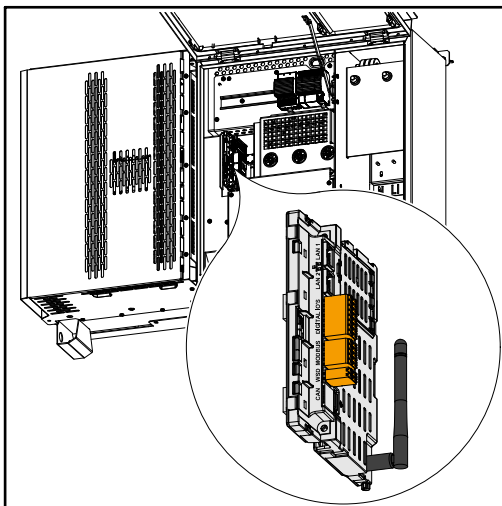
Mounting option for third-party components



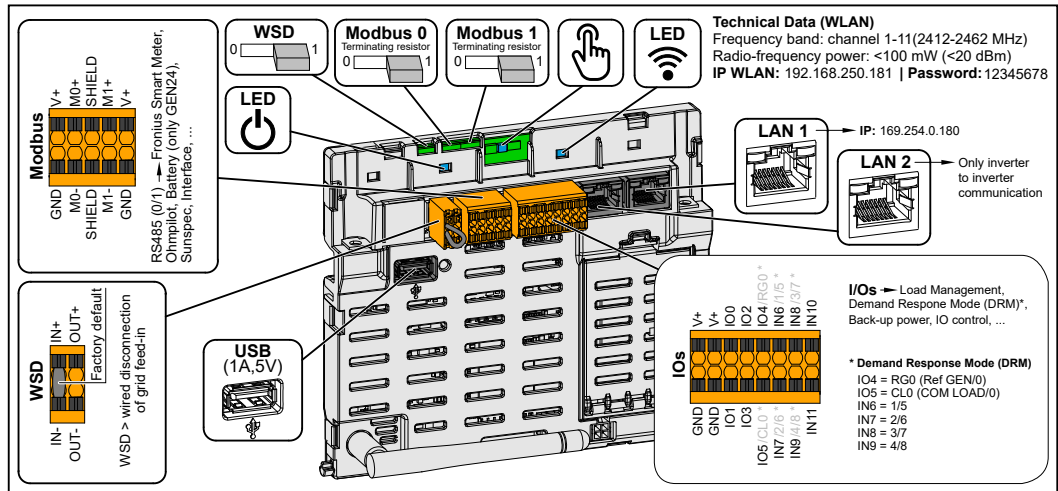
Above the DC connection area there is space for mounting third-party components. Components up to a maximum width of 14.5 cm (8 DU) can be mounted on the DIN rail. The components must have a temperature resistance of -40 °C to +85 °C.

Data communication area in the inverter

The data communication area (Pilot PC board) is located above the DC connections in the inverter.



Data communication area



Modbus terminal

Push-in terminal for the installation of Modbus 0, Modbus 1, 12 V and GND (Ground).

The data connection to the connected components is established via the Modbus terminal. The inputs M0 and M1 can be selected for this purpose. Max. 4 Modbus participants per input, see chapter [Modbus participants](#) on page 53.

WSD (wired shutdown) switch

Defines the inverter as a WSD master or WSD slave.

Position 1: WSD master
Position 0: WSD slave

Modbus 0 (MB0) switch

Switches the terminating resistor for Modbus 0 (MB0) on/off.

Position 1: Terminating resistor on (factory setting)
Position 0: Terminating resistor off

Modbus 1 (MB1) switch

Switches the terminating resistor for Modbus 1 (MB1) on/off.

Position 1: Terminating resistor on (factory setting)
Position 0: Terminating resistor off

Optical sensor

To operate the inverter. See chapter [Button functions and LED status indicator](#) on page 22.

Communication LED

Indicates the inverter connection status.

Operating status LED

Indicates the inverter operating status.

LAN 1

Ethernet connection for data communication.

LAN 2

Ethernet connection for data communication from inverter to inverter.

WSD terminal	Push-in terminal for the WSD installation. See chapter WSD (wired shut-down) on page 56.
USB	Power supply max. 1 A at 5 V. Software updates and data recording via USB is not possible.
IOs terminal	Push-in terminal for digital inputs/ outputs. See chapter Permitted cables for the data communication area on page 53. The designations (RG0, CL0, 1/5, 2/6, 3/7, 4/8) on the terminal refer to the Demand Response Mode function, see chapter "PSC editor - AUS - Demand Response Modes (DRM)" on page 63.

Internal schematic connection diagram of the IOs

On the V+/GND pin, it is possible to feed in a voltage of around 12.5 - 24 V (+ max. 20%) with an external power supply. The outputs IO 0 - 5 can then be operated with the external voltage. A maximum of 1 A can be drawn per output, with a maximum of 3 A allowed in total. The fuse protection must be located externally.

⚠ CAUTION!

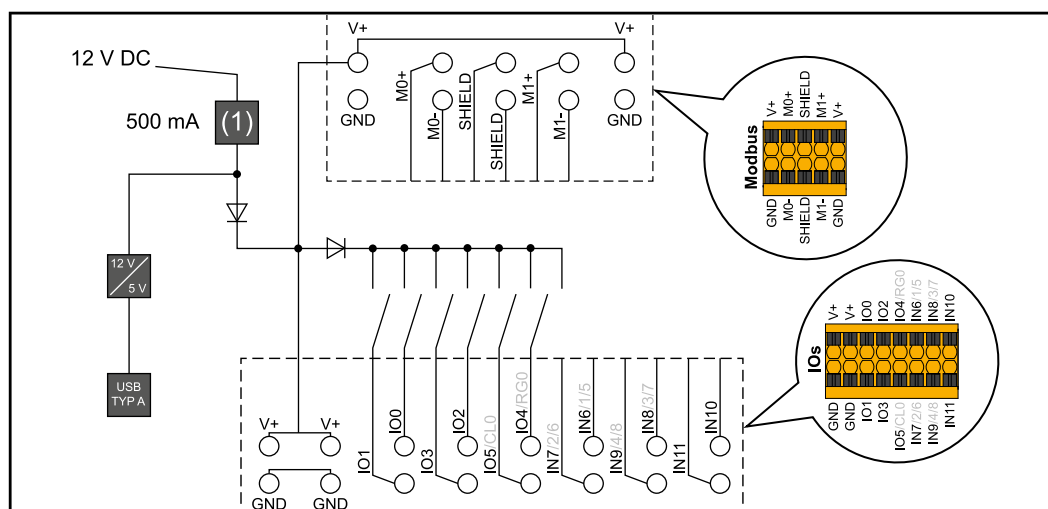
Risk of polarity reversal at the terminals due to improper connection of external power supplies.

This may result in severe damage to the inverter.

- ▶ Check the polarity of the external power supply with a suitable measuring device before connecting it.
- ▶ Connect the cables to the V+/GND outputs with the correct polarity.

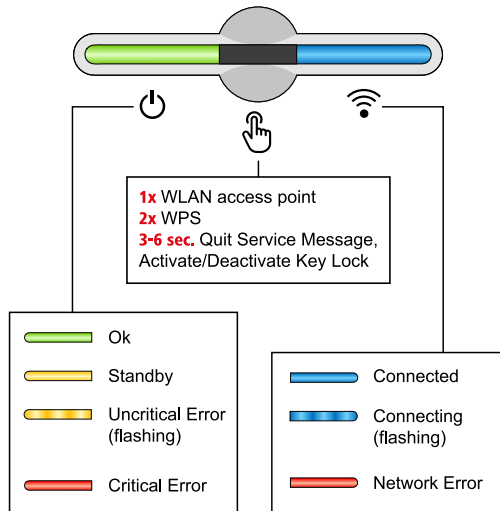
IMPORTANT!

If the total output (6 W) is exceeded, the inverter switches off the entire external power supply.



(1) Power limitation

Button functions and LED status indicator



The status of the inverter is shown via the operating status LED. In the event of faults, carry out the individual steps in the Fronius Solar.web live app.

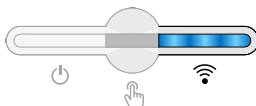


The optical sensor is actuated by touching with a finger.



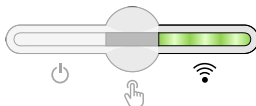
The status of the connection is shown via the communication LED. To establish the connection, carry out the individual steps in the Fronius Solar.web live app.

Sensor functions



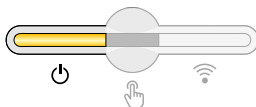
1x = WLAN access point (AP) is opened.

Flashing blue



2x = WLAN Protected Setup (WPS) is activated.

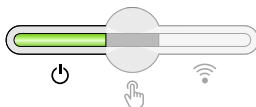
Flashing green



3 seconds (max. 6 seconds) = the service notification is terminated and the key lock is deactivated.

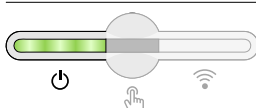
Lights up yellow

LED status indicator



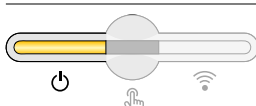
The inverter is operating correctly.

Lights up green



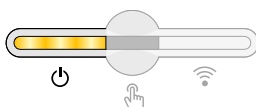
The inverter starts.

Flashing green



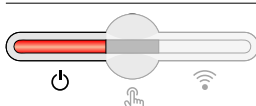
The inverter is in standby, is not operational (e.g. no feed-in at night) or is not configured.

Lights up yellow



The inverter indicates a non-critical status.

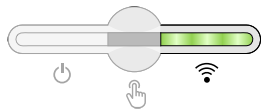
Flashing yellow



The inverter indicates a critical status and there is no grid power feed process.

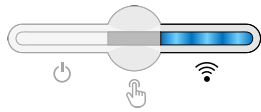
Lights up red

LED status indicator



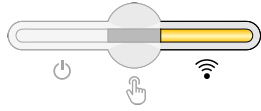
The network connection is being established via WPS.
2x [button icon] = WPS search mode.

Wi-Fi Flashing green



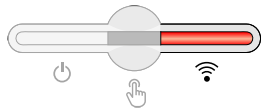
The network connection is being established via WLAN AP.
1x [button icon] = WLAN AP search mode (active for 30 minutes).

Wi-Fi Flashing blue



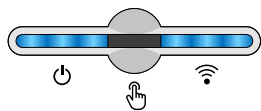
The network connection is not configured.

Wi-Fi Lights up yellow



The inverter is operating correctly, a network fault is indicated.

Wi-Fi Lights up red



The inverter is performing an update.

[power icon] / Wi-Fi Flashing blue

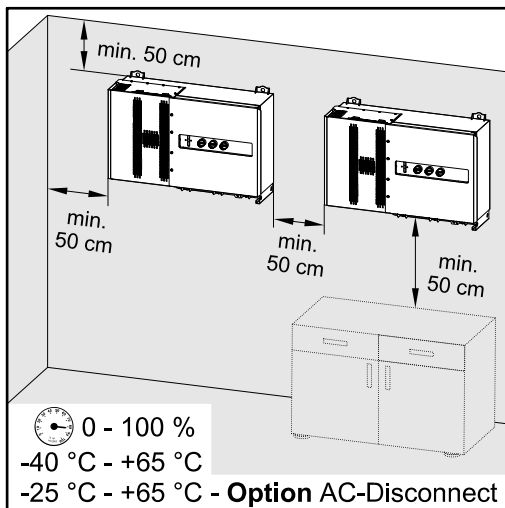
Installation and commissioning

Installation location and position

Choosing the location of the inverter

Please note the following criteria when choosing a location for the inverter:

Only install on a solid, non-flammable surface



Max. ambient temperatures: -40 °C / +65 °C

* with built-in AC disconnect option: -25 °C / +65 °C

Relative humidity: 0-100%

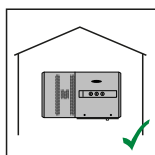
When installing the inverter in a switch cabinet or similar closed environment, it is necessary to make sure that the hot air that develops will be dissipated by forced-air ventilation.

When installing the inverter on the outer walls of cattle sheds, it is important to keep a minimum clearance of 2 m between all sides of the inverter and air vents and building openings.

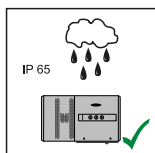
The following surfaces are permissible for installation:

- Walls (corrugated metal walls [mounting rails], brick walls, concrete walls, or other non-flammable surfaces sufficiently capable of bearing loads)
- Poles (installed using mounting rails, behind the solar modules directly on the PV mounting system)
- Flat roofs (if installing on a foil roof, make sure that the foils adhere to the fire protection requirements and are thus not easily flammable. Ensure compliance with the national provisions.)
- Covered car park roofs (no overhead installation)

The DC disconnects must always be freely accessible after installation of the inverter.

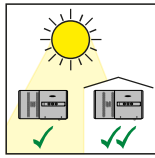


The inverter is suitable for indoor installation.



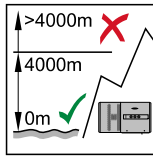
The inverter is suitable for outdoor installation.

Because of its IP 65 protection class, the inverter is resistant to water jets from any direction and can also be used in damp environments.

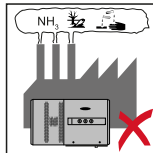


The inverter is suitable for outdoor installation.

In order to minimise the heating up of the inverter, it is better to not expose the inverter to direct insolation. The inverter should be installed in a protected location, for example, near the solar modules or under an overhanging roof.

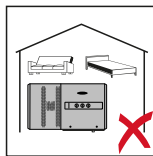


IMPORTANT! The inverter must not be installed or used at altitudes above 4000 m.

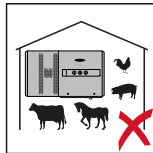


Do not install the inverter in:

- Areas where it may be exposed to ammonia, corrosive gases, acids or salts (e.g. fertiliser storage areas, vent openings for livestock stables, chemical plants, tanneries, etc.)

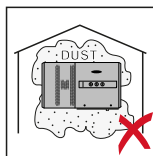


Due to the noise generated by the inverter under certain operating conditions, it should not be installed close to living areas.



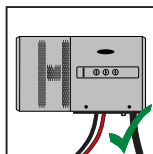
Do not install the inverter in:

- Areas where there is an increased risk of accidents from farm animals (horses, cattle, sheep, pigs, etc.)
- Stables or adjoining areas
- Storage areas for hay, straw, chaff, animal feed, fertilizers, etc.
- Storage or processing areas for fruit, vegetables or viticulture products
- Areas used in the preparation of grain, green fodder or animal feeds

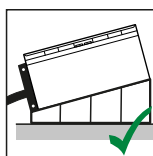
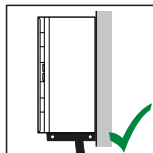


The inverter is designed to be dustproof in line with IP 65. However, in areas with a heavy build-up of dust, the thermal efficiency may still be impaired by dust forming on the cooling surfaces. Regular cleaning is necessary in such situations. We therefore recommend not installing the inverter in areas and environments with high dust accumulation.

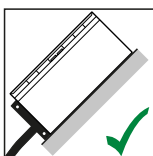
Explanation of symbols for the installation position



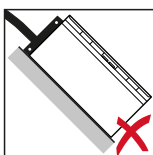
The inverter is designed to be installed vertically on a vertical wall. The optional fitting base must not be used for vertical installation.



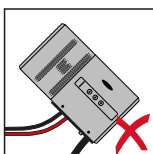
The inverter should have a minimum inclination of 3° in a horizontal installation position so that water can run off. Installing the optional fitting base is recommended. The fitting base may only be used on an installation position of 0 - 45°.



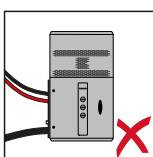
The inverter is suitable for installation on a sloping surface.



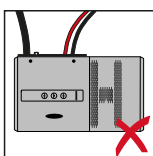
Do not install the inverter on a sloping surface with its connection sockets at the top.



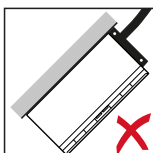
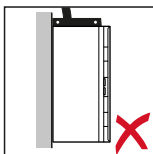
Do not install the inverter at an angle on a vertical wall or column.



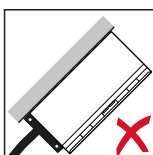
Do not install the inverter horizontally on a vertical wall or pillar.



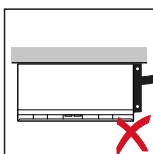
Do not install the inverter on a vertical wall or pillar with its connection sockets facing upwards.



Do not install the inverter overhanging with the connection sockets at the top.



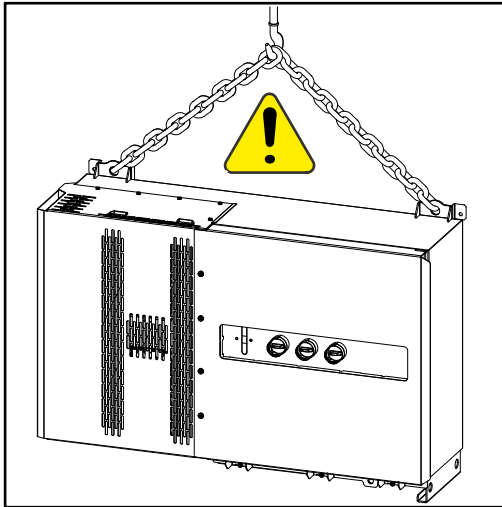
Do not install the inverter overhanging with the connection sockets at the bottom.



Do not install the inverter on the ceiling.

Transport

Crane transport



 **WARNING!**

Danger of serious injury and damage from articles being dropped or falling over.

When transporting by crane:

- ▶ Hook chains and ropes onto the suspension points only
 - ▶ Always hook chains and ropes onto both suspension points
-

Transporting by counterbalanced lift truck or lift truck

 **WARNING!**

Equipment that falls or topples over can cause serious or even fatal injury.

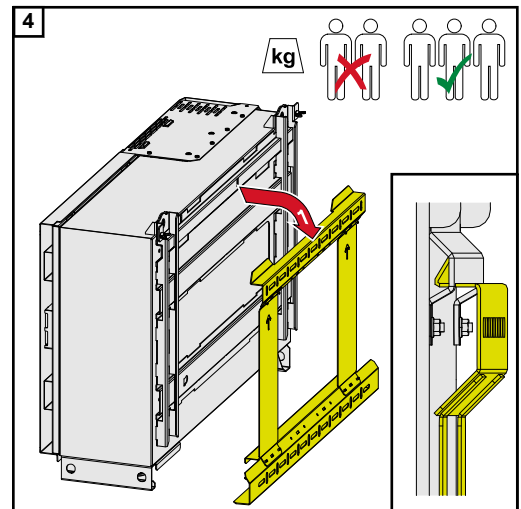
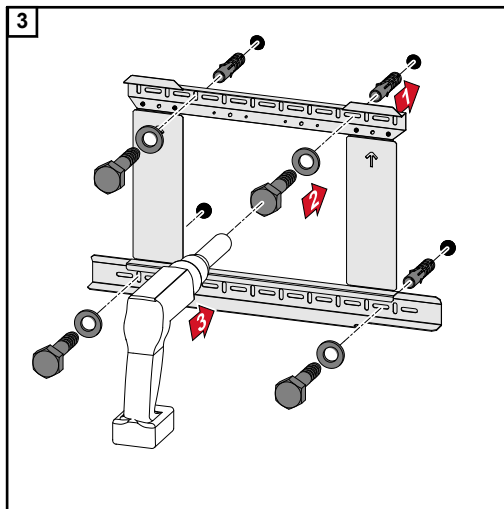
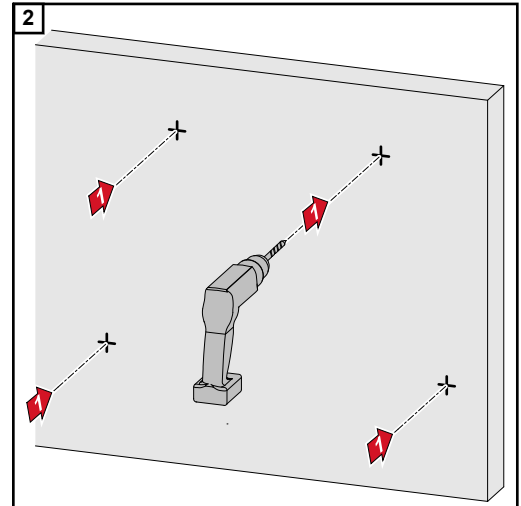
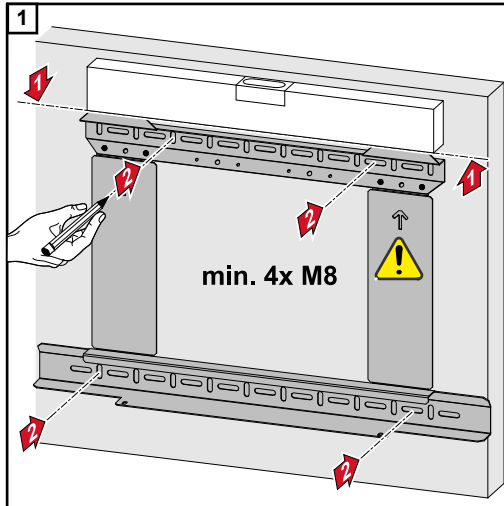
- ▶ Secure the inverter to prevent it from falling over when transporting on a counterbalanced lift truck or lift truck.
 - ▶ Avoid sudden changes in direction, braking or acceleration
-

Mounting the inverter

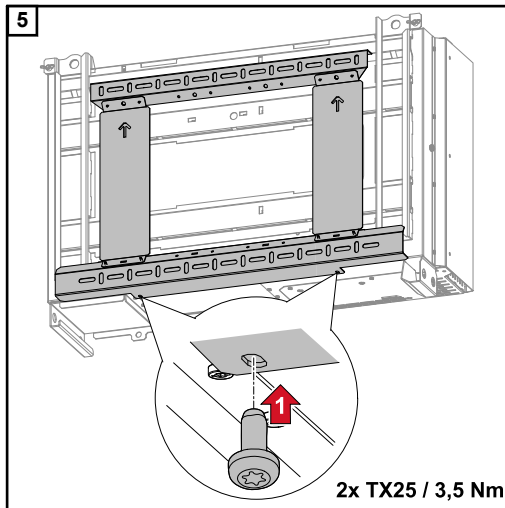
Selecting the fixing material

Use the corresponding fixing materials depending on the subsurface and observe the screw dimension recommendations for the mounting bracket. The installer is responsible for selecting the right type of fixing.

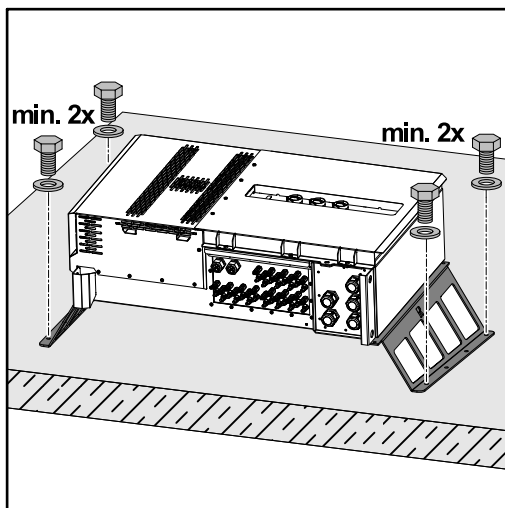
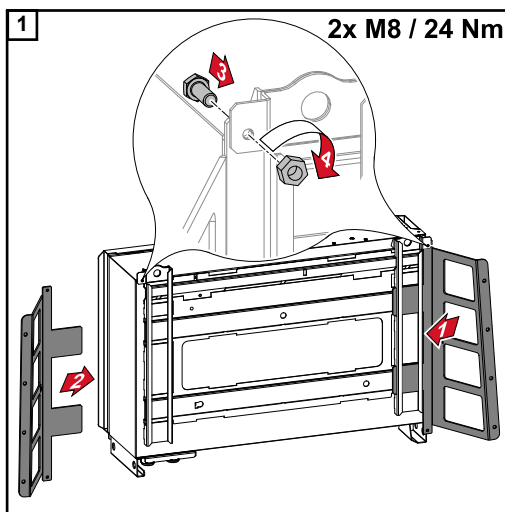
Mounting the inverter on the wall



Observe the local regulations for lifting heavy loads or use a crane to lift the device (attach to crane-hoisting lugs)



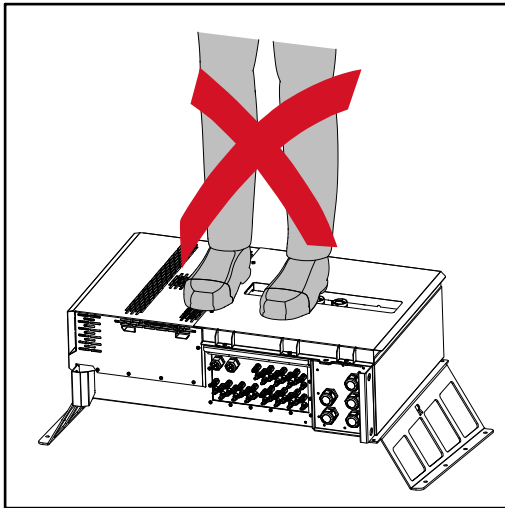
Mounting the inverter on the fitting base



Mounting the inverter on a horizontal mounting surface is not mandatory, but recommended.

Depending on the surface, different wall plugs and screws are required for floor mounting of the fitting base. Wall plugs and screws are therefore not included in the scope of supply of the inverter. The installer is responsible for selecting the correct wall plugs and screws.

- 2** Mount the inverter and fitting base securely to a suitable surface using the appropriate installation materials



Do not climb onto the device!

Connecting the inverter to the public grid (AC side)

Monitoring the grid

IMPORTANT! To provide the best possible grid monitoring, the resistance in the leads to the mains connections should be as low as possible.

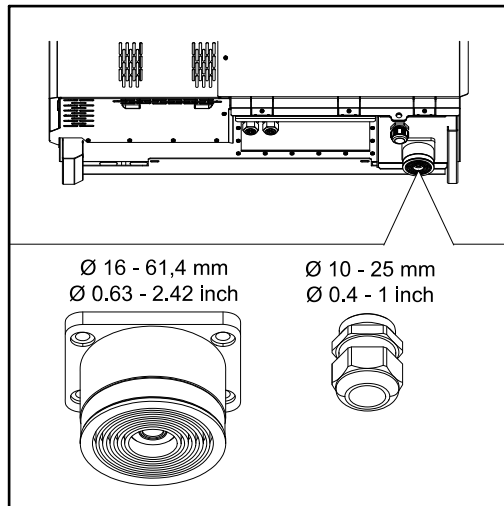
AC connection area

IMPORTANT! Only the following cables may be connected to V-type terminals:

- RE (solid round conductor)
- RM (stranded round conductor)
- SE (solid sector conductor)
- SM (stranded sector conductor)
- Fine-core cables only in conjunction with ferrules

Fine-core cables without ferrules may only be connected to the M10 threaded bolts of the grid connections using a suitable M10 cable lug;
torque = 18 Nm

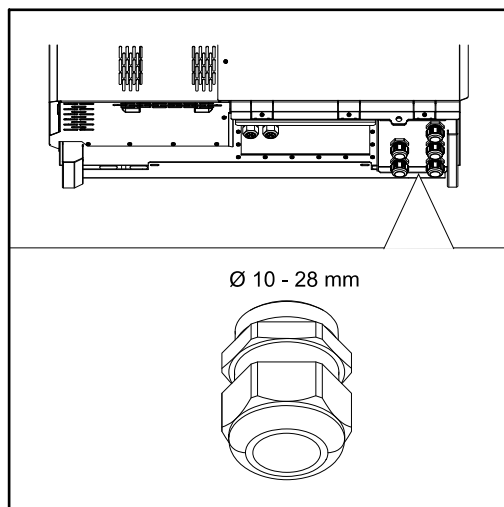
Cable gland "Multicore" version



The following cable outer diameters are compatible with the larger bushing:
16 - 27.8 - 36.2 - 44.6 - 53 - 61.4 mm

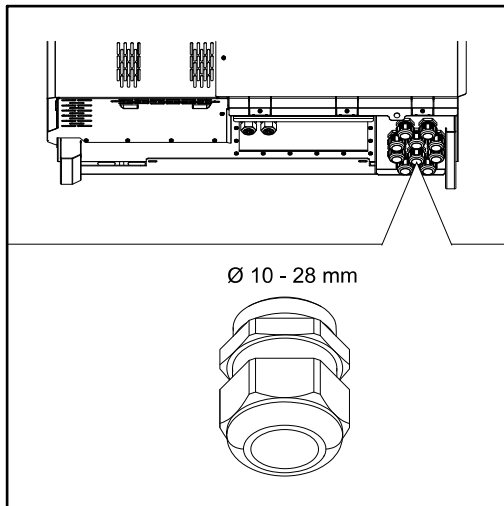
For the small bushing, earthing (grounding) cables of 10 - 25 mm can be fed through.

Cable gland "Singlecore" version



5 M40 bushings

Cable gland "AC Daisy Chain" version



10 M40 bushings

Connecting aluminium cables

Aluminium cables can be connected to the mains connections.

NOTE!

When connecting aluminium cables:

- ▶ Observe national and international guidelines regarding the connection of aluminium cables
- ▶ To protect the aluminium strands from oxidation, grease them with a suitable grease.
- ▶ Follow the instructions of the cable manufacturer

Permitted cables

The temperature resistance of the AC cables must be at least 90 C.

If cables are used that do not meet this temperature requirement, pass the protective hose (item number: 4,251,050) over the phases (L1 / L2 / L3) and neutral conductor (N). The earthing PE does not have to be protected with a protective hose. With the AC Daisy Chain option, all phases and neutral conductors must be protected with the protective hose. Thus, two sets of protective hoses are required for the AC Daisy Chain option.

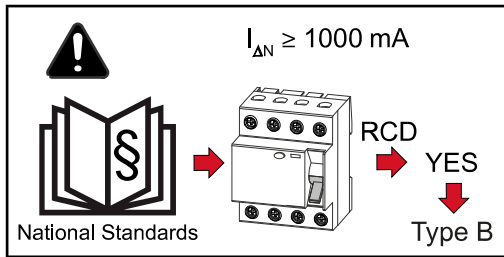
Grid connections		
Select sufficiently high cable cross sections depending on the power category and connection option!		
Power category	Connection option	Cable cross section
Tauro 50-3 Tauro Eco 50-3	Standard	35 - 240 mm ²
	AC disconnecter option	35 - 240 mm ²
	Daisy Chain (without AC disconnecter)	35 - 240 mm ²
Tauro Eco 99-3 Tauro Eco 100-3	Standard	70 - 240 mm ²
	AC disconnecter option	70 - 240 mm ²
	Daisy Chain (without AC disconnecter)	70 - 240 mm ²

Maximum alternating current fuse protection

NOTE!

National regulations, the grid operator's specifications or other factors may require a residual current circuit breaker in the AC connection lead.

For this situation, a type B residual-current circuit breaker is generally adequate. However, false alarms can be triggered for the type B residual current circuit breaker in individual cases and depending on local conditions. For this reason, in accordance with national legislation, Fronius recommends that a residual current protection device with a tripping current of at least 1000mA suitable for frequency converters be used.



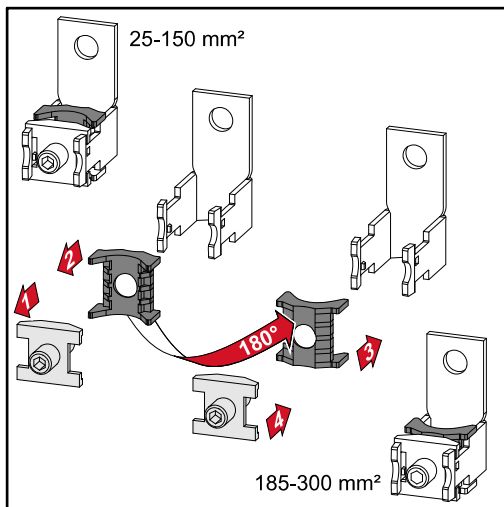
NOTE!

The inverter can be used with max. an automatic circuit breaker 355 A.

Inverter	Phases	Nominal output	Max. fuse rating
Fronius Tauro 50-3	3	50 kVA	3 x 355 A
Fronius Tauro Eco 50-3	3	50 kVA	3 x 355 A
Fronius Tauro Eco 99-3	3	99 kVA	3 x 355 A
Fronius Tauro Eco 100-3	3	100 kVA	3 x 355 A

Changing the clamping area for V-type terminal

The clamping area of the V-type terminal when delivered is 25 - 150 mm². A simple conversion of the V-type terminal can change the clamping area to 185 - 300 mm².



Additional PE introduction for earthing

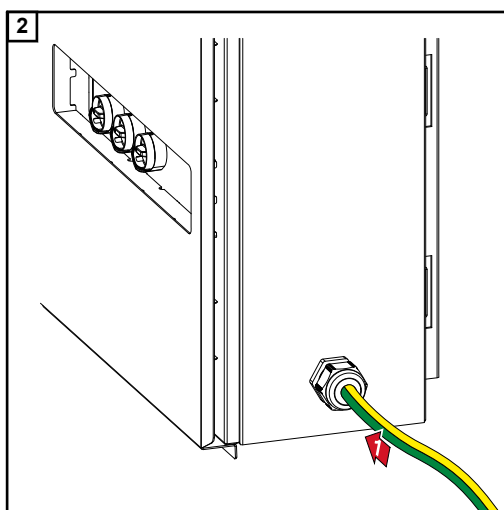
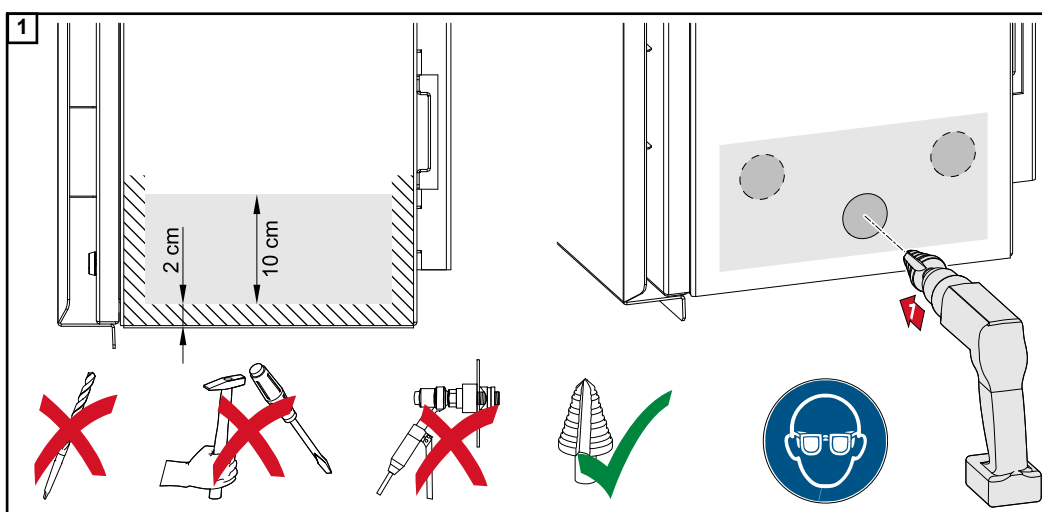
An optional hole can be made on the right side of the housing at the bottom for an additional PE introduction.

CAUTION!

Danger from faulty or incorrect holes.

This may lead to injuries to the eyes and hands as a result of flying debris and sharp edges, as well as damage to the inverter.

- ▶ When drilling, wear suitable protective goggles.
- ▶ Only use a step drill when drilling.
- ▶ Ensure that nothing is damaged inside the device (for example connection block).
- ▶ Adapt the diameter of the hole to match the corresponding connection.
- ▶ Deburr the holes using a suitable tool.
- ▶ Remove the drilling residues from the inverter.



Insert the screw connection in the hole and secure to the torque specified by the manufacturer.

The opening must be sealed in accordance with the protection class of the inverter!

Safety

WARNING!

Danger due to grid voltage and DC voltage from solar modules.

An electric shock can be fatal.

- ▶ Ensure that both the AC side and the DC side of the inverter are de-energised before carrying out any connection work.
- ▶ Only an authorised electrical engineer is permitted to connect this equipment to the public grid.

CAUTION!

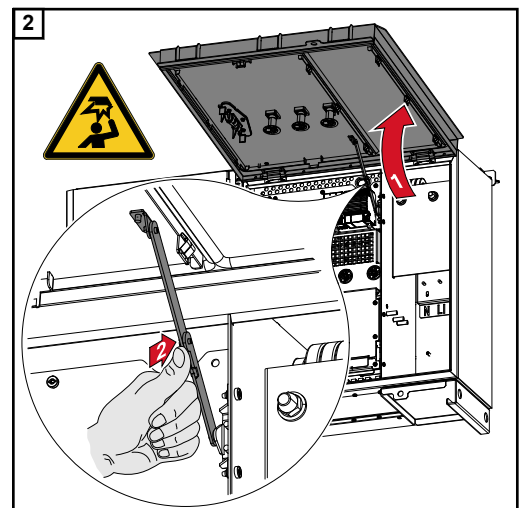
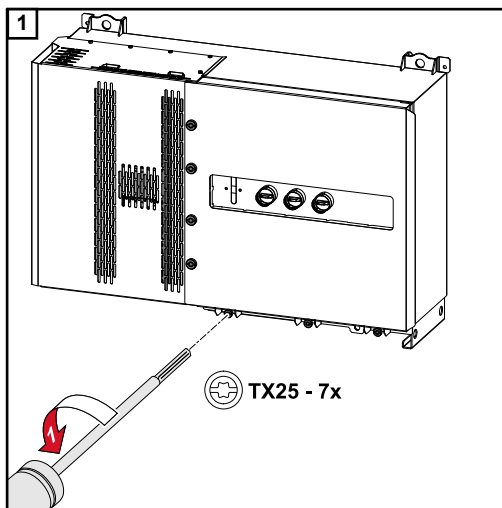
Risk of damage to the inverter as the result of incorrectly tightened cable connections.

Incorrectly tightened cable connections can cause heat damage to the inverter that may result in a fire.

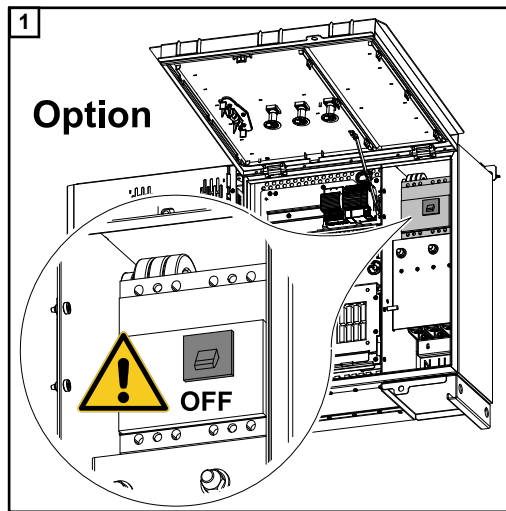
- ▶ When connecting AC and DC cables, ensure that all the cables are tightened to the inverter terminals with the specified torque.

IMPORTANT! For PE connection, the requirements defined under "Safety rules" for a safe connection of the PE conductor must also be observed.

Opening the inverter

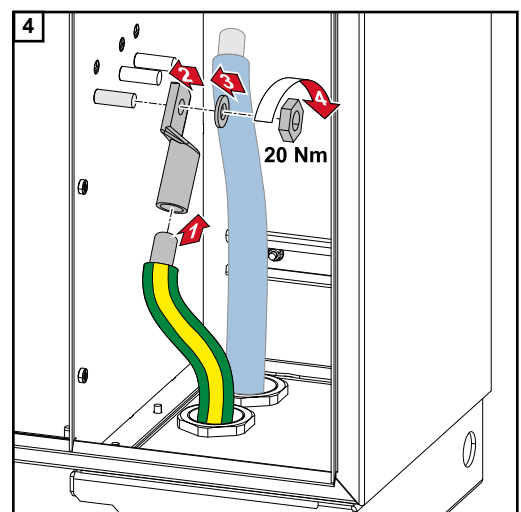
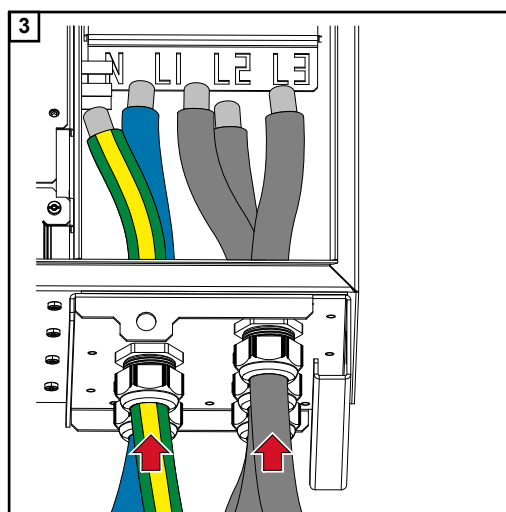
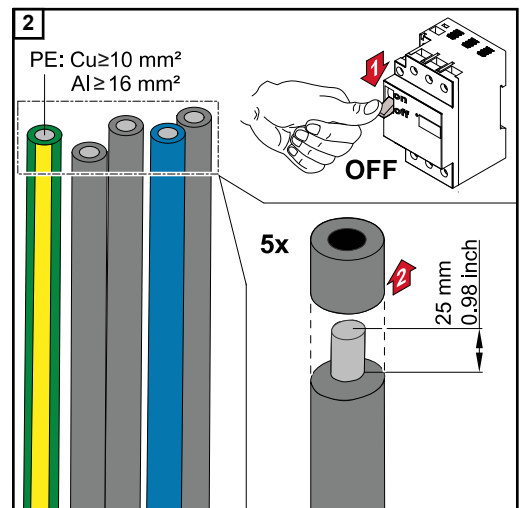
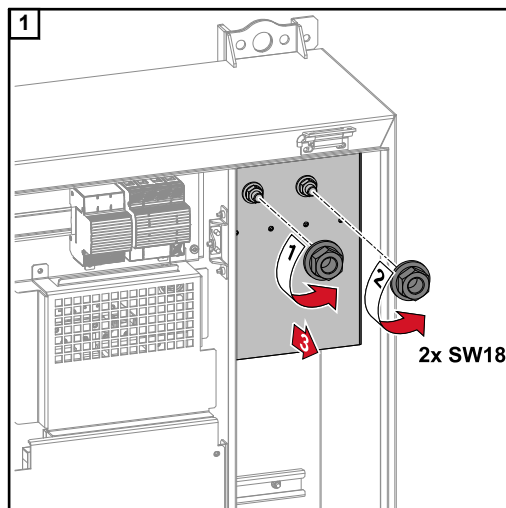


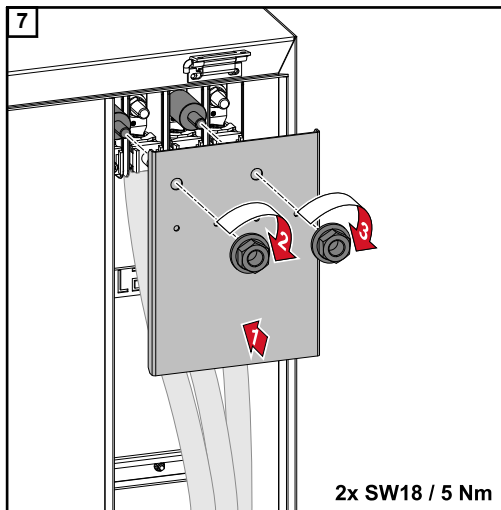
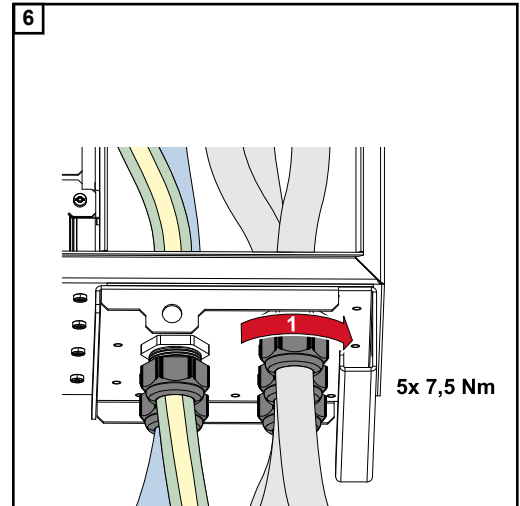
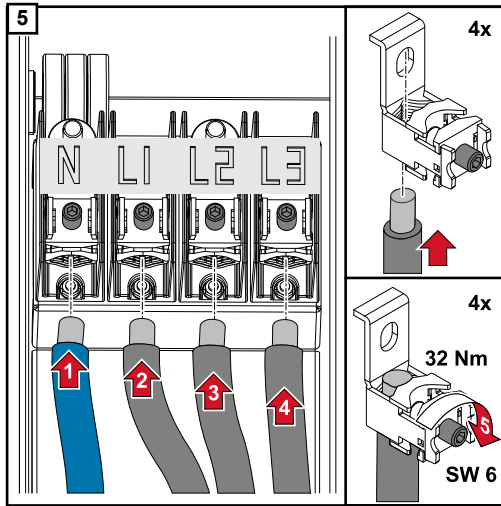
Switching off the AC disconnector option



Connecting the inverter to the public grid - Singlecore

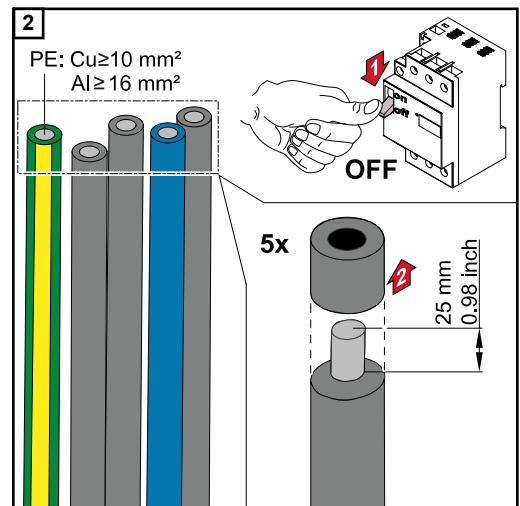
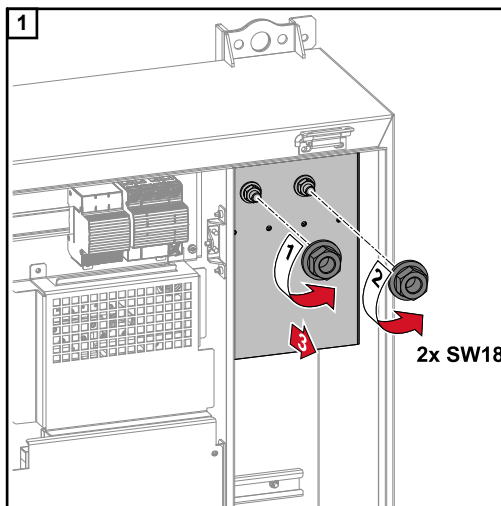
Ensure that the phases are connected in the right order: PE, N, L1, L2 and L3.

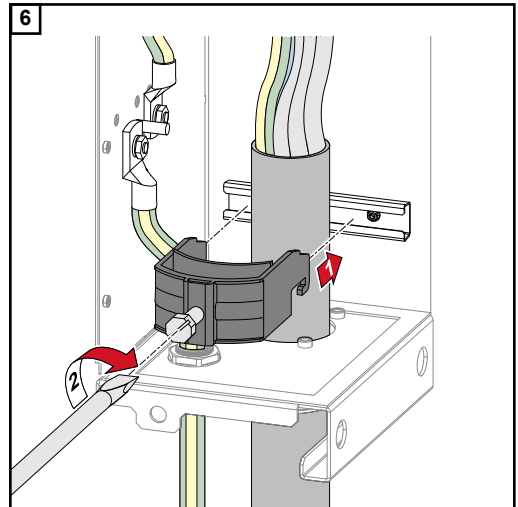
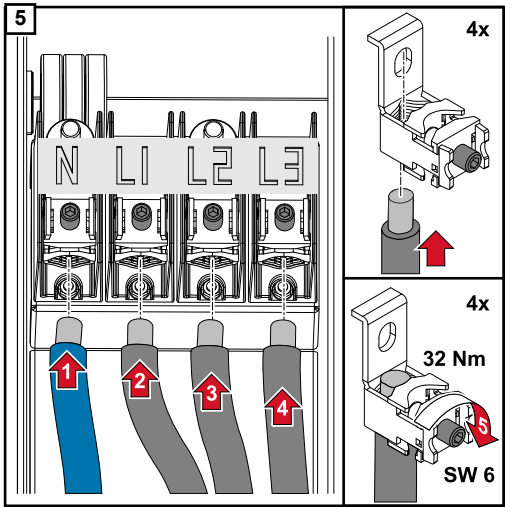
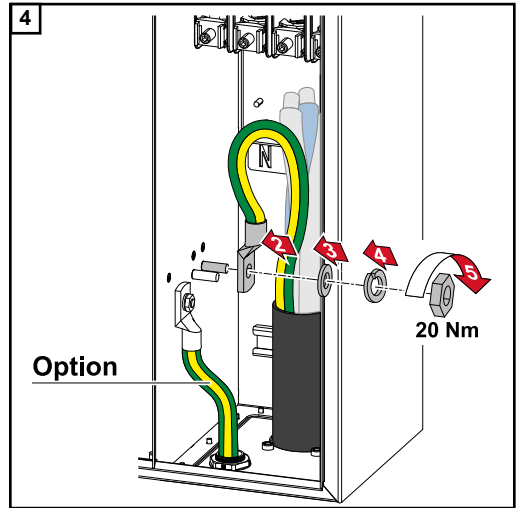
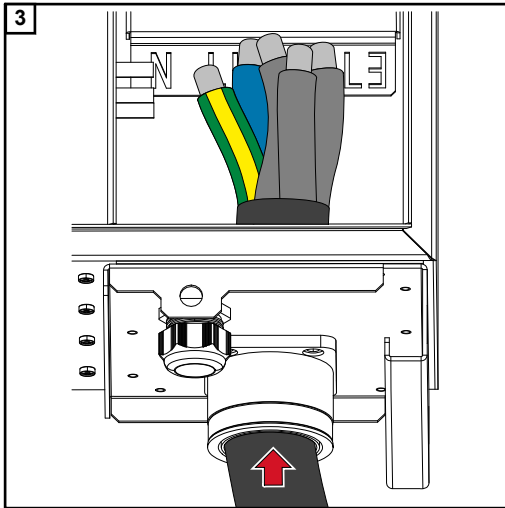




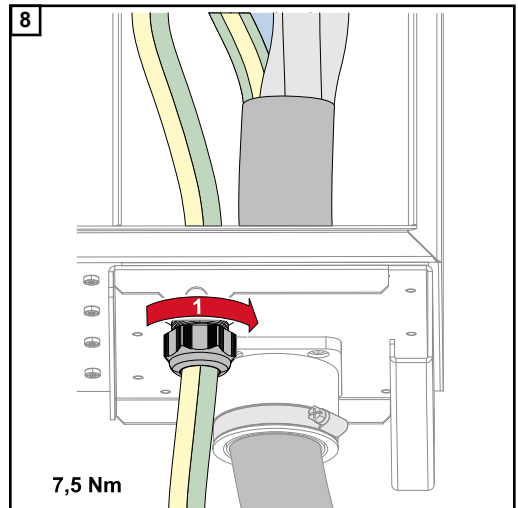
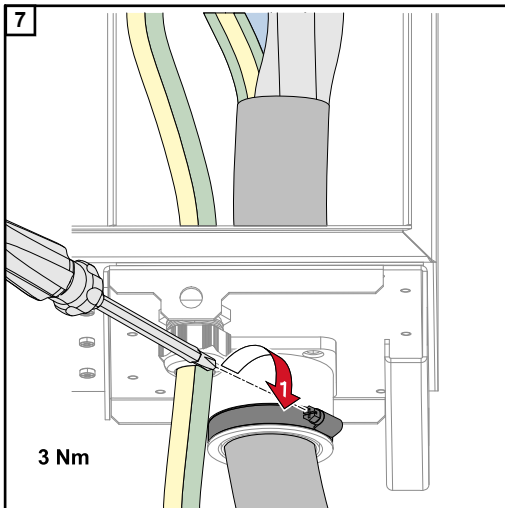
Connecting the inverter to the public grid - Multicore

Ensure that the phases are connected in the right order: PE, N, L1, L2 and L3.

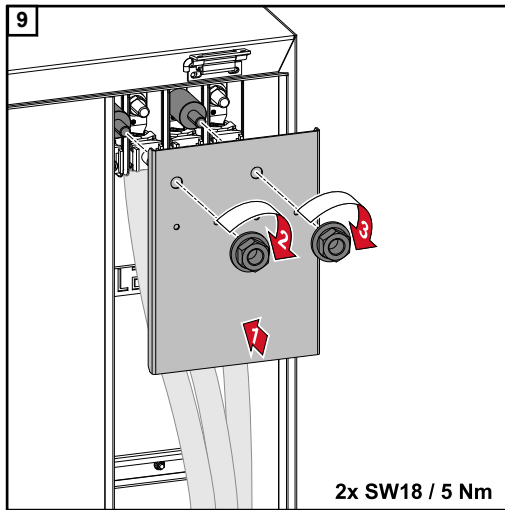




Secure to the torque specified by the manufacturer of the strain-relief device

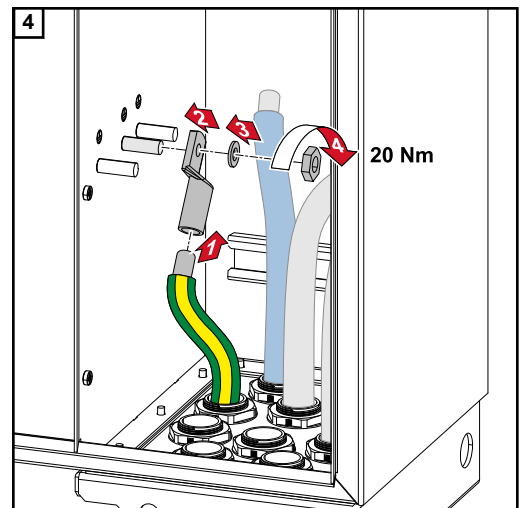
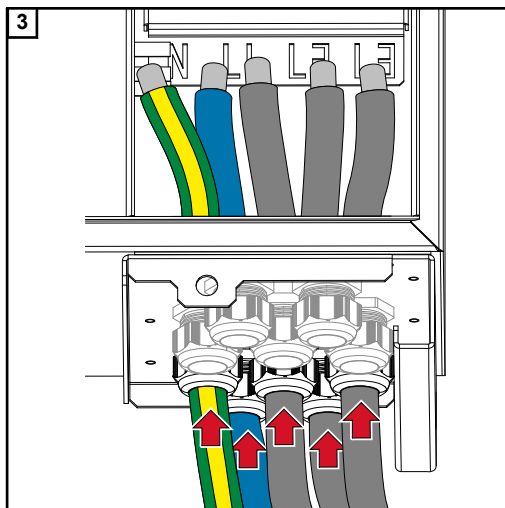
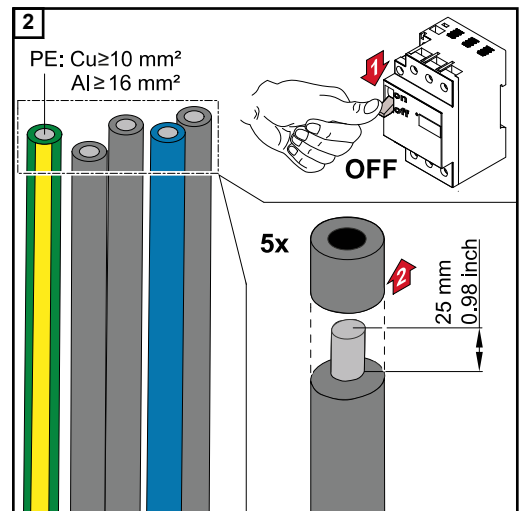
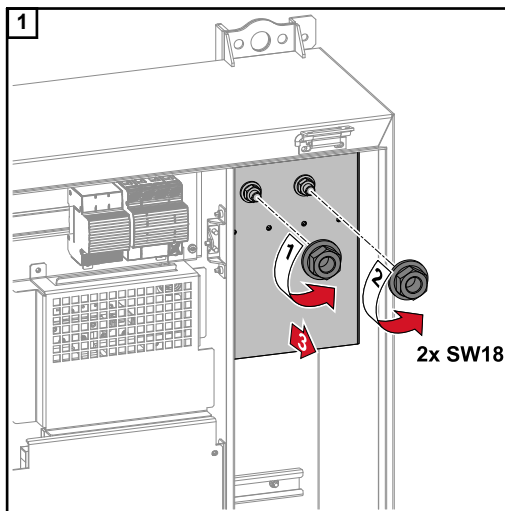


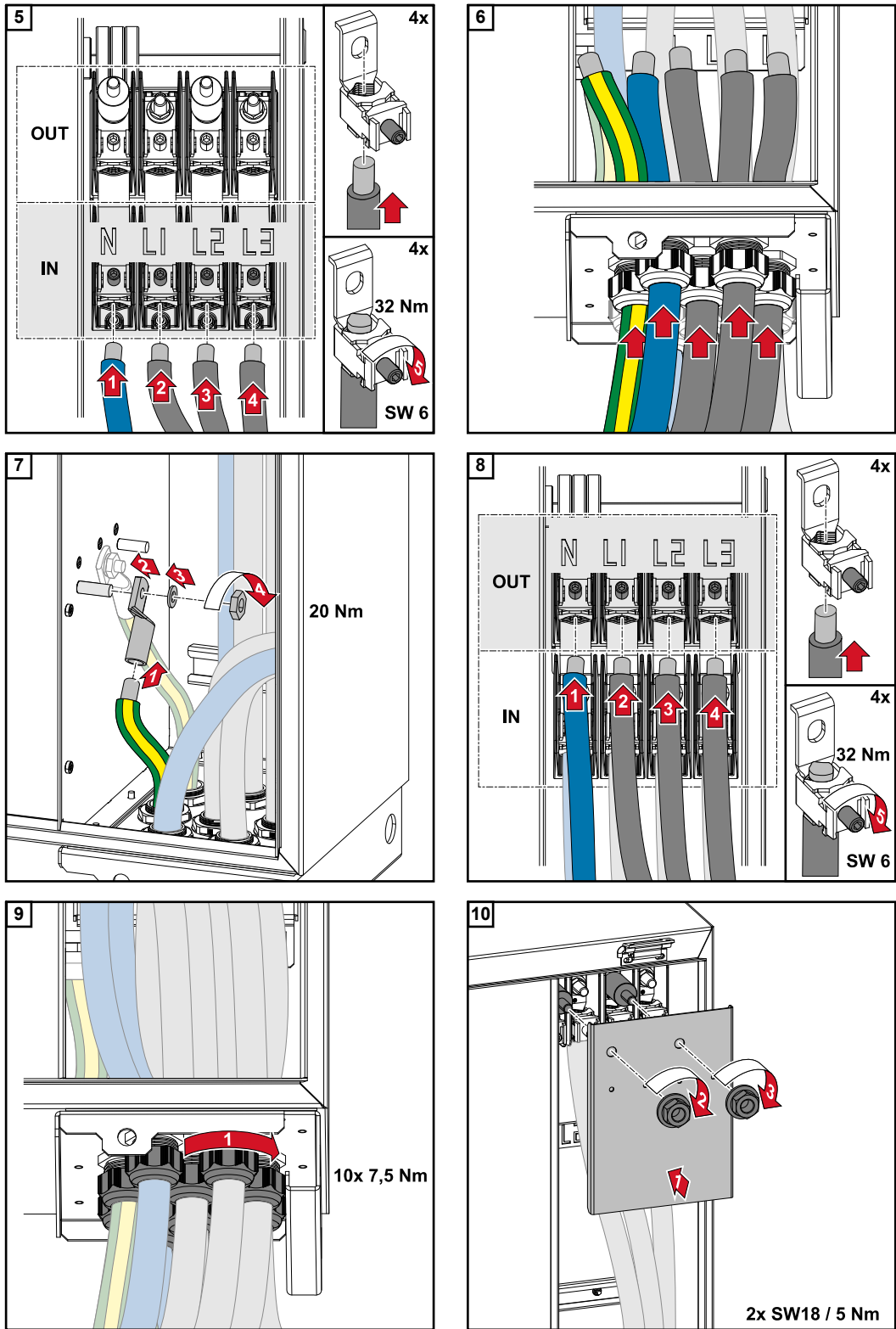
Secure to the torque specified by the manufacturer



Connecting the inverter to the public grid - Daisy Chain

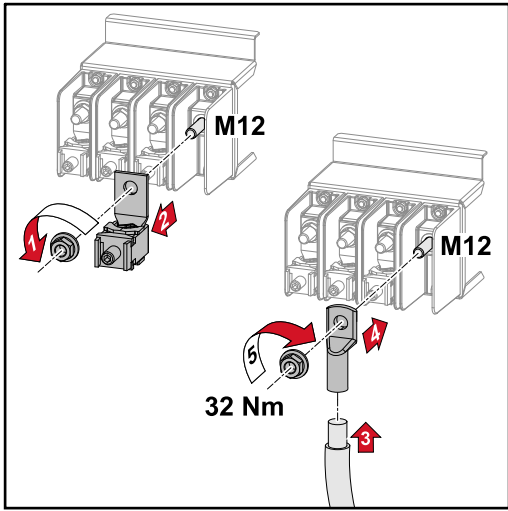
Ensure that the phases are connected in the right order: PE, N, L1, L2 and L3.





Connecting cables with a cable lug

Alternatively, a cable with a cable lug can be connected to the M12 threaded bolts on the grid connections in order to connect the cables to the V-type terminals.



Connecting the PV cable to the inverter

Safety

WARNING!

Danger due to grid voltage and DC voltage from solar modules that are exposed to light.

An electric shock can be fatal.

- ▶ Prior to any connection work, disconnect the inverter on the AC side and the DC side.
- ▶ Only an authorised electrical engineer is permitted to connect this equipment to the public grid.

WARNING!

Danger of electric shock due to incorrectly connected terminals / PV plug connectors.

An electric shock can be fatal.

- ▶ When connecting version D ("direct string"), ensure that every pole of a string is fed across the same PV input, e.g.:
'+ pole string 1' at input PV 1.1+ and '- pole string 1' at input PV 1.1-

WARNING!

Danger from DC voltage. Even when the DC disconnectors are switched off, the fuse boards (100-3-D / 99-3-D) / fuse board (50-3-D) and everything before the DC disconnectors are live.

An electric shock can be fatal.

- ▶ Prior to any connection work, disconnect the inverter on the AC side and the DC side.

CAUTION!

Risk of damage to the inverter as the result of incorrectly tightened terminals.

Incorrectly tightened terminals can cause heat damage to the inverter that may result in a fire.

- ▶ When connecting AC and DC cables, ensure that all the terminals are tightened to the specified torque.

CAUTION!

Risk of damage to the inverter as the result of incompatible plug connectors.

Incompatible plug connectors can cause heat damage to the inverter that may result in a fire.

- ▶ Only use the original plug connectors (MC4) manufactured by Stäubli (formerly Multi-Contact).

⚠ CAUTION!

Risk of damage to the inverter by exceeding the maximum input current per string.
Exceeding the maximum input current per string can cause damage to the inverter.

- ▶ Observe the maximum input current per string for the inverter according to the technical data.
- ▶ The maximum input current must not be exceeded even when using Y or T connectors.

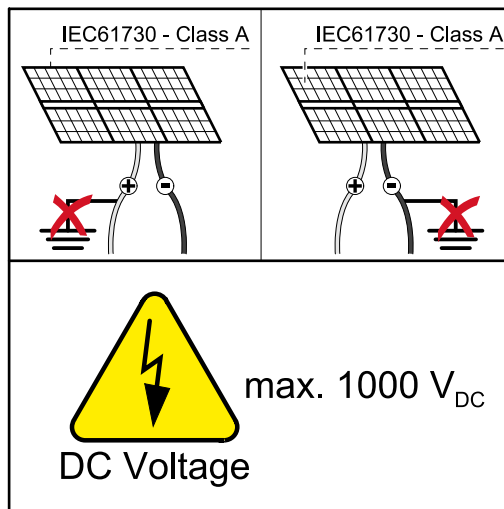
General comments regarding solar modules

To enable suitable solar modules to be chosen and to use the inverter as efficiently as possible, it is important to bear the following points in mind:

- If insolation is constant and the temperature is falling, the open circuit voltage of the solar modules will increase. The open circuit voltage must not exceed the maximum permissible system voltage. If the open circuit voltage exceeds the specified values, the inverter will be destroyed and no warranty claims will be entertained.
- The temperature coefficients on the data sheet of the solar modules must be observed.
- Exact values for sizing the solar modules can be obtained using suitable calculation tools, such as the [Fronius Solar.configurator](#).

IMPORTANT!

Before connecting up the solar modules, check that the voltage for the solar modules specified by the manufacturer corresponds to the actual measured voltage.



IMPORTANT!

The solar modules connected to the inverter must comply with the IEC 61730 Class A standard.

IMPORTANT!

Solar module strings must not be earthed.

Permitted cables

The temperature resistance of the DC cables must be at least 90 °C.

DC connections		
Select sufficiently high cable cross sections depending on the device type!		
Power category	Device type	Cable cross section
Tauro 50-3 / Eco 50-3 / Eco 99-3 / Eco 100-3	pre-combined	25 - 95 mm ²
	direct	2,5 - 10 mm ² (see data sheet for connector)

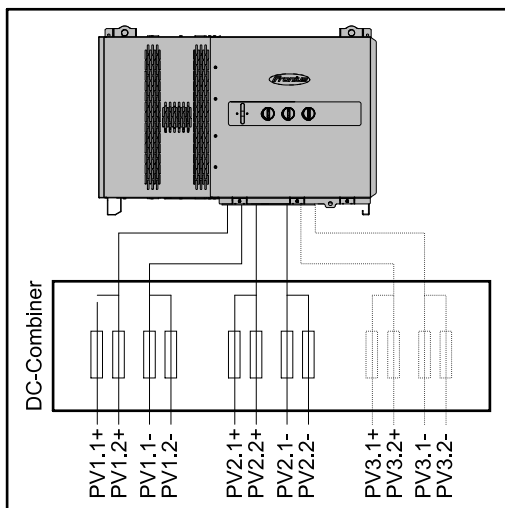
DC fuse protection - pre-combined

⚠ CAUTION!

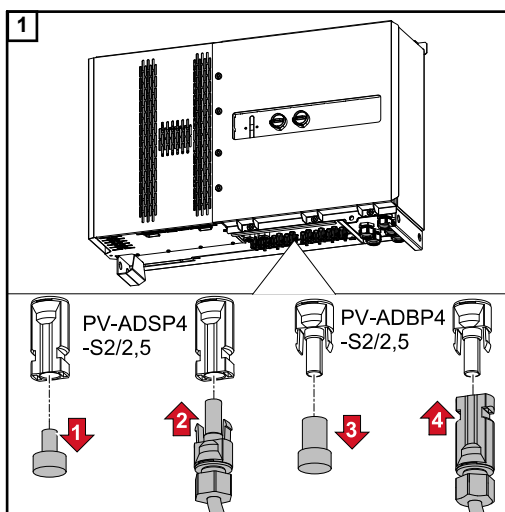
Risk of damage to the inverter as the result of incorrectly fused PV lines.

PV lines for the "pre-combined" model that are not fused can cause damage to the inverter.

- ▶ PV lines must be fused in a combiner box before the inverter ("pre-combined" version).



Connecting PV cables - MC4 connector

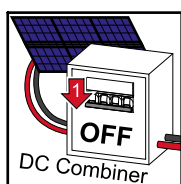


Connect the PV cables from the solar modules to the MC4 connectors as labelled

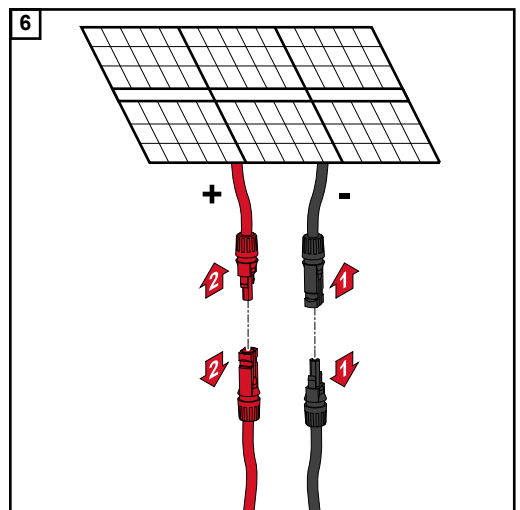
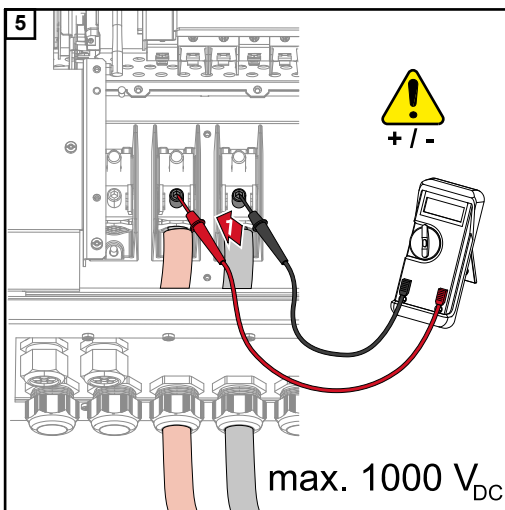
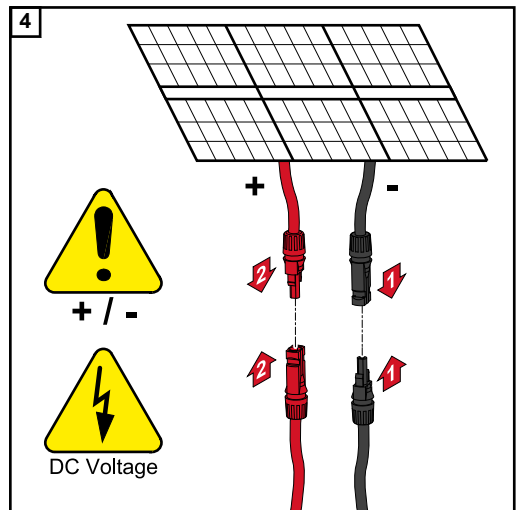
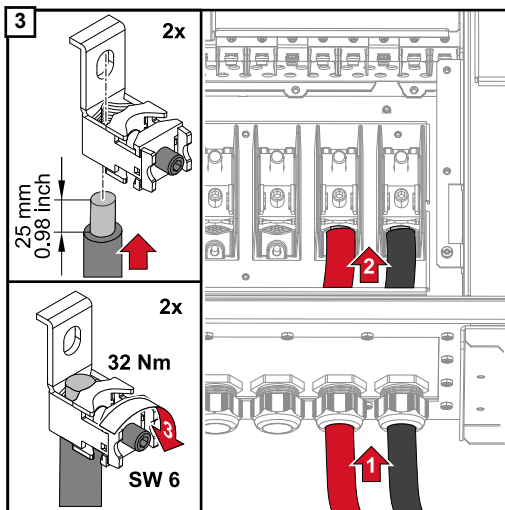
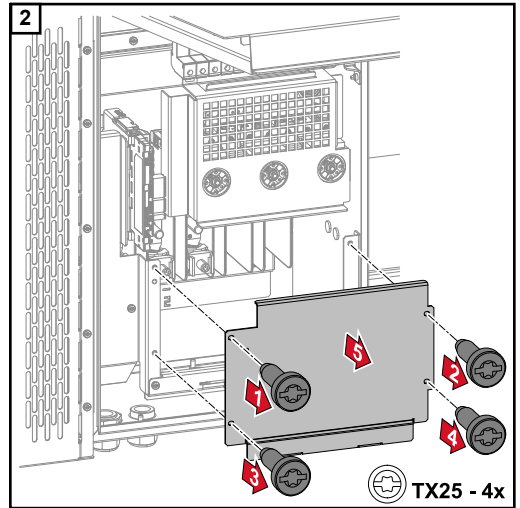
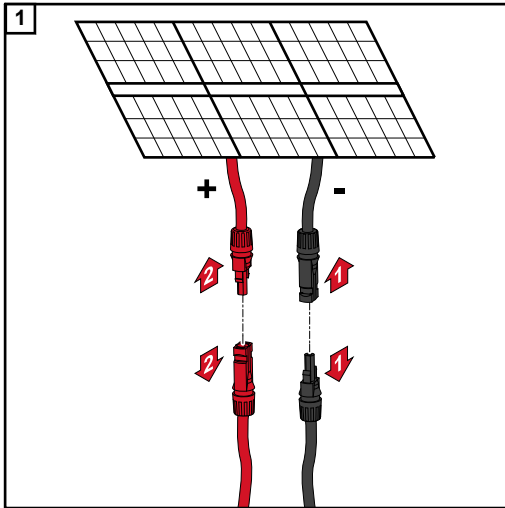
Unused MC4 connectors on the inverter must be covered with the cover plates supplied with the inverter.

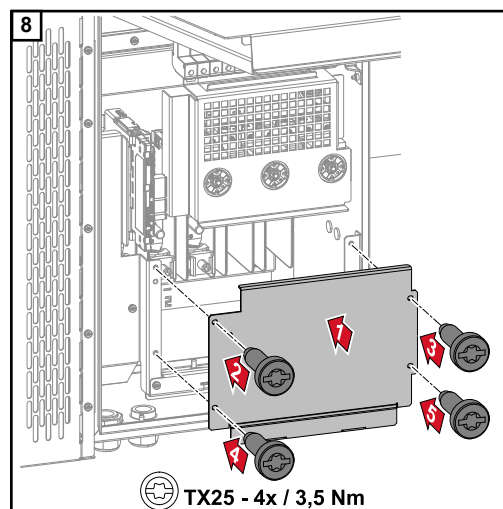
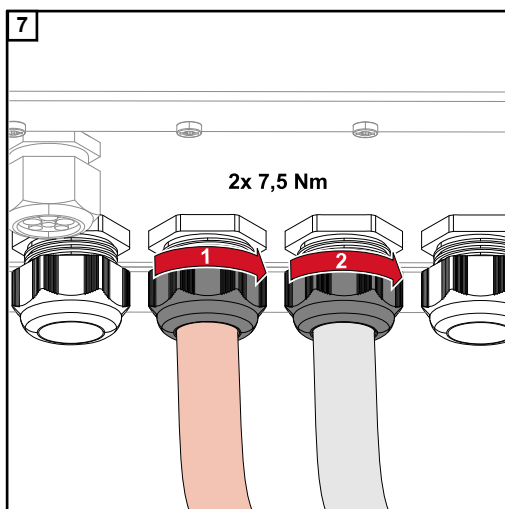
Connecting PV cables - Pre-combined

Solar module strings that are combined in a DC combiner box, must, according to the applicable national regulations, be fused per string in the DC combiner box!



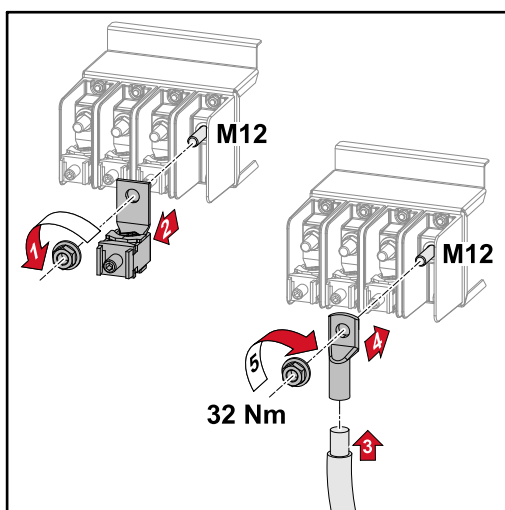
Before working in the connection area of the inverter, the DC voltage must be switched off. This can also be done in the DC combiner box.





Connecting cables with a cable lug

Alternatively, a cable with a cable lug can be connected to the M12 threaded bolts on the grid connections in order to connect the cables to the V-type terminals.



Replacing the string fuses

⚠ CAUTION!

Danger due to faulty fuses.

This can lead to fires.

- ▶ Only replace faulty fuses with new ones of the same rating.
- ▶ Do not replace faulty fuses with bolts.

⚠ CAUTION!

Danger due to incorrectly dimensioned string fuses

Incorrectly dimensioned string fuses can damage on the inverter for these connected components.

The following string fuses should be used for the -D (direct) version of the Fronius Tauro:

- ▶ Max. **10 A** per string → use of **15 A gPV fuse 1000 V** possible (Fronius item number: 41,0007,0230 - fuse 15 1000 F PV 15A)
- ▶ Max. **12 A** per string → use of **20 A gPV fuse 1000V** required (Fronius item number: 41,0007,0233 - fuse-HL 20A 1KV fast)

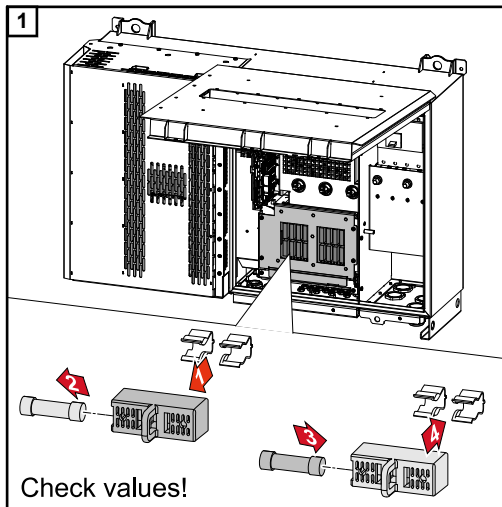
Replacing fuses:

Fronius Tauro 50-3-D string 1.1 - 3.7 /

Fronius Tauro Eco 50-3-D string 1.1 - 2.7 /

Fronius Tauro Eco 99 / 100-3-D string 1.1 - 2.7

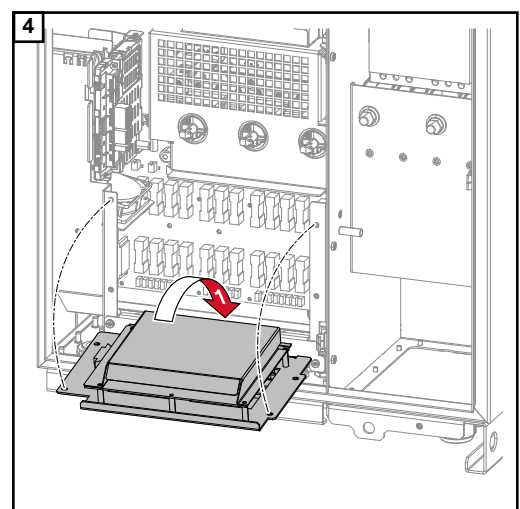
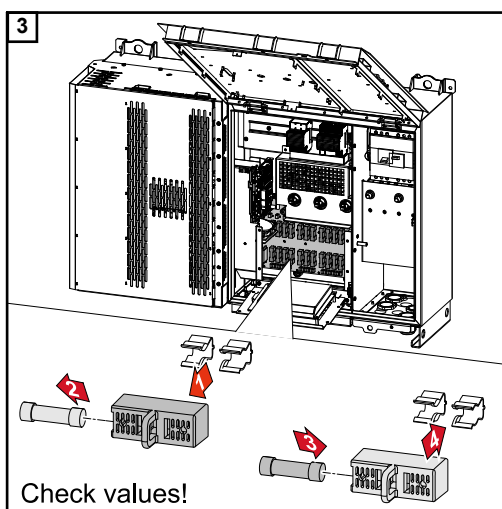
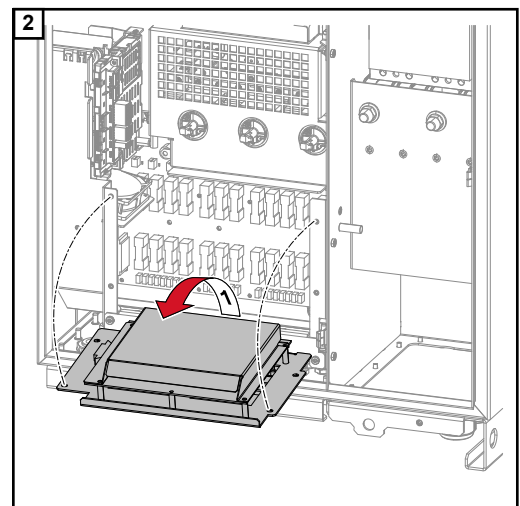
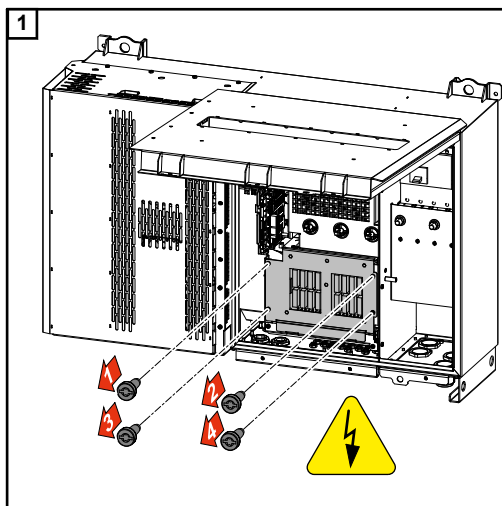
Check values! Only replace faulty fuses with new ones of the same rating.

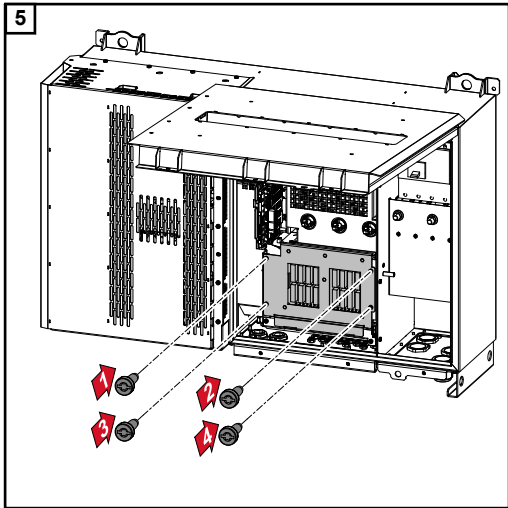


Replacing fuses:

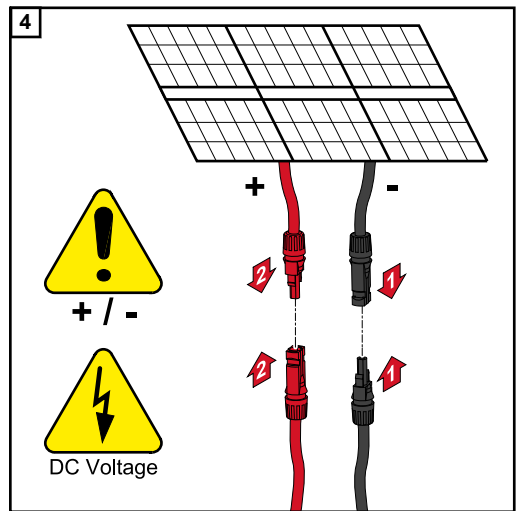
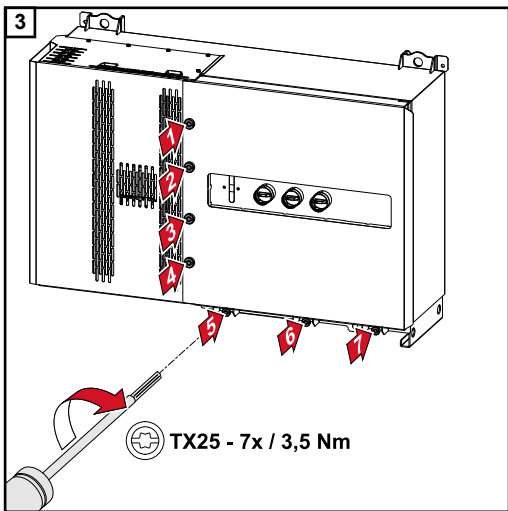
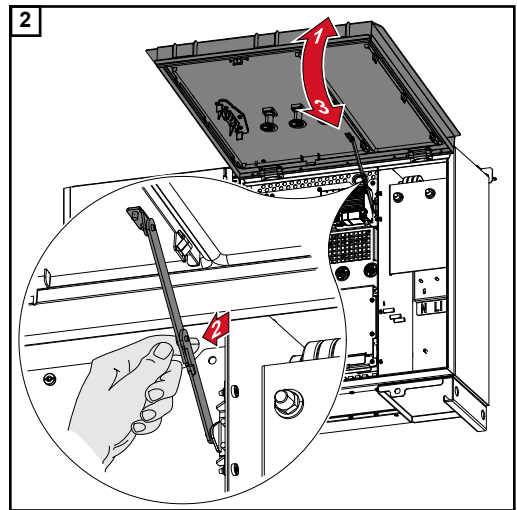
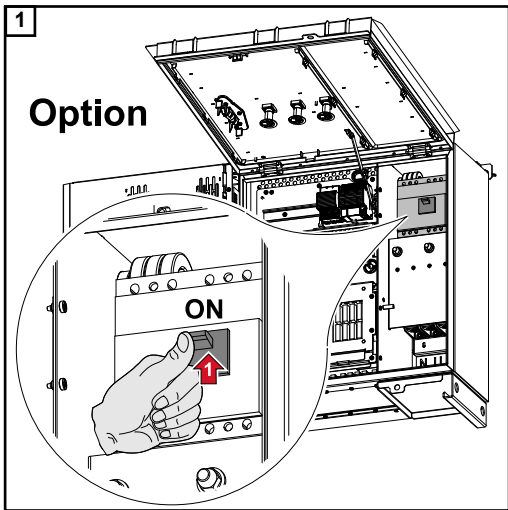
Fronius Tauro Eco 99 / 100-3-D string 3.1 - 3.8

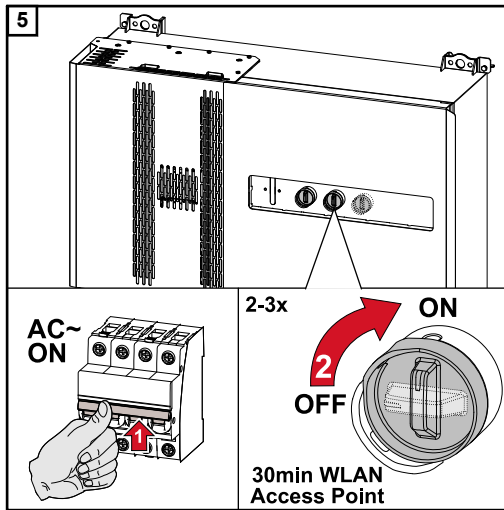
Check values! Only replace faulty fuses with new ones of the same rating.





Closing and switching on the inverter





The DC disconnect in the "On" switch position automatically opens the WLAN access point (AP) when starting for the first time. Alternatively, the WLAN access point can be opened with the optical sensor, see chapter [Button functions and LED status indicator](#) on page 22

Connecting the data communication cable

Modbus participants

A maximum of 4 Modbus participants can be connected to the Modbus terminal on inputs M0 and M1.

IMPORTANT!

Only one primary meter, one battery and one Ohmpilot can be connected per inverter. Due to the high data transfer of the battery, the battery occupies 2 participants. If the "Inverter control via Modbus" function is activated in the "Communication" "Modbus" menu, no Modbus participants are possible. It is not possible to send and receive data at the same time.

Example:

Input	Battery	Fronius Ohmpilot	Quantity Primary meter	Quantity Secondary meter
Modbus 0 (M0)	✗	✗	1	3
	✓	✗	1	1
	✓	✓	1	0
Modbus 1 (M1)	✗	✗	0	4

Permitted cables for the data communication area

Cables with the following design can be connected to the terminals of the inverter:



- Copper: round, solid



- Copper: round, fine-stranded

WSD connections with push-in terminal						
Distance max.	Stripping length	Solid	Fine-stranded	Fine-stranded with ferrules with collar	Fine-stranded with ferrules without collar	Cable recommendation
100 m	10 mm	0.14 - 1.5 mm ²	0.14 - 1.5 mm ²	0.14 - 1 mm ²	0.14 - 1.5 mm ²	min. CAT 5 UTP

Modbus connections with push-in terminal						
Distance max.	Stripping length	Solid	Fine-stranded	Fine-stranded with ferrules with collar	Fine-stranded with ferrules without collar	Cable recommendation
300 m	10 mm	0.14 - 1.5 mm ²	0.14 - 1.5 mm ²	0.14 - 1 mm ²	0.14 - 1.5 mm ²	min. CAT 5 STP

IO connections with push-in terminal						
Distance max.	Stripping length	Solid	Fine-stranded	Fine-stranded with ferrules with collar	Fine-stranded with ferrules without collar	Cable recommendation
30 m	10 mm	0.14 - 1.5 mm ²	0.14 - 1.5 mm ²	0.14 - 1 mm ²	0.14 - 1.5 mm ²	Single conductor possible

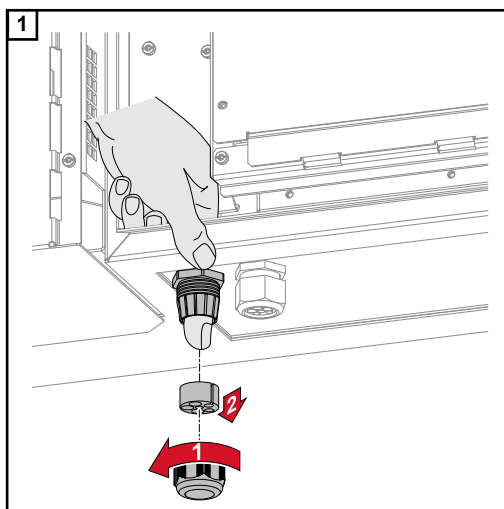
LAN connections
Fronius recommends using at least CAT 5 STP (shielded twisted pair) cables and a maximum distance of 100 m between two devices.

Routing data communication cables

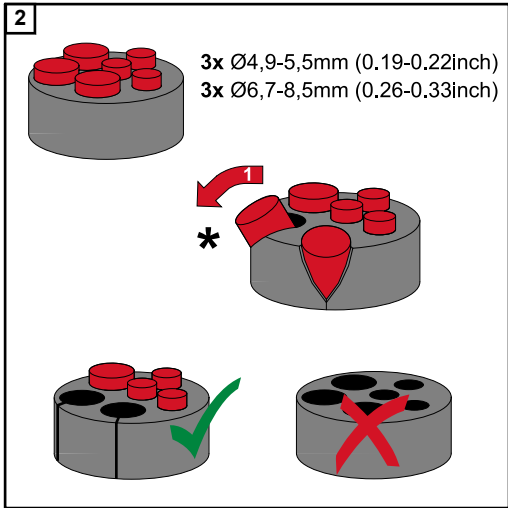
IMPORTANT! If data communication cables are wired into the inverter, observe the following points:

- Depending on the number and cross section of the wired data communication cables, remove the corresponding blanking plugs from the sealing insert and insert the data communication cables.
- Make sure that you insert the corresponding blanking plugs into any free openings on the sealing insert.

Note! Should the blanking plugs be missing or improperly fitted, then protection class IP65 cannot be guaranteed.

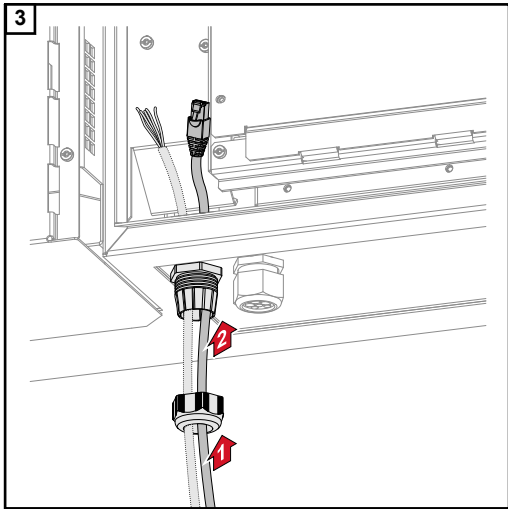


Undo the strain-relief device cap nut and push out the sealing ring and the blanking plug from the inside of the device.

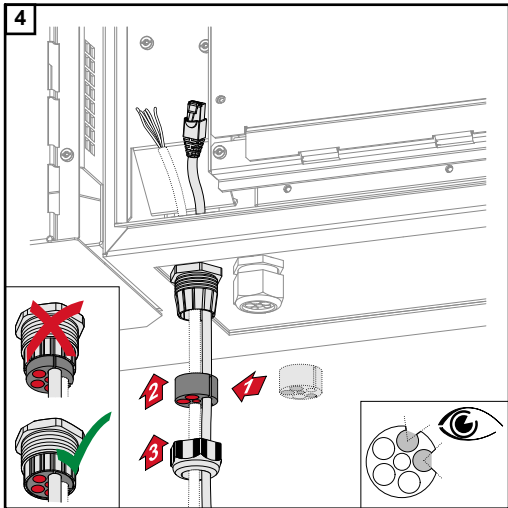


Open up the sealing ring at the location where the blanking plug is to be removed.

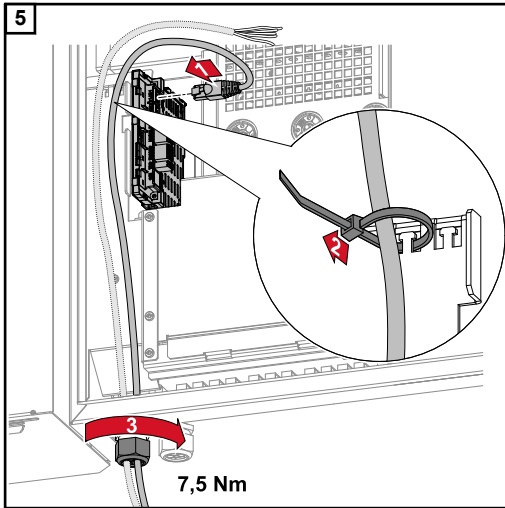
* Liberate the blanking plug by moving it sideways.



Guide the data cables first through the strain-relief device cap nut and then through the housing opening.

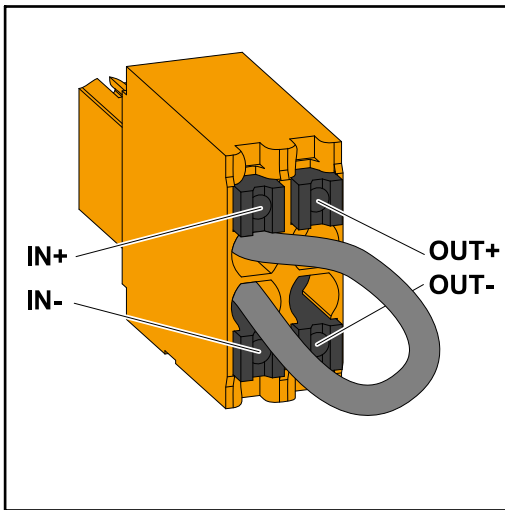


Insert the sealing ring between the cap nut and the housing opening. Press the data cables into the seal's cable guide. Then press in the seal until it reaches the underside of the strain-relief device.



Connect the data cables to the data communication area using a movement loop, and fasten the cap nut with min. 2.5 to max. 4 Nm.

WSD (wired shut-down)

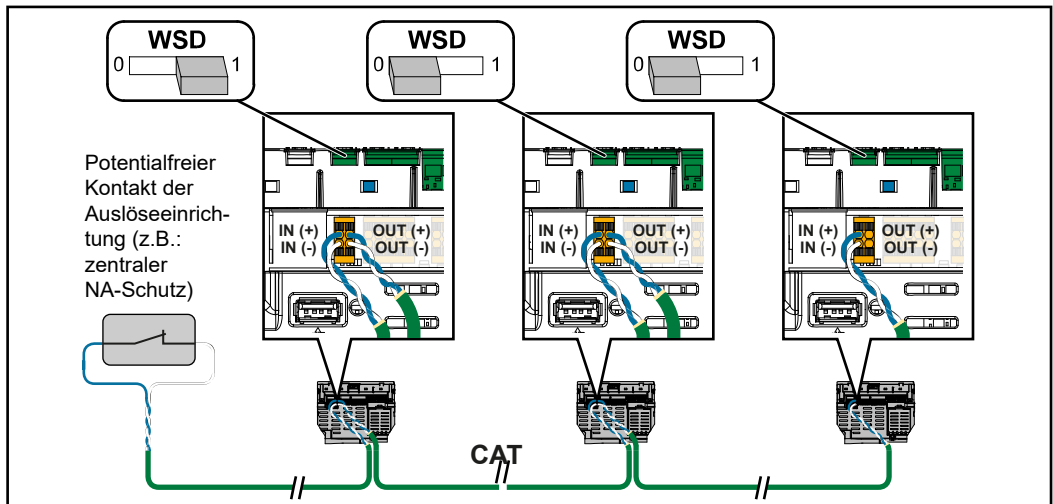


IMPORTANT!

The push-in WSD terminal in the inverter's connection area is delivered with a bypass ex works as standard. The bypass must be removed when installing a trigger device or a WSD chain.

The WSD switch of the first inverter with connected trigger device in the WSD chain must be in position 1 (master). The WSD switch of all other inverters should be in the 0 (slave) position.

Max. distance between two devices: 100 m
 Max. number of devices: 28



Using for the first time

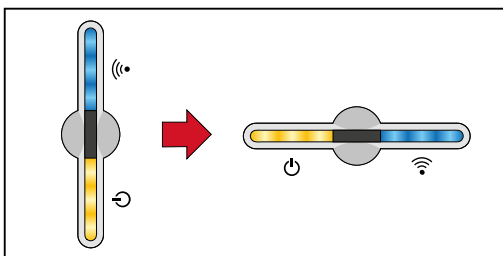
Starting the inverter for the first time

When using the inverter for the first time, various setup settings must be configured.

If the setup process is cancelled before the process is complete, any data that has been input up to this point is lost and the start screen with the installation wizard is shown again. If the process is interrupted, such as in the event of a power outage, the data is saved. Commissioning may be continued from the point at which the process was interrupted once the power supply has been restored. If the setup was interrupted, the inverter feeds energy into the grid at maximum 500 W and the operating status LED flashes yellow.

The country setup can only be set when using the inverter for the first time. If the country setup needs to be changed at a later date, please contact your installer / Technical Support team.

Fronius system monitoring (Pilot) display



To simplify the display, the vertical installation position of the Pilot pc board (LED display) is shown horizontally below.

Installation with the app

The "Fronius Solar.start" app is needed for this installation method. Depending on the end device with which the installation will be carried out, download the app for the respective platform.

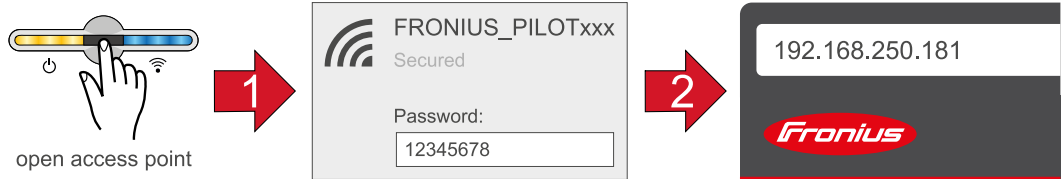


- 1 Start the installation in the app.
- 2 Select the product to which the connection should be established.
- 3 Open the access point by touching the sensor once → Communication LED: flashes blue.
- 4 Follow and complete the installation wizard in the individual sections.
- 5 Add system components in Solar.web and start up the PV system.

The network wizard and the product setup can be carried out independently of each other. A network connection is required for the Solar.web installation wizard.

Installation using the web browser

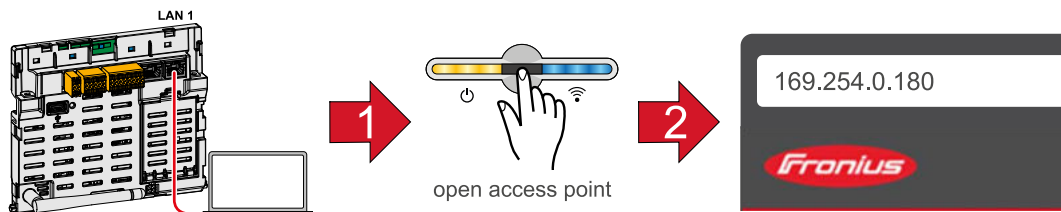
WLAN:



- 1 Open the access point by touching the sensor once → Communication LED: flashes blue.
- 2 Establish the connection to the inverter in the network settings (the inverter is displayed with the name "FRONIUS_PILOT" and the serial number of the device).
- 3 Password: enter 12345678 and confirm.
IMPORTANT!
To enter the password on a Windows 10 operating system, the link "Connect using a security key instead" must first be activated to establish a connection with the password: 12345678.
- 4 In the browser address bar, enter and confirm the IP address 192.168.250.181. The installation wizard is opened.
- 5 Follow the installation wizard in the individual sections and complete the installation.
- 6 Add system components in Solar.web and start up the PV system.

The network wizard and the product setup can be carried out independently of each other. A network connection is required for the Solar.web installation wizard.

Ethernet:



- 1 Establish a connection to the inverter (LAN1) with a network cable (CAT5 STP or higher).
- 2 Open the access point by touching the sensor once → Communication LED: flashes blue.
- 3 In the browser address bar, enter and confirm IP address 169.254.0.180. The installation wizard is opened.
- 4 Follow the installation wizard in the individual sections and complete the installation.
- 5 Add system components in Solar.web and start up the PV system.

The network wizard and the product setup can be carried out independently of each other. A network connection is required for the Solar.web installation wizard.

Settings - website of the inverter

User settings

User login

- 1 Open the website of the inverter in your browser.
- 2 In the “Login” menu, log in using your user name and password, or go to the “User” menu and click on the “User login” button and then log in with your user name and password.

IMPORTANT!

Depending on the user's authorization, settings can be executed in the individual menus.

Selecting the language

- 1 In the “User” menu, click on the “Language” button and select the desired language.

Device configuration

Components

Select "Add component+" to add all available components to the system.

PV generator

Activate the MPP tracker and enter the connected PV power in the associated field. For combined solar module strings, "PV1 + PV2 connected in parallel" must be activated.

Primary meter

To ensure smooth operation in conjunction with other energy producers, it is important to install the Fronius Smart Meter at the feed-in point. The inverter and other producers must be connected to the public grid via the Fronius Smart Meter.

This setting also affects how the inverter behaves overnight. If the function is deactivated, the inverter switches to standby mode as soon as there is no more PV power available. The message "Power low" is displayed. The inverter starts again as soon as sufficient PV power is available.

After connecting the meter, the position must be configured.

Several Fronius Smart Meters can be installed in the system. A different address needs to be set for each Smart Meter.

The Watt value on the generator meter is the sum of all generator meters. The Watt value on the consumption meter is the value of all consumption meters.

Ohmpilot

All Ohmpilots available in the system are displayed. Select the desired Ohmpilot and add it to the system via "Add".

Functions and IOs

Load management

OFF - Demand Response Mode (DRM)

The pins for control via DRM can be set here:

Mode	Description	Information	Default pin
DRM0	Inverter disconnects itself from the grid	Open grid relay	
	REF GEN		RG0
	COM LOAD		CL0
		DRM0 occurs if there is an interruption or short circuit on the REF GEN or COM LOAD leads. Or if the combinations DRM1 - DRM8 are invalid.	

IMPORTANT!

If the Demand Response Mode (DRM) function is enabled and no DRM control is connected, the inverter switches to Standby mode.

**"PSC editor -
AUS - Demand
Response Modes
(DRM)"**

A value for the apparent power consumption and apparent power output can be entered here for the Australia country setup.

System

General

General settings

- 1 In the "System name" input field, enter the name of the system (max. 30 characters).
 - 2 "Synchronize time automatically" enabled → select "Area time zone" and "Location time zone". The date and time are applied from the time zone entered.
 - 2 "Synchronize time automatically" disabled → enter or select "Date", "Time", "Area time zone" and "Location time zone".
 - 3 Click on the "Save" button.
-

Update

All available updates are made available on the product page and in the "Download search" area under www.fronius.com .

Firmware update

- 1 Drag the firmware file into the "Drag&Drop file here" field or select it using "Select file".

The update will start.

Setup wizard

The guided setup wizard can be accessed here.

Restoring the factory settings

All settings

All configuration data is reset with the exception of the country setup. Changes to the country setup may only be carried out by authorized personnel.

All settings with no network

All configuration data is reset with the exception of the country setup and the network settings. Changes to the country setup may only be carried out by authorized personnel.

Event Log

Current events

All current events of the connected system components are shown here.

IMPORTANT!

Depending on the type of event, these must be confirmed via the "tick" button in order to be processed further.

Archived

All events of the connected system components that no longer exist are shown here.

Information

This menu displays all system information and the current settings.

Save as PDF

- 1 Click on the "Save as PDF" button.
- 2 Individually select information with the "tick" next to the information or with the tick "Select all".

- 3 Enter the file name in the input field and click on the "Print" button.

The PDF is created and displayed.

Create support info

- 1 Click on the "Create support info" button.
- 2 The sdp.cry file is downloaded automatically. To download manually, click on the "Download Support-Info" button.

The sdp.cry file is saved in the downloads.

Enable remote maintenance

- 1 Click on the "Enable remote maintenance" button.

Remote maintenance access for the Fronius Support team is enabled.

IMPORTANT!

Remote maintenance access gives Fronius Technical Support exclusive access to the inverter via a secure connection. Diagnostic data is transmitted here that can be used for troubleshooting purposes. Only enable remote maintenance access following a request from the Fronius Support team.

Licence manager

The license file contains the performance data and the scope of functions of the inverter. When replacing the inverter, power stage set or data communication area, the license file must also be replaced.

Licensing - online (recommended):

An Internet connection and completed configuration on Solar.web is required.

- 1 Complete the installation work (see chapter [Using for the first time](#) on page 57).
- 2 Connect to the website of the inverter.
- 3 Enter the serial number and verification code (VCode) of the defective and replacement unit. The serial number and the VCode can be found on the rating plate of the inverter (see chapter [Warning notices and rating plate on the device](#) on page 13).
- 4 Click on the "Start online licensing" button.
- 5 Skip the Terms of use and Network settings menu items by clicking on "Next".

The license activation starts.

Licensing - offline:

- 1 Complete the installation work (see chapter [Using for the first time](#) on page 57).
- 2 Connect to the website of the inverter.
- 3 Enter the serial number and verification code (VCode) of the defective and replacement unit. The serial number and the VCode can be found on the rating plate of the inverter (see chapter [Warning notices and rating plate on the device](#) on page 13).
- 4 Click on the "Start offline licensing" button.
- 5 Download the service file onto the end device by clicking on the "Download service file" button.
- 6 Open the website licensemanager.solarweb.com and log in with your user name and password.
- 7 Drag or upload the service file into the "Drop service file here or click to upload" field.

- 8] Download the newly generated license file onto the end device using the "Download license file" button.
- 9] Go to the inverter website and drag the license file into the "Drag&Drop licence file here" field, or select it via "Select license file".

The license activation starts.

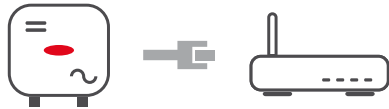
Network

Server addresses for data transfer

If a firewall is used for outgoing connections, the following protocols, server addresses and ports must be allowed for successful data transfer:

- Tcp froniussseiot.azure-devices.net:8883
- Tcp froniussseiot-telemetry.azure-devices.net:8883
- Tcp froniussseiot-telemetry.azure-devices.net:443
- Udp sera-gen24.fronius.com:1194 (213.33.117.120:1194)
- Tcp froniussseiot.blob.core.windows.net:443

LAN:



- 1 Enter host name.
- 2 Select connection type "automatic" or "static".
- 3 For connection type "static" - enter IP address, subnet mask, DNS and gateway.
- 4 Click on the "Connect" button.

The connection is established.

WLAN:



Establishing a connection via WPS:

- 1 Click the "Enable" button.
- 2 Activate WPS on the WLAN router (see documentation provided with the WLAN router).

The connection is established automatically.

Select and connect WLAN network:

The networks found are shown in the list. Clicking on the refresh button ↻ will carry out a second search of the available WLAN networks. The "Find network" input field is used to find hidden networks.

- 1 Select network from the list.
- 2 Select connection type "automatic" or "static".
- 3 For connection type "automatic" - enter WLAN password and host name.
- 4 For connection type "static" - enter IP address, subnet mask, DNS and gateway.
- 5 Click on the "Connect" button.

The connection is established.

Access point:



The inverter acts as the access point. A PC or smart device connects directly with the inverter. It is not possible to connect to the internet. The "Network name (SSID)" and "Network key (PSK)" can be assigned in this menu.

Modbus

"Baud rate"

The baud rate influences the transmission speed between the individual components connected in the system. When selecting the baud rate, ensure that it is the same at both the sending and receiving end.

"Parity"

The parity bit can be used to check the parity. It detects transmission errors. A parity bit can safeguard a specific number of bits. The value (0 or 1) of the parity bit must be calculated by the sender and is checked by the recipient using the same calculation. The parity bit can be calculated for even and odd parity.

"SunSpec Model Type"

Depending on the SunSpec model, there are two different settings.

float: SunSpec Inverter Model 111, 112, 113 or 211, 212, 213.

int + SF: SunSpec Inverter Model 101, 102, 103 or 201, 202, 203.

"SC address"

Depending on the SunSpec model, there are two different settings.

float: SunSpec Inverter Model 111, 112, 113 or 211, 212, 213.

int + SF: SunSpec Inverter Model 101, 102, 103 or 201, 202, 203.

Settings - grid

Feed-in limitation DNO or grid operators may stipulate feed-in limitations for an inverter (e.g. max. 70% of kWp or max. 5 kW).
The feed-in limitation takes account of self-consumption by the household before the power of an inverter is reduced:

- A custom limit can be set.
- A Fronius Smart Meter can be connected to the Modbus push-in terminal of the data communication area at the connections M0/M1- / M0/M1+ for Modbus data.

With the inverter, any PV power that is not allowed to be fed into the grid is used to charge the battery instead and/or used by the Fronius Ohmpilot so that it does not go to waste. The feed-in limitation is only active if the power fed in is higher than the set power reduction. The battery is charged first or the energy is consumed on the Fronius Ohmpilot.

"Limit for entire system"

The entire PV system is limited in accordance with a set power limit. If this setting is disabled, the entire available PV-power is converted and fed into the grid.

"Total DC system power"

Input field for the total DC system power in Wp.
This value is used if the "Maximum permitted feed-in power of the entire system" is specified in %.

"Maximum permitted feed-in power of the entire system"

Input field for the "Maximum permitted feed-in power of the entire system" in W or % (setting range: -10 to 100%).

If there is no meter in the system or if a meter has failed, the inverter limits the feed-in power to the set value.

Example: Feed-in limitation

(without consideration of the efficiency)

PV system on Fronius inverter:	5000 W
Consumption in home:	1000 W
Maximum permitted feed-in power of the entire system:	60% = 3000 W

Case 1: The battery can be charged

Power at grid feed-in point:	0 W
Power at inverter output:	1000 W
Power into the battery:	3000 W

Case 2: The battery cannot be charged

Power at grid feed-in point:	3000 W
Power at inverter output:	4000 W
Power into the battery:	0 W

In this example, no more than 3000 W may be fed into the grid at the grid feed-in point. However, any loads that are located between the inverter and the grid feed-in point can be supplied by additional power from the inverter. These loads are also compensated as required.

DNO Editor – Control priorities

For setting the control priorities for the ripple control signal receiver, the dynamic power reduction and control via Modbus

1 = highest priority, 3 = lowest priority

General

Use the “DNO Editor” menu item to make the settings that are of relevance to an electricity trader.
You can set an effective power limit in % and/or a power factor limit.

IMPORTANT! Settings under the “DNO Editor” menu item are only to be made by trained and qualified personnel!

The service password must be entered in order to access the “DNO Editor” menu item.

I/O power management

General

In this menu item, settings relevant for an electricity company (DNO) are made. An effective power limitation in % and/or a power factor limitation can be set.

IMPORTANT!

The service password must be entered in order to adjust settings in this menu item. Settings in this menu area must only be made by trained and qualified personnel.

"Input pattern" (assignment of individual I/Os)

1 click = white (contact open)
2 clicks = blue (contact closed)
3 x clicks = grey (not used)

"Power factor (cos φ)"

"ind" = inductive
"cap" = capacitive

"DNO feedback"

when the rule is enabled, output I/O 0 is activated (e.g. for operating a signalling device).

For **"Import"** or **"Export"**, the data format *.fpc is supported.

Control priorities

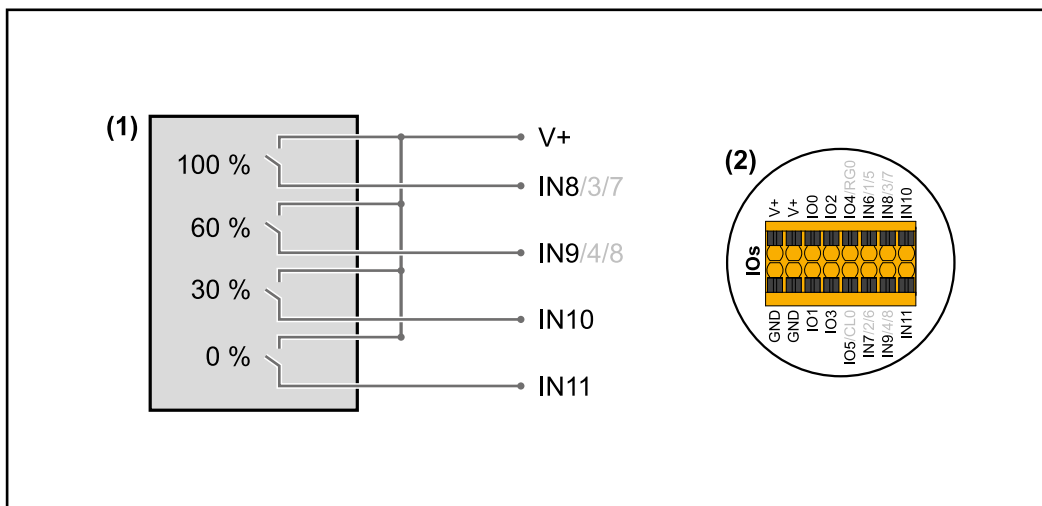
For setting the control priorities for the ripple control signal receiver, the feed-in limitation and control via Modbus.

1 = highest priority, 3 = lowest priority

Connection diagram - 4 relay

The ripple control signal receiver and the I/Os terminal of the inverter can be connected to one another in accordance with the connection diagram.
If the distance between the inverter and the ripple control signal receiver exceeds 10 m,

at least a CAT 5 cable is recommended and the shield must be connected at one end to the push-in terminal of the data communication area (SHIELD).



- (1) Ripple control signal receiver with 4 relays, for effective power limiting.
- (2) I/Os of the data communication area.

Use the preconfigured file for 4-relay mode:

- 1 Download the file (.fpc) **under 4-relay mode** onto the end device.
- 2 Upload the file (.fpc) in the "I/O Power Management" menu using the "Import" button.
- 3 Click on the "Save" button.

The settings for 4-relay mode are stored.

Appendix

Technical data

Tauro 50-3-D / 50-3-P

Input data	
Start voltage	200 V _{DC}
MPP voltage range	400 - 870 V _{DC}
MPP controller	3
Max. input voltage (at 1000 W/m ² / -10 °C in an open circuit)	1000 V _{DC}
Max. input current (I _{DC max}) Total PV1 / PV2 / Pv3per per string (for D-version only)	134 A 36 A / 36 A / 72 A 12 A
Max. short circuit current (I _{SC PV} = I _{SC max}) Total PV1 / PV2 / Pv3per per string (for D-version only)	240 A 72 A / 72 A / 125 A 18 A
Max. input power (P _{PV max}) Total PV1 / PV2 / PV3	75 kWp 25 kWp / 25 kWp / 50 kWp
Output data	
Nominal output power (P _{nom})	50 kW
Max. output power	50 kW
Nominal grid voltage	220 V _{AC} 230 V _{AC} ¹⁾
Grid voltage range	180 - 270 V _{AC}
Grid connection	3~ NPE 380 / 220 V _{AC} 3~ NPE 400 / 230 V _{AC}
Nominal output current (per phase)	75.8 A / 72.5 A
Nominal frequency	50 / 60 Hz ¹⁾
Total harmonic distortion	< 3%
Power factor (cos phi)	0 - 1 ind./cap. ²⁾
Max. feedback current ³⁾	A ⁴⁾
Power-up current pulse and duration ⁵⁾	A ⁴⁾
Max. output fault current per period	A/ms
General data	
Maximum efficiency	98.6%
European efficiency (400 / 600 / 800 Vdc)	97.4 / 98.1 / 97.4%
Overnight self-consumption	15 W
Cooling	Controlled forced-air ventila- tion
Degree of protection	IP 65
Dimensions L x W x H (without mounting bracket)	1109 x 346 x 755 mm
Weight (without mounting bracket)	74 kg

Permitted ambient temperature with built-in "AC disconnect" option	- 40 °C - +65 °C -25 °C - +65 °C
Permitted storage temperature	- 40 °C - +70 °C
Permissible humidity	0 - 100%
EMC device class	B
Overvoltage category AC / DC	3 / 2
Pollution degree	3
Protection class	1
Sound pressure level (580 V _{DC} / 930 V _{DC})	dB(A) (ref. 20 µPA)
Protection devices	
DC insulation measurement	Integrated ²⁾
Response to overload	Operating point shift power limitation
DC disconnect	Integrated
RCMU	Integrated
WLAN	
Frequency range	2412 - 2462 MHz
Channels / power used	Channel: 1-11 b,g,n HT20 Channel: 3-9 HT40 <18 dBm
Modulation	802.11b: DSSS (1Mbps DBPSK, 2Mbps DQPSK, 5.5/11Mbps CCK) 802.11g: OFDM (6/9Mbps BPSK, 12/18Mbps QPSK, 24/36Mbps 16-QAM, 48/54Mbps 64-QAM) 802.11n: OFDM (6.5 BPSK, QPSK, 16-QAM, 64-QAM)

Tauro Eco 50-3-D / 50-3-P

Input data	
Start voltage	650 V _{DC}
MPP voltage range	580 - 930 V _{DC}
MPP controller	1
Max. input voltage (at 1000 W/m ² / -10 °C in an open circuit)	1000 V _{DC}
Max. input current (I _{DC max}) Total PV1 / PV2 per string (for D-version only)	87.5 A 75 A / 75 A 12 A
Max. short circuit current (I _{SC PV} = I _{SC max}) Total PV1 / PV2 per string (for D-version only)	178 A 125 A / 125 A 18 A
Max. input power (P _{PV max}) Total PV1 / PV2	75 kWp 60 kWp / 60 kWp

Output data	
Nominal output power (P_{nom})	50 kW
Max. output power	50 kW
Nominal grid voltage	220 V _{AC} 230 V _{AC} ¹⁾
Grid voltage range	180 - 270 V _{AC}
Grid connection	3~ NPE 380 / 220 V _{AC} 3~ NPE 400 / 230 V _{AC}
Nominal output current (per phase)	75.8 A / 72.5 A
Nominal frequency	50 / 60 Hz ¹⁾
Total harmonic distortion	< 1%
Power factor (cos phi)	0 - 1 ind./cap. ²⁾
Max. feedback current ³⁾	125 A ⁴⁾
Power-up current pulse and duration ⁵⁾	30.5 A / 2.08 ms ⁴⁾
Max. output fault current per period	37.2 A / 19.4 ms
General data	
Maximum efficiency	98.5%
European efficiency (580 / 800 / 930 Vdc)	98,2 / 97,7 / 97,3 %
Overnight self-consumption	15 W
Cooling	Controlled forced-air ventilation
Degree of protection	IP 65
Dimensions L x W x H (without mounting bracket)	1109 x 346 x 755 mm
Weight (without mounting bracket)	103 kg
Permitted ambient temperature with built-in "AC disconnect" option	- 40 °C - +65 °C -25 °C - +65 °C
Permitted storage temperature	- 40 °C - +70 °C
Permissible humidity	0 - 100%
EMC device class	B
Overvoltage category AC / DC	3 / 2
Pollution degree	3
Protection class	1
Sound pressure level (580 V _{DC} / 930 V _{DC})	73,3 / 75,5 dB(A) (ref. 20 μPA)
Protection devices	
DC insulation measurement	Integrated ²⁾
Response to overload	Operating point shift power limitation
DC disconnect	Integrated
RCMU	Integrated
WLAN	
Frequency range	2412 - 2462 MHz

Channels / power used	Channel: 1-11 b,g,n HT20 Channel: 3-9 HT40 <18 dBm
Modulation	802.11b: DSSS (1Mbps DBPSK, 2Mbps DQPSK, 5.5/11Mbps CCK) 802.11g: OFDM (6/9Mbps BPSK, 12/18Mbps QPSK, 24/36Mbps 16-QAM, 48/54Mbps 64-QAM) 802.11n: OFDM (6.5 BPSK, QPSK, 16-QAM, 64-QAM)

Tauro Eco 99-3-D / 99-3-P

Input data	
Start voltage	650 V _{DC}
MPP voltage range	580 - 930 V _{DC}
MPP controller	1
Max. input voltage (at 1000 W/m ² / -10 °C in an open circuit)	1000 V _{DC}
Tauro Eco 99-3-P input data	
Max. input current (I _{DC max}) Total PV1 / PV2	175 A 100 A / 100 A
Max. short circuit current (I _{SC PV} = I _{SC max}) Total PV1 / PV2	250 A 125 A / 125 A
Max. input power (P _{PV max}) Total PV1 / PV2	150 kWp 79 kWp / 79 kWp
Tauro Eco 99-3-D input data	
Max. input current (I _{DC max}) Total PV1 / PV2 / PV3 per string	175 A 75 A / 75 A / 75 A 12 A
Max. short circuit current (I _{SC PV} = I _{SC max}) Total PV1 / PV2 / PV3 per string	355 A 125 A / 125 A / 125 A 18 A
Max. input power (P _{PV max}) Total PV1 / PV2 / PV3	150 kWp 57 kWp / 57 kWp / 57 kWp
Output data	
Nominal output power (P _{nom})	99.99 kW
Max. output power	99.99 kW
Nominal grid voltage	220 V _{AC} 230 V _{AC} ¹⁾
Grid voltage range	180 - 270 V _{AC}
Grid connection	3~ NPE 380 / 220 V _{AC} 3~ NPE 400 / 230 V _{AC}
Nominal output current (per phase)	151.5 A / 144.9 A
Nominal frequency	50 / 60 Hz ¹⁾

Total harmonic distortion	< 1%
Power factor (cos phi)	0 - 1 ind./cap. ²⁾
Max. feedback current ³⁾ Fronius Tauro Eco 99-3-P Fronius Tauro Eco 99-3-D	125 A ⁴⁾ 250 A ⁴⁾
Power-up current pulse and duration ⁵⁾	30.5 A / 2.08 ms ⁴⁾
Max. output fault current per period	93.9 A / 22 ms
General data	
Maximum efficiency	98.5%
European efficiency (580 / 800 / 930 Vdc)	98.2 / 97.7 / 97.3%
Overnight self-consumption	15 W
Cooling	Controlled forced-air ventilation
Degree of protection	IP 65
Dimensions L x W x H (without mounting bracket)	1109 x 346 x 755 mm
Weight (without mounting bracket)	103 kg
Permitted ambient temperature with built-in "AC disconnect" option	- 40 °C - +65 °C -25 °C - +65 °C
Permitted storage temperature	- 40 °C - +70 °C
Permissible humidity	0 - 100%
EMC device class	B
Overvoltage category AC / DC	3 / 2
Pollution degree	3
Protection class	1
Sound pressure level (580 V _{DC} / 930 V _{DC})	74,4 / 79,3 dB(A) (ref. 20 µPA)
Protection devices	
DC insulation measurement	Integrated ²⁾
Response to overload	Operating point shift power limitation
DC disconnect	Integrated
RCMU	Integrated
WLAN	
Frequency range	2412 - 2462 MHz
Channels / power used	Channel: 1-11 b,g,n HT20 Channel: 3-9 HT40 <18 dBm

Modulation	802.11b: DSSS (1Mbps DBPSK, 2Mbps DQPSK, 5.5/11Mbps CCK) 802.11g: OFDM (6/9Mbps BPSK, 12/18Mbps QPSK, 24/36Mbps 16-QAM, 48/54Mbps 64-QAM) 802.11n: OFDM (6.5 BPSK, QPSK, 16-QAM, 64-QAM)
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Tauro Eco 100-3-D / 100-3-P

Input data	
Start voltage	650 V _{DC}
MPP voltage range	580 - 930 V _{DC}
MPP controller	1
Max. input voltage (at 1000 W/m ² / -10 °C in an open circuit)	1000 V DC
Tauro Eco 100-3-P input data	
Max. input current (I _{DC max}) Total PV1 / PV2	175 A 100 A / 100 A
Max. short circuit current (I _{SC PV} = I _{SC max}) Total PV1 / PV2	250 A 125 A / 125 A
Max. input power (P _{PV max}) Total PV1 / PV2	150 kWp 79 kWp / 79 kWp
Tauro Eco 100-3-D input data	
Max. input current (I _{DC max}) Total PV1 / PV2 / PV3 per string	175 A 75 A / 75 A / 75 A 12 A
Max. short circuit current (I _{SC PV} = I _{SC max}) Total PV1 / PV2 / PV3 per string	355 A 125 A / 125 A / 125 A 18 A
Max. input power (P _{PV max}) Total PV1 / PV2 / PV3	150 kWp 57 kWp / 57 kWp / 57 kWp
Output data	
Nominal output power (P _{nom})	100 kW
Max. output power	100 kW
Nominal grid voltage	220 V _{AC} 230 V _{AC} ¹⁾
Grid voltage range	180 - 270 V _{AC}
Grid connection	3~ NPE 380 / 220 V _{AC} 3~ NPE 400 / 230 V _{AC}
Nominal output current (per phase)	151.5 A / 144.9 A
Nominal frequency	50 / 60 Hz ¹⁾
Total harmonic distortion	< 1%
Power factor (cos phi)	0 - 1 ind./cap. ²⁾

Max. feedback current ³⁾ Fronius Tauro Eco 100-3-P Fronius Tauro Eco 100-3-D	125 A ⁴⁾ 250 A ⁴⁾
Power-up current pulse and duration ⁵⁾	30.5 A / 2.08 ms ⁴⁾
Max. output fault current per period	93.9 A / 22 ms
General data	
Maximum efficiency	98,5 %
European efficiency (580 / 800 / 930 Vdc)	98,2 / 97,7 / 97,3 %
Overnight self-consumption	15 W
Cooling	Controlled forced-air ventilation
Degree of protection	IP 65
Dimensions L x W x H (without mounting bracket)	1109 x 346 x 755 mm
Weight (without mounting bracket)	103 kg
Permitted ambient temperature with built-in "AC disconnect" option	- 40 °C - +65 °C -25 °C - +65 °C
Permitted storage temperature	- 40 °C - +70 °C
Permissible humidity	0 - 100%
EMC device class	B
Overvoltage category AC / DC	3 / 2
Pollution degree	3
Protection class	1
Sound pressure level (580 V _{DC} / 930 V _{DC})	74,4 / 79,3 dB(A) (ref. 20 μPA)
Protection devices	
DC insulation measurement	Integrated ²⁾
Response to overload	Operating point shift power limitation
DC disconnect	Integrated
RCMU	Integrated
WLAN	
Frequency range	2412 - 2462 MHz
Channels / power used	Channel: 1-11 b,g,n HT20 Channel: 3-9 HT40 <18 dBm
Modulation	802.11b: DSSS (1Mbps DBPSK, 2Mbps DQPSK, 5.5/11Mbps CCK) 802.11g: OFDM (6/9Mbps BPSK, 12/18Mbps QPSK, 24/36Mbps 16-QAM, 48/54Mbps 64-QAM) 802.11n: OFDM (6.5 BPSK, QPSK, 16-QAM, 64-QAM)

Explanation of footnotes

- 1) The values quoted are default values; the inverter is configured specifically to meet the needs of the country in question.
- 2) Depending on the country setup or device-specific settings
(ind. = inductive; cap. = capacitive)
- 3) Maximum current from a defective solar module to all other solar modules
- 4) Guaranteed by the electrical configuration of the inverter
- 5) Current peak when switching on the inverter

Applicable standards and guidelines

CE mark The devices comply with all the requisite and relevant standards and guidelines that form part of the relevant EU Directive, and are therefore permitted to display the CE mark.

WLAN Compliance with 2014/53/EU Radio Equipment Directive (RED)

The above table of technical data lists the frequency ranges and maximum HF transmission power used by Fronius wireless products available for sale in the EU in accordance with Article 10.8 (a) and 10.8 (b) of the RED.

Fronius products must be installed and operated such that the product is always 20 cm or more away from the body.

Power failure The standard measurement and safety procedures integrated into the inverter ensure that in the event of a grid failure, the feeding in of energy is immediately interrupted (e.g. switch-off by the energy supplier or damage to lines).

Warranty terms and conditions, and disposal

Fronius manufacturer's warranty

Detailed, country-specific warranty terms are available on the internet:
www.fronius.com/solar/warranty

To obtain the full warranty period for your newly installed Fronius inverter or storage system, please register at: www.solarweb.com.

Disposal

If your inverter is to be replaced, Fronius will take back the old device and arrange for it to be recycled in an appropriate manner.

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Under **www.fronius.com/contact** you will find the addresses
of all Fronius Sales & Service Partners and locations.



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