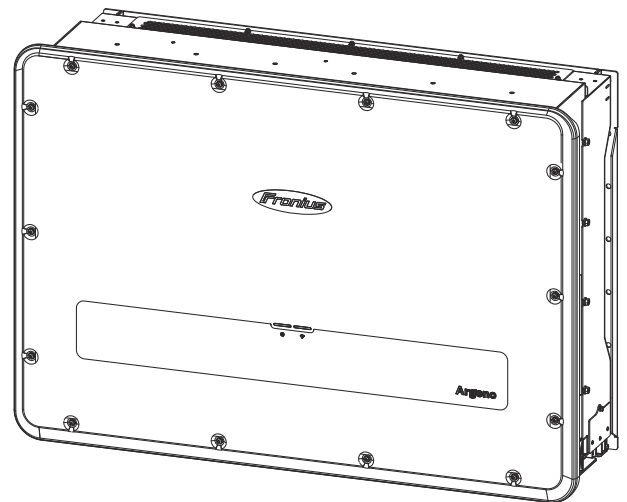


# Operating Instructions

**Fronius Argeno**



**EN** | Operating Instructions



42,0426,0547,EA

008-20032026



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# **General information**



# Safety information

---

## Explanation of warnings and safety instructions

The warnings and safety instructions in these instructions are intended to protect people from possible injury and the product from damage.



### **DANGER!**

#### **Indicates an immediately dangerous situation**

Serious injury or death will result if appropriate precautions are not taken.

- Action step to escape the situation



### **WARNING!**

#### **Indicates a potentially dangerous situation**

Death or serious injury may result if appropriate precautions are not taken.

- Action step to escape the situation



### **CAUTION!**

#### **Indicates a potentially dangerous situation**

Minor or moderate injury may result if appropriate precautions are not taken.

- Action step to escape the situation

### **NOTE!**

**Indicates impaired work results and/or damage to the device and components**

The warnings and safety instructions are an integral part of these instructions and must always be observed to ensure the safe and proper use of the product.

---

## Safety instructions and important information

The device has been manufactured in line with the state of the art and according to recognized safety standards.



### **WARNING!**

#### **Incorrect operation or misuse**

Serious to fatal injuries to the operator or third parties as well as damage to the device and other property of the operator may result.

- All persons involved in the commissioning, maintenance, and servicing of the device must be appropriately qualified and have knowledge of working with electrical installations.
- Read these operating instructions in full and follow them carefully and precisely.
- The operating instructions must always be kept to hand wherever the device is being used.

**IMPORTANT!**

In addition to the operating instructions, observe the following general and local rules:

- Accident prevention
- Fire protection
- Environmental protection

**IMPORTANT!**

Labels, warning notices, and safety symbols are located on the device. A description can be found in these operating instructions.

**IMPORTANT!**

All safety and danger notices on the device:

- Must be kept in a legible state
- Must not be damaged/marked
- Must not be removed
- Must not be covered, have anything stuck on them, or painted over

**WARNING!****Tampered-with and non-functioning protection devices**

Serious to fatal injuries as well as damage to the device and other property of the operator may result.

- ▶ Never bypass or disable protection devices.
- ▶ Any protection devices that are not fully functional must be repaired by an authorized specialist before the device is switched on.

**WARNING!****Loose, damaged, or under-dimensioned cables**

An electric shock can be fatal.

- ▶ Use undamaged, insulated, and adequately dimensioned cables.
- ▶ Fasten the cables according to the specifications in the operating instructions.
- ▶ Loose, damaged, or under-dimensioned cables must be repaired or replaced immediately by an authorized specialist.

**NOTE!****Installations or modifications to the device**

The device may be damaged

- ▶ Do not carry out any alterations, installations, or modifications to the device without first obtaining the manufacturer's permission.
- ▶ Damaged components must be replaced.
- ▶ Only use original spare parts.

---

**Safety measures  
at the installation site**

When installing devices with ventilation slots, ensure that the ambient air can enter and exit unhindered through the vents. When selecting the installation site, observe the protection class (IP).

---

**Environmental  
conditions**

Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended use.

---

**Electromagnetic fields**

During operation, due to the high electrical voltages and currents, local electromagnetic fields (EMF) occur in the environment around the inverter and the Fronius system components as well as in the area of the PV modules including the supply lines.

In the case of exposure to humans, the required limit values are observed when the products are used in line with the intended use and the recommended distance of at least 20 cm is observed.

If these limit values are complied with, according to current scientific knowledge, no health-endangering effects from EMF exposure are to be expected. If wearers of prostheses (implants, metal parts in and on the body) as well as active physical aids (pacemakers, insulin pumps, hearing aids, etc.) are in the vicinity of components of the PV system, they must consult with the responsible doctor regarding possible health risks.

---

**Data on noise emission values**

The sound pressure level of the inverter is indicated in the [Technical data](#).

The cooling of the device takes place via an electronic temperature control system at the lowest possible noise level and depends on the power used, ambient temperature, and the soiling level of the device, etc.

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.

---

**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 equipment that is susceptible to interference 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, the operator is obliged to take action to rectify the situation.

---

**Ground conductor**

Connection of a point in the device, system, or installation to ground to protect against electric shock in the event of a fault. When installing an inverter from safety class 1 (see [Technical data](#)), a ground conductor connection is required.

When connecting the ground conductor, ensure that it is secured to prevent unintentional disconnection. All of the points listed in the chapter headed [Connecting the inverter to the public grid \(AC side\)](#) on page 32 must be observed. When using cable glands, ensure that the ground conductor is last to be subjected to a load in the event of a failure of the cable gland. The respective national standards and regulations and requirements for minimum cross-section must be observed when connecting the ground conductor.

# 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.

---

## INV OFF

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

For installation, see [Connecting and activating INV OFF](#) on page 48.

---

## Central grid and system protection

The inverter offers the option to use the integrated AC relays as section 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 chapter [INV OFF](#) on page 12.

---

## RCMU

The inverter is equipped with an RCMU (residual current monitoring unit) according to IEC 62109-2 and VDE 0126-1-1.

It monitors residual currents from the PV module up to the AC output of the inverter and disconnects the inverter from the grid if an impermissible residual current is detected. If the RCMU is not working properly, the device will be immediately disconnected from the public grid at all poles.

---

## AFCI – arc fault circuit interrupter

A Fronius Argento version is available with AFCI (arc fault circuit interrupter) arc detection (item number: 4,210,471).

An AFCI protects against arc faults and, in the narrower sense, is a protection device in the event of contact faults. The AFCI evaluates faults that occur in the current and voltage flow using an electronic circuit and shuts down the circuit if a contact fault is detected. This prevents overheating and possible fires at poor contact points.



**IMPORTANT!**

Active PV module electronics can impair the function of the ArcGuard. Fronius cannot guarantee correct function when using the Fronius ArcGuard in combination with active PV module electronics.

**CAUTION!****Danger from faulty or incorrect DC installation.**

This may result in a risk of damage and, as a consequence, risk of fire in the PV system due to prohibited thermal loads that occur during an arc.

- ▶ Check the plug connections to ensure that they are correct.
- ▶ Repair faulty insulation correctly.
- ▶ Perform connection work in line with the instructions.

**IMPORTANT!**

Fronius will not bear any costs which may arise due to a detected electric arc and its consequences. Fronius accepts no liability for damage which may occur despite the integrated arc fault circuit interrupter/interruption (e.g., due to a parallel arc).

---

**Safe state**

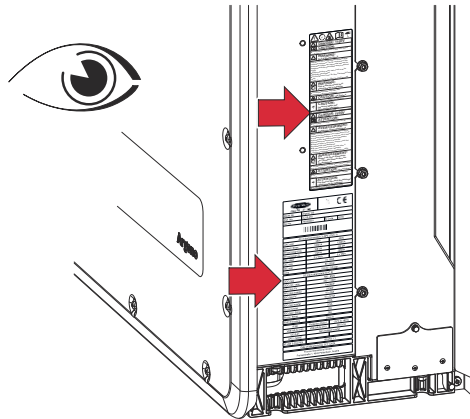
If one of the following safety devices is triggered, the inverter switches to the safe state:

- INV OFF
- Isolation measurement and
- RCMU

In the safe state, the inverter no longer feeds in and is disconnected from the grid by the opening of the AC relay.

# General

## Information on the device



Warning notices, labels, and safety symbols can be found on and in the inverter. This information must be kept in a legible condition and must not be removed, covered, pasted over, or painted over. The notices and symbols warn against incorrect operation, as this may result in serious injury and damage to property.

### Symbols on the rating plate:



CE label – confirms compliance with applicable EU directives and regulations.



WEEE marking – waste electrical and electronic equipment must be collected separately and recycled in an environmentally sound manner in accordance with the European Directive and national law.

### Safety symbols and text:



DANGER: 1100V  
DANGER: 1100 V

WARNING: Risk of Electric Shock

Both AC and DC voltage sources are terminated inside this equipment. The DC conductors of this photovoltaic system are ungrounded and may be energized when the photovoltaic array is exposed to light.

- Before removing cover, each circuit must be individually disconnected.
- Do not remove cover. No user serviceable parts inside.
- Refer Servicing To Qualified Service Personnel.

### Translation:

WARNING: Risk of electric shock

Both AC and DC voltage sources are terminated inside this equipment. The DC conductors of this photovoltaic system are ungrounded and may be energized when the photovoltaic system is exposed to light.

- Before removing cover, each circuit must be individually disconnected.
- Do not remove cover. No user serviceable parts inside.
- Have maintenance performed by qualified service personnel.

## Safety symbols and text:



CAUTION: Read IMPORTANT SAFETY INSTRUCTIONS before Use.

### Translation:

CAUTION: Read IMPORTANT SAFETY INSTRUCTIONS before use.

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

- These operating instructions.
- All operating instructions for the system components of the photovoltaic system, especially the safety rules.



CAUTION: Hot Surface

- To reduce the risk of burns - Do not touch.

### Translation:

CAUTION: Hot surface

- To reduce the risk of burns - Do not touch.



WARNING: Risk of electric shock from stored energy in capacitor

- Do not remove cover until 5 min after disconnecting all sources of supply.

### Translation:

WARNING: Risk of electric shock from stored energy in capacitor

- Do not remove cover until 5 min after disconnecting all sources of supply.



CAUTION: Ingress of water may damage the electronic

- Do not open unit when it rains.

### Translation:

CAUTION: Ingress of water may damage the electronics

- Do not open unit when it is raining.

## How information is presented in the document

The conventions regarding how information is presented in the document, which are set out below, have been defined in order to increase the readability and comprehensibility of the document.

### Application notes

**IMPORTANT!** Indicates application notes and other useful information. It does not indicate a harmful or dangerous situation.

### Software

Software functions and elements of a graphical user interface (e.g., buttons, menu items) are highlighted in the text with this **mark up**.

Example: Click **Save**.

### Instructions for action

**1** Action steps are displayed with consecutive numbering.

✓ This symbol indicates the result of the action step or the entire instruction.

---

## Target group

This document provides detailed information and instructions to ensure that all users can use the device safely and efficiently.

- The information is intended for the following groups of people:
  - **Technical specialists:** People with appropriate qualifications and fundamental electronic and mechanical knowledge, who are responsible for the installation, operation, and maintenance of the device.
  - **End users:** People that use the device in daily operation and want to understand its basic functions.
- Regardless of any qualifications, only perform the activities listed in this document.
- All persons involved in the commissioning, maintenance, and servicing of the device must be appropriately qualified and have knowledge of working with electrical installations.
- The definition of professional qualifications and their applicability are subject to national law.

---

## Data security

With regard to data security, the user is responsible for:

- Backing up any changes made to the factory settings
- Saving and storing personal settings

### NOTE!

#### Data security for network and Internet connection

Unsecured networks and a lack of safeguards can result in data loss and unauthorized access. Observe the following points for safe operation:

- ▶ Operate inverters and system components on a private, secure network. A WiFi network is considered secure if security standard WPA 2 is satisfied as a minimum.
- ▶ Keep the network devices (e.g., WiFi routers) up to date with the latest technology.
- ▶ Keep the software and/or firmware updated.
- ▶ Use a wired network to ensure a stable data connection.
- ▶ For security reasons, do not make inverters and system components accessible from the Internet via port forwarding or Port Address Translation (PAT).
- ▶ Use the solutions provided by Fronius for monitoring and remote configuration.
- ▶ The optional communication protocol Modbus TCP/IP<sup>1)</sup> is an unsecured interface. Only use Modbus TCP/IP if no other secured data communication protocol (MQTT<sup>2)</sup>) is possible (e.g., compatibility with older Smart Meters).

<sup>1)</sup> TCP/IP - Transmission Control Protocol/Internet Protocol

<sup>2)</sup> MQTT - Message Queuing Telemetry Protocol

---

## Copyright

Copyright of these operating instructions remains with the manufacturer.

---

Text and illustrations were accurate at the time of printing, subject to change. We are grateful for suggestions for improvement and information on any discrepancies in the operating instructions.

# Product description

## Description of the device

The inverter transforms the direct current generated by the PV modules into alternating current. This alternating current is fed into the public grid and synchronized with the mains voltage in use.

The inverter has been designed exclusively for use in grid-connected photovoltaic systems. It cannot generate electric power independently of the grid.

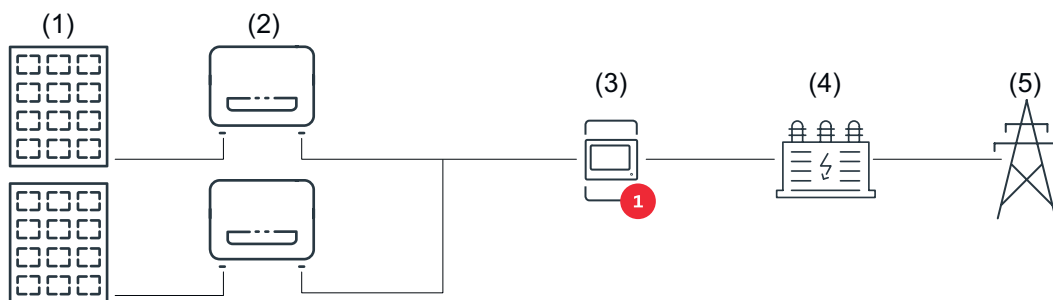
The inverter also has a design and functions that ensure it can offer maximum safety during installation and during operation.

## AC Daisy Chain

With the "AC Daisy Chain" inverter variant, the AC lead can be routed directly from the inverter to another inverter. This makes it possible to quickly connect a maximum of two Argeno inverters to each other. The optionally available Daisy Chain input plate and type 2 AC SPDs are required for this variant (4,240,474,CK).

The minimum cable cross-section is defined based on the fuse on the grid connection point. A larger cable cross-section can be selected at any time. The applicable standards in the respective country must be taken into account and followed.

## System overview



*Fronius Argeno system overview*

|     |                                                                                                                                                                                    |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) | <b>PV module</b><br>generates direct current                                                                                                                                       |
| (2) | <b>Fronius Argeno inverter</b><br>converts the direct current into alternating current                                                                                             |
| (3) | <b>Primary meter</b><br>records the system's power curve                                                                                                                           |
| (4) | <b>Transformer</b><br>feeds the generated energy into the grid                                                                                                                     |
| (5) | <b>Grid</b><br>supplies the loads in the system if the PV modules do not deliver sufficient power. Surplus energy is fed into the grid when more power is generated than consumed. |

# Utilization in accordance with "intended purpose"

---

**Intended use**      The inverter is designed exclusively to convert direct current from PV modules into alternating current and feed this power into the public grid.

Intended use also includes following all information from the operating instructions.

---

**Foreseeable mis-use**      The following circumstances are considered to be reasonably foreseeable mis-use:

- Any use that is not the intended use or goes beyond the intended use.
- Alterations to the inverter that are not expressly recommended by Fronius.
- Installation of components that are not expressly recommended or sold by Fronius.

---

**Provisions for the photovoltaic system**      The inverter is designed exclusively to be connected and used with PV modules. Use with other DC generators (e.g., wind generators) is not permitted.

When configuring the photovoltaic system, make sure that all photovoltaic system components are operating exclusively within their permitted operating range.

All measures recommended by the PV module manufacturer for maintaining the PV module properties must be followed.

# Functional principle

---

## **Operating principle**

The inverter is fully automatic. Starting at sunrise, as soon as the PV modules are generating enough energy, the inverter starts checking the PV system (insulation measurement) and the grid (mains voltage and mains frequency). If all values are within the normative framework, the system is automatically connected to the grid and grid power feed operation begins.

The control system of the inverter ensures that the maximum possible power output is drawn from the PV modules at all times. This function is called MPPT (Maximum Power Point Tracking). In the event of shady conditions affecting the PV modules, a large part of the local maximum power point (LMPP) of the PV system can still be obtained via the "Dynamic Peak Manager" function.

As dusk starts and there is no longer sufficient energy available to feed energy into the grid, the inverter shuts down the connection of the power electronics to the grid completely and stops operating. All settings and recorded data are saved.

---

## **Overload performance**

When the device temperature gets too high, the inverter automatically reduces the current output power in order to protect itself. Reasons for an excessively high device temperature can be a high ambient temperature or insufficient heat dissipation (for example, when installed in containers without sufficient heat dissipation).

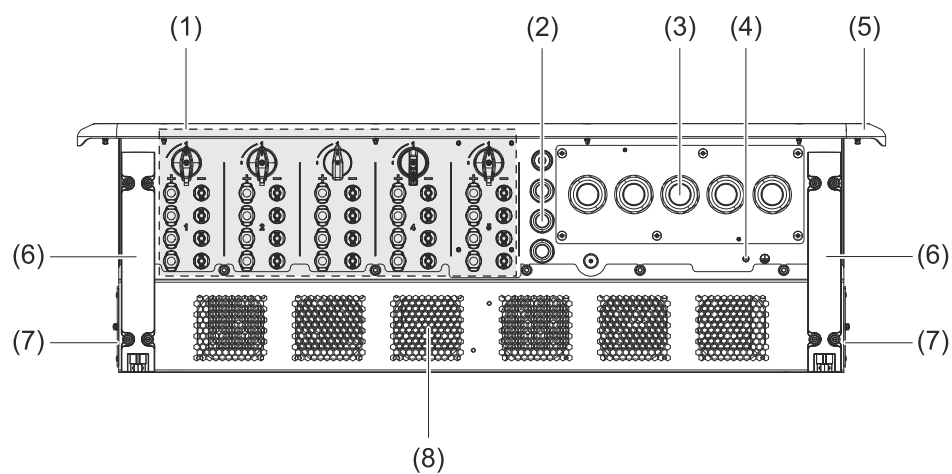
The output of the inverter is reduced such that the temperature will not exceed the permissible limit.

If a maximum temperature is exceeded, the inverter switches off in a safe state and resumes grid power feed operation only after the device has cooled down.

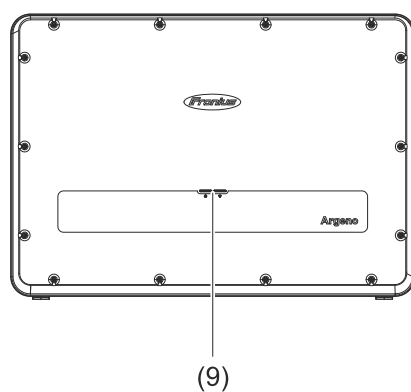


# Operating controls and connections

## Operating elements and displays

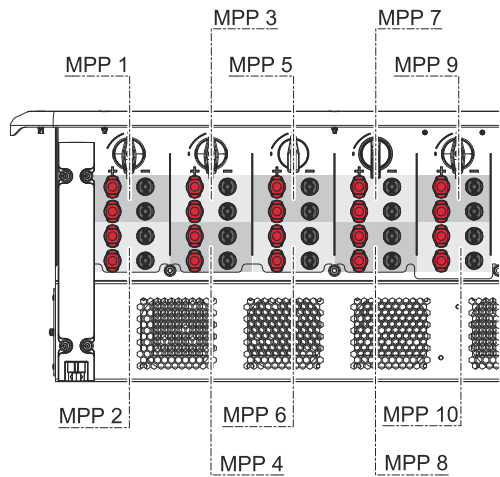


- |     |                                       |
|-----|---------------------------------------|
| (1) | DC disconnectors and DC connections   |
| (2) | Cable glands for data communication   |
| (3) | Cable glands for AC                   |
| (4) | Connection bolt for grounding         |
| (5) | Housing cover                         |
| (6) | Support foot with handle (left/right) |
| (7) | Fan drawer (left/right)               |
| (8) | Fan                                   |

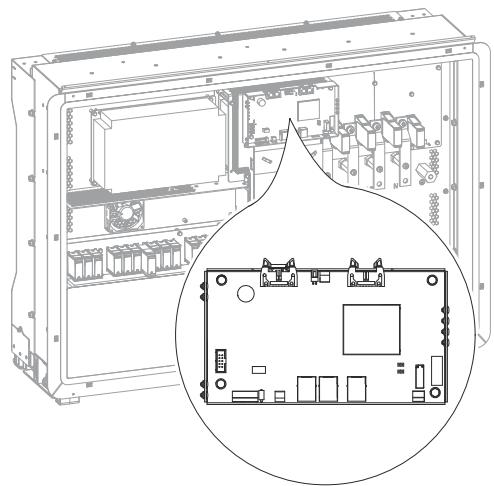


- (9) LED status indicators  
For further information on the LED status indicators, see [Button functions and LED status indicators](#)

PV connections

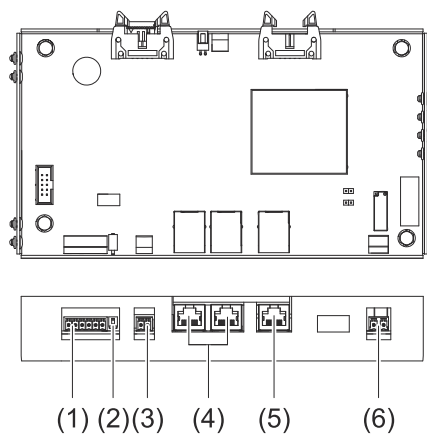


Data communication area in in-verter



The data communication area is located in the middle of the inverter.

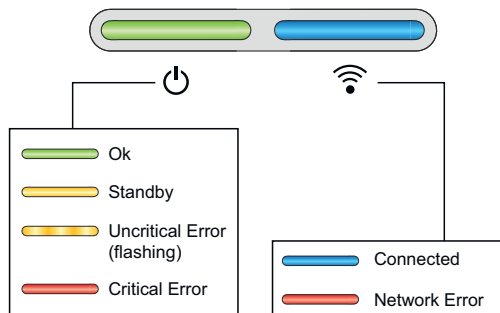
Data communication area



|     |                                                                                                                                                                         |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) | <b>RS485 interface</b><br>Reserved for future functions.                                                                                                                |
| (2) | <b>RS485 switch</b>                                                                                                                                                     |
| (3) | <b>INV OFF</b><br>Connection for external 24 V (+/-20%) / 1 A (min. 15 mA) grid protection component, see <a href="#">Connecting and activating INV OFF</a> on page 48. |

|     |                                                                                                                                                                                                                                                              |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (4) | <b>LAN1 and 2</b><br>Ethernet connection for data communication (e.g., WLAN router, home network, or for commissioning with a laptop, see chapter <a href="#">Establishing a LAN connection via a network</a> on page 50).                                   |
| (5) | <b>LAN direct / Service</b><br>Ethernet connection for commissioning with static IP (direct PC connection), see <a href="#">Establishing a local LAN connection</a> on page 49.                                                                              |
| (6) | <b>ERR error message relay</b><br>The relay contact closes as soon as a malfunction occurs. This function can be used to indicate an error via a visible or audible signal. For installation, see <a href="#">Connecting the ERR alarm relay</a> on page 47. |

## Button functions and LED status indicators

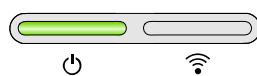


The operating status LED displays the status of the inverter.



The communications LED displays the connection status.

### LED status indicators



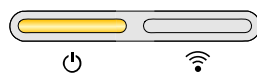
The inverter is operating correctly.

⏻ Lights up green



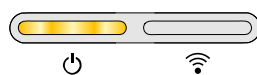
The inverter is starting.

⏻ Flashes green



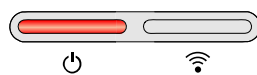
The inverter is on standby, is not operating (e.g., no grid feed-in at night), or is not configured.

⏻ Lights up yellow



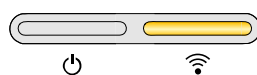
The inverter displays a non-critical status.

⏻ Flashes yellow



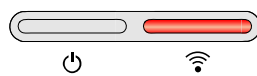
The inverter displays a critical status and no grid feed-in process is taking place.

⏻ Lights up red



The network connection is not configured.

📶 Lights up yellow



A network error is displayed, the inverter is operating correctly.

📶 Lights up red



The inverter is performing an update.

⏻ / 📶 Flash blue



# **Installation and Startup**



# General

## System component compatibility

All installed components in the PV system must be compatible with each other and have the necessary configuration options. The installed components must not restrict or negatively affect the functioning of the PV system.

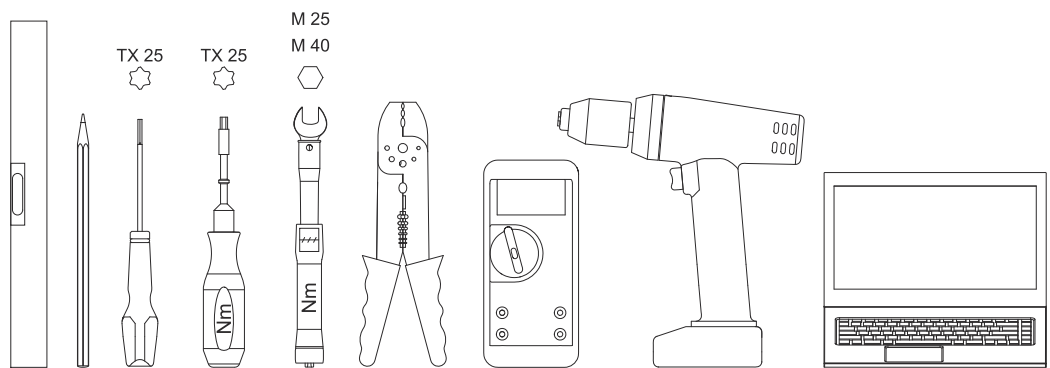
### NOTE!

#### **Risk due to components in the PV system that are not and/or only partially compatible.**

Incompatible components can restrict and/or negatively affect the operation and/or functioning of the PV system.

- Only install components recommended by the manufacturer in the PV system.
- Before installation, check the compatibility of components that have not been expressly recommended with the manufacturer.

## Required tools



- Spirit level
- Pencil
- Screwdriver TX25
- Torque wrench TX25
- Torque wrench M25, M40
- Stripping tool for wires and cables
- Multimeter for measuring voltage
- Drill driver
- Computer for setting up the inverter

# Installation location and position

## Choosing the location of the inverter



### DANGER!

#### **Danger due to flammable or explosive materials in the vicinity of the device.**

Fire poses a risk of serious or fatal injury.

- ▶ Do not install the device in potentially explosive atmospheres or in the vicinity of highly flammable materials.



### CAUTION!

#### **Improper positioning can cause condensate to build up in the device and impair its function (e.g., if the device is positioned in areas outside the specified ambient conditions or moved from a cold to a warm environment on a short-term basis).**

Material damage due to build-up of condensate.

- ▶ Check interior for condensate prior to electrical installation and allow adequate drying time if necessary.
- ▶ Position the device in accordance with the technical data.



### CAUTION!

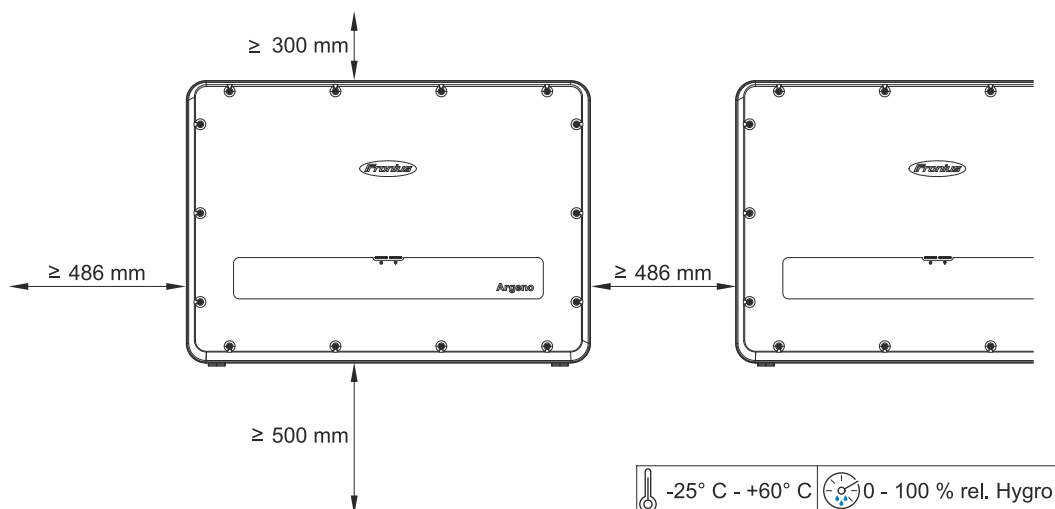
#### **The device housing can be severely damaged due to gases in conjunction with weather-related humidity (e.g., ammonia, sulfur).**

Damage to property due to gases that react aggressively on surfaces in conjunction with weather-related humidity.

- ▶ If the device is exposed to gases, it must be set up at a location where it can be checked.
- ▶ Carry out regular visual inspections.
- ▶ Remove moisture on the housing immediately.
- ▶ Ensure adequate ventilation at the setup location.
- ▶ Remove soiling immediately, especially on vents.
- ▶ Damage to the device resulting from failure to observe these instructions is not covered by the warranty.

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

Only install on a solid, non-flammable surface





When installing the inverter in a switch cabinet or similar closed environment, ensure adequate heat dissipation by forced-air ventilation.

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

The following substrates are allowed:

- Wall installation: Corrugated sheet metal (mounting rails), brick, concrete, or other non-flammable surfaces sufficiently capable of bearing loads
- Pole mounted: Mounting rails, behind the PV modules directly on the PV mounting system
- Flat roofs (if a film roof, make sure that the films comply with the fire protection requirements and are not highly flammable. Ensure compliance with the national provisions.)
- Covered parking lot roof (no overhead installation)

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



The inverter is suitable for indoor installation.



The inverter is suitable for outdoor installation.

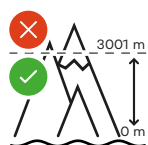
Due to its IP 66 protection class, the inverter is not susceptible to water spray from any direction.



Do not expose the inverter to direct sunlight in order to keep inverter heating as low as possible.



The inverter should be installed in a protected location, e.g., near the PV modules or under an overhanging roof.



The inverter must not be installed or operated at more than 3,000 m above sea level.



Do not install the inverter:

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



**Caution:** This device is not intended for use in living environments and may not provide sufficient protection for radio reception in such environments.

This device is intended for use at locations that are at least 30 m away from any sensitive wireless services belonging to third parties.



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.



The inverter is designed to be dust-proof (IP 66). In areas of high dust accumulation, dust deposits may collect on the cooling surfaces, and thus impair the thermal performance. Regular cleaning is necessary in such situations. We therefore recommend not installing the inverter in areas and environments with high dust accumulation.



Do not install the inverter in:

- Greenhouses
- Storage or processing areas for fruit, vegetables, or viticulture products
- Areas used in the preparation of grain, green fodder, or animal feeds

## Installation position of the inverter



The inverter is suitable for vertical installation on a vertical wall or column.

Do not install the inverter:

- In a tilted position
- With the connections pointing upwards
- On feet



The inverter is suitable for a horizontal installation position or installation on a sloping surface.

Do not install the inverter:

- On a sloping surface with the connections pointing upwards
- Overhanging with the connections pointing downwards
- On the ceiling

# Installing the inverter

## Selecting the mounting material



### WARNING!

**Using unsuitable mounting material can cause the device to fall.**

This can result in personal injury.

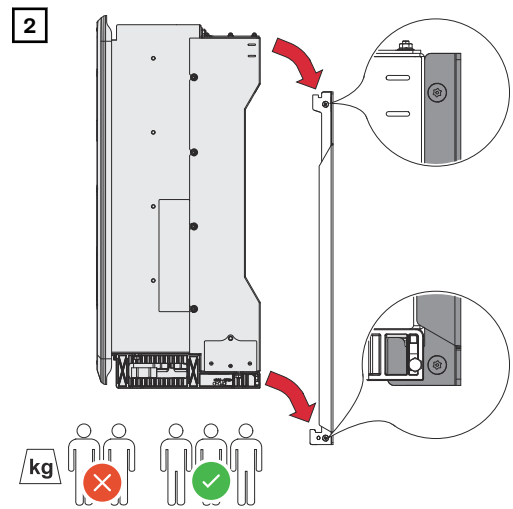
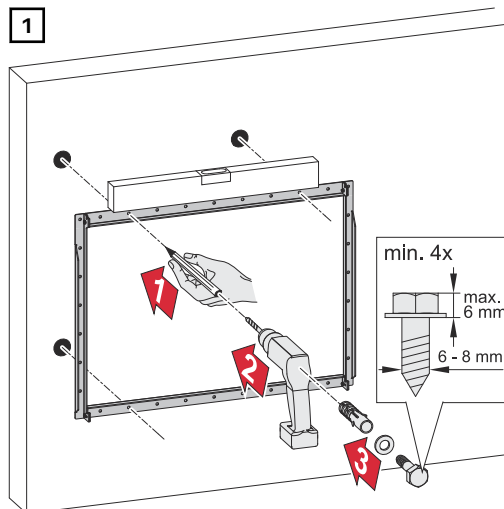
- ▶ Only use mounting material suitable for the mounting surface. Only use the supplied mounting material for masonry and concrete.
- ▶ Only mount the device in a suspended upright position.

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

## Dimensions of the mounting bracket

The dimensions of the mounting bracket can be found on page 90 at the end of the document.

## Mounting the inverter on the wall



Observe local provisions for lifting heavy loads.

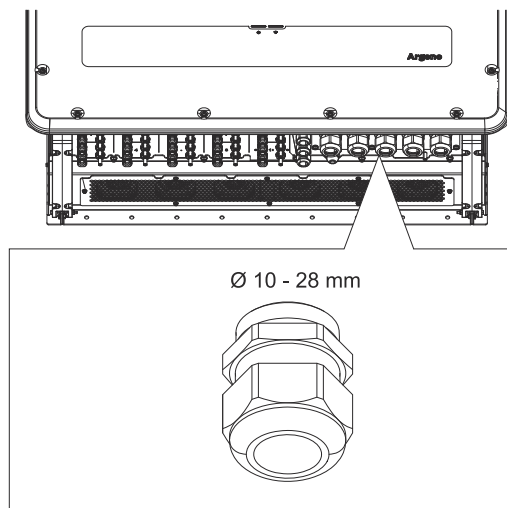
# Connecting the inverter to the public grid (AC side)

## 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.

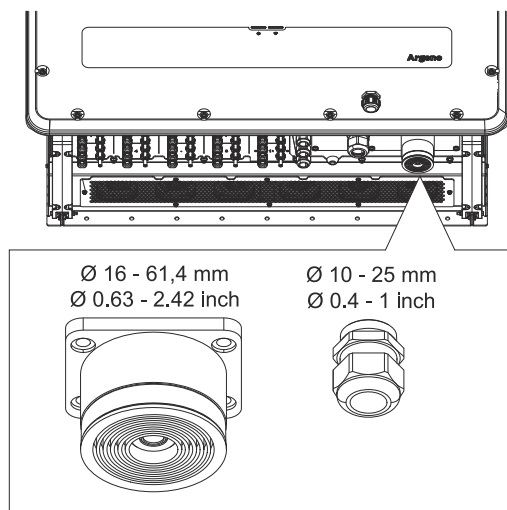
## AC connection area

### Singlecore cable gland version - Standard



5x M40 cable glands  
Diameter: 10 - 28 mm

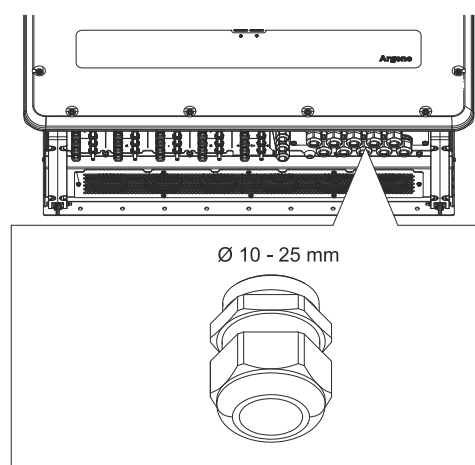
### Multicore cable gland version - Optional



The following cable outer diameters can be used with the larger cable gland:  
16 - 61.4 mm

Grounding cables measuring 10 - 25 mm can be routed through the small cable gland (M32 cable gland).

### AC Daisy Chain cable gland version – Optional



10x M40 cable glands  
Diameter: 10 - 28 mm

### Connecting aluminum cables

Aluminum cables can be connected to the AC connections.



#### **DANGER!**

**If electrolytes are present (e.g., condensate), the aluminum can be destroyed by the copper busbar.**

Fire poses a risk of serious or fatal injury.

- ▶ Cable lugs must be suitable for the conductor material and copper busbars used.
- ▶ When using aluminum cable lugs, select cable lugs with electroplating or AL/CU cable lugs and matching AL/CU washers.

#### **NOTE!**

**When using aluminum cables:**

- ▶ Follow all national and international guidelines regarding the connection of aluminum cables.
- ▶ Grease aluminum wires with appropriate grease to protect them from oxidation.
- ▶ Follow the instructions provided by the cable manufacturer.

### Permitted cables

Select cross-sections of sufficient size depending on the power category and connection version!

| Power category | Connection version | Cable cross-section    |
|----------------|--------------------|------------------------|
| Argene 125     | Singlecore         | 50-240 mm <sup>2</sup> |
|                | Multicore          | 50-240 mm <sup>2</sup> |
|                | Daisy Chain        | 50-240 mm <sup>2</sup> |

### Maximum alternating current fuse protection

If an external residual current circuit breaker is required due to installation regulations, a type A residual current circuit breaker must be used.

If a type B residual current circuit breaker is used, the **Compliant with type B**

RCD menu item must be enabled.

If one of these types is used, it must have a protective rating of at least 1250 mA.

**NOTE!**

The inverter may be used with a maximum 500 A automatic circuit breaker.

## Safety



**WARNING!**

**Danger from mains voltage and DC voltage from PV modules.**

An electric shock can be fatal.

- Prior to any connection work, ensure that the inverter is de-energized on the AC side and the DC side.
- Only an authorized electrical engineer is permitted to connect this equipment to the public grid.



**CAUTION!**

**Danger of damaging the inverter due to improperly connected wires.**

Improperly connected wires can cause thermal damage to the inverter and may cause a fire.

- When connecting AC and DC wires, make sure that all cables are secured to the inverter connections using the correct torque.

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

## Opening the inverter



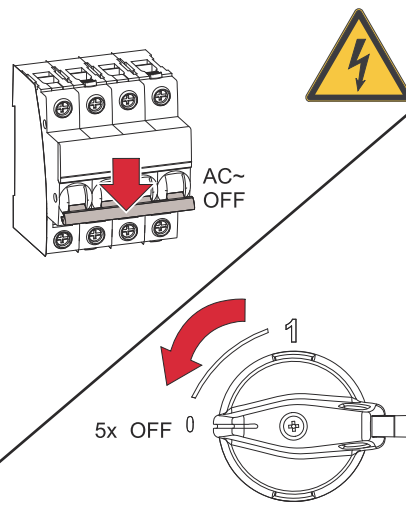
**CAUTION!**

**Components inside the device can be irreparably damaged by static discharge.**

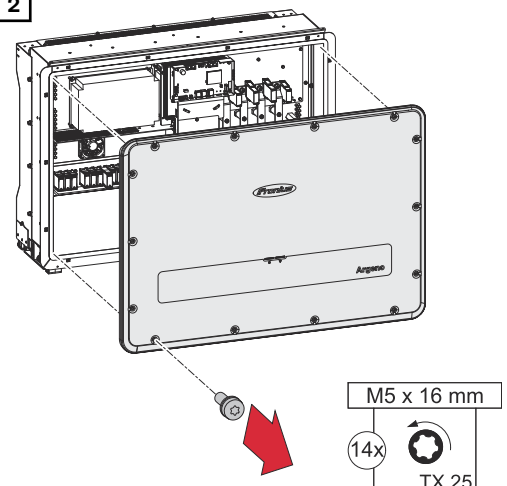
Damage to the device due to electrostatic discharge.

- Observe the ESD protection measures.
- Before touching a component, ground it by touching an earthed object.

1

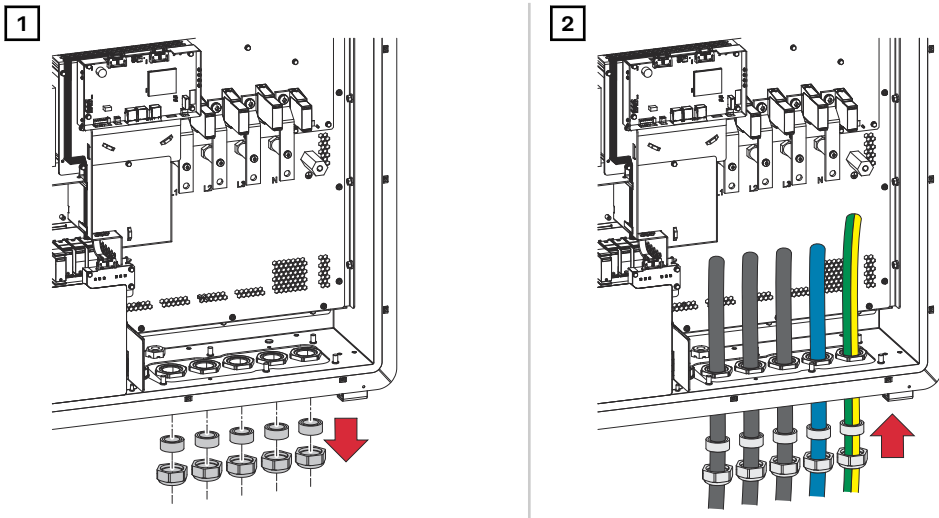


2



## Connecting the inverter to the public grid – Singlecore

The phases should be connected in the proper order: L1, L2, L3, N, and PE.

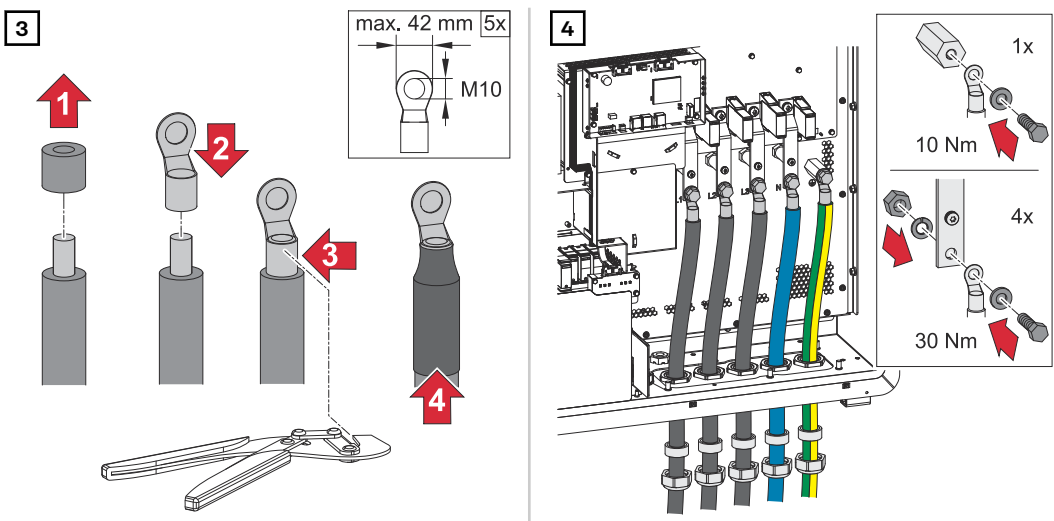


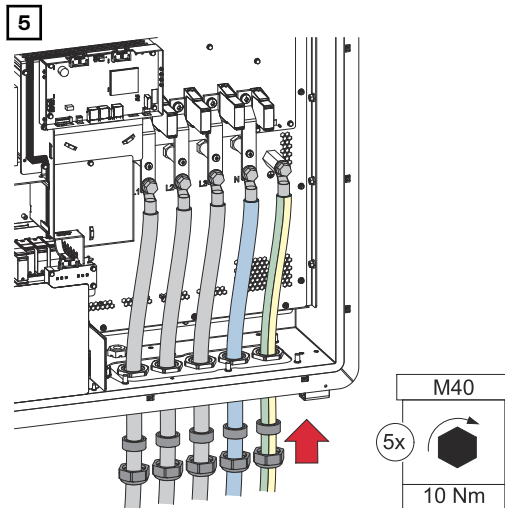
**CAUTION!**

**Short circuits may damage the inverter.**

AC leads that are not installed and routed correctly can result in damage to the device.

- ▶ Insulate bare parts of the connection cable and cable lug, e.g., using shrink sleeve.
- ▶ Connect the AC leads with as much distance between them as possible.





### Connecting the inverter to the public grid – PE (without N) or PEN conductor

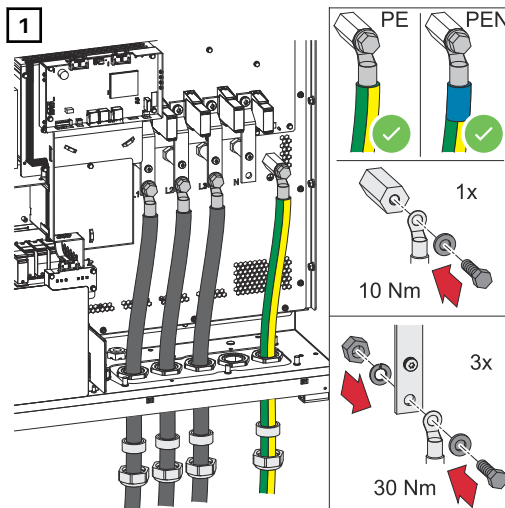
The connection process corresponds to that of the **Singlecore** version, see [Connecting the inverter to the public grid – Singlecore](#) on page 35.

#### ⚠ CAUTION!

##### Short circuits may damage the inverter.

AC leads that are not installed and routed correctly can result in damage to the device.

- ▶ Insulate bare parts of the connection cable and cable lug, e.g., using shrink sleeve.
- ▶ Connect the AC leads with as much distance between them as possible.



The cable gland of the N conductor that is not being used must be closed.

### Connecting the inverter to the public grid – Daisy Chain

The connection process corresponds to that of the **Singlecore** version, see [Connecting the inverter to the public grid – Singlecore](#) on page 35.

The optionally available **AC input plate - Daisy Chain** is required to connect the **Daisy Chain** version.



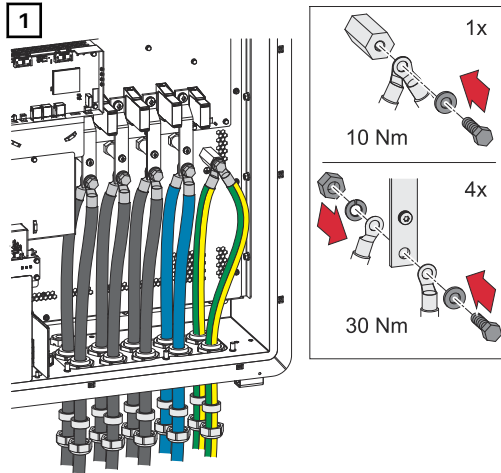


## CAUTION!

### Short circuits may damage the inverter.

AC leads that are not installed and routed correctly can result in damage to the device.

- ▶ Insulate bare parts of the connection cable and cable lug, e.g., using shrink sleeve.
- ▶ Connect the AC leads with as much distance between them as possible.



The L1 / L2 / L3 / N leads are connected to the front and rear of the busbar in each case. The groundings are connected to the PE connection.

# Connecting the PV cable to the inverter

## Safety



### DANGER!

**DC voltage is present at the exposed ends of the DC leads when there is irradiation on the PV modules.**

Touching the live connections can result in severe injury or death.

- ▶ Only touch insulated parts of the PV module leads. Do not touch exposed lead ends.
- ▶ Avoid short circuits.
- ▶ Do not connect shorted strings to the device.
- ▶ The device must not be operated with PV modules with a negative or positive ground.



### DANGER!

**Danger from mains voltage and DC voltage of PV modules that are exposed to light.**

An electric shock can be fatal.

- ▶ Prior to any connection work, ensure that the inverter is de-energized on the AC side and the DC side.
- ▶ Only an authorized electrical engineer is permitted to connect this equipment to the public grid.



### WARNING!

**Danger of an electric shock due to improperly connected terminals/PV plug connectors.**

An electric shock can be fatal.

- ▶ When connecting, ensure that each pole of a string is routed via the same PV input, e.g.:  
+ pole string 1 to the input **PV 1.1+** and - pole string 1 to the input **PV 1.1-**



### WARNING!

**Danger from DC voltage. Even if the DC disconnectors are switched off, the fuse PCB and everything before the DC disconnectors are live.**

An electric shock can be fatal.

- ▶ Prior to any connection work, ensure that the inverter is de-energized on the AC side and the DC side.



### CAUTION!

**Danger due to polarity reversal at the terminals.**

This may result in severe damage to the inverter.

- ▶ Use a suitable measuring instrument to check the polarity of the DC cabling.
- ▶ Use a suitable measuring instrument to check the voltage.



## CAUTION!

### Risk of damage to the inverter by exceeding the maximum input current per string.

Exceeding the maximum input current per string can damage 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 plugs.

## General information about PV modules

To enable suitable PV 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 PV modules will increase. The open-circuit voltage must not exceed the max. permissible system voltage. An open-circuit voltage above the indicated values will damage the inverter, and all warranty rights will become null and void.
- The temperature coefficients on the data sheet of the PV modules must be observed.
- Exact values for sizing the PV modules can be obtained using suitable calculation tools, such as the [Fronius Solar.creator](#).

### IMPORTANT!

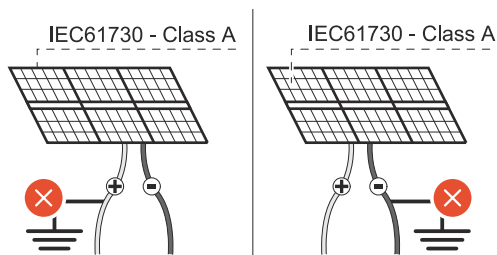
Before connecting up the PV modules, check that the voltage for the PV modules specified by the manufacturer corresponds to the actual measured voltage.



DC Voltage

### IMPORTANT!

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



### IMPORTANT!

Solar module strings must not be grounded.

max. 1100 V<sub>DC</sub>

**Permitted cables** Select sufficiently large cable cross-sections.

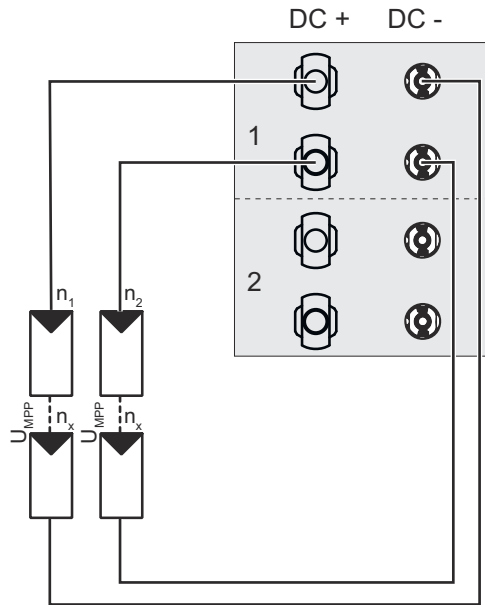
| Permitted adapters                                            | Cable cross-section                                   |
|---------------------------------------------------------------|-------------------------------------------------------|
| Phoenix/PV-C3F-S 2.5-6 (+)<br>Phoenix/PV-C3M-S 2.5-6 (-)      | 2.5-6 mm <sup>2</sup><br>(see data sheet of the plug) |
| Optional - These plugs are not part of the scope of delivery: |                                                       |
| Phoenix/PV-C4F-S 6-16 (+)<br>Phoenix/PV-C4M-S 6-16 (-)        | 6-16 mm <sup>2</sup><br>(see data sheet of the plug)  |
| Phoenix/PV-C1F-C-HSG (+)<br>Phoenix/PV-C1M-C-HSG (-)          | 2.5-6 mm <sup>2</sup><br>(see data sheet of the plug) |

**Recommended  
default configur-  
ation**

**All DC inputs disconnected**

**IMPORTANT!** String fuses may be required depending on the selected PV modules. Observe the information provided by the manufacturer of the module.

**Two strings on one MPP tracker**

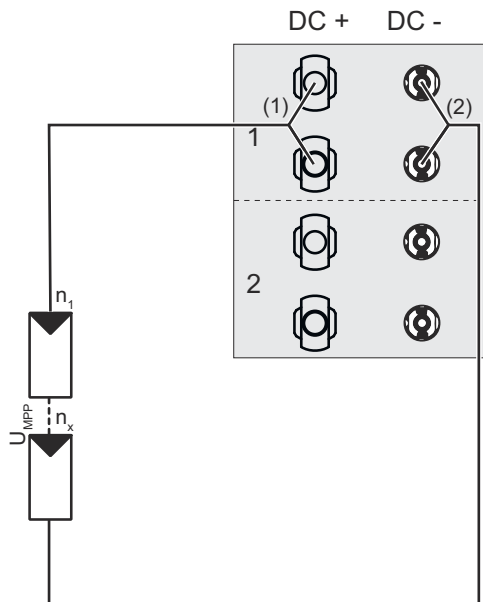


Two strings on an MPP tracker

**Restriction:**

Max. 20 A per plug /  
Max. 30 A per MPP tracker

**High-current module string > 20 A with Y cable on an MPP tracker**



Two strings on an MPP tracker

**Restriction:**

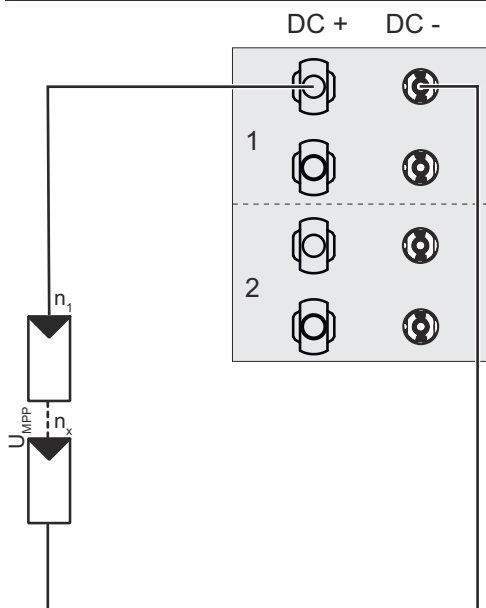
from 20 A per string on the Y cable

**Required accessories:**

Min. two Y cables (one PV+ / PV-  
each) for a high-current module  
string

- (1) PD-ED6/Y-120 (2+/1-)
- (2) PD-ED6/Y-120 (1+/2-)

### One string on one MPP tracker

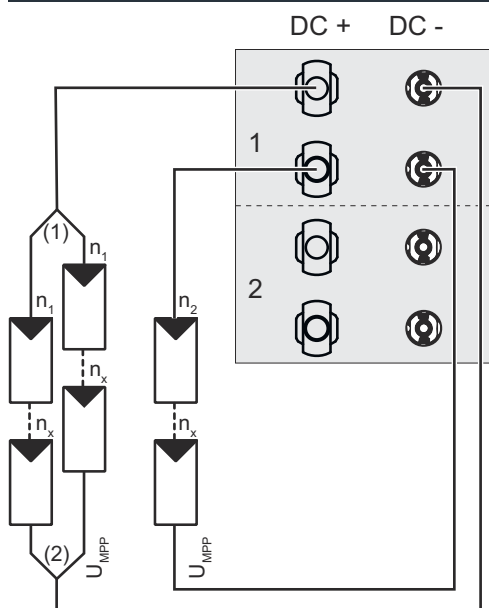


One string on an MPP tracker

#### Restriction:

Max. 20 A per plug and MPP tracker

### Two strings via Y cables and one string directly on one MPP tracker



Two strings via Y cables and one string directly on an MPP tracker

#### Restriction:

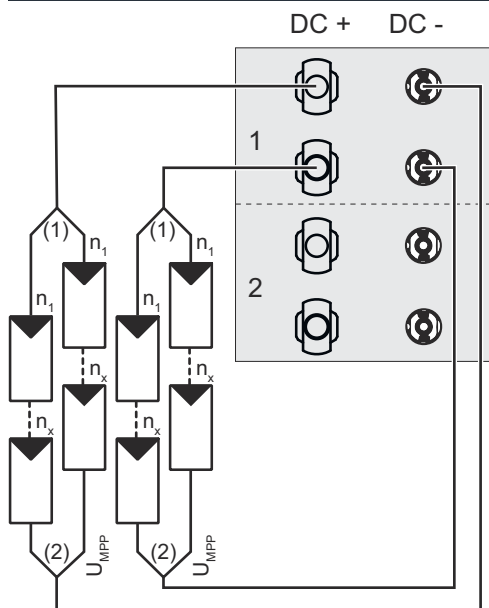
Max. 10 A per string on the Y cable /  
Max. 30 A on the MPP tracker

#### Required accessories:

Min. two Y cables (one PV+ / PV-  
each) for a string

- (1) PD-ED6/Y-120 (1+/2-)
- (2) PD-ED6/Y-120 (2+/1-)

## Two strings via Y cables on one MPP tracker



Two strings via Y cables directly on an MPP tracker

### Restriction:

Max. 7.5 A per string on the Y cable /  
Max. 30 A on the MPP tracker

### Required accessories:

Min. four Y cables (1 PV+ / PV- each)  
for a string

- (1) PD-ED6/Y-120 (1+/2-)
- (2) PD-ED6/Y-120 (2+/1-)

### All DC inputs parallel (All inputs parallel)

When the All inputs parallel function is enabled, the current is restricted to 20 A per plug and 60 A per interconnected MPP tracker.



### WARNING!

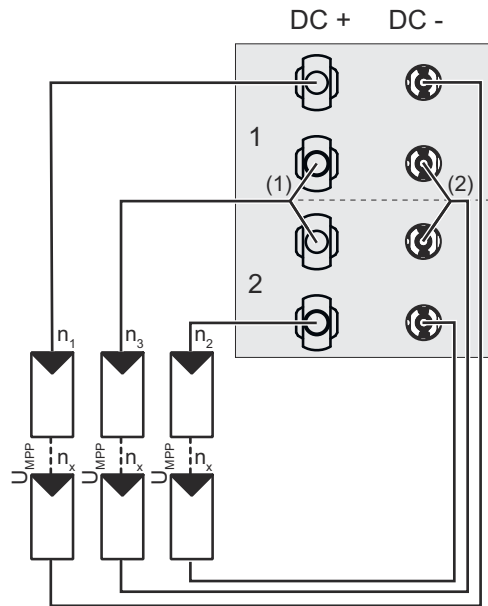
#### Damage to the device due to overloaded DC plug connections

In parallel DC operation, the device is not designed for a current of more than 20 A per DC plug connection.

- Each DC plug connection must not exceed a current of 20 A.

**IMPORTANT!** String fuses may be required depending on the selected PV modules. Observe the information provided by the manufacturer of the module.

## One parallel string via two MPP trackers and one separated string each per MPP tracker



One string parallel via two MPP trackers and one separated string on each MPP tracker

### Restriction:

Max. 20 A on the Y plug ( $n_3$ ) and 20 A each on the plug (MPP tracker 1/ $n_1$  and MPP tracker 2/ $n_2$ )

Max. 30 A per MPP tracker

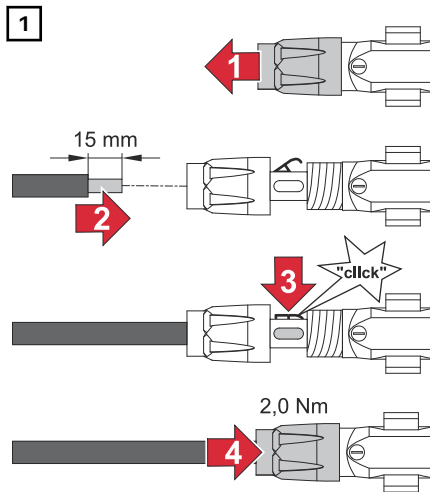
### Required accessories:

10x Y cable (1x PV- / PV+)

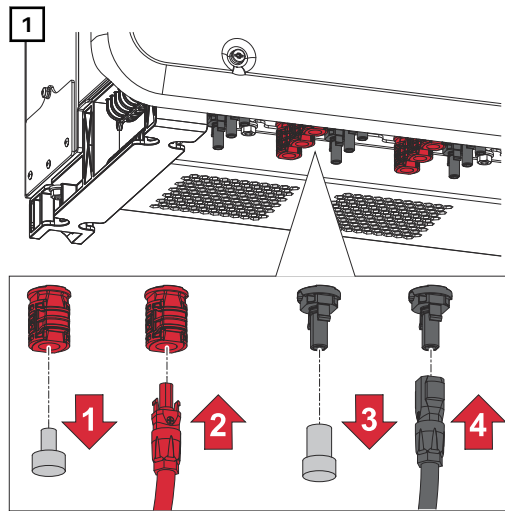
(1) PD-ED6/Y-120 (2+/1-)

(2) PD-ED6/Y-120 (1+/2-)

## Installing PV plugs



## Connecting PV cables



Connect the PV cables of the PV modules as labeled.

Unused plugs on the inverter must be closed using the cover caps supplied with the inverter.

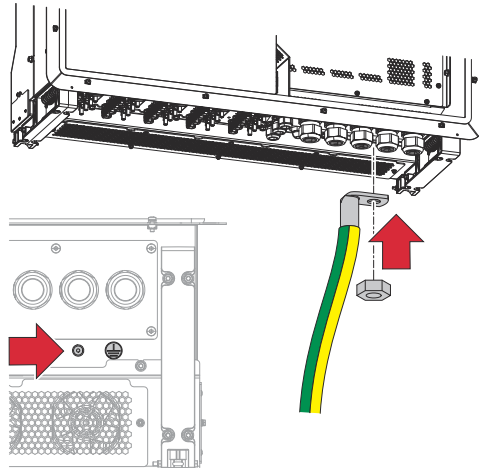


# Establishing equipotential bonding

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## Establishing equipotential bonding

Depending on local installation regulations, it may be necessary to ground the device with a second ground connection. The threaded bolt on the underside of the device can be used for this purpose.



# Connecting the data communication cables

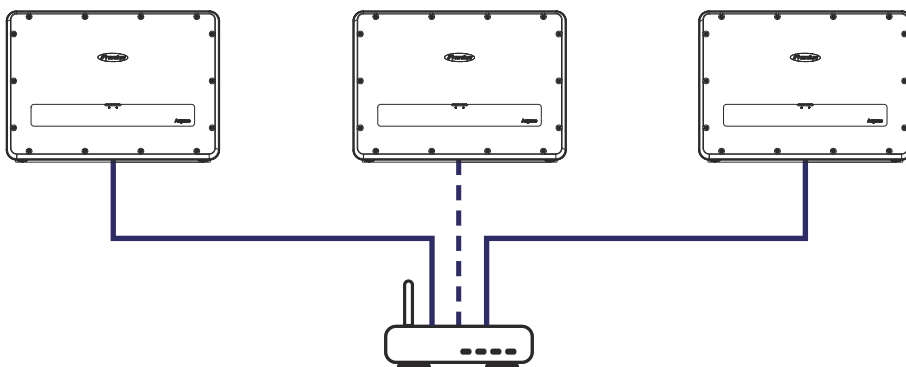
## Permitted cables for the data communication area

### LAN connections

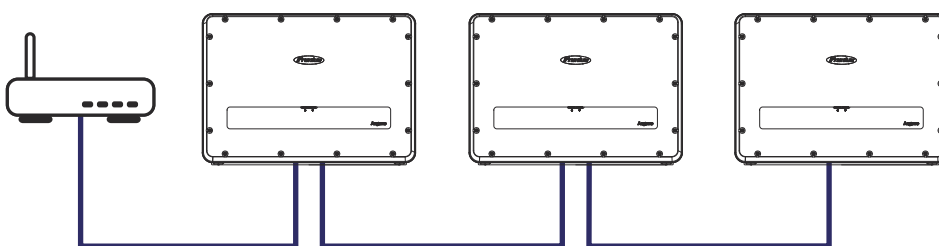
Fronius recommends using at least CAT 5 STP (shielded twisted pair) cables and a maximum distance of 100 m.

## Multiple inverters in a network

The network cabling of the inverters can have a star or linear configuration. Ring connection is not permitted. Note the maximum lengths and cable requirements.



Network setup with star configuration



Network setup with linear configuration

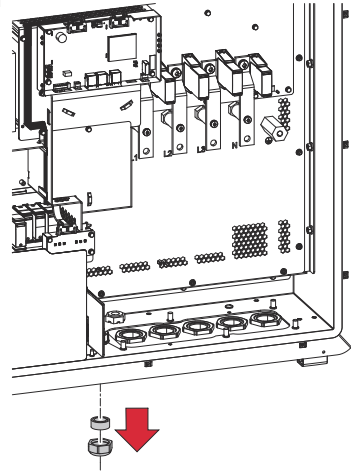
## Connecting the LAN cables

**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.

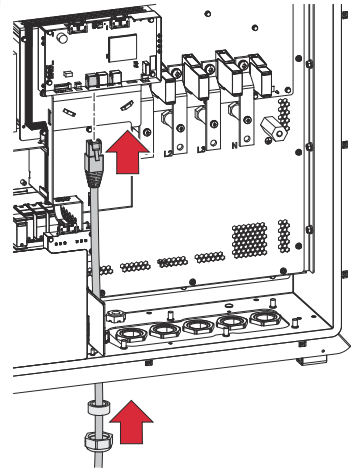
**Note!** Safety class IP 66 cannot be ensured if blanking plugs are missing or incorrectly inserted.

1



Remove the cap nut on the strain-relief device and press the sealing ring out from the inside of the device using the blanking plugs.

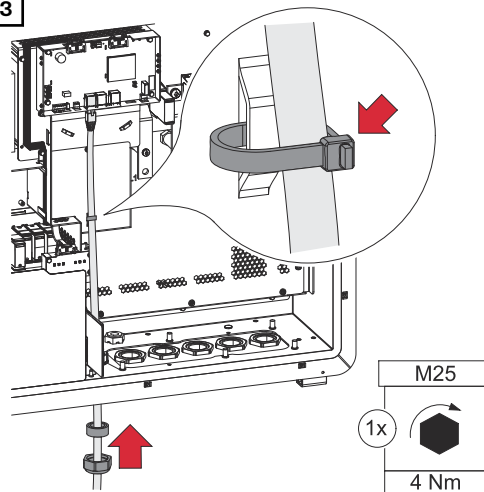
2



First, guide the data cables through the cap nut of the strain-relief device and then through the housing opening.

In the area of the shield support of the EMC cable gland, strip the lead by 10 mm up to the shield. The cable shield must touch the shield support of the EMC cable gland.

3



Connect the data cables to the data communication area and fasten the cap nut with min. 2.5-max. 4 Nm.

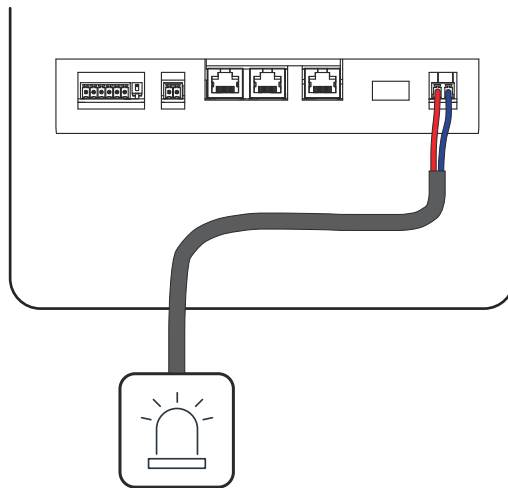
### Connecting the ERR alarm relay

In addition to the option of connecting an audible or visible warning signal, external grid protection devices can also be controlled here.

#### Maximum contact rating

|    |           |
|----|-----------|
| DC | 30 V/1 A  |
| AC | 250 V/1 A |

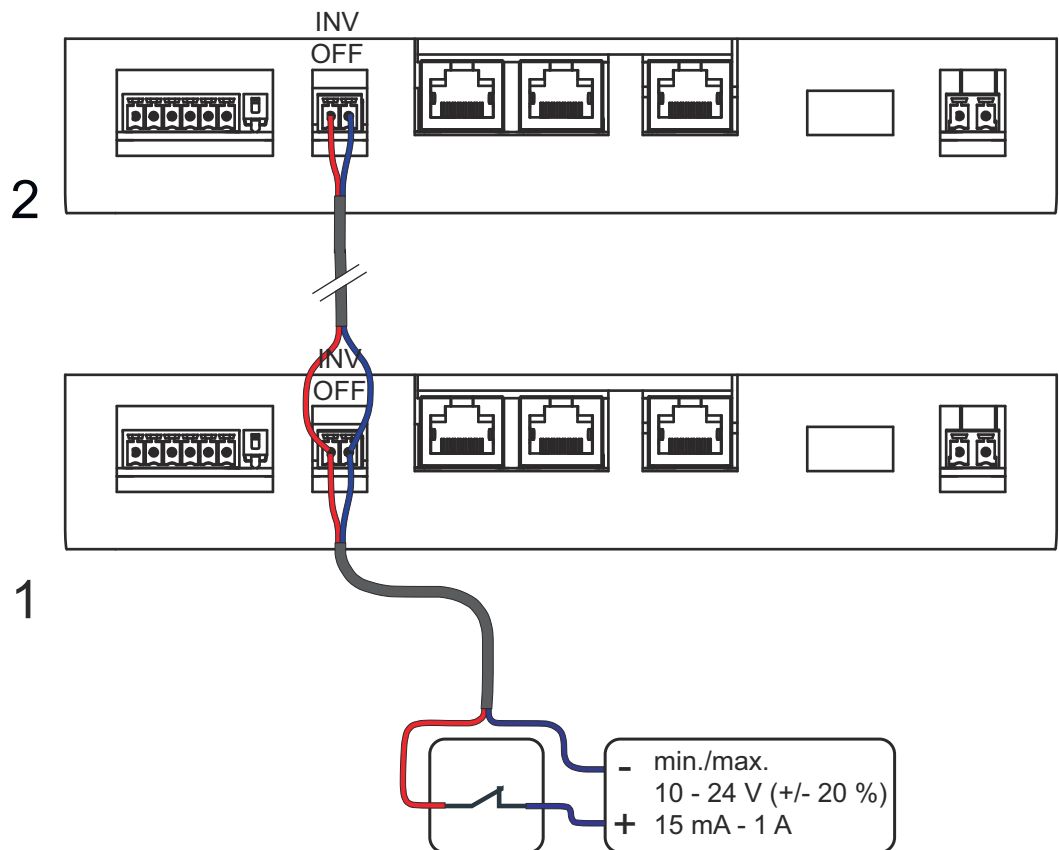
The contact is designed as a normally open contact.



### Connecting and activating INV OFF

A separate power supply is needed when using a third-party device. An active-low signal is required to switch off the power supply.

One or more inverters can be connected.

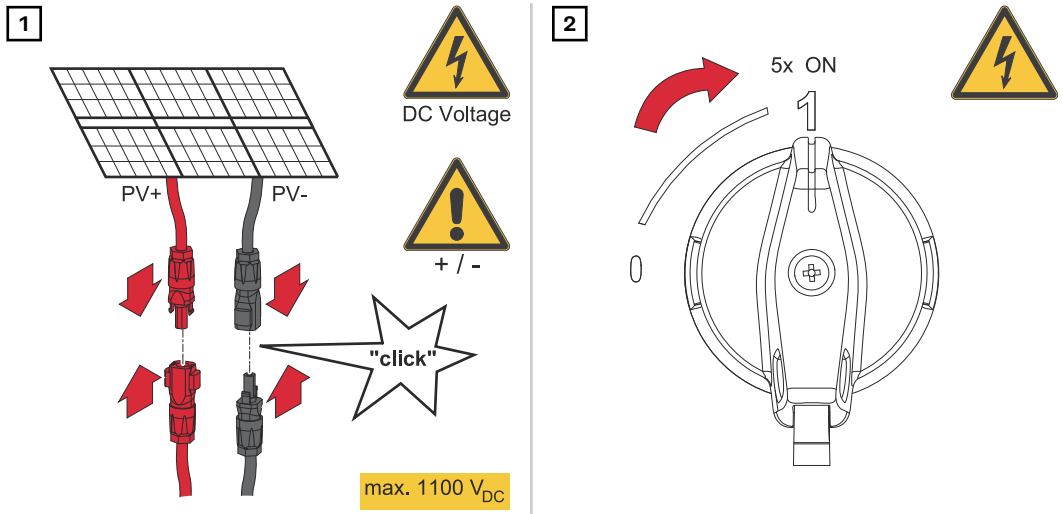


To activate the function:

- 1 Open the user interface of the inverter.
- 2 Log in with the installer or service user credentials.
- 3 Go to **Configuration > AC settings > External grid protection**.
- 4 Set **External grid protection** to **Third-party device**.
- 5 Set the **Third-party device operating mode** to **On**.
- 6 Click on **Apply settings**.

# First startup

## Switching on DC



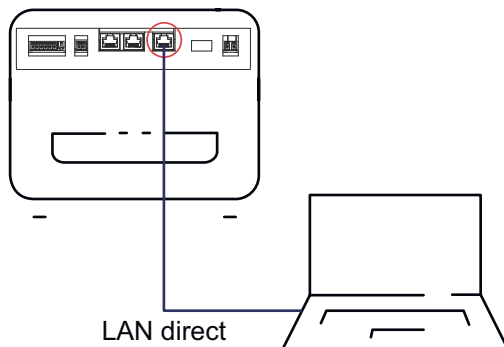
## Attaching safety stickers (France)



When connecting to the low-voltage grid in France, a safety sticker must be attached as per directive UTE C15-712-1. This sticker states that both voltage sources must be isolated in all cases before every intervention in the device.

- 1 Affix the supplied safety stickers on the outside of the device in a clearly visible location.

## Establishing a local LAN connection



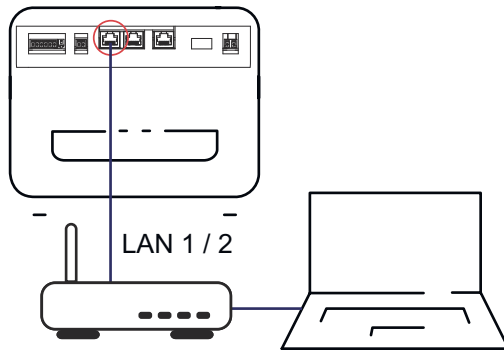
Application: The planned network infrastructure is not available yet. A DC power supply to the inverter is sufficient for commissioning.

You will need a laptop with a LAN interface and a LAN cable.

- 1 Connect the LAN cable to the laptop and inverter (direct LAN connection).
- 2 Enter the IP address **http://169.254.1.1** in the browser's address line and confirm.  
✓ The installation wizard is displayed.
- 3 Follow the installation wizard's instructions in the individual sections and connect the installation.

---

### Establishing a LAN connection via a network



Application: The network infrastructure is available and the inverter needs to be integrated in this infrastructure. A DC power supply to the inverter is sufficient for commissioning.

The configuration may require IT work in the external network so a device IP can be assigned to the inverter.

- 1** Use a LAN cable (LAN1 or LAN2 connection) to connect the inverter to the existing network.
  - ✓ A device IP address is automatically assigned to the inverter. This can either be requested from the network administrator or found using an IP scanner tool.
- 2** Open a browser on the PC.
- 3** Enter the device IP address (**http://<device-IP-address>**) or host name (**http://xyz**). The host name is the serial number of the device.
  - ✓ The device configuration page is displayed.

---

### Starting the inverter for the first time

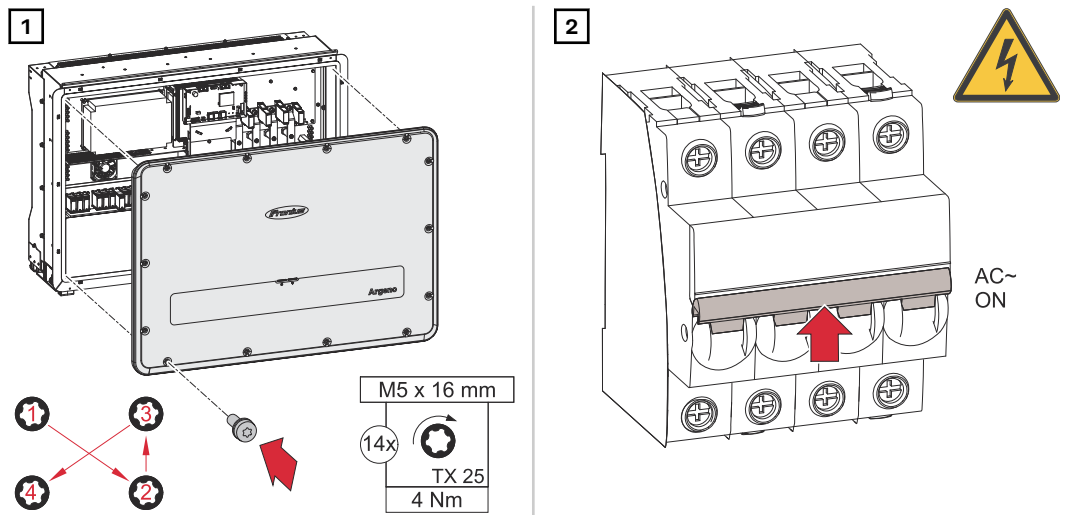
The device must be mounted and all electrical installation work completed when starting for the first time. The PV modules must supply a higher voltage than the start-up input voltage.

Once authorization is complete and the "Configuration" option has been selected in the main menu, you will be taken straight to the installation wizard (provided that the device is still as delivered and has yet to be commissioned). The installation wizard can also be accessed again later on to make subsequent changes to the original configuration.

The installation includes a number of steps as described below:

- Language selection
- Country configuration
- Power limitation (if necessary)
- Network parameters
- Localization
- Modbus
- Optional parameters
- Finalization

## Closing the inverter and switching on AC



### WARNING!

**Housing components may become hot during operation.**

Risk of burns due to hot housing components.

► Only touch the housing cover during operation.

## Access via Modbus

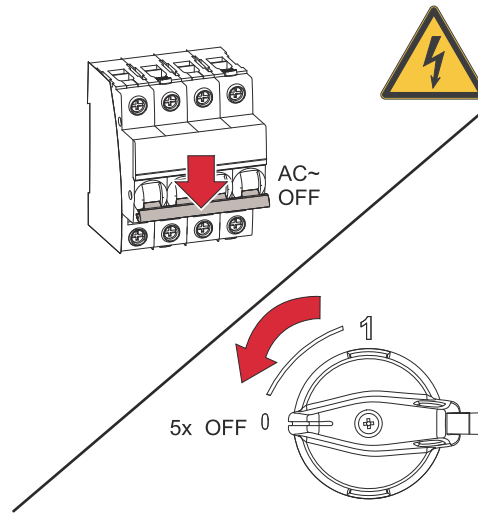
The device supports Modbus/TCP and the standard SunSpec models. Write access can be disabled if security is an issue.

- 1 On the user interface of the inverter, activate the **Modbus TCP/UDP activation** entry under **Configuration – Communication – Ethernet – Modbus TCP/UDP**.
- 2 Enable **Write access** if necessary.
- 3 Set the **Port** for Modbus access [default: **502**].

✓ *Modbus access is enabled.*

# De-energizing the inverter and switching it back on

De-energizing  
the inverter and  
switching it back  
on



**Disconnecting the inverter from the power supply:**

- 1 Turn off the automatic circuit breaker.
- 2 Turn the DC disconnect to the "off" switch setting.

**IMPORTANT!**

Wait for the capacitors of the inverter to discharge!

**Switching on the inverter:**

If the inverter has not been in operation for six months or more after installation, it must be tested before commissioning.

- 1 Turn the DC disconnect to the "on" switch setting.
- 2 Turn on the automatic circuit breaker.



# **User interface of the inverter**



# General

## Overview



### Monitor

Displays a current overview of the most important measurement data.



### Yield

Displays the system yield as a diagram.



### Configuration (only visible when logged in)

The various configuration options of the system are displayed.



### Service (only visible to **service** users)

Various system service settings are displayed.



### Info

Displays the following information:

- Device information
- Software version
- Network information



### Login/user/installer/service

Logging in unlocks additional system functions. When logged in, it is possible to change the password or log out.



### Pair with/disconnect from the network (only visible when logged in)

The pair / disconnect function can be enabled or disabled by double-clicking.

## Network

The device carries out regular checks for relevant updates at: ...fronius.com. For information on changes and improvements included in the updates (change logs) and information on pending updates, please see: ...fronius.com

### Server addresses for data transfer

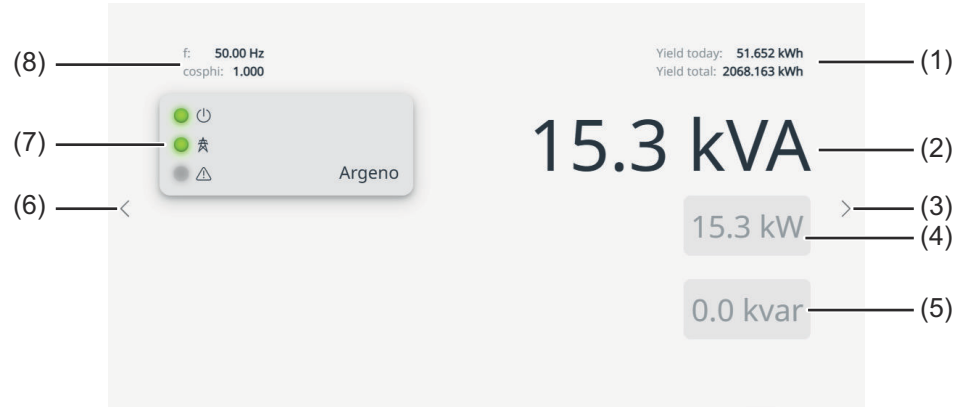
If a firewall is used for outgoing connections, the below protocols, server addresses, and ports must be allowed for successful data transfer, see:

[https://www.fronius.com/~/downloads/Solar%20Energy/Firmware/SE\\_FW\\_Changelog\\_Firewall\\_Rules\\_EN.pdf](https://www.fronius.com/~/downloads/Solar%20Energy/Firmware/SE_FW_Changelog_Firewall_Rules_EN.pdf)

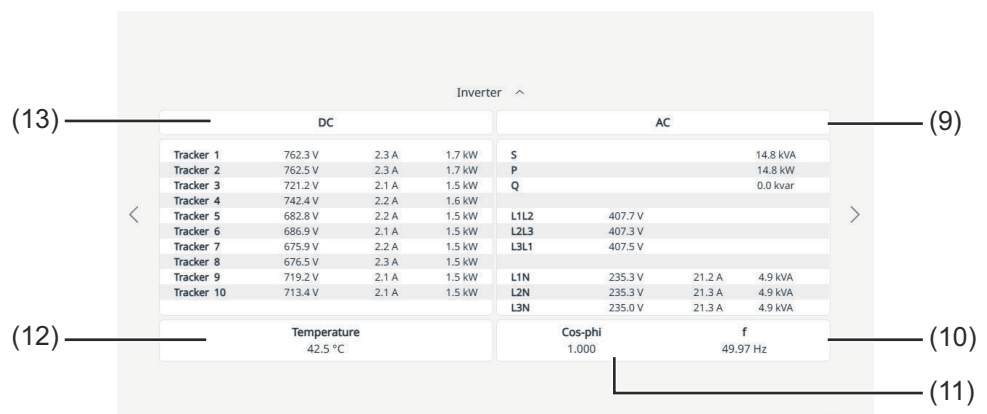
When using FRITZ!Box products, Internet access must be configured without any restrictions or limitations. The DHCP Lease Time (validity) must not be set to 0 (=infinite).

# Monitoring

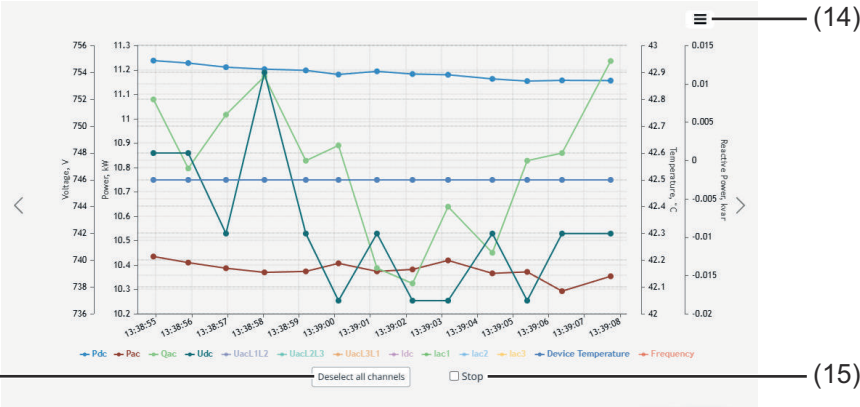
## Monitoring



- (1) Yield today and Yield total
- (2) Current power in kVA
- (3) Button for scrolling to the next page
- (4) Current power in kW
- (5) Current reactive power in kvar
- (6) Button for scrolling to the previous page
- (7) Inverter status indicators
- (8) Reactive power factor



- (9) AC values
- (10) Frequency
- (11) Cos-phi
- (12) Temperature
- (13) DC values



(14)    **Export function**

(15)    **Stop**

(16)    **Deselect all channels**

# Yield

## Configuring via a web interface

| Display        | Setting                                  | Description                                                                                                                          |
|----------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Day view       |                                          | Displays recorded operating data as a diagram.<br><b>1</b> Select a day.<br>✓ <i>The web interface displays the selected data.</i>   |
| Week view      |                                          | Displays recorded operating data as a diagram.<br><b>1</b> Select a week.<br>✓ <i>The web interface displays the selected data.</i>  |
| Month view     |                                          | Displays recorded operating data as a diagram.<br><b>1</b> Select a month.<br>✓ <i>The web interface displays the selected data.</i> |
| Year display   |                                          | Displays recorded operating data as a diagram.<br><b>1</b> Select a year.<br>✓ <i>The web interface displays the selected data.</i>  |
| All view       |                                          | Shows total yield so far.                                                                                                            |
| Export / Print | Print<br>PNG   PDF   JPEG<br>  SVG   GIF | Option to print or save the diagram.<br><b>1</b> Select output format.<br><b>2</b> Specify the save location.                        |

# Configuration

## Localization Input screens for basic settings

| Display          | Setting                                                               | Description                                          |
|------------------|-----------------------------------------------------------------------|------------------------------------------------------|
| Language         | Castellano   Dansk   Deutsch   English   Français   Italiano   Magyar | <b>1</b> Select the desired user interface language. |
| Date             |                                                                       | The current date is selected automatically.          |
| Time             |                                                                       | The current time is selected automatically.          |
| Timezone         |                                                                       | <b>1</b> Select the time zone.                       |
| Temperature unit | Celsius   Fahrenheit                                                  | <b>1</b> Specify the temperature unit.               |
| Device name      |                                                                       | <b>1</b> Enter the device name.                      |

## AC settings Input screens for network parameters.

For detailed explanations of the menu items, see

<https://manuals.fronius.com/html/4204260586/>

| Display                                                                                                | Setting         | Description                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Country / Grid</b><br>This option influences the country-specific operating settings of the device. |                 |                                                                                                                                                                                                                                   |
| Country                                                                                                |                 | <b>1</b> Select the country.                                                                                                                                                                                                      |
| Nominal grid voltage                                                                                   | [V]             | <b>1</b> Optional: Specify the nominal grid voltage.                                                                                                                                                                              |
| Nominal grid frequency                                                                                 | [Hz]            | <p>If the grid frequency deviates from the nominal grid frequency by more than 9.5 Hz, the device switches off.</p> <p><b>1</b> Optional: Specify the nominal grid frequency.</p> <p><b>2</b> Click on <b>Apply settings</b>.</p> |
| <b>Trip settings</b><br>Enable shutdown according to generic parameters, frequency, or voltage.        |                 |                                                                                                                                                                                                                                   |
| <b>- Generic parameters</b><br>Option to activate standard protective shutdown                         |                 |                                                                                                                                                                                                                                   |
| Trip with intentional delay                                                                            | Check to enable | <p><b>1</b> Enable delayed trip if necessary.</p> <p><b>2</b> Click on <b>Apply settings</b>.</p>                                                                                                                                 |
| <b>- Frequency</b><br>Option to monitor frequency tripping                                             |                 |                                                                                                                                                                                                                                   |
| Trip underfrequency monitoring                                                                         | Status          | <b>1</b> Enable if necessary.                                                                                                                                                                                                     |
| Number of trip under-frequency levels                                                                  | 1-5             | <b>1</b> Specify the number of protection levels.                                                                                                                                                                                 |

| Display                                                           | Setting                       | Description                                                                                                                                                                                                              |
|-------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trip underfrequency level 1                                       | 45–65 [Hz]                    | If the grid frequency is in the deactivation range for the duration of the deactivation time, the function is disabled.<br><div>1</div> Define the range and trip time.                                                  |
| Trip underfrequency time level 1                                  | 0–100,000 [ms]                |                                                                                                                                                                                                                          |
| Trip underfrequency level 2–5                                     | 42.5–65 [Hz]                  |                                                                                                                                                                                                                          |
| Trip underfrequency time level 2–5                                | 0–100,000 [ms]                |                                                                                                                                                                                                                          |
| Trip overfrequency monitoring                                     | Status                        | <div>1</div> Enable if necessary.                                                                                                                                                                                        |
| Number of trip overfrequency levels                               | 1–5                           | <div>1</div> Specify the number of protection levels.                                                                                                                                                                    |
| Trip overfrequency level 1                                        | 45.0–66 [Hz]                  | If the grid frequency is in the deactivation range for the duration of the deactivation time, the function is disabled.<br><div>1</div> Define the range and trip time.<br><div>2</div> Click on <b>Apply settings</b> . |
| Trip overfrequency time level 1                                   | 0–1,000,000 [ms]              |                                                                                                                                                                                                                          |
| Trip overfrequency level 2–5                                      | 45.0–66 [Hz]                  |                                                                                                                                                                                                                          |
| Trip overfrequency time level 2–5                                 | 0–1,000,000 [ms]              |                                                                                                                                                                                                                          |
| <div>-</div> <b>Voltage</b><br>Option to monitor voltage tripping |                               |                                                                                                                                                                                                                          |
| Under-voltage shut-down monitoring                                | Status                        | <div>1</div> Enable if necessary.                                                                                                                                                                                        |
| Number of trip under-voltage levels                               | 1–5                           | <div>1</div> Specify the number of protection levels.                                                                                                                                                                    |
| Under-voltage shut-down level 1                                   | 10–100 [% U <sub>nom</sub> ]  | <div>1</div> Define the range and trip time.                                                                                                                                                                             |
| Trip undervoltage time level 1                                    | 0–180,000 [ms]                |                                                                                                                                                                                                                          |
| Under-voltage shut-down level 2–5                                 | 10–100 [% U <sub>nom</sub> ]  |                                                                                                                                                                                                                          |
| Under-voltage shut-down time level 2–5                            | 0–180,000 [ms]                |                                                                                                                                                                                                                          |
| Trip overvoltage monitoring                                       | Status                        | <div>1</div> Enable if necessary.                                                                                                                                                                                        |
| Number of trip over-voltage levels                                | 1–5                           | <div>1</div> Specify the number of protection levels.                                                                                                                                                                    |
| Trip overvoltage level 1                                          | 100–125 [% U <sub>nom</sub> ] | <div>1</div> Define the range and trip time.<br><div>2</div> Click on <b>Apply settings</b> .                                                                                                                            |
| Trip overvoltage time level 1                                     | 0–180,000 [ms]                |                                                                                                                                                                                                                          |
| Trip overvoltage level 2–5                                        | 100–125 [% U <sub>nom</sub> ] |                                                                                                                                                                                                                          |
| Trip overvoltage time level 2–5                                   | 0–180,000 [ms]                |                                                                                                                                                                                                                          |



| Display                                                                                                                                                                                                                                          | Setting                                         | Description                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>- 10 minutes average</b><br>Monitor a deviation in the average voltage over 10 minutes.                                                                                                                                                       |                                                 |                                                                                                                                                                                                                                                                                          |
| 10 minutes average                                                                                                                                                                                                                               | 100-125 [% Unom]                                | <b>1</b> Enable if necessary.                                                                                                                                                                                                                                                            |
| <b>Island detection</b><br>If islanding is detected, utilities require that the device be shut down, see <a href="https://manuals.fronius.com/html/4204260586/#0_t_0000008322">https://manuals.fronius.com/html/4204260586/#0_t_0000008322</a> . |                                                 |                                                                                                                                                                                                                                                                                          |
| Mode                                                                                                                                                                                                                                             | Off   ROCOF   RO-COF enhanced   Frequency shift | Function is set to active at the factory and may only be disabled in the case of autonomous stand-alone operation (without grid).<br><br><b>1</b> Select the mode and note the menu items.<br><b>2</b> Enable optional password protection.<br><b>3</b> Click on <b>Apply settings</b> . |
| <b>Ramp rate limitation</b><br>Option to limit power when rated/maximum power increases and decreases.                                                                                                                                           |                                                 |                                                                                                                                                                                                                                                                                          |
| Operation mode                                                                                                                                                                                                                                   | On   Off                                        | <b>1</b> Select the mode and note the menu items.                                                                                                                                                                                                                                        |
| Increasing & decreasing gradient                                                                                                                                                                                                                 | 1-65,534 [%/min]                                | This percentage value refers to the rated/maximum power.<br><br><b>1</b> Select the mode and note the menu items.<br><b>2</b> Click on <b>Apply settings</b> .                                                                                                                           |
| <b>Connection conditions</b><br>Set the connection conditions precisely according to your network conditions.                                                                                                                                    |                                                 |                                                                                                                                                                                                                                                                                          |
| Min. conn. voltage after grid mon.                                                                                                                                                                                                               | 10-110 [% Unom]                                 | <b>1</b> Set connection voltage range after grid monitoring.                                                                                                                                                                                                                             |
| Max. conn. voltage after grid mon.                                                                                                                                                                                                               | 90-125 [% Unom]                                 |                                                                                                                                                                                                                                                                                          |
| Min. conn. frequency after grid mon.                                                                                                                                                                                                             | 45-65 [Hz]                                      | <b>1</b> Set connection frequency range after grid monitoring.                                                                                                                                                                                                                           |
| Max. conn. frequency after grid mon.                                                                                                                                                                                                             | 45-65 [Hz]                                      |                                                                                                                                                                                                                                                                                          |
| Min. conn. voltage after grid failure                                                                                                                                                                                                            | 10-110 [% Unom]                                 | <b>1</b> Set connection voltage range after grid failure.                                                                                                                                                                                                                                |
| Max. conn. voltage after grid failure                                                                                                                                                                                                            | 90-125 [% Unom]                                 |                                                                                                                                                                                                                                                                                          |
| Min. conn. frequency after grid failure                                                                                                                                                                                                          | 45-65 [Hz]                                      | <b>1</b> Set connection frequency range after grid failure.                                                                                                                                                                                                                              |
| Max. conn. frequency after grid failure                                                                                                                                                                                                          | 45-65 [Hz]                                      |                                                                                                                                                                                                                                                                                          |
| Monitoring time PV voltage                                                                                                                                                                                                                       | 1,000-1,800,000 [ms]                            | <b>1</b> Set time for monitoring the grid voltage and PV voltage.                                                                                                                                                                                                                        |
| Waiting time after grid failure                                                                                                                                                                                                                  | 1,000-1,800,000 [ms]                            | <b>1</b> Set waiting time after grid failure.<br><b>2</b> Enable optional password protection.<br><b>3</b> Click on <b>Apply settings</b> .                                                                                                                                              |

| Display                                                                                                                                                                                                                                                                                                                                      | Setting                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Active power control</b><br>Active power control can be used to permanently set the output power of the device to a smaller value than the maximum output power; see <a href="https://manuals.fronius.com/html/4204260586/#0_t_0000008316">https://manuals.fronius.com/html/4204260586/#0_t_0000008316</a> .                              |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>- Internal</b><br>Option to set an internal power limit in accordance with the requirements of the utility to limit the maximum connected load of the system at the grid connection point.                                                                                                                                                |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Power limitation                                                                                                                                                                                                                                                                                                                             | Check to enable              | <b>1</b> Specify the activation status.                                                                                                                                                                                                                                                                                                                                                                                                        |
| Maximum apparent power Slim                                                                                                                                                                                                                                                                                                                  | 10,000–125,000 [VA]          | Maximum apparent power limits the internal power of the device.<br><br><b>1</b> Enter value or set using the slider.                                                                                                                                                                                                                                                                                                                           |
| Maximum active power Plim                                                                                                                                                                                                                                                                                                                    | 1.0–100.0 [% Slim]           | Maximum active power (effective power) limits the internal power of the device.<br><br><b>1</b> Enter value or set using the slider.                                                                                                                                                                                                                                                                                                           |
| <b>- External</b><br>Parameters configured here are used as defaults if they are not sent via the communication interface or if communication for the configured fallback time fails.                                                                                                                                                        |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Power limitation                                                                                                                                                                                                                                                                                                                             | Check to enable              | <b>1</b> Specify the activation status.                                                                                                                                                                                                                                                                                                                                                                                                        |
| AC fallback active power                                                                                                                                                                                                                                                                                                                     | 0–100 [% Plim]               | Specifies the standard power in the event of a communication failure. If no effective power command is received within the fallback time configured below, the inverter sets the power to the configured fallback power.<br><br><b>1</b> Set the fallback power.                                                                                                                                                                               |
| Fallback time                                                                                                                                                                                                                                                                                                                                | 0–43,200 [s]                 | <b>IMPORTANT!</b> After the configured fallback time, external (RS485 or Modbus) defaults for cos phi, Q, and P are reset to the respective fallback value configured (Cos-phi constant, Q constant, or fallback power).<br><br>If the fallback time is set to 0s, external defaults for cos phi, Q, and P are not reset (inverter continues operating with the last set value received).<br><br><b>1</b> Enter value or set using the slider. |
| Output gradient limitation increase & decrease                                                                                                                                                                                                                                                                                               | 1–65,534 [% Slim / min]      | <b>1</b> Set maximum change in the effective power if power increases.<br><b>2</b> Set maximum change in the effective power if power decreases.                                                                                                                                                                                                                                                                                               |
| Settling time                                                                                                                                                                                                                                                                                                                                | 200–60,000 [ms] / 1,000 [ms] | <b>1</b> Set the settling time.<br><b>2</b> Click on <b>Apply settings</b> .                                                                                                                                                                                                                                                                                                                                                                   |
| <b>- Feed-in limit</b><br>Energy companies or grid operators can prescribe import limitations for inverters. The effective power at the grid connection point (installation location of the Fronius Smart Meter IP or primary meter) is limited to the set value. The feed-in limit only works in conjunction with a Fronius Smart Meter IP. |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Operation mode                                                                                                                                                                                                                                                                                                                               | Check to enable              | <b>1</b> Enable if necessary.                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Display                                                                               | Setting                           | Description                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reference power                                                                       | Total power  <br>Each phase       | <p><b>Total power:</b> The entire photovoltaic system is limited to a fixed feed-in limit. A value must be set for the permissible total power of feeding in.</p> <p><b>Each phase:</b> Each individual phase is measured. If the permissible feed-in limit is exceeded on one phase, the inverter symmetrically reduces the total power for all phases until the limit is reached.</p> <p>1 Select reference power.</p> |
| Maximum power of feeding in                                                           | 0 - 125,000 [W]                   | <p>If this value is exceeded, the inverter readjusts down to the set value.</p> <p>1 Set maximum power of feeding in.</p>                                                                                                                                                                                                                                                                                                |
| Trip feed-in monitoring                                                               | Check to enable                   | 1 Enable if necessary.                                                                                                                                                                                                                                                                                                                                                                                                   |
| Feed-in monitoring trip value                                                         | 0 - 125,000 [W]                   | <p>If this value is exceeded, the inverter switches off within max. 5 seconds. This value must be higher than the value set for <b>Maximum power of feeding in</b>.</p> <p>1 Set the feed-in monitoring trip value.</p>                                                                                                                                                                                                  |
| Trip communication timeout                                                            | Check to enable                   | <p>Reduce inverter power to 0% if the connection to the Smart Meter has been lost.</p> <p>1 Enable if necessary.</p> <p>2 Click on <b>Apply settings</b>.</p>                                                                                                                                                                                                                                                            |
| <p>- <b>P(f)</b><br/>Enable frequency-dependent power reduction in the P(f) menu.</p> |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Operation mode                                                                        | Off   Mode 1  <br>Mode 2   Mode 3 | <p>1 Specify the operating mode.</p> <p>Mode 1 = Hysteresis active - Limit ; Mode 2 = Hysteresis inactive - Limit; Mode 3 = Hysteresis inactive - Set</p>                                                                                                                                                                                                                                                                |
| Power reference at underfrequency                                                     | Actual power  <br>Rated power     | <p>1 Specify control method for underfrequency.</p> <p>2 Specify control method for overfrequency.</p>                                                                                                                                                                                                                                                                                                                   |
| Power reference at overfrequency                                                      | Actual power  <br>Rated power     |                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Dynamic gradient mode                                                                 | On   Off                          | <p>"Gradient at under/overfrequency (feed-in)" is not displayed.</p> <p>1 Enable dynamic gradient.</p>                                                                                                                                                                                                                                                                                                                   |
| Gradient at underfrequency (feed-in)                                                  | 0-200 (%/Hz)                      | <p>1 Specify gradient for feed-in at overfrequency.</p> <p>2 Specify gradient for feed-in at underfrequency.</p>                                                                                                                                                                                                                                                                                                         |
| Gradient at overfrequency (feed-in)                                                   | 0-200 (%/Hz)                      |                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Activation threshold at underfrequency                                                | 40-50 [Hz]                        | 1 Set frequency thresholds for the activation of the power limitation in case of undervoltage.                                                                                                                                                                                                                                                                                                                           |
| Activation threshold at overfrequency                                                 | 50-60 [Hz]                        | 2 Set frequency thresholds for the activation of the power limitation in case of overvoltage.                                                                                                                                                                                                                                                                                                                            |
| Activation delay                                                                      | 0-5,000 [ms]                      | 1 Set the regulation delay.                                                                                                                                                                                                                                                                                                                                                                                              |
| Output gradient limitation increase & decrease                                        | 1-65,534<br>[% Slim / min]        | 1 Specify the output gradient limitation increase and decrease.                                                                                                                                                                                                                                                                                                                                                          |

| Display                                                                                                                                                                                                                             | Setting                                                 | Description                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Settling time                                                                                                                                                                                                                       | 200–2,000 [ms]                                          | <ol style="list-style-type: none"> <li>1 Set the settling time mode.</li> <li>2 Click on <b>Apply settings</b>.</li> </ol>                                                                                                                   |
| Deact. lim. time after fault                                                                                                                                                                                                        | 0–1,000 [s]                                             | <p>The change in the effective power is limited to the configured gradient for the specified time after a fault.</p> <p>Only evaluated in modes 2 and 3.</p>                                                                                 |
| Deact. grad. incr. & decr. after fault                                                                                                                                                                                              | 0–65,534 [% / min]                                      | <p>Limits the change in effective power after a fault.</p> <p>Only evaluated in modes 2 and 3.</p>                                                                                                                                           |
| <b>- P(U)</b><br>Enable voltage-dependent power reduction in the P(U) menu.                                                                                                                                                         |                                                         |                                                                                                                                                                                                                                              |
| Operation mode                                                                                                                                                                                                                      | Off   On                                                | <ol style="list-style-type: none"> <li>1 Enable the control process.</li> </ol> <p><b>Off:</b> Deactivates dynamic grid support using dynamic reactive current. Dynamic grid support remains active on account of interference immunity.</p> |
| Reference power                                                                                                                                                                                                                     | Actual power   Rated power                              | <ol style="list-style-type: none"> <li>1 Select the power-dependent control method.</li> </ol>                                                                                                                                               |
| Evaluated voltage                                                                                                                                                                                                                   | Maximum phase voltage   Positive phase sequence voltage | <p>Specifies which voltage is evaluated in a three-phase system.</p> <ol style="list-style-type: none"> <li>1 Select the power-dependent control method.</li> </ol>                                                                          |
| Hysteresis mode                                                                                                                                                                                                                     | Off   On                                                | <p>Hysteresis mode affects the shutdown response of P(U).</p> <ol style="list-style-type: none"> <li>1 Enable the mode.</li> </ol>                                                                                                           |
| Deactivation gradient                                                                                                                                                                                                               | 0–65,534 [% / min]                                      | <ol style="list-style-type: none"> <li>1 Set gradients for the voltage limitation.</li> </ol>                                                                                                                                                |
| Deactivation time                                                                                                                                                                                                                   | 0–60,000,000 [ms]                                       | <ol style="list-style-type: none"> <li>1 Specify the time for voltage reduction.</li> </ol>                                                                                                                                                  |
| Output gradient limitation increase & decrease                                                                                                                                                                                      | 1–65,534 [% Slim / min]                                 | <ol style="list-style-type: none"> <li>1 Specify the output gradient limitation increase and decrease.</li> </ol>                                                                                                                            |
| Settling time                                                                                                                                                                                                                       | 500–120,000 [ms]                                        | <ol style="list-style-type: none"> <li>1 Set the settling time.</li> </ol>                                                                                                                                                                   |
| Active curve                                                                                                                                                                                                                        | Curve 1–5                                               | <p>Up to five characteristics can be configured independently and one of them can be enabled for regulation each time.</p> <ol style="list-style-type: none"> <li>1 Select active curve.</li> </ol>                                          |
| Number of nodes                                                                                                                                                                                                                     | 2–5                                                     | <ol style="list-style-type: none"> <li>1 Specify the number of nodes.</li> </ol>                                                                                                                                                             |
| Power                                                                                                                                                                                                                               | 0.0–100.0 [% Pref]                                      | <ol style="list-style-type: none"> <li>1 Specify power for 1st, 5th ... node as a percentage of the maximum power.</li> </ol>                                                                                                                |
| Voltage                                                                                                                                                                                                                             | 80.0–125.0 [% Unom]                                     | <ol style="list-style-type: none"> <li>2 Specify voltage for 1st, 5th ... node as a percentage of the maximum voltage.</li> <li>3 Click on <b>Apply settings</b>.</li> </ol>                                                                 |
| <b>- Power rampup</b><br><b>Power rampup is used to ramp up the power gradually; see</b><br><a href="https://manuals.fronius.com/html/4204260586/#0_m_0000041356">https://manuals.fronius.com/html/4204260586/#0_m_0000041356</a> . |                                                         |                                                                                                                                                                                                                                              |
| Power rampup gradient                                                                                                                                                                                                               | 1–3,000 [% / min]                                       | <ol style="list-style-type: none"> <li>1 Set increase.</li> </ol>                                                                                                                                                                            |

| Display                                                                                                                                                                                                                          | Setting                                                       | Description                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rampup on every connection                                                                                                                                                                                                       | Check to enable                                               | <div>1</div> Enable option.                                                                                                                                                                                                          |
| Rampup on first connection                                                                                                                                                                                                       |                                                               | <div>2</div> Click on <b>Apply settings</b> .                                                                                                                                                                                        |
| Rampup after grid failure                                                                                                                                                                                                        |                                                               |                                                                                                                                                                                                                                      |
| <b>Reactive power control</b><br>Enable the reactive power process in the mode menu; see <a href="https://manuals.fronius.com/html/4204260586/#0_t_0000008311">https://manuals.fronius.com/html/4204260586/#0_t_0000008311</a> . |                                                               |                                                                                                                                                                                                                                      |
| <b>- Mode</b>                                                                                                                                                                                                                    |                                                               |                                                                                                                                                                                                                                      |
| Mode                                                                                                                                                                                                                             | Cos-phi constant   Q constant   Cos-phi(P/Plim)   Q(U)   Q(P) | <div>1</div> Select a control process. <div>2</div> Click on <b>Apply settings</b> .                                                                                                                                                 |
| <b>- Cos-phi constant</b>                                                                                                                                                                                                        |                                                               |                                                                                                                                                                                                                                      |
| Cos-phi constant                                                                                                                                                                                                                 | 0.3-1                                                         | <div>1</div> Determine the specified power factor.                                                                                                                                                                                   |
| Power gradient increase & decrease                                                                                                                                                                                               | 1-65,534 [% Slim / min]                                       | <div>1</div> Set the maximum change in the reactive power %Slim/min in the event of a change to overexcited mode. <div>2</div> Set the maximum change in the reactive power %Slim/min in the event of a change to underexcited mode. |
| Settling time                                                                                                                                                                                                                    | 1,000-120,000 [ms]                                            | <div>1</div> Set the settling time in the event of an abrupt change in the reactive power set value (e.g., caused by a voltage jump). <div>2</div> Click on <b>Apply settings</b> .                                                  |
| <b>- Q constant</b>                                                                                                                                                                                                              |                                                               |                                                                                                                                                                                                                                      |
| Priority mode                                                                                                                                                                                                                    | Q-Priority   P-Priority                                       | <div>1</div> Set priority.                                                                                                                                                                                                           |
| Q constant                                                                                                                                                                                                                       | 0-100 [% Slim] underexcited   overexcited                     | <div>1</div> Set reactive power Q to a fixed value. <div>2</div> Select the type of phase shift.<br><br>Underexcited corresponds to an inductive load, overexcited to a capacitive load.                                             |
| Output gradient limitation increase & decrease                                                                                                                                                                                   | 1-65,534 [% Slim / min]                                       | <div>1</div> Set the maximum change in the reactive power in the event of a change to overexcited mode. <div>2</div> Set the maximum change in the reactive power in the event of a change to underexcited mode.                     |
| Settling time                                                                                                                                                                                                                    | 1,000-120,000 [ms]                                            | <div>1</div> Set the settling time in the event of an abrupt change in the reactive power set value (e.g., caused by a voltage jump). <div>2</div> Click on <b>Apply settings</b> .                                                  |
| <b>- Cos-phi(P)</b>                                                                                                                                                                                                              |                                                               |                                                                                                                                                                                                                                      |
| Lock-In voltage                                                                                                                                                                                                                  | 10-126.6 [% Un-om]                                            | <div>1</div> Set the voltage (above this voltage, the control is activated).                                                                                                                                                         |
| Lock-Out voltage                                                                                                                                                                                                                 | 10-126.6 [% Un-om]                                            | <div>1</div> Set the voltage (below this voltage, the control is activated).                                                                                                                                                         |

| Display                            | Setting                                                 | Description                                                                                                                                                                                                                                                                                     |
|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power gradient increase & decrease | 1-65,534 [% S <sub>lim</sub> /min]                      | <ol style="list-style-type: none"> <li>1 Set the maximum change in the reactive power %S<sub>lim</sub>/min in the event of a change to overexcited mode.</li> <li>2 Set the maximum change in the reactive power %S<sub>lim</sub>/min in the event of a change to underexcited mode.</li> </ol> |
| Settling time                      | 1,000-120,000 [ms]                                      | <ol style="list-style-type: none"> <li>1 Set the settling time in the event of an abrupt change in the reactive power set value.</li> </ol>                                                                                                                                                     |
| Number of nodes                    | 2-10                                                    | <p>The maximum number of configurable nodes depends on the selected grid type.</p> <ol style="list-style-type: none"> <li>1 Specify the number of nodes.</li> </ol>                                                                                                                             |
| Node 1-node 10 Power Curve         | 0-100% [% S <sub>lim</sub> ]                            | <p>For the first node, the power must be 0%, for the last node the power must be 100%. The power values of the nodes must increase continuously.</p> <ol style="list-style-type: none"> <li>1 Specify the power factor for 1st, 10th ... node as a percentage of the maximum power.</li> </ol>  |
| Cos phi Curve                      | 0.3-1 [ind./cap.]                                       | <ol style="list-style-type: none"> <li>1 Specify cos j of the node.</li> </ol>                                                                                                                                                                                                                  |
| Excitation Curve                   | overexcited   underexcited                              | <p>Overexcited corresponds to a capacitive load, underexcited to an inductive load.</p> <ol style="list-style-type: none"> <li>1 If a reactive power not equal to 1 is selected: Select the type of phase shift.</li> <li>2 Click on <b>Apply settings</b>.</li> </ol>                          |
| <b>- Q(P)</b>                      |                                                         |                                                                                                                                                                                                                                                                                                 |
| Power gradient increase & decrease | 1-65,534 [% S <sub>lim</sub> /min]                      | <ol style="list-style-type: none"> <li>1 Specify the power gradient increase and decrease.</li> </ol>                                                                                                                                                                                           |
| Settling time                      | 200-60,000 [ms]                                         | <ol style="list-style-type: none"> <li>1 Set the settling time in the event of an abrupt change in the rated power set value.</li> </ol>                                                                                                                                                        |
| Number of nodes                    | 2-10                                                    | <p>The maximum number of configurable nodes depends on the selected grid type.</p> <ol style="list-style-type: none"> <li>1 Specify the number of nodes.</li> </ol>                                                                                                                             |
| Node 1-node 10 Power Curve         | 0-100% [% S <sub>lim</sub> ]                            | <p>For the first node, the power must be 0%, for the last node the power must be 100%. The power values of the nodes must increase continuously.</p> <ol style="list-style-type: none"> <li>1 Specify the power factor for 1st, 10th ... node as a percentage of the maximum power.</li> </ol>  |
| Q Curve                            | 0.3-1 [ind./cap.]                                       | <ol style="list-style-type: none"> <li>1 Specify cos φ of the node.</li> </ol>                                                                                                                                                                                                                  |
| Excitation Curve                   | overexcited   underexcited                              | <ol style="list-style-type: none"> <li>1 If a reactive power not equal to 1 is selected: Select the type of phase shift.</li> </ol>                                                                                                                                                             |
| <b>- Q(U)</b>                      |                                                         |                                                                                                                                                                                                                                                                                                 |
| Evaluated voltage                  | Maximum phase voltage   Positive phase sequence voltage | <ol style="list-style-type: none"> <li>1 Select the rated voltage.</li> </ol>                                                                                                                                                                                                                   |
| Lock-In power                      | 0-100 [% S <sub>lim</sub> ]                             | <ol style="list-style-type: none"> <li>1 Set the effective power as a % of the rated power above which control is activated.</li> </ol>                                                                                                                                                         |

| Display                                         | Setting                                               | Description                                                                                                                                                                                                                       |
|-------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lock-Out power                                  | 0-100 [% S <sub>lim</sub> ]                           | <b>1</b> Set the effective power as a % of the rated power below which control is deactivated.                                                                                                                                    |
| Lock-In time                                    | 0-60,000 [ms]                                         | <b>1</b> Set the length of time that the effective power must remain above the lock-in/lock-out power before control is activated.                                                                                                |
| Lock-Out time                                   | 0-60,000 [ms]                                         |                                                                                                                                                                                                                                   |
| Dead time                                       | 0-10,000 [ms]                                         | <b>1</b> Set the intentional delay for the start of the Q(U) function.                                                                                                                                                            |
| Output gradient limitation increase & decrease  | 1-65,534 [% S <sub>lim</sub> /min]                    | <b>1</b> Set the maximum change in the reactive power in the event of a change to overexcited mode.                                                                                                                               |
|                                                 |                                                       | <b>2</b> Set the maximum change in the reactive power in the event of a change to underexcited mode.                                                                                                                              |
| Settling time                                   | 1,000-120,000 [ms]                                    | <b>1</b> Set the response speed of the control.                                                                                                                                                                                   |
| Min. cos-phi Q1 - min. cos-phi Q4               | 0-1                                                   | <b>1</b> Enter the minimum cos φ factor for quadrants 1 and 4.                                                                                                                                                                    |
| Voltage dead band                               | 0-5 [% Uref]                                          | <b>1</b> Set voltage dead band in %.                                                                                                                                                                                              |
| Q(U) offset (temporary)<br>U offset<br>Q offset | -100-100 [% Slim]<br>-100-100 [% Slim]                | <b>1</b> Set intended Q or U Offset for the function.                                                                                                                                                                             |
| Q minimum                                       | 0-100 [% Slim]<br>underexcited  <br>overexcited       | <b>1</b> Set reactive power Q to a min. value.                                                                                                                                                                                    |
|                                                 |                                                       | <b>2</b> Select the type of phase shift.<br><br>Underexcited corresponds to an inductive load, overexcited to a capacitive load.                                                                                                  |
| Q maximum                                       | 0-100 [% Slim]<br>underexcited  <br>overexcited       | <b>1</b> Set reactive power Q to a max. value.                                                                                                                                                                                    |
|                                                 |                                                       | <b>2</b> Select the type of phase shift.<br><br>Underexcited corresponds to an inductive load, overexcited to a capacitive load.                                                                                                  |
| US, US: Autonomous adjustment Vref              |                                                       | <b>1</b> When activating autonomous adjustment, the reference voltage of the reactive power function is adjusted to the measured voltage with the help of a PT-1 filter. This causes dynamic shifting of the Q(U) characteristic. |
| US, UD: Time constant Vref adjustment           | 300-5,000 [s]                                         | <b>1</b> Set the time constant for adjusting the dynamic reference voltage.                                                                                                                                                       |
| Priority mode                                   | Q-Priority   P-Priority                               | With P priority, the reactive power adjustment range is limited subject to the effective power that is currently available and being fed in.<br><br><b>1</b> Set priority for reactive power – Q or effective power – P.          |
| Active curve                                    | 1-4 / Curve 1<br>TMP / Curve 2 /<br>Curve 3 / Curve 4 |                                                                                                                                                                                                                                   |
| Number of nodes                                 | 2-10                                                  | The maximum number of configurable nodes depends on the selected grid type.                                                                                                                                                       |
|                                                 |                                                       | <b>1</b> Specify the number of nodes.                                                                                                                                                                                             |

| Display                                                                                                                                                                                                                                         | Setting                                                            | Description                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1st node ... 10th node                                                                                                                                                                                                                          | <b>Power</b>   Voltage   Excitation<br>0-100 [% S <sub>lim</sub> ] | <div>1</div> Set the reactive power of the node as a percentage of the maximum power                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                 | Power   <b>Voltage</b>   Excitation<br>0-125 [% S <sub>lim</sub> ] | The voltage values of the nodes must increase continuously. At voltages below the first node and voltages above the last node, the reactive power value of the first or last node is used. <div>1</div> Enter the voltage of the node in volts.                                      |
|                                                                                                                                                                                                                                                 | Power   Voltage   <b>Excitation</b><br>overexcited   underexcited  | Overexcited corresponds to a capacitive load, underexcited to an inductive load. <div>1</div> Select the type of phase shift.                                                                                                                                                        |
| <b>Dynamic grid support</b><br>The device supports dynamic grid stabilization (fault ride through); see <a href="https://manuals.fronius.com/html/4204260586/#0_t_0000008334">https://manuals.fronius.com/html/4204260586/#0_t_0000008334</a> . |                                                                    |                                                                                                                                                                                                                                                                                      |
| Operation mode                                                                                                                                                                                                                                  | On   Off                                                           | <div>1</div> Select a control process.<br><br><b>On:</b> Activates dynamic grid support using dynamic reactive current.<br><br><b>Off:</b> Deactivates dynamic grid support using dynamic reactive current. Dynamic grid support remains active on account of interference immunity. |
| Settings                                                                                                                                                                                                                                        | Manual   Pre-defined zero current                                  | <div>1</div> Select a control process.                                                                                                                                                                                                                                               |
| Reference voltage                                                                                                                                                                                                                               | [% Unom]                                                           | <div>1</div> Set reference voltage for active control process.                                                                                                                                                                                                                       |
| Zero current under-voltage threshold                                                                                                                                                                                                            | 0-100 [% Unom]                                                     | If one or more phase-phase or phase-neutral conductor voltages fall below or exceed the configured threshold, the inverter switches to zero current mode. The total current is regulated to virtually zero. <div>1</div> Set the voltage source for zero current mode.               |
| Zero current under-voltage threshold deactivation                                                                                                                                                                                               | 0-100 [% Unom]                                                     |                                                                                                                                                                                                                                                                                      |
| Zero current over-voltage threshold deactivation                                                                                                                                                                                                | 100-125 [% Unom]                                                   |                                                                                                                                                                                                                                                                                      |
| Zero current over-voltage threshold                                                                                                                                                                                                             | 100-125 [% Unom]                                                   |                                                                                                                                                                                                                                                                                      |
| <b>Overvoltage protection</b><br>Shutdown is carried out within a grid cycle.                                                                                                                                                                   |                                                                    |                                                                                                                                                                                                                                                                                      |
| Transient surge protection                                                                                                                                                                                                                      | 115-135<br>[% Unom]                                                | <div>1</div> Set the transient surge protection. <div>2</div> Click on <b>Apply settings</b> .                                                                                                                                                                                       |
| Enable <b>External grid protection</b><br>External inverter shutdown (INV OFF).                                                                                                                                                                 |                                                                    |                                                                                                                                                                                                                                                                                      |
| External grid protection                                                                                                                                                                                                                        | No device   INV OFF                                                | <div>1</div> Select device.                                                                                                                                                                                                                                                          |
| Third-party device name                                                                                                                                                                                                                         |                                                                    | <div>1</div> Enter name.                                                                                                                                                                                                                                                             |



| Display                           | Setting  | Description                                                                                                                                                                                                                        |
|-----------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Third-party device operating mode | On   Off | <p>In the "On" operating mode only, the inverter responds to the active-low signal (10-24 V<sub>DC</sub>) at the 2-pole signal input INV OFF.</p> <p><b>1</b> Select on / off.</p> <p><b>2</b> Click on <b>Apply settings</b>.</p> |

### Dynamic feed-in limit with multiple inverters

To be able to manage the feed-in limits of energy companies or utilities centrally, a Fronius inverter (master) can control the dynamic feed-in limit for other Fronius inverters in the system (secondary devices). To do so, the following requirements must be met:

- Power limitation and the **Limit multiple inverters (Soft Limit and I/O Power Management only)** function are activated and configured on the user interface of the master (primary device).
- Master and secondary device(s) are physically connected to the same network router via LAN.
- Inverter control via Modbus TCP is activated and configured for all secondary devices.
- The Fronius Smart Meter is configured as a primary meter and connected to the master.

Dynamic feed-in limitation is available for the following device combinations:

| Master        | Secondary devices                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| Fronius GEN24 | Fronius GEN24, Fronius Verto, Fronius Tauro, Fronius Argeno, Fronius SnapINverter with Fronius Datamanager 2.0* |
| Fronius Verto | Fronius GEN24, Fronius Verto, Fronius Tauro, Fronius Argeno, Fronius SnapINverter with Fronius Datamanager 2.0* |
| Fronius Tauro | Fronius GEN24, Fronius Verto, Fronius Tauro, Fronius Argeno, Fronius SnapINverter with Fronius Datamanager 2.0* |

*\* Up to 4 additional Fronius SnapINverters can be connected to each Fronius SnapINverter with Fronius Datamanager 2.0.*

### System limits

- Systems with a maximum of 20 inverters (1 master + 19 secondary devices) are supported.
- The control system is designed for photovoltaic systems with a total output of up to 300 kW.
- The greater the system power, the greater the switching time between inverters.
- The use of a plant controller is recommended for systems >300 kW.

### Secondary device

A secondary device adopts the feed-in limit from the master. No data for the feed-in limit is sent to the master. The following configurations must be set for power limitation:

### Fronius Argeno user interface for secondary device

- 1** On the user interface, select the menu area **Communication > Ethernet > Modbus TCP /UDP**.

- 2 Check the box for **Modbus TCP/UDP Activation** and **Modbus TCP/UDP Write access**.
  - 3 Enter the value 502 for the **Modbus TCP/UDP Port**.
  - 4 Click on **Apply settings**.
  - 5 Select the menu area **AC settings > Active power control > External**
  - 6 Enter a fallback time of 10 seconds for a fail-safe scenario. The remaining preset parameters remain unchanged.
  - 7 Click on **Apply settings**.
- ✓ *The dynamic feed-in limit has been configured.*

### IMPORTANT!

The secondary device automatically stops feeding into the grid in the event of a communication failure, where the Modbus controller is not sending signals to the inverter.

## DC Settings

Input screens for DC source (module array/battery).

| Display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Setting                                   | Description                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DC starting voltage</b><br>The device starts feeding in as soon as this voltage is present.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           |                                                                                                                                                                                                                                                                                                                     |
| DC starting voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           | <ol style="list-style-type: none"> <li>1 Set the start-up input voltage.</li> <li>2 Click on <b>Apply settings</b>.</li> </ol>                                                                                                                                                                                      |
| <b>Insulation resistance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                           |                                                                                                                                                                                                                                                                                                                     |
| Insulation resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 36-1,000 [kOhm]                           | <ol style="list-style-type: none"> <li>1 Set the threshold value from which the insulation monitoring reports an error.</li> <li>2 Click on <b>Apply settings</b>.</li> </ol>                                                                                                                                       |
| <b>DC Configuration</b><br>The correct DC configuration must be set prior to connecting the individual DC strings. The inputs used may be connected either separately or in parallel. Mixed operation can damage the device.                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                           |                                                                                                                                                                                                                                                                                                                     |
| DC configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | All inputs separate   All inputs parallel | Observe the recommended default configuration! <ol style="list-style-type: none"> <li>1 Select <b>All inputs separate</b> if strings are connected individually.</li> <li>2 Optional: Select <b>All inputs parallel</b> if strings are connected in parallel.</li> <li>3 Click on <b>Apply settings</b>.</li> </ol> |
| <b>Global MPPT</b><br>To determine the global MPP, first MPP trackers (1/3/5/7/9) and then MPP trackers (2/4/6/8/10) are considered. During this time, which lasts approx. 30 minutes in each case, the system deviates from the MPP and causes a reduction in yield. A reduction in the interval time therefore further reduces the yield. If a parallel connection (all inputs parallel) is made to two DC inputs of the device in each case, only one cycle is performed to determine the global MPP. If a global MPP is found, the MPP search algorithm is active again and tracks the changes to make the maximum possible power of the PV modules available. |                                           |                                                                                                                                                                                                                                                                                                                     |
| Global MPPT enable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | On   Off                                  | <ol style="list-style-type: none"> <li>1 Enable mode for active management to all MPPT trackers.</li> </ol>                                                                                                                                                                                                         |
| Time interval                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5-120 min                                 | <ol style="list-style-type: none"> <li>1 Set the time interval.</li> </ol>                                                                                                                                                                                                                                          |

**Communication** Input screens for configuring the interfaces.

| Display                                                                                                                                                                                                                                                                                                                                                                          | Setting         | Description                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ethernet</b><br>Option to parameterize the Ethernet interface.                                                                                                                                                                                                                                                                                                                |                 |                                                                                                                                                                                                                                                                       |
| <b>Secure network operation</b><br>The devices must only be operated within a secure network (e.g., company network segment or private network). Direct connection to the public Internet is prohibited, as this poses potential security risks. Ensure that appropriate security measures such as firewalls and access controls are implemented to prevent unauthorized access. |                 |                                                                                                                                                                                                                                                                       |
| - <b>IP settings</b><br>Option to parameterize network access.                                                                                                                                                                                                                                                                                                                   |                 |                                                                                                                                                                                                                                                                       |
| DHCP                                                                                                                                                                                                                                                                                                                                                                             | Check to enable | <b>On:</b> If a DHCP server is available, the IP address, subnet mask, gateway, and DNS server are automatically obtained from this server and the mentioned menu entries filled out.<br><br><b>Off:</b> Settings are made manually.<br><br>1 Enable or disable DHCP. |
| IP address                                                                                                                                                                                                                                                                                                                                                                       |                 | 1 Assign an IPv4 address that is unique in the network.                                                                                                                                                                                                               |
| Subnet mask                                                                                                                                                                                                                                                                                                                                                                      |                 | 1 Assign subnet mask.                                                                                                                                                                                                                                                 |
| Default gateway                                                                                                                                                                                                                                                                                                                                                                  |                 | 1 Enter the IPv4 address of the gateway.                                                                                                                                                                                                                              |
| Primary & Secondary DNS (optional)                                                                                                                                                                                                                                                                                                                                               |                 | 1 Enter the IPv4 address of the DNS server.<br>2 Confirm the action field.                                                                                                                                                                                            |
| - <b>Modbus TCP/UDP</b><br>Option to set the Modbus port.                                                                                                                                                                                                                                                                                                                        |                 |                                                                                                                                                                                                                                                                       |
| Modbus TCP/UDP Activation                                                                                                                                                                                                                                                                                                                                                        | Check to enable | 1 Allow Modbus TCP/UDP write access.                                                                                                                                                                                                                                  |
| Modbus TCP/UDP Write access                                                                                                                                                                                                                                                                                                                                                      | Check to enable | Enabling write access makes it possible to set system-critical parameters via Modbus TCP. Are you sure you want to allow write access?<br><br>1 Allow Modbus TCP write access.<br>2 Confirm the action field.                                                         |
| Modbus TCP/UDP Port                                                                                                                                                                                                                                                                                                                                                              |                 | 1 Set network port.                                                                                                                                                                                                                                                   |
| - <b>MQTT</b><br>The MQTT protocol is used to implement the advanced functions between the segment controller and the inverter (in particular, firmware updates, distribution of device configurations, etc.)                                                                                                                                                                    |                 |                                                                                                                                                                                                                                                                       |
| Broker auto discovery                                                                                                                                                                                                                                                                                                                                                            | Check to enable |                                                                                                                                                                                                                                                                       |
| Broker IP                                                                                                                                                                                                                                                                                                                                                                        |                 | The default setting ensures successful communication with the segment controller.<br><br>1 Displays the IP address transmitted by the segment controller.<br>2 Confirm the action field.                                                                              |
| Broker port                                                                                                                                                                                                                                                                                                                                                                      |                 |                                                                                                                                                                                                                                                                       |

| Display                                                                                                                                                                                                                                                             | Setting | Description |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------|
| <b>Solar.web</b>                                                                                                                                                                                                                                                    |         |             |
| In this menu, the user can agree to the technically necessary data processing or reject it. If consent is refused, the inverter in Solar.web remains offline and does not transmit any data. Without consent, no data communication will take place with Solar.web. |         |             |

## Features / Functions

Input screens for extended device functions.

| Display                                                                                                                                                                                                                                                                                                                           | Setting         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AFPE (arc-fault protection equipment)</b>                                                                                                                                                                                                                                                                                      |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| AFPE monitoring                                                                                                                                                                                                                                                                                                                   | Check to enable | <ol style="list-style-type: none"> <li>1 Enable AFPE monitoring if necessary.</li> <li>2 Click on <b>Apply settings</b>.</li> </ol>                                                                                                                                                                                                                                                                                                                                                         |
| ARC Manual Restart                                                                                                                                                                                                                                                                                                                |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Constant voltage control</b><br>Option to disable MPP seek mode so the device operates with a constant DC voltage. Energy recovery to the PV generator can occur if constant voltage control is enabled and the system is running in "Q on Demand" mode. Please note the instructions and approval of the module manufacturer. |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Constant voltage mode                                                                                                                                                                                                                                                                                                             | Off   On        | <ol style="list-style-type: none"> <li>1 Enable or disable constant voltage regulator.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                           |
| Constant voltage                                                                                                                                                                                                                                                                                                                  |                 | <ol style="list-style-type: none"> <li>1 Set value for constant voltage regulator.</li> <li>2 Click on <b>Apply settings</b>.</li> </ol>                                                                                                                                                                                                                                                                                                                                                    |
| <b>SPD monitoring</b><br>Option to check the available surge protection device with corresponding status codes                                                                                                                                                                                                                    |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SPD monitoring AC<br>SPD monitoring DC                                                                                                                                                                                                                                                                                            | Check to enable | <ol style="list-style-type: none"> <li>1 Activate surge protection monitoring.</li> <li>2 Click on <b>Apply settings</b>.</li> </ol>                                                                                                                                                                                                                                                                                                                                                        |
| <b>Q on Demand</b><br>Only enable this function if this is expressly permitted by the utility. Further conditions: <ul style="list-style-type: none"> <li>- No PID solution connected to the device.</li> <li>- Constant voltage regulator in the device is disabled.</li> </ul>                                                  |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Night Shutdown                                                                                                                                                                                                                                                                                                                    | Check to enable | <p>The reactive power settings currently specified are used. Power-dependent functions are not used.</p> <p>If an AC disconnect occurs overnight, the function will only be available the following day.</p> <ol style="list-style-type: none"> <li>1 "Q on Demand" function is enabled by disabling the night shutdown.</li> <li>2 Transfer the function to the memory.</li> <li>3 Note information in the notification window and use <b>OK</b> button to enable the function.</li> </ol> |
| <b>Compliant with type B RCD</b><br>Enable this function when using a type B RCD                                                                                                                                                                                                                                                  |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Compliant with type B RCD                                                                                                                                                                                                                                                                                                         | Check to enable | <ol style="list-style-type: none"> <li>1 Activate "Compliant with type B RCD".</li> <li>2 Click on <b>Apply settings</b>.</li> </ol>                                                                                                                                                                                                                                                                                                                                                        |
| <b>Relay</b>                                                                                                                                                                                                                                                                                                                      |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Display                                                                                             | Setting                                                  | Description                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relay                                                                                               | Positive logic   Negative logic<br><br>Inactive   Active | <ol style="list-style-type: none"> <li>1 Select the type of logic.</li> <li>2 Select the form of activity.</li> <li>3 Click on <b>Apply settings</b>.</li> </ol> |
| <b>Smart Meter</b><br>Smart Meters installed in the system can be found and connected in this menu. |                                                          |                                                                                                                                                                  |
| Overview of Smart Meters                                                                            |                                                          | The IP address, device serial number, and connection status of the Smart Meter are displayed.                                                                    |

**Service / Maintenance**      Option to perform updates, access service and parameter data, and grant remote access.

| Display                                                                                                                                                                   | Setting                   | Description                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Firmware Update</b><br>Option to update the device. Parameter data is not overwritten during firmware updates.                                                         |                           |                                                                                                                                                                                                                                                                                                                                                                                |
| Instant Update                                                                                                                                                            |                           | <ol style="list-style-type: none"> <li>1 Select the firmware update file using the <b>Browse...</b> button and confirm</li> <li>2 Start the firmware update using the <b>Upload</b> button.</li> <li>3 The AC and DC supply to the inverter must be ensured throughout the entire update process. A loss of supply may damage the device. Continue with the update?</li> </ol> |
| Rollback Update                                                                                                                                                           |                           | This function can be used to reset the inverter to the last firmware version installed. <ol style="list-style-type: none"> <li>1 Perform firmware rollback by clicking on the <b>Rollback</b> button.</li> </ol>                                                                                                                                                               |
| <b>Export Service Package</b><br>Option to export a service package. The service package contains status messages, weblogs, production data, and various measured values. |                           |                                                                                                                                                                                                                                                                                                                                                                                |
| Export Service Package                                                                                                                                                    |                           | <ol style="list-style-type: none"> <li>1 Press the export button and send the file to Fronius.</li> </ol>                                                                                                                                                                                                                                                                      |
| <b>Service Log</b><br>Shows all logged installations. All maintenance activities should be added manually via the <b>Add service log entry</b> button.                    |                           |                                                                                                                                                                                                                                                                                                                                                                                |
| Service Log                                                                                                                                                               |                           | <ol style="list-style-type: none"> <li>1 Enter additional service tasks.</li> <li>2 Export service logs if necessary.</li> </ol>                                                                                                                                                                                                                                               |
| <b>Logging Management</b><br>Input screens for log and service data and defaults.                                                                                         |                           |                                                                                                                                                                                                                                                                                                                                                                                |
| - <b>Settings</b><br>Set the interface for data logging and the basic counter.                                                                                            |                           |                                                                                                                                                                                                                                                                                                                                                                                |
| User logging interval                                                                                                                                                     | 1   5   10   15 [minutes] | Setting and time until memory is overwritten: 1 min-5 days; 5 min-4.5 years; 10 min-9 years; 15 min-14 years. <ol style="list-style-type: none"> <li>1 Specify time span between two log data captures.</li> </ol>                                                                                                                                                             |

| Display                                                                                                                                | Setting                                                                  | Description                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Service logging interval                                                                                                               | 1-120 [sec]                                                              | Setting and time until memory is overwritten: 1 sec-9 days; 10 sec-92.5 days; 120 sec-1,110 days<br><br><b>1</b> Specify time span between two log data captures.                                                                                                                 |
| DC-DSP logging interval                                                                                                                | 1-120 [sec]                                                              | Setting and time until memory is overwritten: 1 sec-9 days; 10 sec-92.5 days; 120 sec-1,110 days<br><br><b>1</b> Specify time span between two log data captures.                                                                                                                 |
| ARC-DSP logging interval                                                                                                               | 1-120 [sec]                                                              | Setting and time until memory is overwritten: 1 sec-9 days; 10 sec-92.5 days; 120 sec-1,110 days<br><br><b>1</b> Specify time span between two log data captures.                                                                                                                 |
| <b>- Analyze Log Data</b><br>All measurement data can be transferred to a USB thumb drive by making individual or multiple selections. |                                                                          |                                                                                                                                                                                                                                                                                   |
| User logs                                                                                                                              | cosPhi   fac (Hz)   lac1 (A)   lac2 (A)   lac3 (A)   idc (A)   Qac (var) | <b>1</b> Select a date in the calendar.<br><b>2</b> Select measurement data from the drop-down field.<br><b>3</b> Update the measurement data.<br><b>4</b> Transfer the selected measurement data to the storage device or transfer the data selectively.                         |
| <b>Parameter Management</b><br>Option to reset set values as well as to import and export specific parameters.                         |                                                                          |                                                                                                                                                                                                                                                                                   |
| Factory Settings                                                                                                                       |                                                                          | <b>1</b> Compare all parameters / country-specific parameters / network-specific parameters with basic setting value.<br><b>2</b> If necessary, reset parameters using the <b>Restore</b> button.                                                                                 |
| Export configuration (*.kcfp)                                                                                                          |                                                                          | <b>1</b> Parameters to export for device independent settings / Export all settings.<br><b>2</b> Confirm the following window with <b>OK</b> .                                                                                                                                    |
| Import configuration (*.kcfp)                                                                                                          |                                                                          | <b>1</b> Select the parameter file using the <b>Browse...</b> button.<br><b>2</b> Import the parameters using the <b>Upload</b> button.                                                                                                                                           |
| <b>Installation Wizard</b>                                                                                                             |                                                                          |                                                                                                                                                                                                                                                                                   |
| Installation Wizard                                                                                                                    |                                                                          | After the installation is complete, the following text appears: <b>Installation wizard was completed</b><br><br>In addition, a report with the complete device configuration can be created and downloaded. This report is requested by some grid operators during commissioning. |
| <b>Network Statistics</b><br>Displays the data packages that have been transmitted and received.                                       |                                                                          |                                                                                                                                                                                                                                                                                   |
| Network Statistics                                                                                                                     |                                                                          |                                                                                                                                                                                                                                                                                   |
| <b>History</b>                                                                                                                         |                                                                          |                                                                                                                                                                                                                                                                                   |

| Display                                                               | Setting | Description                               |
|-----------------------------------------------------------------------|---------|-------------------------------------------|
| Shows all actions carried out in the system and on the web interface. |         |                                           |
| <b>Reboot Device</b>                                                  |         |                                           |
| Reboot Device                                                         |         | <b>1</b> Restart the device if necessary. |





# Appendix



# Care and maintenance

## Safety



### DANGER!

**Lethal voltages are still present in the connections and leads of the device even after the device has been switched off and disconnected.**

Touching the leads or terminals/busbars in the device can result in severe injuries or death.

- ▶ The device must be permanently installed prior to electrical connection.
- ▶ Comply with all safety rules and current technical connection specifications of the responsible utility.
- ▶ The device must only be opened and serviced by a qualified electrician.
- ▶ Switch off the mains voltage by switching off the external circuit breakers.
- ▶ Check that all AC and DC cables are completely free of current using a clamp ammeter.
- ▶ Do not touch the leads or terminals/busbars when switching the device on and off.
- ▶ Keep the device closed when in operation.



### DANGER!

**Dangerous voltage due to two operating voltages**

Touching the leads or terminals/busbars in the device can result in severe injuries or death. The discharge time of the capacitors is up to 5 minutes.

- ▶ The device must only be opened and serviced by a qualified electrician who has been authorized by the utility.
- ▶ Observe the information provided on the warning sticker of the device housing.
- ▶ Before opening the device: Disconnect the AC and DC sides and wait at least 5 minutes.



### WARNING!

**If the device is not completely disconnected from the voltage source, the fan may start unexpectedly.**

The fan can sever or injure limbs.

- ▶ Before working on the device, make sure that the device is disconnected from all voltage sources.
- ▶ After disconnecting from all voltage sources, wait for at least another 5 minutes before starting maintenance work.



### CAUTION!

**Cleaning with compressed air or other unsuitable means can result in damage.**

This can cause damage to the device.

- ▶ Do not use compressed air or high-pressure cleaners.
- ▶ Use a vacuum cleaner or a soft brush to remove dust from the fan covers and from the top of the device on a regular basis.
- ▶ Remove soiling from ventilation inlets if necessary.

---

**General**

The inverter is designed so that it does not require additional maintenance work. Nevertheless, a few points must be considered during operation to ensure that the inverter works perfectly.

---

**Maintenance**

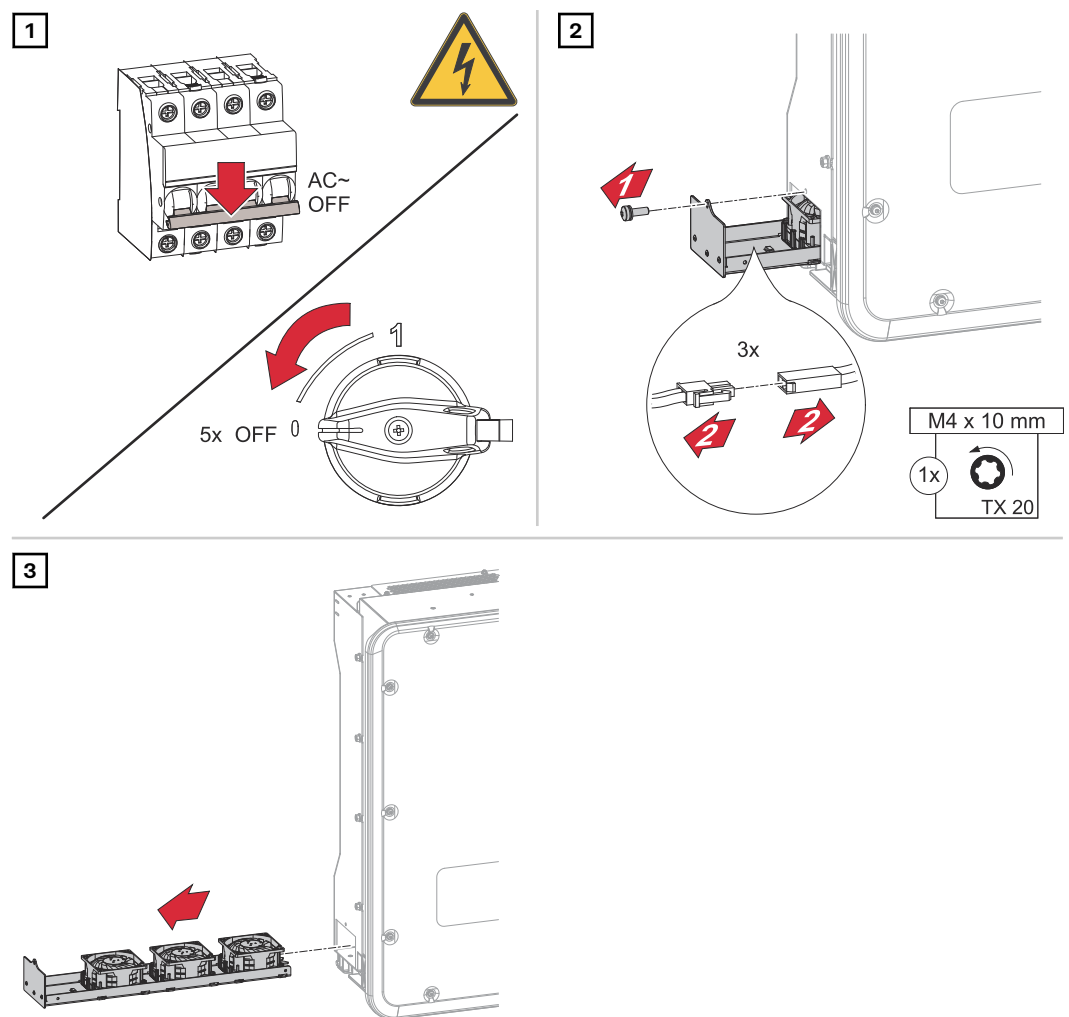
Maintenance and service work may only be carried out by a trained technician.

---

**Cleaning**

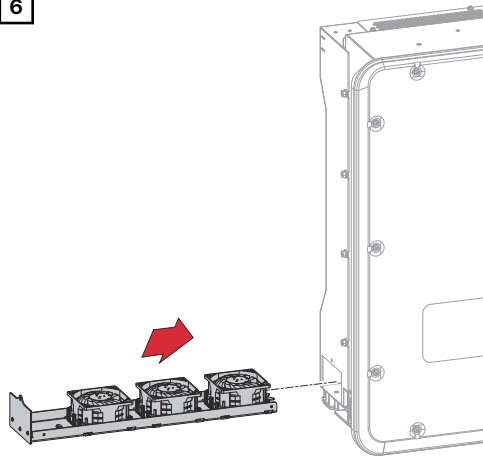
Wipe the inverter, if necessary, with a damp cloth.  
Do not use cleaning agents, scouring agents, solvents, or similar products to clean the inverter.

---

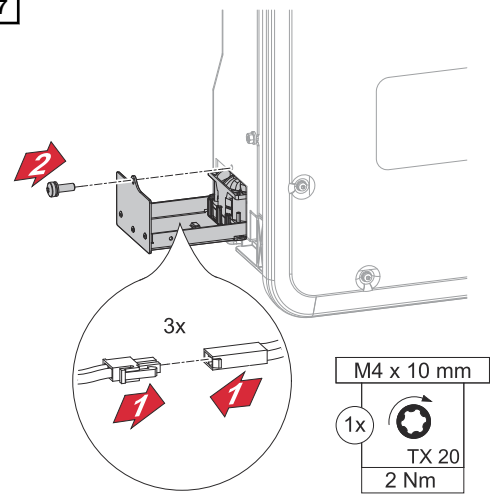
**Cleaning the fan drawer**

- 4** Use a suitable brush to remove dirt and dust particles from all fans.
- 5** Remove any dust inside by tapping gently on the side of the fan grille.

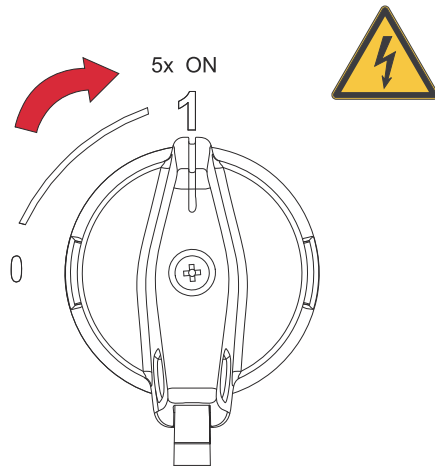
6



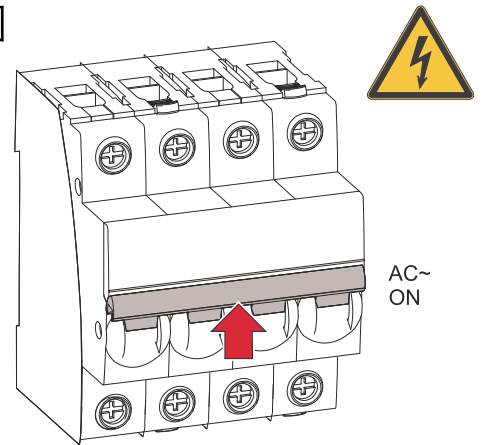
7



8



9



# Status codes and remedy

## Status codes

---

### LEDs do not light up

Cause: No mains voltage

Remedy: Contact a Fronius-trained service technician

---

### The device stops grid power feed operation shortly after switching on even though there is irradiation present

Cause: Defective section switches in the device

Remedy: If the section switches are defective, the device will recognize this fault during the self-test.

Remedy: Contact a Fronius-trained service technician

---

### Device is active but not connected to the grid. The operating LED indicates a grid fault.

Cause: Due to a grid fault (over/undervoltage, over/underfrequency), the device stops the feed-in process and disconnects from the grid for safety reasons.

Remedy: Contact a Fronius-trained service technician

---

### The mains fuse trips.

Cause: The inverter exceeds its nominal current for a short time in case of a high level of irradiation. The mains fuse capacity is too low.

Remedy: Contact a Fronius-trained service technician

Cause: If the mains fuse trips immediately when the device goes into grid power feed operation, the device's hardware is likely damaged.

Remedy: Contact a Fronius-trained service technician

---

### The device displays an impossible daily peak value

Cause: Faults in the grid

Remedy: The device continues to operate as normal without losses in the yield, despite displaying an incorrect daily peak value. The value is reset overnight.

Remedy: To reset the value immediately, see [De-energizing the inverter and switching it back on](#)

---

### Daily yields do not match the yields on the electricity meter

Cause: The measuring elements in the device have been selected to ensure maximum yields. Due to tolerances, the daily yields displayed may deviate from the values on the electricity meter by up to 15%.

Remedy: No action necessary.

---

### Device is active but not connected to the grid

Cause: The PV module voltage or power is not sufficient for feed-in (solar irradiation is too low). The inverter checks the grid parameters before the feed-in process begins. The length of time it takes to switch on differs from country to country depending on the applicable standards and regulations and can last several minutes. The start-up input voltage setting may be incorrect.

Remedy: No action necessary.

Remedy: If status code persists, contact a Fronius-trained service technician.

---

**In spite of high irradiation levels, the inverter does not feed the maximum power into the grid.**

Cause: The device reduces the power because the temperatures inside the device are too high.

Remedy: Ensure sufficient cooling of the device.

Remedy: Remove any foreign matter from the device

Remedy: If the first two steps do not help, contact a Fronius-trained service technician

Cause: A module string is disconnected from the device due to a defective DC fuse.

Remedy: Contact a Fronius-trained service technician

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# Technical data

## Argeno 125

| Input data                                                                   |                         |
|------------------------------------------------------------------------------|-------------------------|
| Max. input voltage<br>(at 1,000 W/m <sup>2</sup> /-10 °C in an open circuit) | 1,100 V <sub>DC</sub>   |
| Nominal input voltage                                                        | 620 V <sub>DC</sub>     |
| DC starting voltage                                                          | 250 V <sub>DC</sub>     |
| MPP voltage range                                                            | 550-850 V <sub>DC</sub> |
| Number MPP-controller                                                        | 10                      |
| Maximum input current (I <sub>DC max</sub> ) PV1-PV10<br>per string          | 30 A<br>20 A            |
| Max. short circuit current <sup>8)</sup> PV1-PV10<br>per string              | 37.5 A<br>25 A          |
| Max. power / MPP tracker                                                     | 15.5 kW                 |
| Max. array power (P <sub>PV max</sub> ) in total                             | 250 kWp                 |
| DC overvoltage category                                                      | 2                       |
| Max. inverter backfeed current to the array <sup>3)</sup>                    | 0 A <sup>4)</sup>       |

| Output data                                                     |                                                                          |
|-----------------------------------------------------------------|--------------------------------------------------------------------------|
| Grid voltage range during permanent operation<br>(phase/phase)  | 305-560 V <sub>AC</sub>                                                  |
| Max. grid voltage range (up to 100 s)                           | 612 V <sub>AC</sub>                                                      |
| Rated grid voltage                                              | 380/400 V <sub>AC</sub> (3P+(N)+PE)<br><sup>1)</sup>                     |
| France (4,210,472 / 4,210,472A)                                 | 400 V <sub>AC</sub> (3P+N+PE) <sup>1)</sup>                              |
| Rated power (at 400 VAC)                                        | 125 kVA                                                                  |
| Rated apparent power                                            | 125 kVA                                                                  |
| Rated frequency                                                 | 50/60 Hz <sup>1)</sup>                                                   |
| Maximum output current/phase                                    | 182 A                                                                    |
| Initial symmetrical short-circuit current/phase I <sub>K"</sub> | 190.2 A                                                                  |
| Power factor (cos phi)                                          | 0.8 ind ... 0.8 cap. <sup>2)</sup>                                       |
| Grid connection                                                 | 3~ (N)PE 380 / 220 V <sub>AC</sub><br>3~ (N)PE 400 / 230 V <sub>AC</sub> |
| Earthing systems                                                | TN-C (not with 4,210,472) /<br>TN-C-S / TN-S / TT, solid<br>grounded wye |
| Maximum output power                                            | 125 kW                                                                   |
| Nominal output power                                            | 125 kW                                                                   |
| Rated output current / phase                                    | 3x 180.4 A                                                               |
| Total harmonic distortion                                       | < 3%                                                                     |



| Output data                                                               |                                    |
|---------------------------------------------------------------------------|------------------------------------|
| AC overvoltage category                                                   | 3                                  |
| Current (inrush) <sup>5)</sup>                                            | < 20 A [RMS (20 ms)] <sup>4)</sup> |
| Duration of short circuit alternating current (max. output fault current) | 3 x 182.66 A                       |

| General data                                |                               |
|---------------------------------------------|-------------------------------|
| Night-time power loss = standby consumption | 4.8 W<br>400 V AC no LAN      |
| European efficiency                         | 98.7%                         |
| Maximum efficiency                          | 99.1%                         |
| Protective class                            | 1                             |
| EMC emission class                          | A <sup>10)</sup>              |
| Pollution degree inside housing             | 2                             |
| Outside housing                             | 3                             |
| Permitted ambient temperature               | - 25 °C-+60 °C                |
| Permitted storage temperature               | - 40 °C-+80 °C                |
| Relative humidity                           | 0-100%                        |
| Noise emission                              | < 60 dB(A) (ref. 20 µPA)      |
| Ingress protection (IP) rating              | IP 66                         |
| Dimensions (height x width x depth)         | 740 x 1,023 x 330 mm          |
| Weight                                      | 85 kg                         |
| Inverter topology                           | Non-insulated, no transformer |

| Protection devices                                 |                                           |
|----------------------------------------------------|-------------------------------------------|
| DC disconnect                                      | Integrated                                |
| Cooling principle                                  | Controlled forced-air ventilation         |
| RCMU                                               | Integrated                                |
| DC isolation measurement                           | integrated <sup>2)</sup>                  |
| Overload performance                               | Operating point shift<br>Power limitation |
| Active anti-islanding method                       | Phase shift process, cyclical phase jump  |
| AFCI                                               | Integrated                                |
| AFPE (AFCI) classification (according to IEC63027) | F-I-AFPE-2-4-5                            |

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**Explanation of footnotes**

- 1) The values provided are standard values. If required, the inverter is customized for a specific country.
- 2) Depending on the country setup or device-specific settings (ind. = inductive; cap. = capacitive)
- 3) Maximum current from a defective PV module to all other PV modules. From the inverter itself to the PV side of the inverter, this is 0 A.
- 4) Assured by the electrical design of the inverter
- 5) Peak current when turning on the inverter
- 6) The values provided are standard values. These values must be adjusted according to requirements and PV output.
- 7) The value provided is a max. value. If this value is exceeded, this may impair the function.
- 8)  $I_{SC\ PV} = I_{CP\ PV} \geq I_{SC\ max} = I_{SC\ (STC)} \times 1.25$  acc. to e.g.,: IEC 60364-7-712
- 9) Software class B (single-channel with periodic self-test) according to IEC 60730-1 Appendix H.
- 10) Standards:
  - Interference immunity
    - EN IEC 61000-6-1:2019
    - EN 61000-6-1:2007
    - EN IEC 61000-6-2:2019
    - EN 61000-6-2:2005/AC:2005
    - EN 62920:2017/A11:2020 Class A
  - Emitted interference
    - EN 62920:2017/A11:2020 Class A\*
    - EN 55011:2016/A11:2020+ A2:2021 Group 1, Class A\*
    - EN IEC 61000-6-4:2019
    - EN 61000-6-4:2007 +A1:2011
  - Grid interferences
    - EN 61000-3-11:2000
    - EN IEC 61000-3-11:2019
    - EN 61000-3-12:2011

# Relevant Standards and Directives

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## **CE Conformity Marking**

The equipment complies with all the requisite and relevant standards and directives that form part of the relevant EU directive, and therefore is permitted to display the CE mark.

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## **Mains failure**

The standard measurement and safety procedures integrated into the inverter ensure that the power feed is immediately interrupted in the event of a grid failure (for example shut-off by the grid operator or damage to lines).

# Service, warranty terms and conditions, and disposal

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## Fronius SOS

Under [sos.fronius.com](https://sos.fronius.com) you can retrieve warranty and device information at any time, start troubleshooting independently, and request replacement components.

For more information on spare parts, contact your installer or point of contact for the PV system.

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## Fronius manufacturer's warranty

Detailed warranty conditions specific to your country can be found at [www.fronius.com/solar/garantie](https://www.fronius.com/solar/garantie).

To secure the full warranty period for the newly installed Fronius product, it is necessary to register at [www.solarweb.com](https://www.solarweb.com).

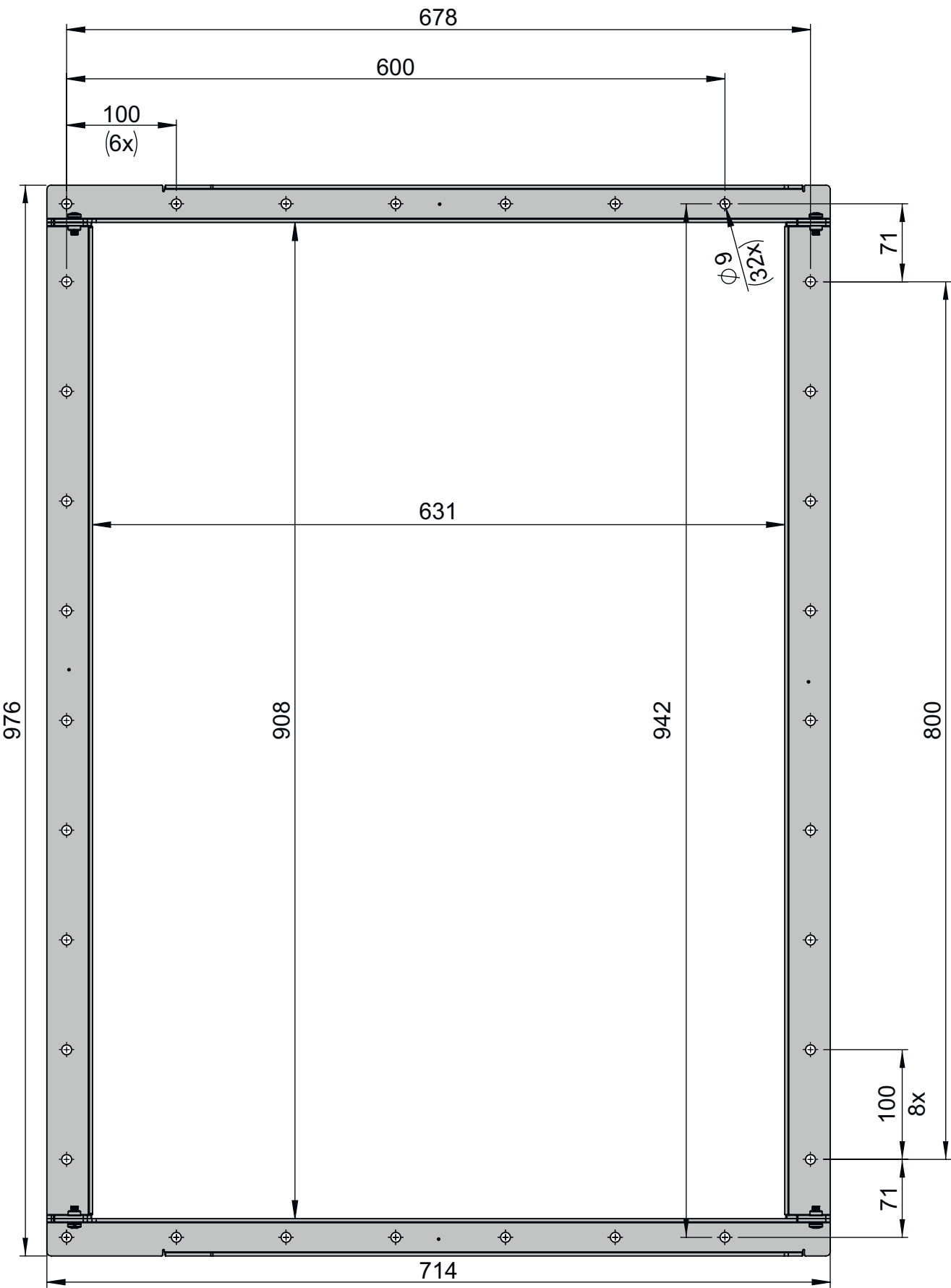
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## Disposal

The manufacturer, Fronius International GmbH, will take back the old device and arrange for it to be professionally recycled. Observe the national regulations for the disposal of electronic equipment.

# Dimensions

# Dimensions of the mounting bracket







[fronius.com/en/solar-energy/installers-partners/products-solutions/monitoring-digital-tools](https://fronius.com/en/solar-energy/installers-partners/products-solutions/monitoring-digital-tools)

MONITORING &  
DIGITAL TOOLS

**Fronius International GmbH**

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Austria  
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[www.fronius.com](http://www.fronius.com)

At [www.fronius.com/contact](http://www.fronius.com/contact) you will find the contact details of all Fronius subsidiaries and Sales & Service Partners.