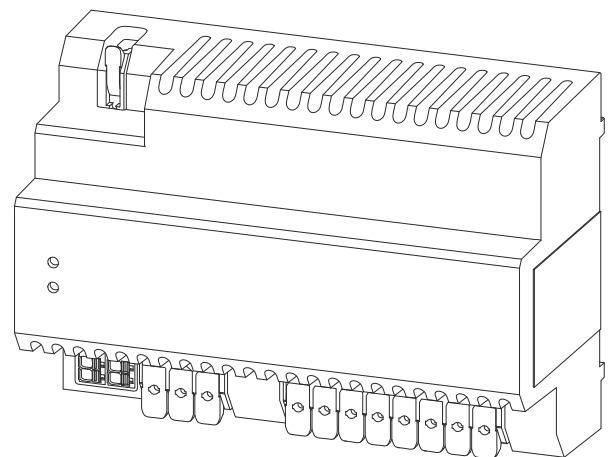


Operating Instructions

Fronius Backup Controller
3P-35A



EN | Operating Instructions



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Safety rules

Safety rules

Explanation of safety notices

DANGER!

Indicates immediate danger.

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

WARNING!

Indicates a potentially hazardous situation.

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

CAUTION!

Indicates a situation where damage or injury could occur.

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

NOTE!

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

General

The device has been manufactured in line with the state of the art and according to recognized safety standards. If used incorrectly or misused, however, it can cause:

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

All personnel involved in commissioning, maintenance, and servicing of the device must:

- Be suitably qualified
 - Have knowledge of and experience in dealing with electrical installations and
 - Have fully read and precisely followed these Operating Instructions
-

The Operating Instructions must always be at hand wherever the device is being used. In addition to the Operating Instructions, attention must also be paid to any generally applicable and local regulations regarding accident prevention and environmental protection.

All safety and danger notices on the device:

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

The terminals can reach high temperatures.

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

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

Any safety devices that are not fully functional must be repaired by an authorised specialist before the device is switched on.

Never bypass or disable protection devices.

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

Any equipment malfunctions which might impair safety must be remedied before the device is turned on.

This is for your personal safety!

Environmental conditions

Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended purpose. The manufacturer accepts no liability for any damage resulting from improper use.

Qualified personnel

The servicing information contained in these operating instructions is intended only for the use of qualified service engineers. An electric shock can be fatal. Do not carry out any actions other than those described in the documentation. This also applies to qualified personnel.

All cables and leads must be secured, undamaged, insulated and adequately dimensioned. Loose connections, scorched, damaged or inadequately dimensioned cables and leads must be immediately repaired by authorised personnel.

Maintenance and repair work must only be carried out by an authorised specialist.

It is impossible to guarantee that bought-in parts are designed and manufactured to meet the demands made on them, or that they satisfy safety requirements. Use only original spare parts (also applies to standard parts).

Do not carry out any alterations, installations, or modifications to the device without first obtaining the manufacturer's permission.

Components that are not in perfect condition must be changed immediately.

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, then the operator is obliged to take action to rectify the situation.

Data security

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

- backing up any changes made to the factory settings
- saving and retaining personal settings

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 regarding any discrepancies in the operating instructions.

General information

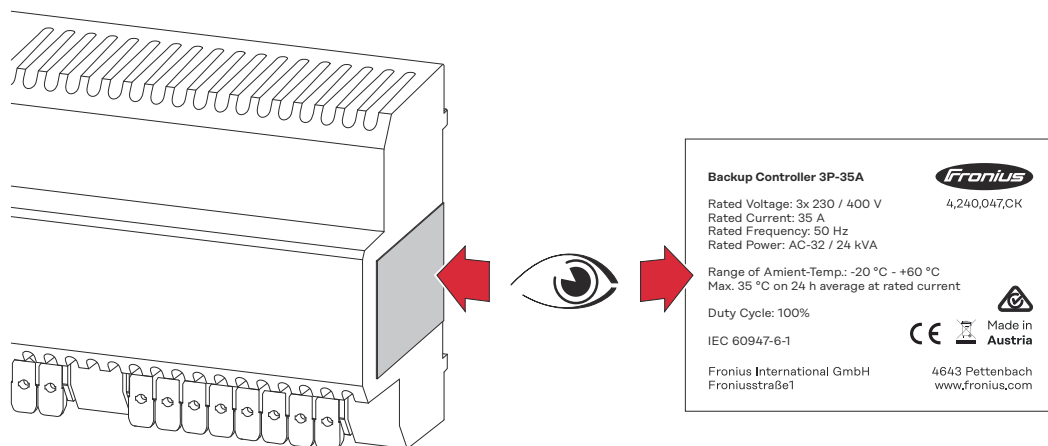
Intended use

The Fronius Backup Controller is a fixed piece of equipment designed for use in public grids with TN-C-S/TN-S systems. Its main function is to automatically and securely disconnect all connected loads and generators from the public grid in the event of a grid failure or grid malfunction in accordance with the specifications of the grid operator. As soon as grid stability has been restored, the loads and generators are automatically reconnected to the public grid.



1. **Application:** The Fronius Backup Controller is required for systems with storage batteries to enable automatic backup power switching.
2. **Installation:** The Fronius Backup Controller is installed either on an indoor DIN rail or in special enclosures with corresponding IP protection, depending on the environmental conditions.
3. **Safety precautions:** In conjunction with a Fronius Smart Meter, corresponding back-up fuses must be selected to suit the cable cross-sections of the copper conductors and the maximum current of the Fronius Backup Controller.
4. **Intended use:** The Fronius Backup Controller must only be operated in accordance with the specifications in the enclosed documentation and in accordance with local laws, regulations, provisions, standards and within the limits of technical possibilities. Any use of the product other than as described under intended use shall be deemed to be not in accordance with intended use.
5. **Documentation:** The available documentation forms part of the product and must be read, observed and kept in good condition. It must also be accessible at all times at the place of installation. The available documents do not replace regional, state, provincial or national laws, or regulations or standards that apply to the installation, electrical safety and use of the product. Fronius International GmbH assumes no responsibility for compliance with or non-compliance with these laws or regulations in connection with the installation of the product.
6. **Interventions and modifications:** Interventions in the Fronius Backup Controller, e.g. modifications and alterations, are not permitted. Unauthorised interventions will void the warranty and warranty claims and, as a rule, void the user's authority to operate the equipment. The manufacturer shall not be liable for any damage resulting from such use.
7. **Reasonably foreseeable misuse:** The Fronius Backup Controller is not suitable for supplying power to life-sustaining medical equipment.

Information on the device

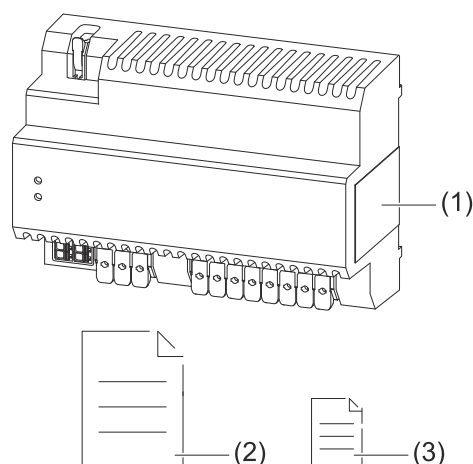
Technical data and markings are located on the Fronius Backup Controller. These must NOT be removed or painted over.



Markings:

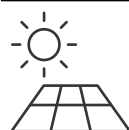
-  CE mark – confirms compliance with applicable EU directives and regulations.
-  WEEE mark – waste electrical and electronic equipment must be collected separately and recycled in an environmentally sound manner in accordance with the European Directive and national law.
-  RCM mark – tested in accordance with the requirements of Australia and New Zealand.

Scope of supply



- (1) Fronius Backup Controller
- (2) Quick Start Guide
- (3) Backup power warning notice

Explanation of symbols



PV module
 generates direct current



Fronius GEN24 inverter
 converts direct current into alternating current and charges the battery (battery charging is only possible with Fronius GEN24 Plus inverters). The integrated system monitoring enables the inverter to be integrated into a network by means of WLAN.



Fronius Backup Controller

automatically and securely disconnects all connected loads and generators from the public grid in the event of a grid failure or grid malfunction in accordance with the specifications of the grid operator. As soon as grid stability has been restored, the loads and generators are automatically reconnected to the public grid.



Inverter in the system

e. g. Fronius Primo, Fronius Symo, etc.



Primary meter

records the system's load curve and provides measurement data for energy profiling in Fronius Solar.web. The primary meter also controls the dynamic power of feeding in.



Utility meter

measures the measurement data relevant for billing amounts of energy (in particular kilowatt hours of energy sourced from the grid and energy fed into the grid). Based on the relevant billing data, the electricity retailer will invoice the energy sourced from the grid and the purchaser of the surplus energy will reimburse the energy fed into the grid.



Grid

supplies the loads in the system if insufficient power is being generated by the PV modules or supplied by the battery.



Battery

is coupled to the inverter on the direct current side, and stores electrical energy.



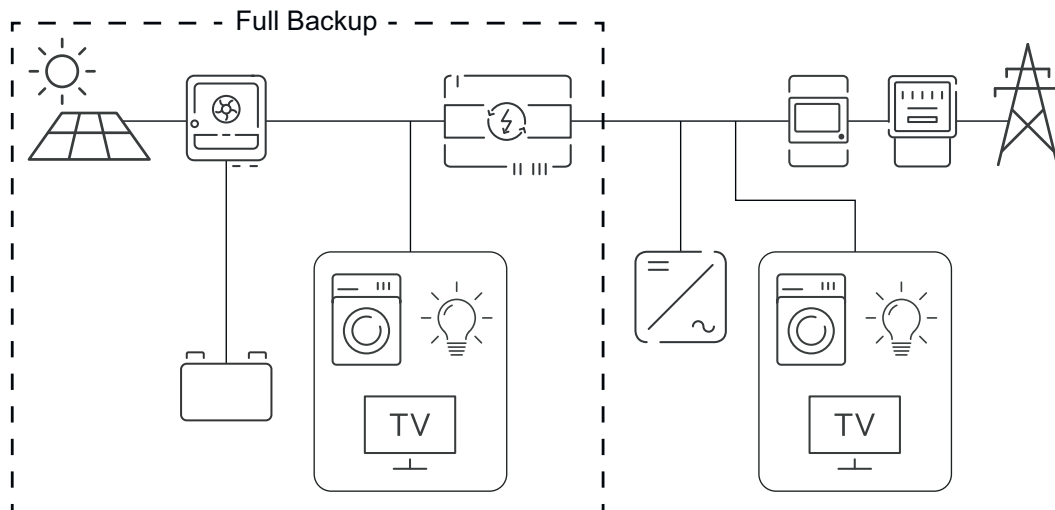
Loads in the system

e. g. washing machine, lamps, TV, etc.



Positioning

The Fronius Backup Controller must be installed in the following position in the system.

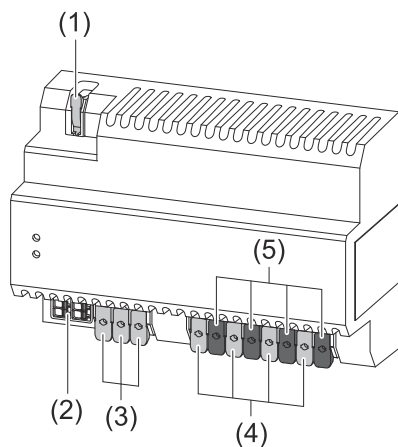


**Recommended
Fronius Smart
Meter**

Device name	Item number
Fronius Smart Meter IP	42,0411,0347
Fronius Smart Meter 63A-3	43,0001,1473
Fronius Smart Meter TS 65A-3	43,0001,0044

Control elements and connections

Connection area



- (1) 1-pin push-in terminal for the neutral conductor connection to the Fronius Smart Meter (max. 1 A).
- (2) Push-in terminal for digital inputs/outputs. (I/Os).
- (3) 3-pin push-in terminal for the supply from the public grid.
- (4) 4-pin push-in terminal for the loads in the backup power circuit.
- (5) 4-pin push-in terminal for the generators in the backup power circuit.

Description of digital inputs/outputs (I/Os)

I/O pin	Parameter	Description
IO 0	Enable backup power locking	Before the inverter switches to backup power mode, the pin IO 0 must be active (value = 1).
IN 6	Grid relay open feedback	If the mains voltage is too low or the relay K3 is closed and therefore the relays K1, K2 and K4 are open, the auxiliary contacts of the mains isolation relays are closed and the pin IN 6 is active (value = 1).
IN 7	Locking feedback	When relay K3 is activated, the auxiliary contact of relay K3 closes and pin IN 7 is active (value = 1). The inverter receives feedback that relay K3 is closed.

LED status indicator

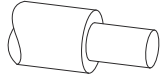
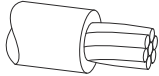
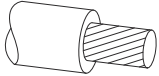
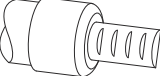
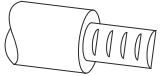
The LED status indicator shows the operating status and the Fronius Backup Controller.

Symbol	LED status	Description
	 Lights up green	The "Grid" LED indicates that all connected loads and generators in the backup power circuit are being supplied by or are connected to the public grid.
	 Lights steady blue	The "Full Backup" LED indicates that all connected loads and generators in the backup power circuit are safely disconnected from the public grid and that the Full Backup power supply is active.

Installation



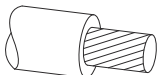
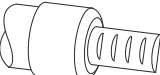

Prerequisites for connecting the Backup Controller



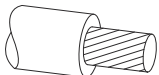
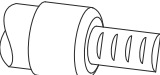

Different cable types

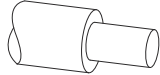
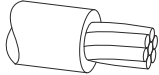
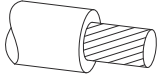
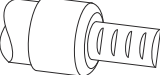
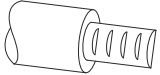
Single-core	Multi-stranded	Fine-stranded	Fine-stranded with ferrule and collar	Fine-stranded with ferrule without collar
				

Permissible cables for the electrical connection

Round copper conductors can be connected to the terminals as described below.

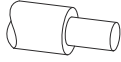
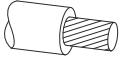

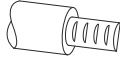
Push-in terminals for the supply from the public grid.* Select a sufficiently large cable cross-section based on the actual connected output.				
				
2.5 - 10 mm ²	2.5 - 10 mm ²	2.5 - 10 mm ²	2.5 - 6 mm ²	2.5 - 6 mm ²

Push-in terminals for the loads/generators in the backup power circuit.* Select a sufficiently large cable cross-section based on the actual connected output.				
				
2.5 - 10 mm ²	2.5 - 10 mm ²	2.5 - 10 mm ²	2.5 - 6 mm ²	2.5 - 6 mm ²

Push-in terminal for the neutral conductor connection to the Fronius Smart Meter (max. 1 A)				
				
1 - 4 mm ²	1 - 4 mm ²	1 - 4 mm ²	1 - 2.5 mm ²	1 - 2.5 mm ²

Permitted cables for digital inputs/outputs (I/Os)

Round copper conductors can be connected to the push-in terminals for digital inputs/outputs (I/Os) as described below.

IO connections with push-in terminal						
Max. distance	Strip-ping length					Cable recommendation
30 m * 32 yd *	10 mm 0.39 inch	0.14 - 1.5 mm ² AWG 26 - 16	0.14 - 1.5 mm ² AWG 26 - 16	0.14 - 1 mm ² AWG 26 - 18	0.14 - 1.5 mm ² AWG 26 - 16	Single conductor possible

* Fronius recommends at least CAT 5 STP (shielded twisted pair) cables and a maximum distance of 30 m (32 yd).

Requirements

The following components must be installed in the switch cabinet to permit the safe operation of the Fronius Backup Controller:

- Upstream overcurrent protection as specified in chapter [Technical data](#) on page [28](#).
- A surge protective device (SPD) as specified in chapter [Technical data](#) on page [28](#).

Installation

Safety



WARNING!

Danger from short circuits due to foreign bodies in the housing.

An electric shock can cause serious injury or death.

- ▶ Cover vents during installation.
-



WARNING!

Danger due to incorrect operation and incorrectly performed work.

This can result in serious injury and damage to property.

- ▶ Commissioning as well as maintenance and service work on the inverter and battery must only be carried out by service personnel trained by the respective inverter or battery manufacturer and only within the scope of the respective technical regulations.
 - ▶ Read the installation and operating instructions provided by the respective manufacturer before installing and commissioning the equipment.
-



WARNING!

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

This can result in serious injury and damage to property.

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



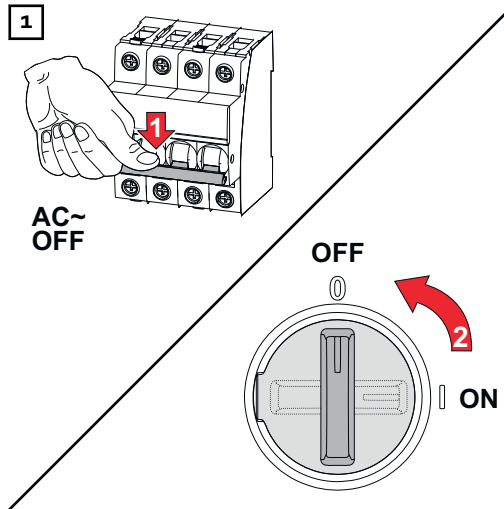
WARNING!

Danger due to damaged and/or contaminated terminals.

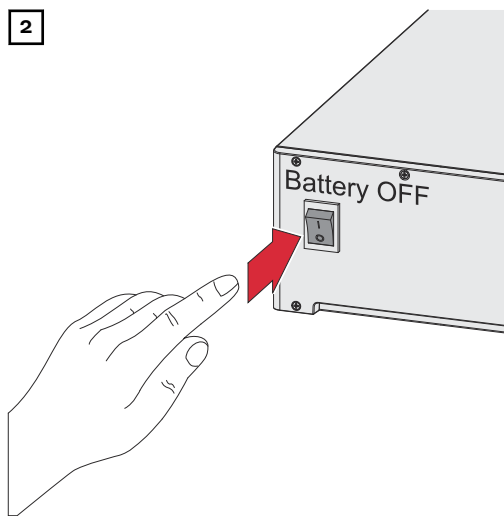
This can result in serious injury and damage to property.

- ▶ Before making any connections, check the terminals for damage and contamination.
 - ▶ Remove contamination in the de-energized state.
 - ▶ Have defective terminals repaired by an authorised specialist.
-

De-energising all sides of the PV system



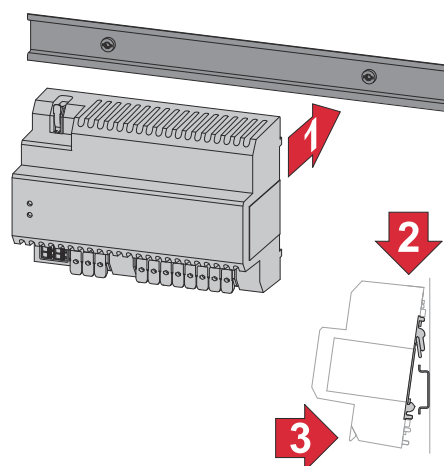
Turn off the automatic circuit breaker. Set the DC disconnecter to the "Off" switch position.



Switch off the battery connected to the inverter.

Wait for the capacitors of the inverter to discharge (2 minutes).

Installation



The Fronius Backup Controller can be mounted on a 35 mm DIN rail. The housing comprises 8 modules according to DIN 43880 and conforms to unit size 2.

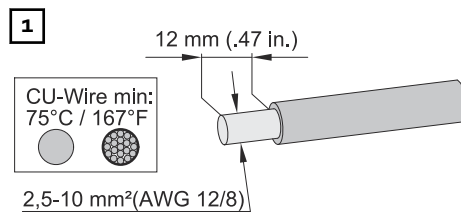
Connecting the Backup Controller to the public grid

WARNING!

Danger due to individual conductors in the terminal that are loose and/or improperly connected.

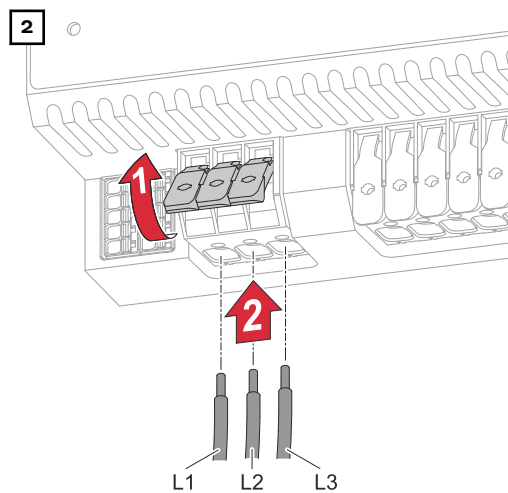
This can result in serious injury and damage to property.

- ▶ Only connect one single conductor in the slot provided for each terminal.
- ▶ Check that the single conductor is held securely in the terminal.
- ▶ Ensure that all of the single conductor is within the terminal and that no individual wires are sticking out of the terminal.

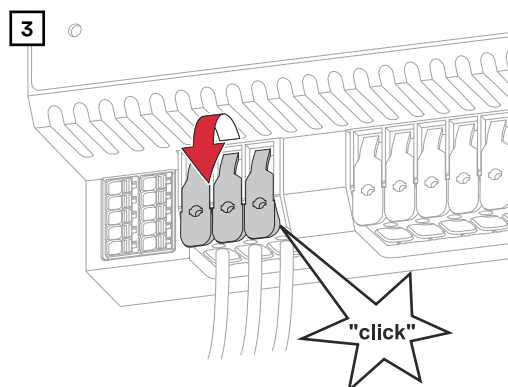


Strip the insulation of the single conductors by 12 mm.

Select the cable cross-section in accordance with the instructions in [Permissible cables for the electrical connection](#) from page 17.



Lift the operating levers of the terminals to open. Insert the stripped single conductors into the slot provided in the terminal, in each case as far as it will go.



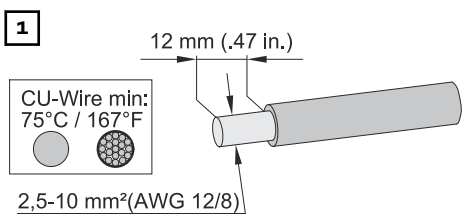
Close the terminal operating levers until they engage.

Connecting loads in the backup power circuit to the Backup Controller

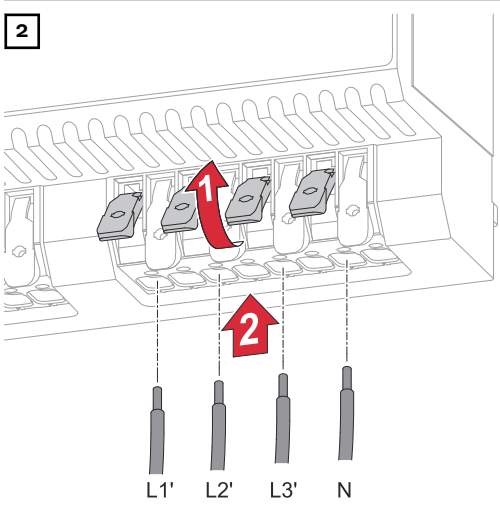
⚠ WARNING!

Danger due to individual conductors in the terminal that are loose and/or improperly connected.

- This can result in serious injury and damage to property.
- ▶ Only connect one single conductor in the slot provided for each terminal.
 - ▶ Check that the single conductor is held securely in the terminal.
 - ▶ Ensure that all of the single conductor is within the terminal and that no individual wires are sticking out of the terminal.

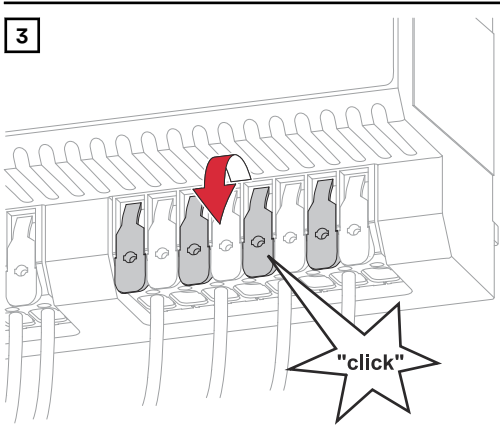


Strip the insulation of the single conductors by 12 mm. Select the cable cross-section in accordance with the instructions in [Permissible cables for the electrical connection](#) from page 17.



Lift the operating levers of the terminals to open. Insert the stripped single conductors into the slot provided in the terminal, in each case as far as it will go.

IMPORTANT!
The neutral conductor must be connected to the public grid.



Close the terminal operating levers until they engage.

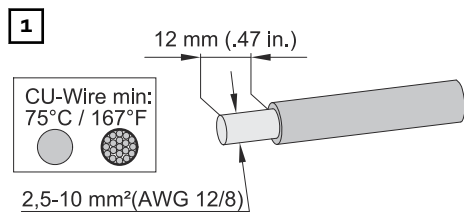
Connecting generators in the backup power circuit to the Backup Controller

⚠ WARNING!

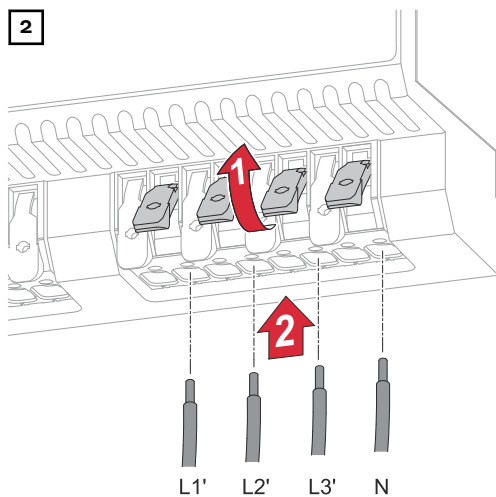
Danger due to individual conductors in the terminal that are loose and/or improperly connected.

This can result in serious injury and damage to property.

- ▶ Only connect one single conductor in the slot provided for each terminal.
- ▶ Check that the single conductor is held securely in the terminal.
- ▶ Ensure that all of the single conductor is within the terminal and that no individual wires are sticking out of the terminal.



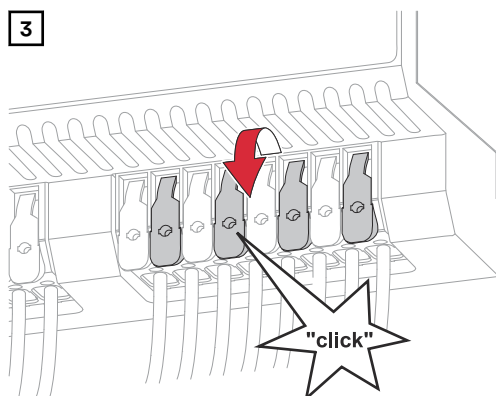
Strip the insulation of the single conductors by 12 mm. Select the cable cross-section in accordance with the instructions in [Permissible cables for the electrical connection](#) from page 17.



Lift the operating levers of the terminals to open. Insert the stripped single conductors into the slot provided in the terminal, in each case as far as it will go.

IMPORTANT!

The neutral conductor must be connected to the public grid.



Close the terminal operating levers until they engage.

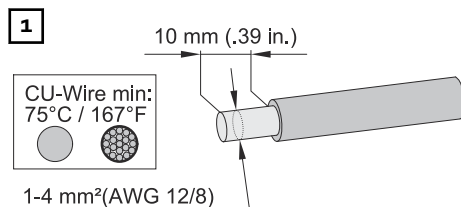
Connecting the neutral conductor for the Fronius Smart Meter to the Backup Controller (optional)

⚠ WARNING!

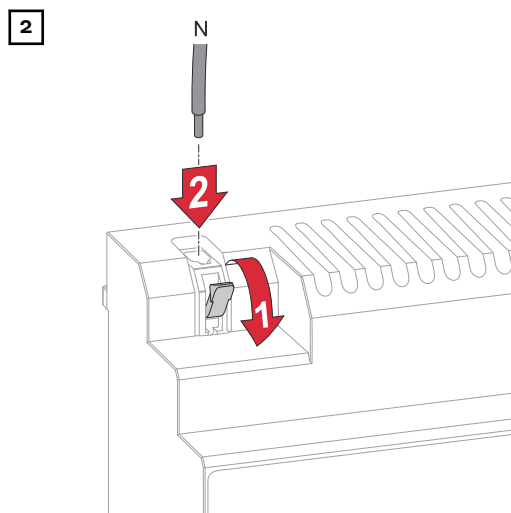
Danger due to individual conductors in the terminal that are loose and/or improperly connected.

This can result in serious injury and damage to property.

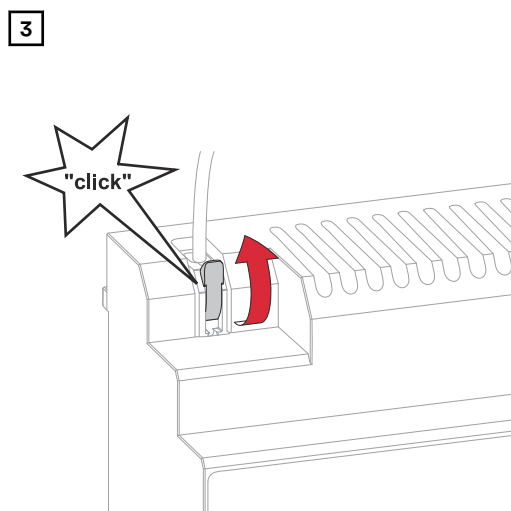
- ▶ Only connect one single conductor in the slot provided for each terminal.
- ▶ Check that the single conductor is held securely in the terminal.
- ▶ Ensure that all of the single conductor is within the terminal and that no individual wires are sticking out of the terminal.



Strip the insulation of the single conductors by 10 mm. Select the cable cross-section in accordance with the instructions in [Permissible cables for the electrical connection](#) from page 17.



Lift the operating levers of the terminals to open. Insert the stripped single conductor into the slot provided in the terminal as far as it will go.



Close the operating lever of the terminal until it engages.

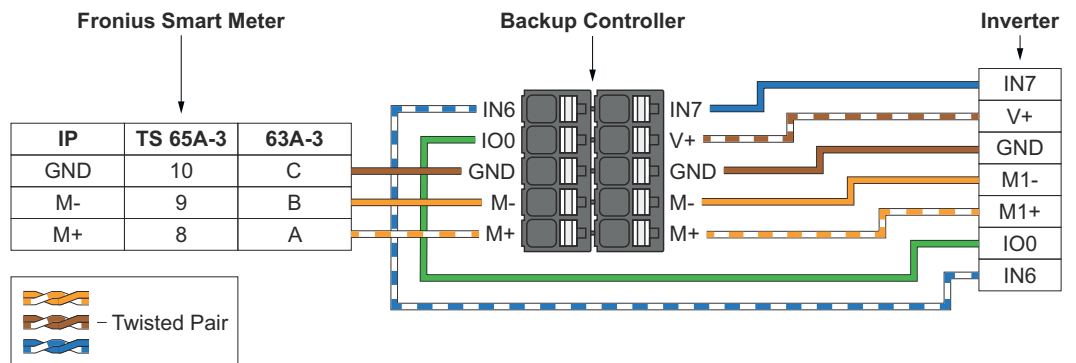
Connecting the data communication cable to the Backup Controller

IMPORTANT!

Further information on successful commissioning.

Observe the following information on connecting the data communication cable to the Backup Controller.

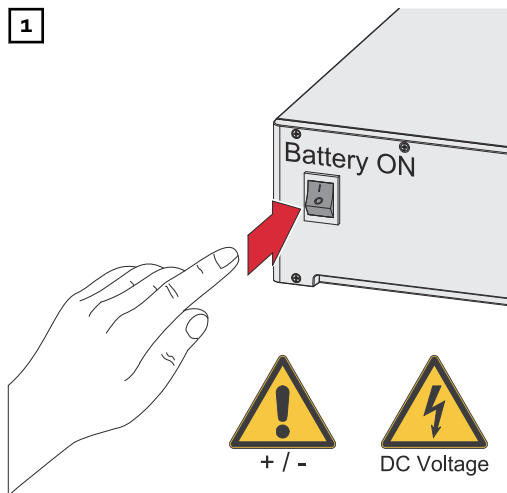
- Use network cables of type CAT5 STP or higher.
- Use a mutual twisted cable pair for corresponding data lines.
- Use double-insulated or sheathed data lines when they are close to bare conductors.
- Use shielded twisted pair cables to avoid faults.



Start-up

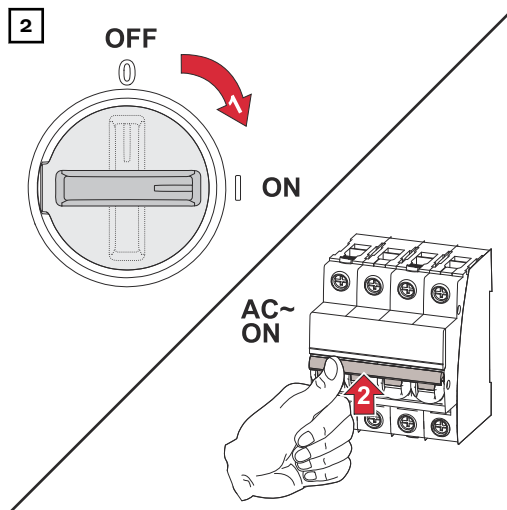
Putting the PV system into operation

1



Switch on the battery connected to the inverter.

2



Set the DC disconnector to the "On" switch position. Switch on the automatic circuit breaker.

General

IMPORTANT!

Settings under the "Device configuration" → "Functions and I/Os" menu item are only to be made by trained and qualified personnel! The service password must be entered in order to access the "Device configuration" menu item.

Backup power - Configuring Full Backup

1

- Access the user interface of the inverter.
 - Open your web browser.
 - In the address bar of the browser, enter the IP address (IP address for WLAN: 192.168.250.181, IP address for LAN: 169.254.0.180) or the host and domain name of the inverter and confirm.
 - The user interface of the inverter is displayed.

2

Log in to the login area with the "Technician" user and the technician password.

3

In the "Device configuration" menu, click on the "Functions and I/Os" button.

4

Enable "Backup power" mode.

5

Select "Full Backup" mode in the "Backup power mode" drop-down list.

6 Click the **"Save"** button to save the settings.

The Full Backup backup power mode has been configured.

Testing backup power mode

Testing backup power mode is recommended:

- During the initial installation and configuration
- After working on the switch cabinet
- During ongoing operation (recommendation: at least once a year)

For test mode, a battery charge of min. 30% is recommended.

A description on how to run test mode can be found in the [backup power check-list](https://www.fronius.com/en/search-page) (https://www.fronius.com/en/search-page, item number: 42,0426,0365).

Appendix

Cleaning Clean the Backup Controller as required with a damp cloth. Do not use cleaning agents, abrasives, solvents or similar to clean the Backup Controller.

Maintenance Maintenance and servicing may only be carried out by Fronius-trained service technicians.

Disposal Waste electrical and electronic equipment must be collected separately and recycled in an environmentally responsible manner in accordance with the EU Directive and national law. Used equipment must be returned to the distributor or through a local, authorised collection and disposal system. Correct disposal of the used device promotes sustainable recycling of resources and prevents negative effects on health and the environment.

Packaging materials

- Collect separately
 - Observe locally valid regulations
 - Compress the cardboard box to reduce volume
-

Fronius manufacturer's warranty Detailed, country-specific warranty conditions are available at www.fronius.com/solar/warranty.

To obtain the full warranty period for your newly installed Fronius product, please register at www.solarweb.com.

Technical data

General data	
Mains supply type	TN-S / TN-C-S
Housing	8 modules according to DIN 43880
Mounting	35 mm DIN rail
Weight	625 g
Protection class	IP 20
Fault Ride Through (FRT)	According to EN 50549-10
Short-circuit breaking capacity	Class PC

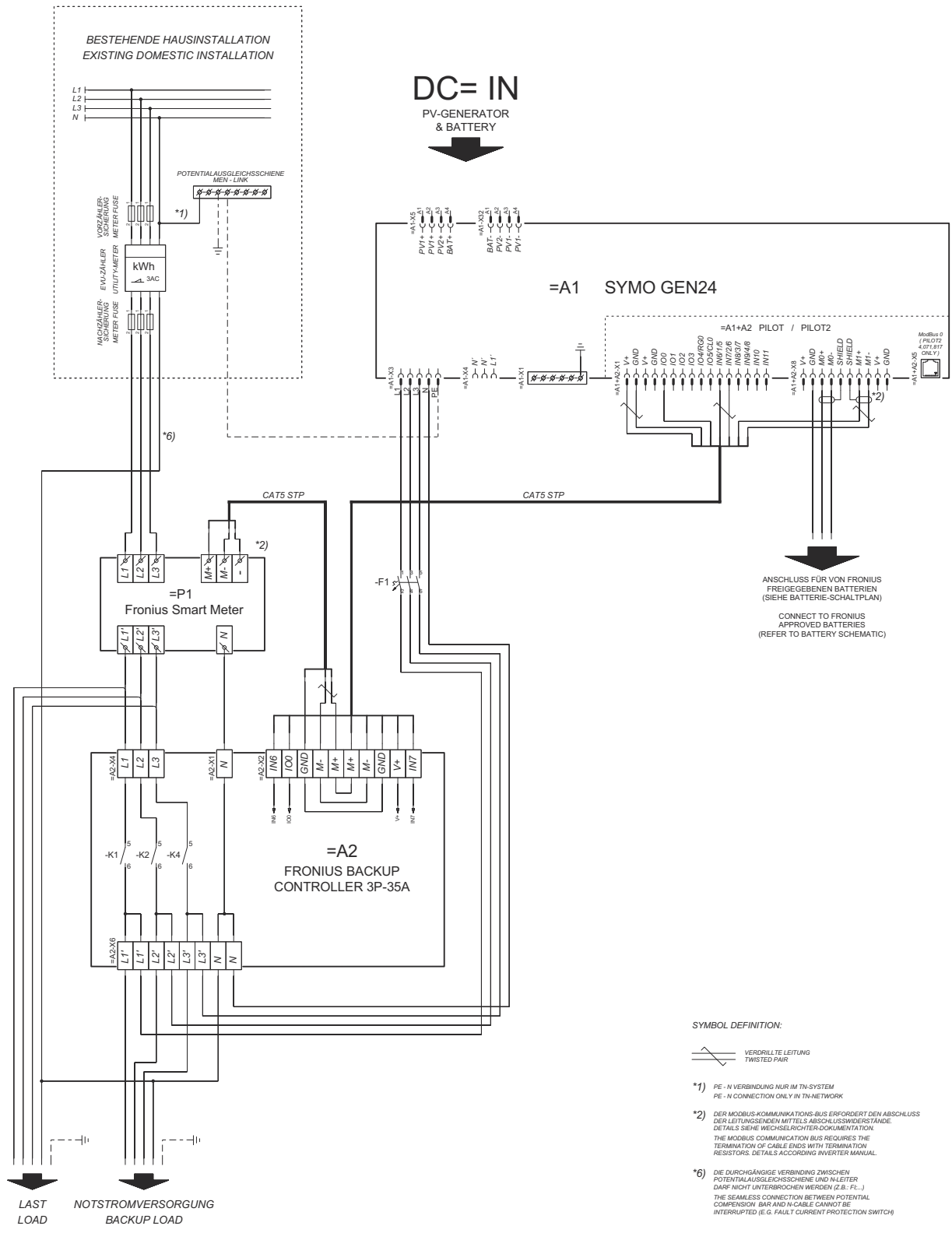
Environmental conditions	
Permitted ambient temperature	-20 to +60 °C
Permissible humidity	50% relative humidity at 40 °C
Max. altitude	2000 m
Vibrations	Not permitted

Rated values	
Nominal voltage	230 / 400 V 3-pole or 3-pole + N
Nominal current	35 A
Duty cycle	100% at AC-32
Rated power	24 kVA
Grid frequency	50 Hz
Power loss (at nominal current)	15 W
Overvoltage category	III

Electromagnetic compatibility	
Immunity	According to EN 61000-6-2 2019-12-01
Emissions	According to EN 61000-6-3 2020-07

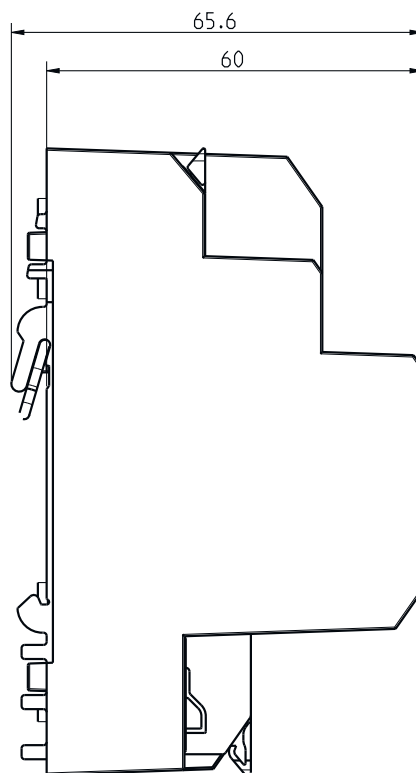
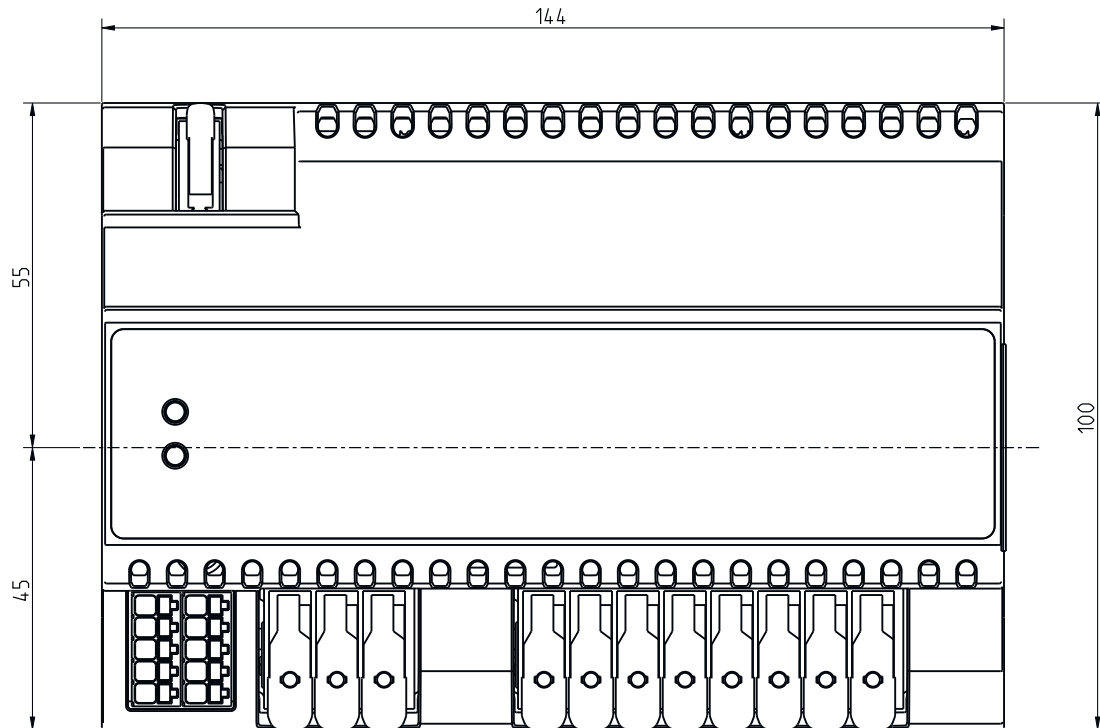
Circuit diagram

Fronius Backup Controller 3-pin separation, e.g. Austria



Dimensions

Dimensions - Fronius Backup Controller 3P-35A





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**MONITORING &
DIGITAL TOOLS**

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