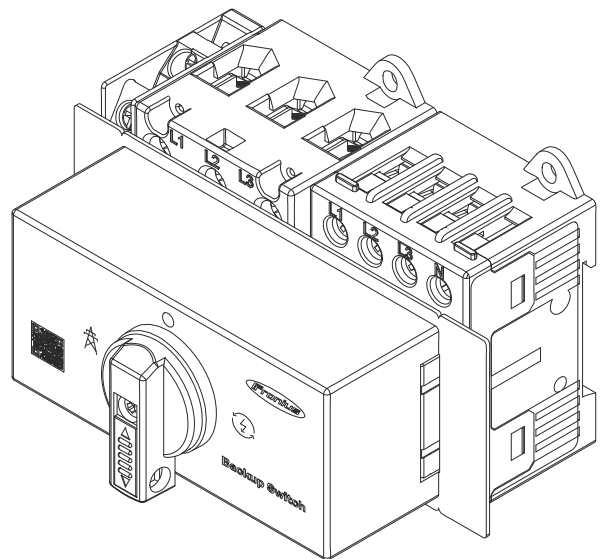


Operating Instructions

Fronius Backup Switch 1P/3P-63A



EN-US | Operating instructions



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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, all applicable local rules and regulations regarding accident prevention and environmental protection must also be followed.

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.

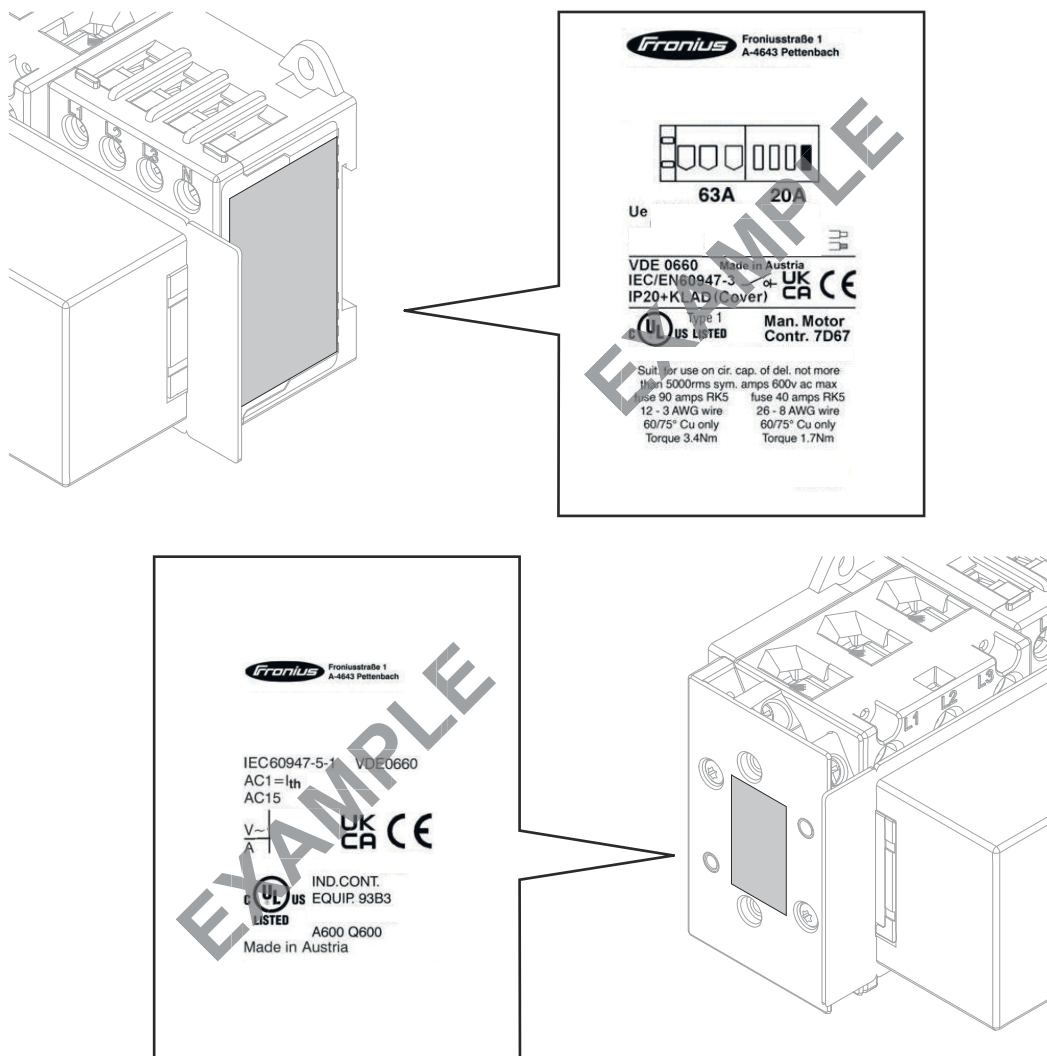
Environmental conditions

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

General

Information on the device

Technical data and markings are present on the Fronius Backup Switch. They must not be removed or painted over.



Markings



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



UKCA marking – confirms compliance with applicable UK directives and regulations.



C UL US LISTED marking – confirms compliance with applicable standards for Canada and the USA.

IMPORTANT!

NO power categories of the US versions of the Fronius product series "Primo GEN24 X.X **208-240** (Plus) (SC)" are compatible with the Fronius Backup Switch.

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!

Observe the following points for safe operation:

- ▶ Operate inverters and system components on a private, secure network.
- ▶ 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.
- ▶ The optional communication protocol Modbus TCP/IP¹⁾ is an unsecured interface. Only use Modbus TCP/IP if no other secured data communication protocol (MQTT²⁾) is possible (e.g., compatibility with older Smart Meters).

- 1) TCP/IP - Transmission Control Protocol/Internet Protocol
 - 2) MQTT - Message Queueing 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.

Fronius Backup Switch

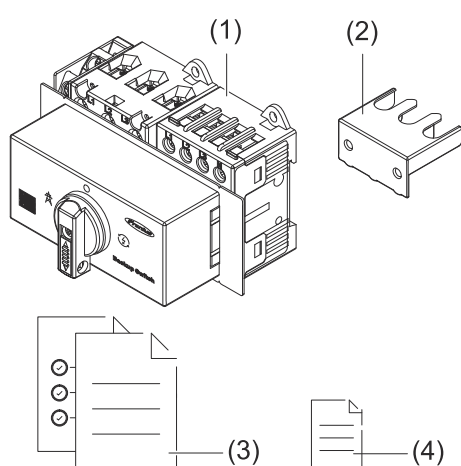
Intended use

The Fronius Backup Switch is a piece of stationary equipment that was developed for use in public power grids with TN/TT systems. In the event of a grid failure, all connected loads and producers can be manually disconnected from the public grid in accordance with the specifications of the grid operator. The Fronius Backup Switch enables manual switching to the backup power supply. As soon as the public grid is stable again, the Fronius Backup Switch can be used to switch manually back to the power supply from the public grid. The Fronius Backup Switch can only be used in systems equipped with a battery storage system.

Foreseeable misuse

The Fronius Backup Switch is not suitable for the backup power supply of life-sustaining medical devices.

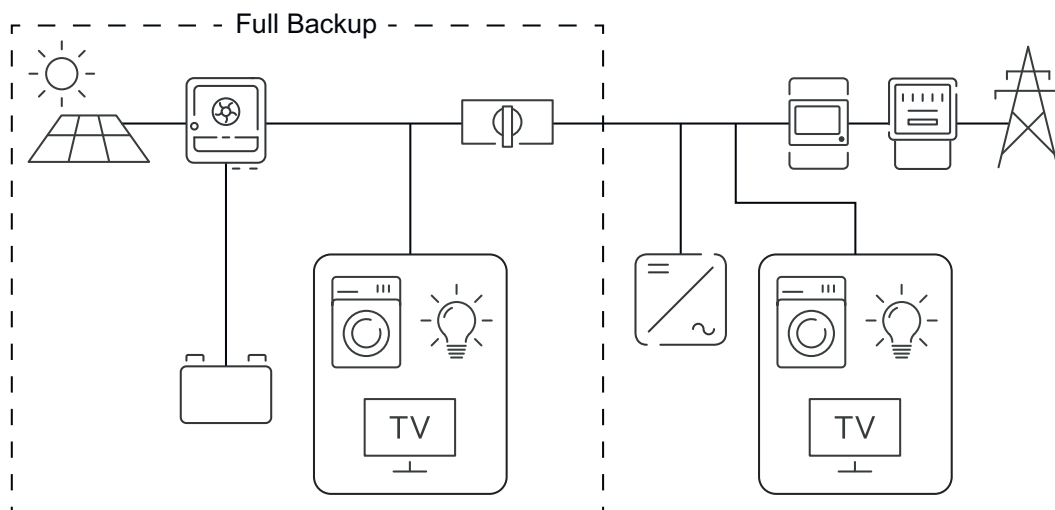
Scope of supply



- (1) 1 pc Fronius Backup Switch
- (2) 2 pcs protective cover incl.
4 pcs screws B2.2 x 6.5 mm (not shown)
- (3) 1 pc Quick Start Guide
- (4) 1 pc "backup power supply" sticker

Positioning

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



Compatible devices

Compatible inverters

- Fronius Primo GEN24 Plus
- Fronius Symo GEN24 Plus

IMPORTANT!

NO power categories of the US versions of the Fronius product series "Primo GEN24 X.X **208-240** (Plus) (SC)" are compatible with the Fronius Backup Switch.

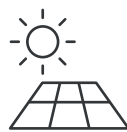
Compatible Smart Meters

- Fronius Smart Meter IP
- Fronius Smart Meter 50kA-3
- Fronius Smart Meter 63A-1
- Fronius Smart Meter 63A-3
- Fronius Smart Meter TS 5kA-3
- Fronius Smart Meter TS 65A-3
- Fronius Smart Meter TS 100A-1

Details on how to connect a Fronius Smart Meter can be found in the respective operating instructions.

To download the Smart Meter operating instructions, either click on the link [Smart Meter operating instructions](#) or visit the page [fronius.com/en/solar-energy/installers-partners/downloads](https://www.fronius.com/en/solar-energy/installers-partners/downloads) on an end device and enter the search term "Smart Meter".

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 Switch

In the event of a power failure or grid malfunction, this enables all connected loads and producers to be disconnected from the public grid manually and safely in accordance with the specifications of the grid operator. Once grid stability has been restored, manual reconnection to the public grid is possible.



Inverter in the system

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



Primary meter (Fronius Smart Meter)

records the load curve of the system and makes the measured data available for energy profiling in Fronius Solar.web. The primary meter also regulates the dynamic feed-in control.



Utility meter

measures the metering data relevant for the billing of electricity quantities (primarily the kilowatt hours of grid purchases and grid power feed). On the basis of the data relevant for billing, the electricity retailer invoices a grid purchase and the purchaser of the surplus pays for the grid power feed.

**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, lights, television, etc.



Operating controls and connections

Switch positions of the Backup Switch



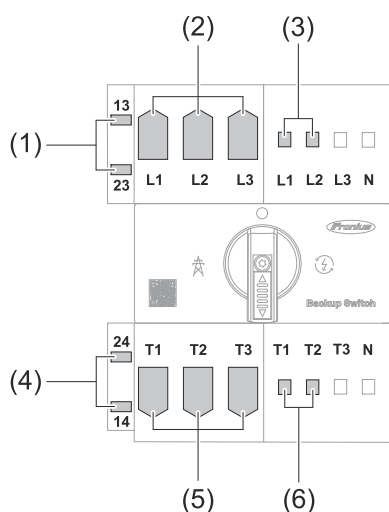
The backup switch has three switch positions:

- (1) **Grid operation**
The power is supplied by the public grid.
- (2) **o-position (de-energized)**
The power supply is safely disconnected from the public grid or from the backup power supply.
- (3) **Backup power mode**
The power is supplied as backup power via the inverter or the battery.

IMPORTANT!

In the switch position (2) the Backup Switch can be secured to prevent it from being switched on/off using a standard padlock. The national guidelines must be complied with in this respect.

Connection area



- (1) Auxiliary contact switch terminals: Data communication
- (2) Load disconnector 63 A terminals: Grid
- (3) Load disconnector 20 A terminals: Data communication
- (4) Auxiliary contact switch terminals: Data communication
- (5) Load disconnector 63 A terminals: Load
- (6) Load disconnector 20 A terminals: Data communication

For information about installing data communication, see chapter [Connecting the data communication cables](#) on page 28.

Installation and Startup

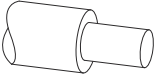
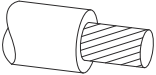

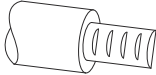
Requirements for connecting the Backup Switch

Protective circuit

For safe operation of the Fronius Backup Switch, the following components must be installed in the switch cabinet:

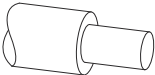
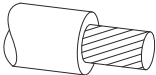

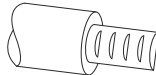
- Upstream overcurrent protection according to the information in the chapter [Technical data](#) on page 35.
- A surge protection device (SPD) as specified in chapter [Technical data](#) on page 35.

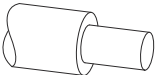
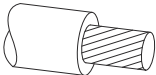

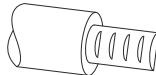
Various cable types

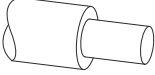
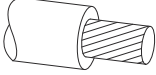
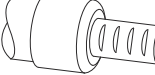
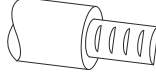
Solid	Fine-stranded	Fine-stranded with ferrule and collar	Fine-stranded with ferrule without collar
			

Permitted cables for the electrical connection

Connect only round copper wires to the terminals. See tables below:

Terminals on load disconnecter 63 A ¹⁾			
			
1 - 25 mm ²	4 - 16 mm ²	2.5 - 16 mm ²	2.5 - 16 mm ²
max. 2 x 10 mm ²	max. 2 x 10 mm ²		

Terminals on load disconnecter 20 A ¹⁾			
			
0.13 - 10 mm ²	0.5 - 6 mm ²	0.5 - 6 mm ²	0.5 - 6 mm ²

Terminals on auxiliary contact switch			
			
0.13 - 2.5 mm ²	0.75 - 2.5 mm ²	0.5 - 1.5 mm ²	0.5 - 1.5 mm ²

¹⁾ Select the cross-section of the sufficiently large cable. The cable cross-section depends on the power actually connected.

Permitted connection screws

	Load disconnect- or 63 A	Load disconnect- or 20 A	Auxiliary con- tact switch
Connection screw	M5	M3.5	M3.5

	Load disconnect- or 63 A	Load disconnect- or 20 A	Auxiliary con- tact switch
Tightening torque	2 - 4 Nm	0.8 - 1.7 Nm	0.8 - 1.4 Nm
Conductors per ter- minal	2	1	2

Preparing for the installation

Safety



WARNING!

Danger due to short circuits resulting from foreign bodies in the connection area.

An electric shock can lead to serious injury or death.

- Keep foreign objects away from the connection area or remove them if necessary.



WARNING!

Danger from incorrect operation and work that is not carried out properly.

This can result in severe personal injury and damage to property.

- Only trained service technicians who have received training from the respective inverter or battery manufacturer are authorized to perform commissioning, maintenance, and service activities for inverters and batteries, and only within the scope of the technical regulations.
- Read the installation instructions and operating instructions from the respective manufacturer before installing and commissioning the equipment.



WARNING!

Danger from mains voltage and DC voltage from PV modules that are exposed to light, as well as batteries.

This can result in severe personal injury and damage to property.

- All connection, maintenance and service work should only be carried out when the AC and DC sides have been disconnected from the inverter and battery, and are de-energized.
- Only an authorized electrical engineer is permitted to make the connection to the public grid.



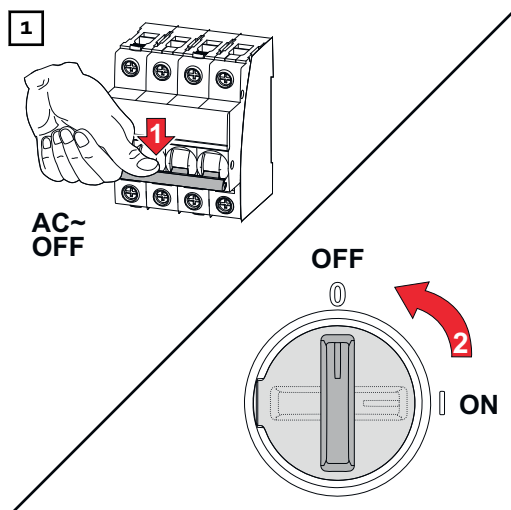
WARNING!

Danger from damaged and/or contaminated terminals.

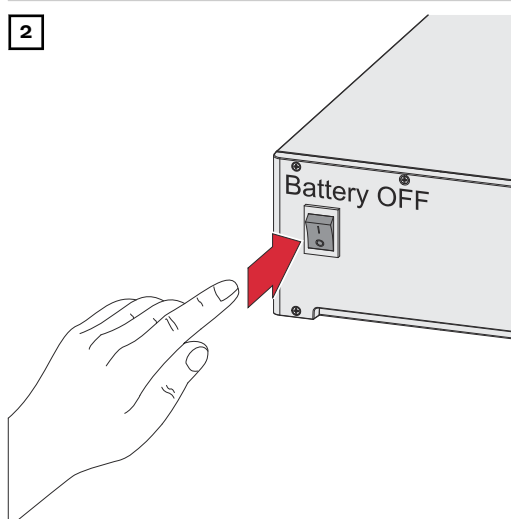
This can result in severe personal injury and damage to property.

- Prior to connection work, check the terminals for damage and contamination.
- Remove any contamination while the equipment is de-energized.
- Have defective terminals repaired by an authorized specialist.

General disconnection of the power supply



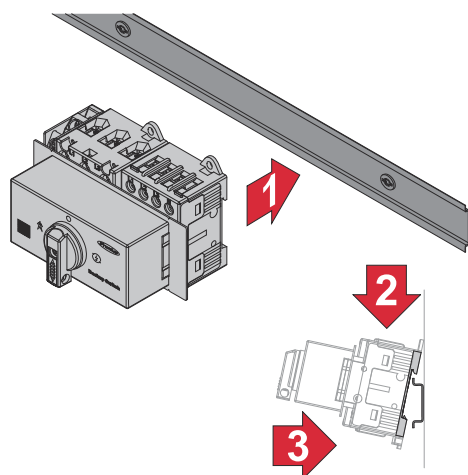
Turn off the automatic circuit breaker. Set the DC disconnecter to the "off" (OFF) switch position.



Switch off the battery connected to the inverter.

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

Installation



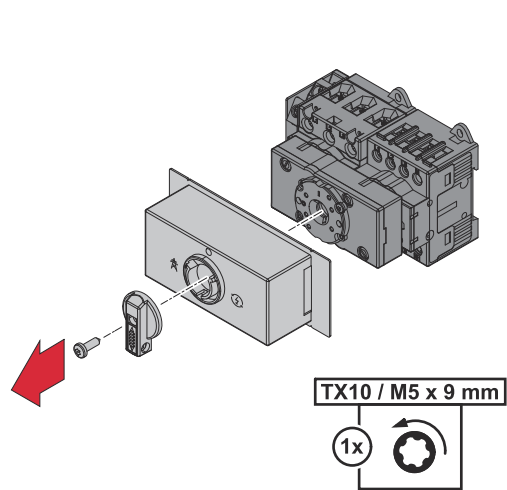
The Fronius Backup Switch can be mounted on a 35 mm DIN rail.

Housing dimensions according to DIN 4388:

- 7.2 TE (horizontal pitch) with left and right end tabs (corresponds to the delivery condition)
- 6.1 TE without end tabs

Disassembly of the switch and the housing cover

Before connecting the cables, the housing cover must be removed.



- 1** Set the switch to position "O".
- 2** Push the switch lock down.
 - ✓ *The switch is now unlocked.*
- 3** Remove the screw.
 - ✓ *The switch and housing cover can now be removed.*

Stripping lengths

Load disconnecter 63 A	Load disconnecter 20 A	Auxiliary contact switch
14 mm (0.55 in.)	11 mm (0.43 in.)	8 mm (0.31 in.)

1-pin installation

Connecting the Backup Switch 1-pin to the public grid



WARNING!

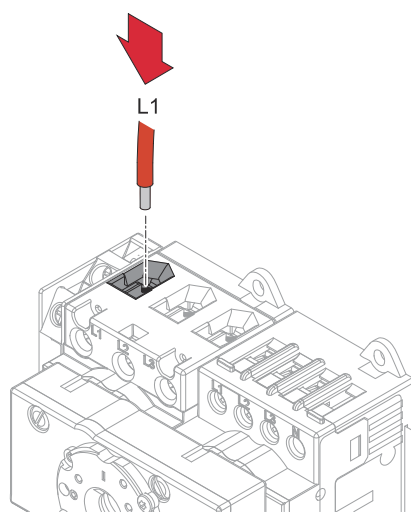
Danger from loose and/or incorrectly clamped single conductors in the terminal.

This can result in severe personal injury and damage to property.

- ▶ Check that the single conductors are secure in the terminal.
- ▶ Make sure that the single conductor has been fully inserted into the terminal and that no single wires are protruding out of the terminal.

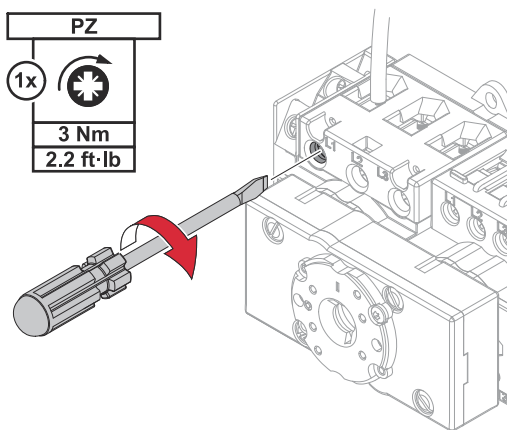
- 1 Before starting the connection work, strip all cables of their insulation in accordance with the specifications. See chapter [Stripping lengths](#) on page 23.

2



Plug the single conductor (L1) coming from the grid into the terminal.

3



Tighten the single conductor (L1) in the terminal. For permissible connection screws and torques, see [Permitted connection screws](#) on page 19.

Connecting load 1-pin in the backup power circuit to the Backup Switch



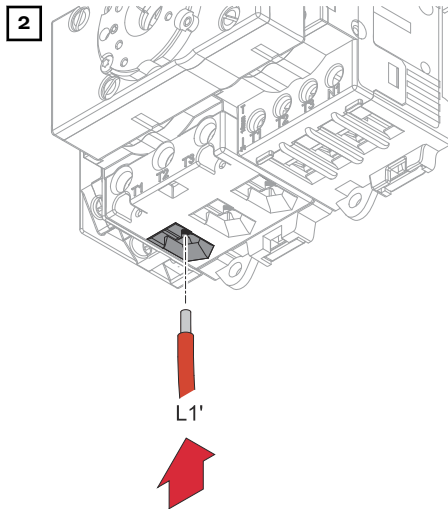
WARNING!

Danger from loose and/or incorrectly clamped single conductors in the terminal.

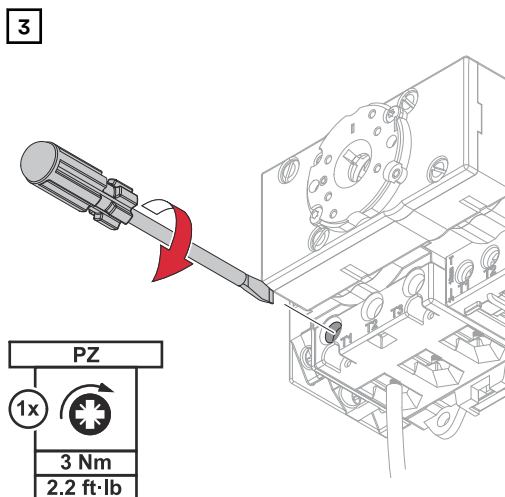
This can result in severe personal injury and damage to property.

- Check that the single conductors are secure in the terminal.
- Make sure that the single conductor has been fully inserted into the terminal and that no single wires are protruding out of the terminal.

- 1 Before starting the connection work, strip all cables of their insulation in accordance with the specifications. See chapter [Stripping lengths](#) on page 23.



Plug the single conductor (L1') coming from the backup power circuit into the terminal.



Tighten the single conductor (L1') in the terminal. For permissible connection screws and torques, see [Permitted connection screws](#) on page 19.

3-pin installation

Connecting the Backup Switch 3-pin to the public grid



WARNING!

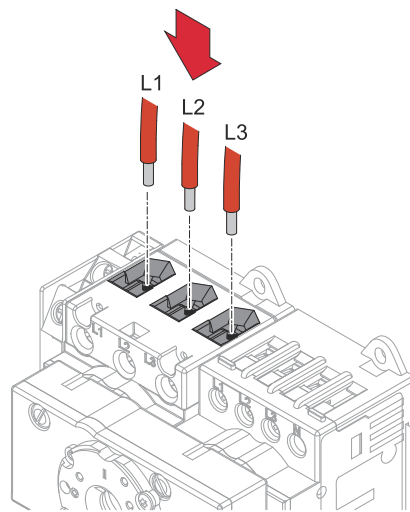
Danger from loose and/or incorrectly clamped single conductors in the terminal.

This can result in severe personal injury and damage to property.

- Check that the single conductors are secure in the terminal.
- Make sure that the single conductor has been fully inserted into the terminal and that no single wires are protruding out of the terminal.

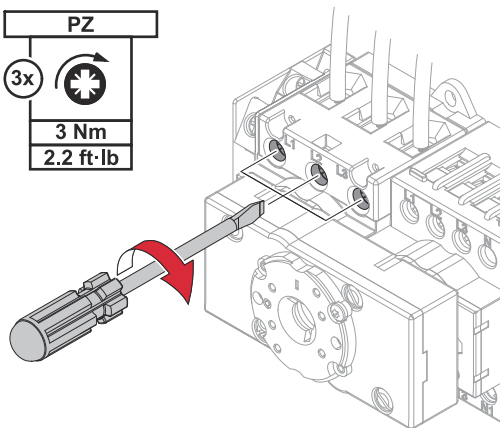
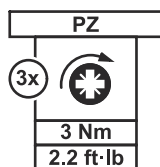
- 1 Before starting the connection work, strip all cables of their insulation in accordance with the specifications. See chapter [Stripping lengths](#) on page 23.

2



Plug the single conductors (L1, L2, L3) coming from the grid into the terminal.

3



Tighten the single conductors (L1, L2, L3) in the terminals. For permissible connection screws and torques, see [Permitted connection screws](#) on page 19.

Connecting load 3-pin in the backup power circuit to the Backup Switch



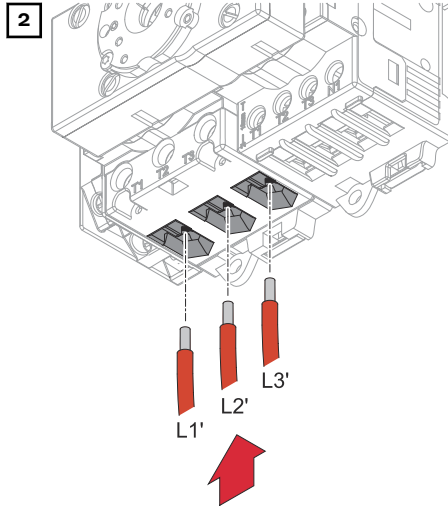
WARNING!

Danger from loose and/or incorrectly clamped single conductors in the terminal.

This can result in severe personal injury and damage to property.

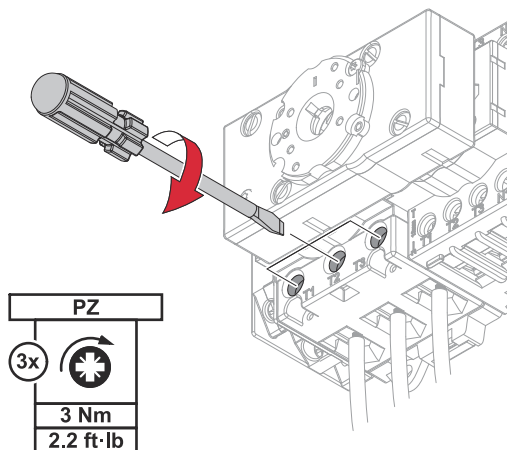
- Check that the single conductors are secure in the terminal.
- Make sure that the single conductor has been fully inserted into the terminal and that no single wires are protruding out of the terminal.

- 1 Before starting the connection work, strip all cables of their insulation in accordance with the specifications. See chapter [Stripping lengths](#) on page 23.



Plug the singles conductor (L1', L2', L3') coming from the backup power circuit into the terminals.

3



Tighten the single conductors (L1', L2', L3') in the terminals. For permissible connection screws and torques, see [Permitted connection screws](#) on page 19.

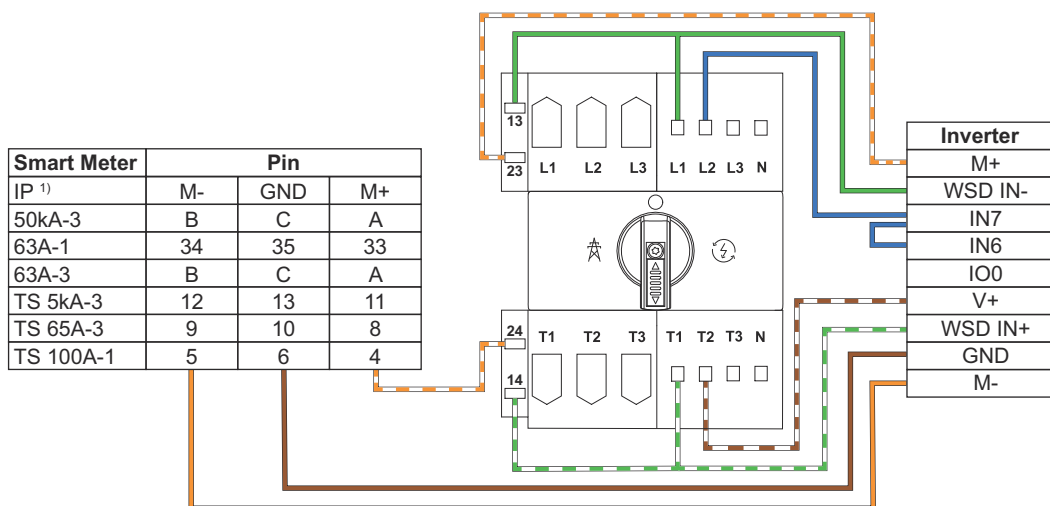
Connecting the data communication cables

Connecting the data communication cable to the Backup Switch

IMPORTANT!

Observe the following information regarding connection of the data communication cables to the Backup Switch.

- Use network cables of type CAT5 STP or higher.
- Use a twisted cable pair for data cables that belong together.
- Use double insulated or sheathed data cables when they are near to bare conductors.
- Use shielded twisted pair cables to avoid interference.



¹⁾ When the Smart Meter IP is integrated via the network, backup power mode is terminated by the inverter when the public power grid returns. If backup power mode is to be maintained until the system is switched back to mains operation manually, cable the Fronius Smart Meter IP via Modbus RTU. The Modbus cable must be disconnected during backup power mode.

Description of the data communication

Feedback switch in backup power position (IN6/IN7)

When the Backup Switch is switched to backup power supply, the inverter checks the position of the switch. If this position is correct, the backup power supply of the connected loads in the backup power circuit is enabled.

Communication Modbus Smart Meter (M+/M-)

The communication between the inverter and the Fronius Smart Meter is interrupted via the contact. The interrupted communication prevents automatic termination of backup power mode. The inverter remains in backup power mode. If a stable power supply from the grid is available again, the switch of the Fronius Backup Switch must be switched to grid operation manually.

If backup power mode is to be automatically terminated when the mains power supply returns, do not route the communication line via the Fronius Backup Switch.

Wired Shut Down (WSD IN/WSD OUT)

In the "O" switch position, the WSD line is interrupted. The inverter switches off immediately. An asynchronous switchback to the grid is prevented.

Mounting the protective cover

Mounting the protective covers



WARNING!

Danger due to electrical voltage from missing or incorrectly fitted protective covers.

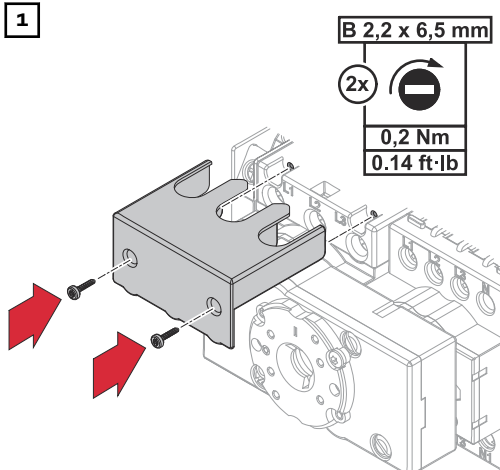
Electric shocks can be fatal and/or cause serious property damage.

- ▶ Fit the protective covers immediately after installing the live cables
- ▶ Fit the protective covers correctly and check that they are secure.

IMPORTANT!

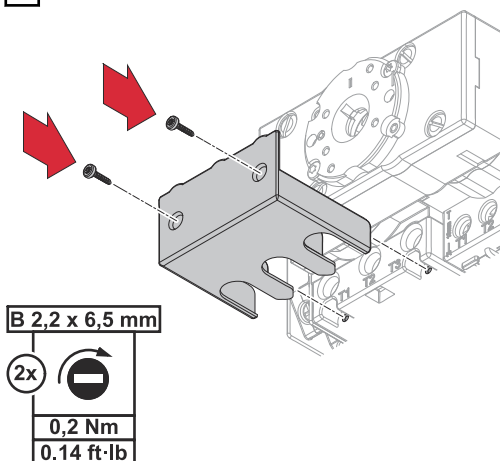
The protective covers are used for additional insulation of the live lines to the data transfer lines.

1



Mount a top protective cover on the load disconnecter 63 A. Fit using the screws supplied with the delivery.

2

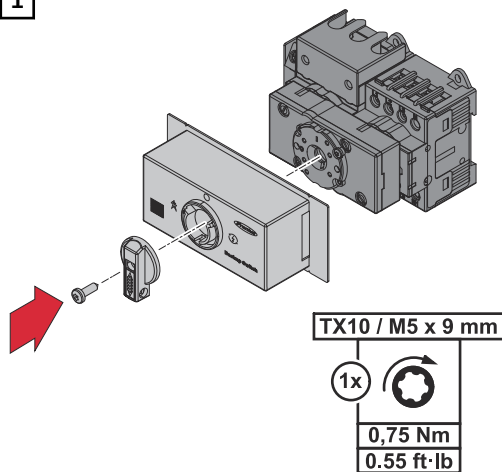


Mount a bottom protective cover on the load disconnecter 63 A. Fit using the screws supplied with the delivery.

Mounting housing cover and switch

Mounting the
housing cover
and the switch

1

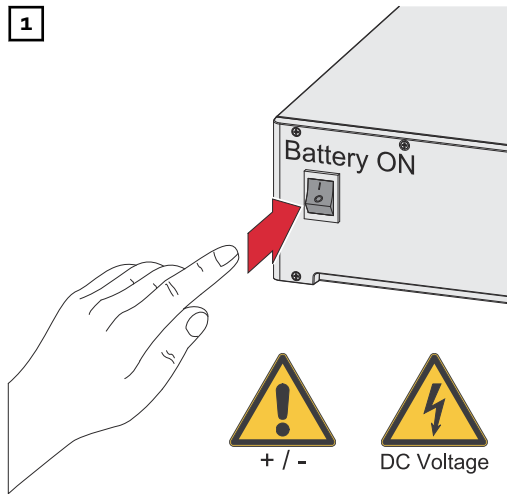


Reinstall the housing cover and the
switch and secure with the screw.

Commissioning

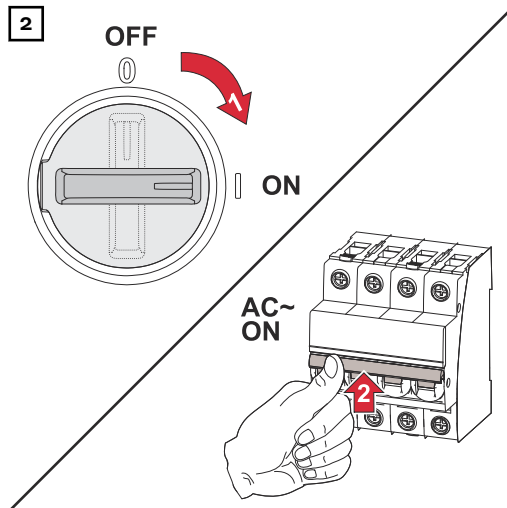
Putting the PV system into operation

1



Switch on the battery connected to the inverter.

2



Set the DC disconnect to the "on" switch position. Turn on the automatic circuit breaker.

General

IMPORTANT!

Settings in the **Device configuration > Functions and I/Os** menu item may only be implemented by staff trained to do so! The service password must be entered for the **Device configuration** menu item.

Backup power - Configuring Full Backup

1

- Call up the user interface of the inverter.
 - Open web browser.
 - In the address bar of the browser, enter the IP address (**WiFi:** 192.168.250.181, **LAN:** 169.254.0.180) or enter and confirm the host and domain name of the inverter.

✓ *The user interface of the inverter is displayed.*

2

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

3

- Activate the **Backup Power** function in the **Device Configuration > Functions and I/Os** menu area.

4

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

5

- Click the **Save** button to save the settings.

✓ *The Full 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

Technical data

Technical data

Technical data ¹⁾		Load dis- connector 63 A	Load dis- connector 20 A	Auxiliary contact switch
Thermal rated operating current				
open I_{th}		63 A	20 A	10 A
encapsulated I_{the}		63 A	20 A	
Rated insulation voltage $U_i^{2)}$		690 V	690 V	690 V
Breaking capacity I_{eff}				
3 x 220 - 440 V		330 A	160 A	
3 x 500 V		330 A	160 A	
3 x 660 - 690 V		190 A	80 A	
Utilization categories AC21A, AC21B				
Rated operating cur- rent I_e	400 V	63 A	20 A	
Rated operating power	220 – 240 V	24 kW	8 kW	
	380 – 440 V	42 kW	13 kW	
3-phase 3-pin	660 – 690 V	72 kW	23 kW	
Utilization categories AC23A, AC23B				
Rated operating cur- rent I_e	400 V	45 A	16 A	
Rated operating power	220 – 240 V	15 kW	4 kW	
	380 – 440 V	22 kW	7.5 kW	
	660 – 690 V	18.5 kW	5.5 kW	
Fuse	gL (gG)	max. 63 A	max. 25 A	max. 20 A

General data	
Weight	421 g
Permitted ambient temperature	-40 °C to +60 °C
Dimensions	64 x 125.4 x 91 mm
Protection class	IP20 + KLAD
Mains frequency	50 - 60 Hz
Nominal voltage	3 - 230 / 400 V
Grid disconnection	1-pin or 3-pin

¹⁾ According to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

²⁾ Applies to: Grids with grounded neutral point, overvoltage category I to III, pollution degree 3: $U_{imp} = 6kV$.

Circuit diagrams

Detailed circuit diagrams can be found in the operating instructions for the inverter. Follow the link to the Fronius download search <https://www.fronius.com/en-us/usa/solar-energy/installers-partners> and search for the device type.

Service, warranty terms and conditions, and disposal

Maintenance Maintenance and service work may only be carried out by qualified technical personnel.

Disposal 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. Used equipment must be returned to the distributor or through a local authorized collection and disposal system. Proper disposal of the used device promotes sustainable recycling of resources and prevents negative effects on health and the environment.

Packaging materials

- Collect separately
 - Observe local regulations
 - Crush cardboard boxes
-

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.



fronius.com/en/solar-energy/installers-partners/products-solutions/monitoring-digital-tools

MONITORING &
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