MANUAL

SOLARINVERT- WINDINVERT - BATTERYINVERT

IMPRINT

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DISCLAIMER

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VALIDITY

These instructions are valid for all inverter products of the SOL, WIN and BAT series from firmware version v.60 (from production date 06/2019). You can download the current version of these instructions here:

https://solarinvert.de/downloads

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Table of Contents

1 General information

Before using your inverter, please familiarize yourself with this manual and the following safety instructions and read the related product information.

1.1 Warnings in the instructions

SolarInvert inverters are designed and manufactured according to the current state of the art and generally accepted safety rules. Nonetheless, risks may arise if these instructions are disregarded, which are pointed out as follows:

DANGER!

There is a danger to life from the most serious injuries.

ATTENTION!

There is a risk of property damage or injury.

In addition, we highlight separately important information that you must observe to ensure proper operation of the inverter:

NOTE

There is a possibility of reduced performance or loss of manufacturer's warranty.

Liability for damage due to improper installation or operation is excluded. If the device is used improperly or for a purpose other than that for which it is intended, all warranty and guarantee claims will also be voided. If you do not understand a section or note or have questions that are not answered in this manual, please contact SolarInvert customer service or your supplier.

1.2 Markings on the device

The following marks and symbols are located on the device:

The device contains a safety transformer according to DIN EN 61558-2-6 which isolates the secondary side from the mains voltage.

Do not dispose of the device in household waste!
Please use the disposal service of SolarInvert

Grounding point for large conductor cross-sections (e.g. lightning protection)

1.3 Safety instructions

Safe operation of the devices is basically guaranteed if the instructions in this manual and on the device are observed.

Components inside the devices are sensitive and may carry dangerous voltages. Do not open the housing. Do not carry out any modifications or repair attempts on the device itself, but contact your dealer or SolarInvert customer service if necessary.

DANGER!

The inverter may only be opened by a qualified specialist authorized by SolarInvert.

It electric shock can be fatal and the inverter can be destroyed.

Do not operate the device if the safety or function of the device is impaired. Indications that safe operation of the device may no longer be guaranteed:

- The housing was damaged due to excessive mechanical stress
- Objects have entered the interior of the device or you hear the sound of a freely moving part in the housing
- Water may have entered the interior of the device or the device was temporarily submerged
- Smoke is coming out of the housing or you notice an acrid smell
- The power supply cable or plug connectors are damaged
- The function display no longer shows any function, although the device should be working normally

If one of the described cases occurs, take the inverter out of operation and contact your dealer or SolarInvert customer service.

ATTENTION!

Only use original connectors and accessories approved by SolarInvert.

The use of incompatible spare parts or accessories may impair the safety and function of the device.

1.4 Packing and transport

Our inverters are sensitive electronics. Please handle them with care so that you can enjoy them for a long time.

Check the completeness and proper condition of the scope of delivery immediately after unpacking the device. Report any transport damage to your supplier or customer service immediately so that the missing or damaged item can be replaced without complications.

Avoid unnecessary shocks and place the carton on a flat surface with the opening facing upwards when unpacking and packing.

ATTENTION!

To avoid transport damage, the inverters may only be transported in their original packaging. In particular, the device must be embedded in the included shock absorbers (foam inserts).

Special care should be taken when shipping built-in devices that have not been delivered in a SolarInvert retail enclosure. If suitable packaging is not available, please contact SolarInvert Customer Service.

Vibration and insufficient damping can damage the inverter and render it unusable.

1.5 Scope of delivery

The scope of delivery includes the following objects:

- Inverter
- Connection set (depending on the inverter type, consisting of AC / DC connection plugs or pre-assembled connection cables)
- Technical manual or reference to download the manual
- Transport protection (foam inserts)

1.6 Areas of application and intended use

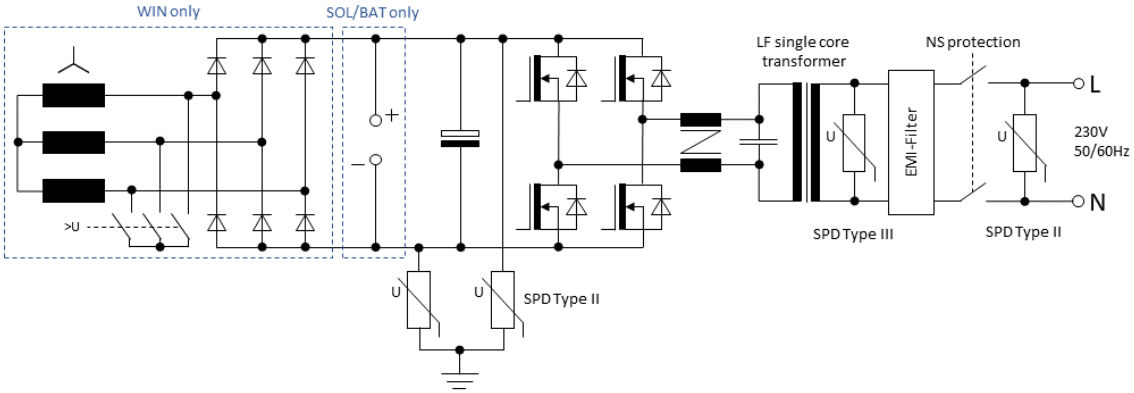
The inverters were developed for use in grid-connected energy systems. It is not possible to set up your own (stand-alone) grid. However, parallel operation with a generator forming an island grid or corresponding inverters from third-party suppliers is possible, provided that the connection conditions have been adapted to the voltage quality of the island grid on the software side and the manufacturer of the grid former has provided for this.

The devices are designed to control the flow of current between an AC network and an energy source (or sink). The current flow can basically be bidirectional. This means that current can be converted not only from DC to AC, but also from AC to DC.

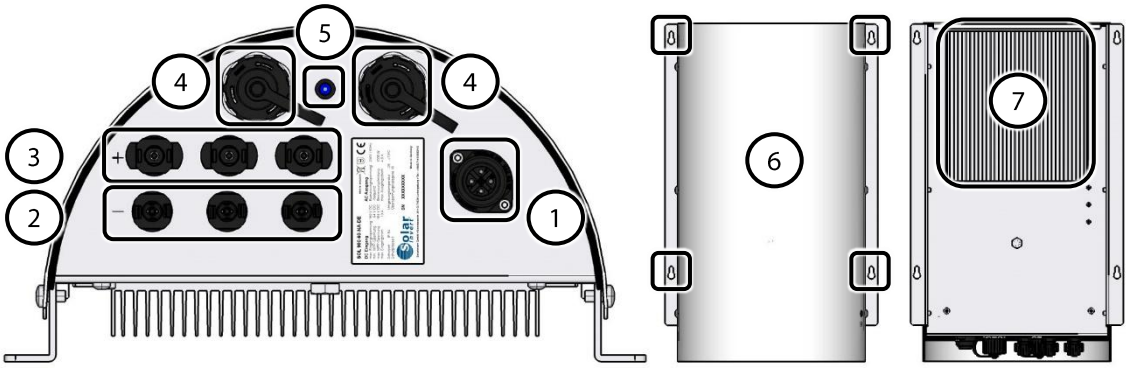
Depending on the model and version, different functions are available that are optimized for a specific type of energy source. The devices may only be operated with the energy source intended for them.

2 Device description

2.1 Schematic diagram



2.2 Overview

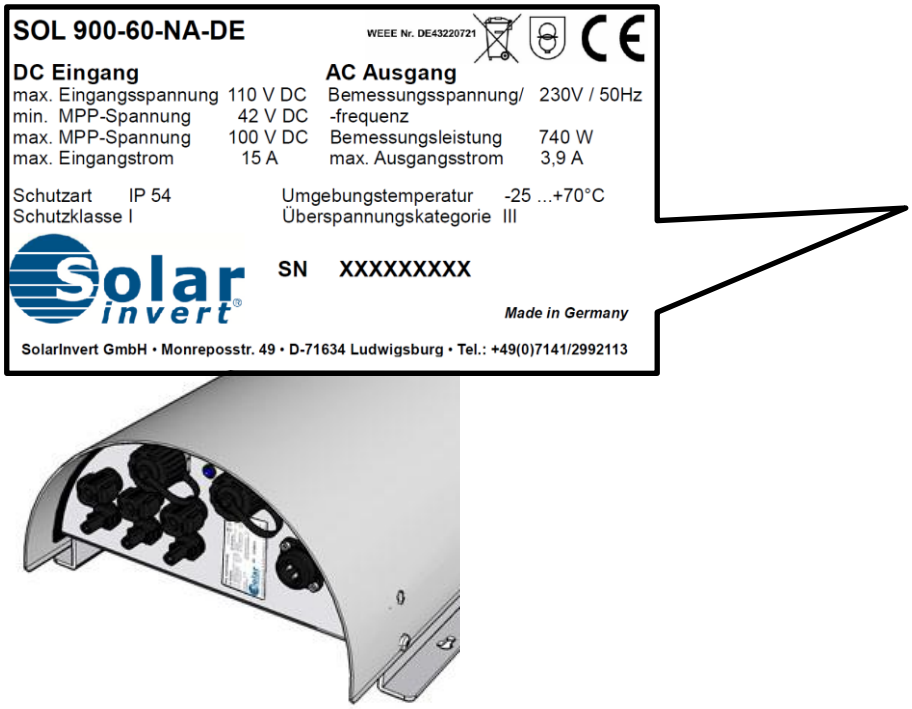


1	Mains connection socket	5	Status display LED
2	Minus connection for power source	6	Fastening lugs
3	Plus connection for energy source	7	Heat sink (omitted for some devices)
4	Communication port (RJ45)	(2)	Configuration switch (optional / WIN only)

This illustration is exemplary. The type and number of connection options may vary depending on the model and variant.

2.3 Nameplate and identification

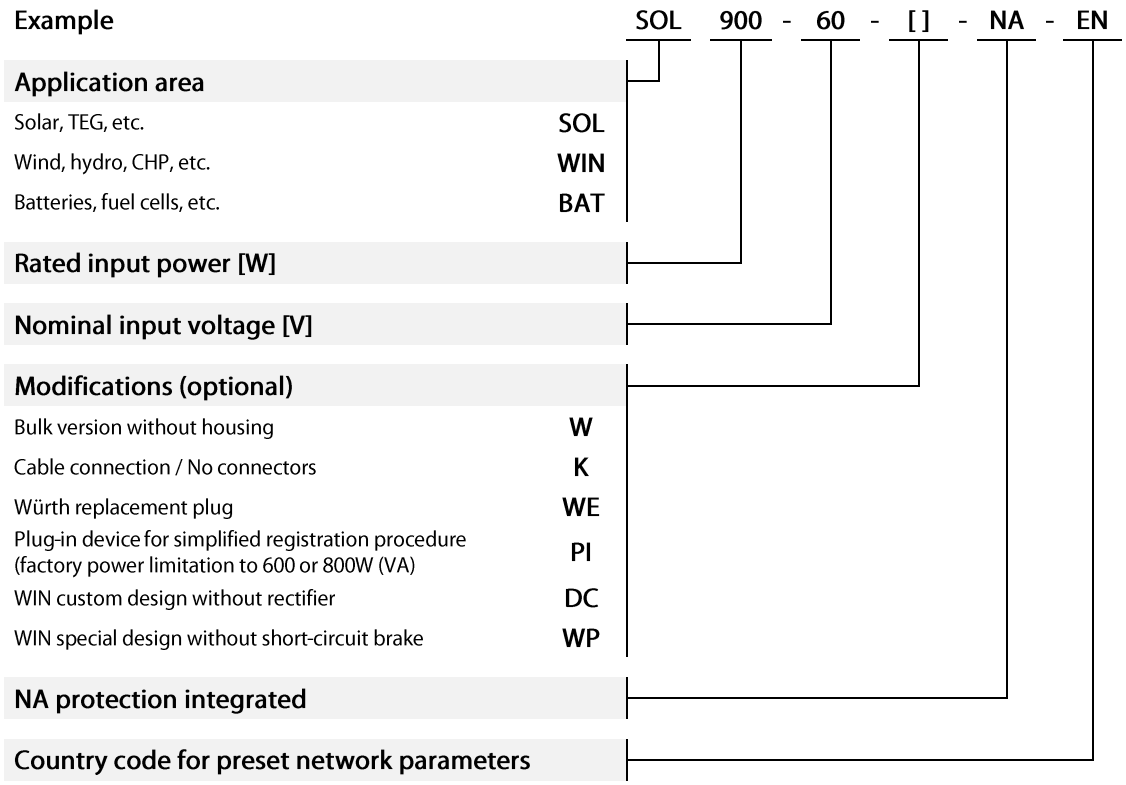
The nameplate with the model designation and serial number (SN) is located on the bottom of the device, for example:



NOTE

Please always have the model designation and serial number available when contacting customer service.

The model designation is made up of the following components:



2.4 Product benefits and features

PPI - Professional Protecting Inverter

The PPI technology developed by Solarinvert is a long-standing design principle whose purpose is to make renewable energy technology as manageable as possible for the end user. PPIs offer professional-level technology that is easy and safe to use.

The safety of the system is also ensured in the event of a fault during the entire operating period. This is ensured by the integrated protective transformer and the limitation of the secondary voltage to a safe level (protective extra-low voltage).

For example, grounding the generator and the rack construction is not mandatory.

The risk of electric shock or fire due to arcing is reduced to such an extent that work on the DC side can be carried out without hesitation by persons who have not undergone specialist electrical engineering training and additional protective measures (e.g. additional isolating points, insulation monitoring, arc detection, etc.), as well as preventive inspection for early fault detection, can be dispensed with.

Pure sinusoidal feed

The shape of the output voltage generated by the inverter corresponds approximately to an ideal sine wave and does not contain any DC components, as these cannot overcome the isolating transformer. This also serves as a low-pass filter that attenuates high-frequency interference signals. Therefore, neither special residual current protection or filter components susceptible to aging are required. The electromagnetic emissions (electrosmog) of the entire system are permanently reduced to a minimum.

Efficient and quiet

SolarInvert inverters are characterized by very low self-consumption. As a result, they switch on earlier and operate longer than other inverters with comparable power.

Through careful selection and tuning of power components, peak efficiencies of over 97% can be achieved in some cases, and power can be maintained for extended periods of time even at ambient temperatures as low as 40°C without active cooling.

The operating noise typical of transformer devices is largely attenuated by an active hum controller, which also continuously compensates for external interference from the power grid.

Ready for the future thanks to open interfaces

Easily accessible interfaces are available for controlling and monitoring the inverters. In this way, the devices keep pace with the rapid development of IT systems and are easy to integrate into smart home controls, energy management systems or self-built IT solutions.

Versatile and flexible

SolarInvert inverters can be used individually or in groups. This makes it possible to realize small plants as well as large plants with >100kW power and to use different energy sources (wind, solar, hydropower, fuel cells, battery storage, etc.).

Each model is based on the same, reliable hardware platform, but offers connection options adapted to the respective area of application and a specialized range of functions. Even unusual requirements can usually be realized on the basis of SolarInvert's modular hardware system.

Certified according to the current feed-in guidelines

All units incorporate advanced control techniques for dynamic grid support and respond autonomously to changes in grid frequency and voltage by adjusting their feed-in power or injecting additional reactive power.

The inverters are delivered from the factory with the country code-specific grid settings. The behavior of the inverter can be adapted to deviating requirements of the respective location via the SolarInvert Control Center PC software.

Integrated lightning surge protection

All power connections have staggered, integrated high-power varistors of overvoltage category 2 and 3 to protect the inverter and the equipment connected behind it against the effects of indirect lightning strikes.

Therefore, additional surge protection is often not required when power cables are installed in buildings.

Robust and sustainable

The inverters are designed to withstand harsh environmental conditions and temperature fluctuations. Should a defect nevertheless occur, you can rely on SolarInvert's uncomplicated replacement service. In addition, all devices are built in such a way that components susceptible to aging can be easily replaced.

Repairable electrical appliances can be operated at low cost far beyond their planned period of use and make an important contribution to environmental protection.

3 Functional description

3.1 Status display

The status display (LED) of the inverter provides information on whether the device is ready to feed in. Ready to feed in means that the device has successfully connected to the AC grid and the inverter is active.

If the display does not light up unexpectedly, this can have various causes. These are described in section 0 listed.

3.2 Energy saving functions

4 operating states can be distinguished for each inverter:

1. **Off** (relay off, inverter off, no communication possible)
2. **Stand-by** (relay off, inverter off, communication via RS485 possible)
3. **Idle** (relay on, inverter on, power transfer +/- 0 Watt)
4. **Work** (relay on, inverter on, power transfer in progress).

The operating status indicator (LED) of the inverter only lights up in the Work or Idle state.

The following overview shows the energy consumption of the different operating states:

State	LED	MCU	Relay	Inverter	Load	Energy consumption
OFF	○	○	○	○	○	Approx. 0.5 W (from AC)
Stand-By	○	●	○	○	○	Approx. 0.7 W (from DC)
Idle	●	●	●	●	○	Approx. 4-16 W (depending on type)
Work	●	●	●	●	●	load-dependent

In the switched-off state (OFF) and in stand-by, the integrated mains monitoring on the AC side is automatically active as soon as a mains voltage is present.

In stand-by, the internal microcontroller (MCU) of the inverter is active, but the device is not yet ready to feed in. The controller is automatically supplied via the DC side of the inverter as soon as a sufficiently high input voltage (approx. 10-50 V depending on type, 1V under Umin) is present.

The AC and DC consumption add up when voltage is applied from both sides.

If the switch-on conditions are met and the inverter has not received a switch-off signal, it automatically switches to the Work state.

To avoid unnecessary energy consumption, the idle state is automatically avoided. If an inverter is in idle state for a longer period of time, it automatically switches to stand-by after expiration of the set NightOff time (except type BAT). An exception to this are certain grid events that prevent a feed-in but do not allow a grid disconnection (fault ride-through).

3.3 Integrated mains and system protection

All SolarInvert inverters with the name extension "-NA" in the type designation have integrated grid and system protection (SolarInvert GridInspector). The integrated NA protection complies with the requirements of the application rule DIN VDE AR N 4105 (German Low Voltage Directive), but can be provided with country settings for other grid areas.

The factory-set country settings are indicated by the country abbreviation in the type designation (e.g. -NA-DE).

NOTE

In accordance with the application rule, the installation of a central NA protection with an accessible switching point for the disconnection function is required in addition to the integrated NA protection for generator systems >30 kW.

3.3.1 Active island detection

Furthermore, an active islanding detection is implemented, which reliably detects grid failures and prevents further feed-in. In a stand-alone grid, the selected method detects a change in the period length of the AC voltage, while the inverter changes the proportion of reactive power fed in.

3.3.2 Combination with central NA protection

If required, a system with several inverters can be disconnected from the grid by an external NA protection with assigned switching elements. No settings on the inverter are required in order to use external NA protection. Communication between the central NA protection and individual inverters is not provided.

3.4 Function SOL inverter

In addition to PV modules, solar inverters are also suitable for other semiconductor-based power generators, such as thermoelectric generators.

3.4.1 Mains connection

As soon as the input voltage of the inverter reaches the defined start voltage, grid connection starts automatically. The inverter starts feeding into the grid after the prescribed waiting time has elapsed and the grid-connection conditions have been met. If required by the grid operator, the inverter can gradually increase its maximum feed-in power.

A special preloading of the solar generator ensures that the inverter only switches on when the PV generator's output is greater than its own consumption. This prevents the grid from being drawn on when there is insufficient irradiation.

3.4.2 MPP operation

Solar inverters use a so-called MPP (Maximum Power Point) tracker to optimize the power output. This control algorithm regularly performs small power jumps and gradually shifts the operating point in the direction where the maximum power is assumed to be. The MPP tracker is constantly active unless the power is very low.

3.4.3 Constant voltage mode (CV)

When starting the inverter or when the irradiation is very low, the inverter operates in CV mode (Constant Voltage) and regulates the operating voltage to a predefined value. This value is stored in the variable U_SOLCV. The CV mode is only exited when the power is sufficiently high for an effective MPP search. CV operation can also be forced and terminated with the corresponding control signal via the RS485 interface.

3.4.4 Control options

The output power of the SOL inverters can be throttled via the digital RS485 interface if required.

3.5 WIN inverter function

Wind inverters from SolarInvert are suitable for both AC and DC generators due to the integrated B6-diode-rectifier. They can be operated with any type of electromechanical generator and are therefore also suitable for e.g. hydroelectric power plants, stirling machines or small steam or gas turbines.

3.5.1 Mains connection

As soon as the input voltage of the inverter reaches the set start voltage, grid connection starts automatically. The inverter starts feeding into the grid after the prescribed waiting time has elapsed and the grid-connection conditions have been met. If required by the grid operator, the inverter can gradually increase its maximum feed-in power.

3.5.2 Characteristic operation

Wind turbines can have different characteristics depending on their operating principle. The inverter must be able to adapt the power consumption to the energy supply as quickly as possible in gusty winds in order to prevent the generator from overspeeding or braking too much.

The best method for this is a characteristic curve that precisely matches the load behavior of the inverter to the wind turbine used. Over the characteristic control time, the dynamics of the wind turbine can also be optimized to the characteristic points.

Wind inverters are delivered with a standard characteristic curve, unless the device was purchased from a turbine manufacturer. This is specified in the inverter data sheet. To ensure that the turbine delivers its optimum yield, the characteristic curve must be adjusted during commissioning in accordance with the turbine manufacturer's specifications. The characteristic curve also determines the speed of the rotor via the voltage and can thus influence the noise development of the turbine.

NOTE

Consult your turbine manufacturer for the recommended U/I characteristic curve. If required, SolarInvert offers the measurement of the characteristic curve in a wind tunnel.

An incorrectly set characteristic curve reduces the yield and can influence the noise development of your wind turbine.

For instructions on how to set your wind characteristic, refer to section 7 (Using the SolarInvert Control Center Program).

3.5.3 Short circuit brake and storm protection

Every wind inverter has an integrated short-circuit brake as standard. This component works autonomously and is not controlled by the inverter. The main purpose of this brake is to protect the inverter against excessive generator voltages. The brake activates automatically in the event of a grid failure or when the predefined threshold voltage is exceeded. The brake deactivates again as soon as the turbine has come to a standstill for a while.

The brake can also be used as an automatic storm protection device to protect the turbine from damage. For this, however, it is absolutely necessary that the generator can counteract the rotor in the short circuit with a sufficiently high braking torque and that it is sufficiently cooled so that it does not overheat due to the short circuit current.

Turbines recommended by SolarInvert have been tested in the wind tunnel under extreme conditions and approved by the turbine manufacturer for use with the short-circuit brake. In all other cases, the short-circuit brake serves only for self-protection of the inverter and prevents its destruction by overvoltage of an unbraked rotating generator.

NOTE

The tripping threshold of the short-circuit brake is fixed on the hardware side and cannot be changed by software. By setting the characteristic curve and the values for Pmax and Uhigh, a switch-off via the SW (also before the HW setting) can be brought about. For effective storm protection, it is necessary that the braking effect is sufficient so that the turbine cannot accelerate uncontrollably in the short circuit.

No warranty is given for the safety of the overall system.

DANGER!

Be sure to follow the turbine manufacturer's assembly instructions and ensure that you only approach the rotor when it is braked. Never operate a wind turbine without an effective braking mechanism and storm protection. In the worst case, this can lead to the turbine disintegrating.

An unbraked wind turbine means risk of serious injury resulting in death from rotating and flying parts.

3.5.4 Configuration switch

Some wind inverters have an additional power supply unit that is activated via a toggle switch on the bottom. This power supply unit is used to be able to configure the device without sufficient DC voltage and to accelerate the mains connection.

NOTE

As long as the internal power supply is activated, the inverter's control card is permanently supplied from the mains. This means that it is immediately ready to feed into the grid when the wind comes up.

This is particularly useful in regions where a waiting time for grid connection (typically 60 - 180 seconds) is prescribed.

With the power supply switched on, the AC standby consumption of the inverter on the power supply side is approximately 1. 5 watts.

3.5.5 Control options

The output power of the WIN inverters can be throttled via the digital RS485 interface if required.

3.6 Function BAT inverter

Battery inverters from SolarInvert are specially designed to meet the requirements of electrochemical energy storage systems, such as accumulators and fuel cells, or electrostatic energy storage systems, such as supercapacitors. Select the inverter according to the voltage range of your power source, basically any cell chemistry is supported (e.g. Pb, Li-ion, Na-ion, NiCd, NiMH, NiFe, Zn-air, etc.) The inverter can regulate the current flow in both directions to ensure controlled charging and discharging. The operator can choose from different control methods or autonomous operation without external control.

Battery inverters manufactured from 2026 onward will feature a new hardware function for precharging the large electrolytic capacitors (electrolytic caps) in the inverter. Since connecting a battery that can immediately deliver currents exceeding 100 A can result in very high inrush currents, the “Charge” switch can be used to precharge the electrolytic caps. In this process, the electrolytic capacitors are first charged to Umin (for a nominal voltage of 48 V, this corresponds to 38 V) before the battery is connected. The AC standby power consumption increases to only 1 W, so the “Charge” switch can remain permanently on. In winter, this feature can also help prevent the battery from being deeply discharged. The power supply integrated into the inverter delivers up to 8 W of power and operates very efficiently with low standby power consumption.

3.6.1 Mains connection

As soon as a sufficiently high DC voltage is present at the inverter, grid connection starts automatically. After the prescribed waiting time has elapsed and the grid-connection conditions have been met, the inverter connects to the power grid. If required by the grid operator, the inverter can gradually increase its maximum feed-in power.

Unless the inverter is in an autonomous operating mode or an external control signal is present, it remains idle after grid connection.

3.6.2 External battery management system (BMS)

Many commercially available battery packs include an integrated battery management system (BMS). BMS perform a number of important functions, for example temperature monitoring, charge balancing, determination of state of charge (SOC) or state of health (SOH).

A direct communication connection between inverter and BMS is not possible. This may have to be implemented by an external control unit.

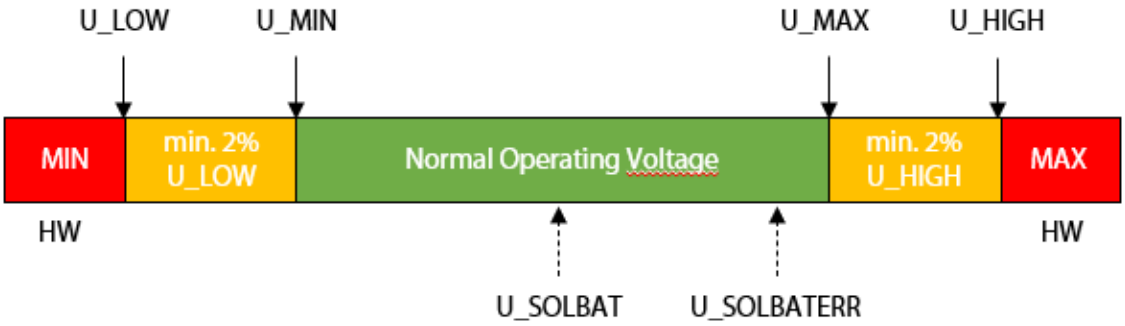
NOTE

The BMS of some battery packs has the option to actively disconnect the battery from the inverter if necessary. It could be that the battery manufacturer requires communication with the battery or that you have to make certain settings on the battery so that you can use the battery without an existing communication connection.

Obtain the required information from the battery manufacturer before commissioning.

3.6.3 Charging and discharge end

To prevent overcharging or overdischarging of the battery during normal operation, BAT inverters have a setting for the end-of-charge and end-of-discharge voltage. The voltage range of the inverter is limited at the outer limits by the hardware and is structured as follows:



The values **U_LOW** and **U_HIGH represent** the switch-off limits of the inverter. If these are exceeded, the inverter automatically disconnects from the grid (stand-by). The inverter only switches on when the battery voltage is >**U_LOW** or <**U_HIGH.**

The values **U_MIN** and **U_MAX represent** the discharge and charge end points. When the battery voltage approaches these values, the inverter reduces its power to 0 watts, but remains switched on and connected to the grid (idle).

You can adjust these values to your requirements using the SolarInvert Control Center Software (SICC).

⚠ ATTENTION!

Set the voltage limits of the inverter correctly according to the specifications of the battery manufacturer or send them to SolarInvert when ordering so that the inverter is already delivered with the correct settings.

Overcharging could cause the battery to catch fire. Overdischarge could damage the battery or render it unusable.

3.6.4 Deep discharge protection

In addition to the normal control modes, there is a safety mode that automatically shuts down the inverter if a problem occurs with the external control. In the default setting, the inverter switches off (stand-by).

The safety mode can also be configured to charge the battery to a certain quiescent voltage (**U_SOLBATERR**) before shutdown, thus protecting it against deep discharge. In addition, the charging power can be limited (**P_MAXERR**). The inverter switches on automatically and repeats the process as soon as the open-circuit voltage of the battery falls below the average value of **U_SOLBATERR** and **U_MIN.**

Alternatively, instead of **U_SOLBATERR, you** can also charge to **U_MAX.** Then the process is repeated as soon as the open-circuit voltage of the battery falls below the average value of **U_MAX** and **U_MIN.**

The setting value for the safety mode is stored in the variable **S_BIOFF** and can be set by you via the SolarInvert Control Center (SICC).

S_BIOFF	Safety mode
0	Load on U_SOLBATERR with P_MAXERR
1	Safety shutdown (standard)
2	Load to U_MAX with P_MAXERR

ATTENTION!

If you want to disconnect the inverter from the grid for a longer period of time, remove the DC connection cables from the battery. This will prevent the battery from being deep-discharged by the self-consumption of the inverter control unit (see 3.2)

A deep discharge can damage the battery or make it unusable.

3.6.5 Control options

BAT inverters have 6 possible control modes. The current mode is stored in the variable **S_CVPMAX** and is coded as follows:

S_CVPMAX	Description of the control mode
0	Voltage and/or power setting via digital interface (RS485)
1	Voltage specification via analog interface (0-10 V)
2	Power setting via analog interface (0-10 V)
3	Voltage and/or power setting via digital interface (RS485), Shutdown in case of communication interruption (set timeout)
4	Autonomous surplus feed, unidirectional (no power drawn from the grid)
5	Characteristic operation, bidirectional (power as a function of battery voltage)

After changing **S_CVPMAX** and saving with Write EEP, a reset of the inverter is required. The reset can be performed using the SolarInvert Control Center (SICC) software or by issuing the appropriate command via the RS485 interface. Alternatively, you can reset the inverter by disconnecting and reconnecting the DC and AC connections for at least 60 sec.

NOTE

External control signals must always be galvanically isolated from the power supply.

Voltage and power setting via digital interface (RS485)

The serial interface of the inverter can be addressed in two ways:

1. Modbus RTU in connection with a SUNSPEC compatible register directory
2. SI-Modbus, a collection of proprietary function codes for a more performant and simplified handling

For the inverter to accept control signals via the digital interface, S_CVPMAX must be set to 0 or 3.

In mode 0, the inverter permanently executes the last transmitted command.

In mode 3 there is an additional failsafe function to be able to detect a communication failure with the control unit by means of timeout. The setting value for the timeout interval must be transmitted at least once from the control unit to the inverter, but can also be updated continuously during operation.

If no timeout value is transmitted or if no valid transmission is received from the inverter within the time interval, the device switches to safety mode (see 3.6.4).

NOTE

A complete interface documentation of all registers and function codes can be found in the download area at www.solarinvert.de.

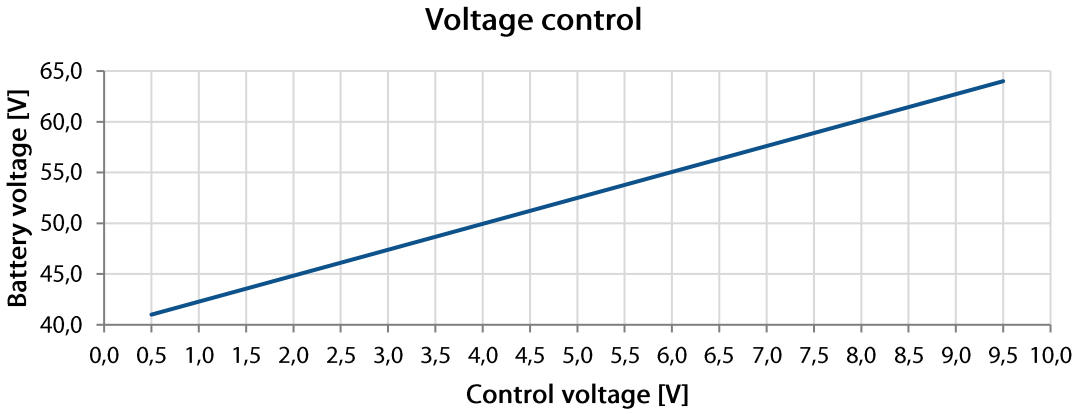
Voltage and power setting via analog interface (0-10 V)

For the inverter to accept control signals via the analog interface, S_CVPMAX must be set to 1 or 2.

The valid value range of the control voltage is 0.5 - 0.95 V. Voltages outside the value range are evaluated as an error and put the inverter into safety mode (see 3.6.4). In this way, faults in the control (e.g. due to cable breakage) are detected and intercepted.

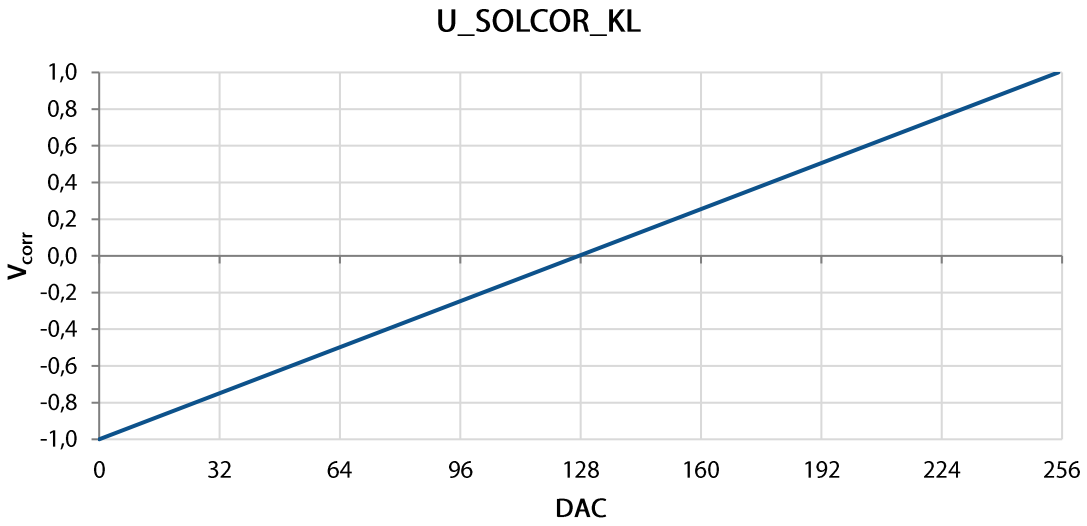
In mode 1 (voltage preset), the input voltage at the 0-10 V interface is referenced relative to the voltage range of the inverter and the battery voltage is regulated to the corresponding setpoint.

Example:



The charging or discharging power automatically adjusts to the maximum value at a given battery voltage and depends on the internal resistance of the battery and the connecting cable.

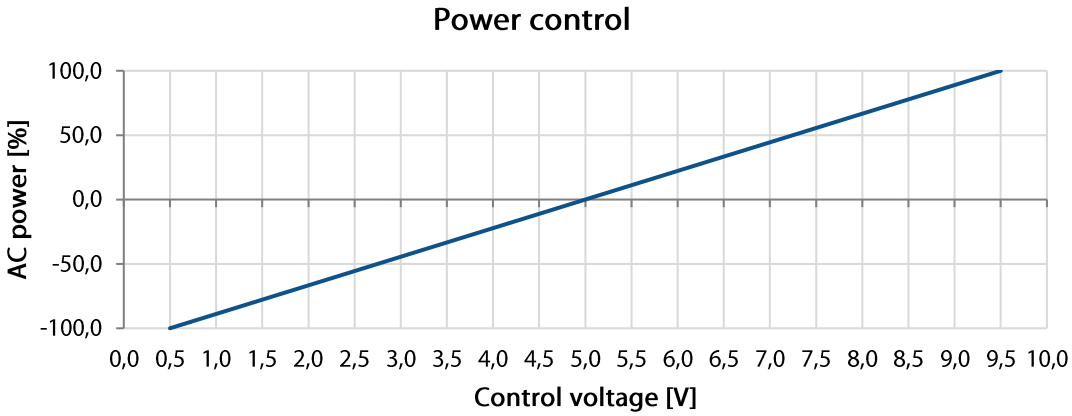
Any voltage drop at high power can be compensated by the correction characteristic (**U_SOLCOR_KL**).
Example:



A DAC of 0 represents maximum charge power, while a DAC of 255 represents maximum discharge power. A side effect of the characteristic curve is that the power gradually decreases as the battery voltage approaches the set point.

By reversing the sign in the **U_SOLCOR_KL**, a constant artificial internal resistance of the battery can be simulated in order to achieve a power reduction/regulation.

In mode 2 (power setting), the charging or discharging power is controlled directly. The input voltage at the 0-10 V interface is here relatively referred to the power range of the inverter and the AC power is controlled to the corresponding setpoint. Example:



If the control voltage is 5.0 V, the inverter regulates the AC power to 0 W (idle). In order to save power, the inverter switches off (stand-by), if it is in this state for longer than 60 s. When a power demand of at least +/- 2% is reached, operation is automatically resumed.

4 Mounting instructions

4.1 Site conditions

Select the location of the inverter as close as possible to the energy source to avoid unnecessary line losses and voltage drop. For a recommendation on the maximum distance depending on the selected line cross-sections, refer to chapter 5.1.1.

SolarInvert inverters comply with the IP 54 enclosure protection class, which means that they are fully protected against contact and against splashing water from all sides and are suitable for use both in-doors and in protected outdoor areas. This means that the devices must be protected against direct weather influences (water jets, standing water, etc.) with a roof.

The housing is made exclusively of corrosion-resistant materials, such as stainless steel and aluminum. Thus, the inverter is also suitable for use in coastal regions. However, permanently high or condensing humidity must be avoided.

The operating altitude must not exceed 2,000m above sea level and the ambient temperatures should be between -20 and +60°C if possible.

The inverter must not be mounted in passageways or escape routes where it may obstruct persons. If possible, occupied areas such as living and working spaces should be avoided.

DANGER!

Never use the inverter in rooms with dust or gas hazards, fuel storage facilities or other environments with **explosion hazards.**

Sparking, e.g. in the relays contained, may cause **ignition of gases, vapors, aerosols and dusts.**

4.2 Suspending the inverter

Mount the devices preferably hanging upright (connections downwards). An inclination of up to 45° is harmless. The inverter must be installed on a load-bearing surface. Use fastening material suitable for the respective substrate.

ATTENTION!

Never operate the devices upside down outdoors. The connection area is only splash-proof and water could penetrate the housing.

The device may be damaged by water ingress.

ATTENTION!

Depending on the type, the devices can weigh up to 32 kg. They may only be moved and assembled by persons without health impairments. Handle it carefully, wear non-slip gloves and get assistance if necessary.

The device will be damaged if it is dropped. There is also a risk of injury or damage to property.

NOTE

Avoid direct sunlight on the housing and ensure that air can flow freely around the device.

If the unit is oriented horizontally or lying down (heatsink down or fins horizontal), heat dissipation may not be sufficient.

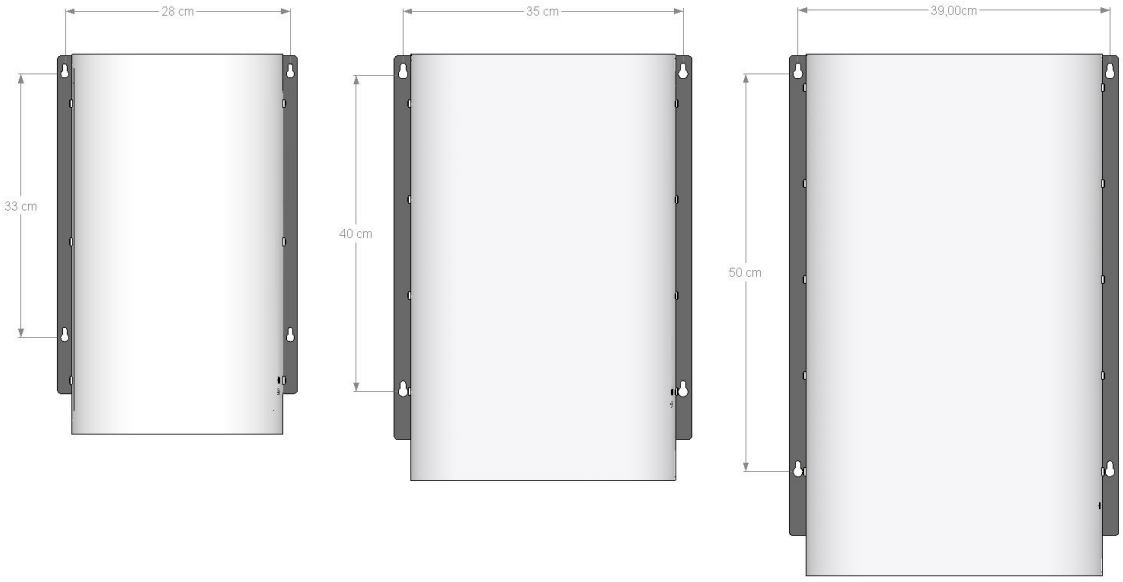
Active ventilation can improve the performance of the device.

Overheating due to inadequate heat dissipation will reduce the performance and expected life of your device.

4.2.1 Hole spacing

Depending on the device type, the inverter is supplied in a small, medium or large enclosure. The external dimensions are included in the respective data sheet:

	S (small)	M (medium)	L (large)
Height x width x depth	475 x 300 x 157 mm	533 x 372 x 204 mm	653 x 412 x 230 mm
Hole spacing	330 x 280 mm	400 x 350 mm	500 x 390 mm



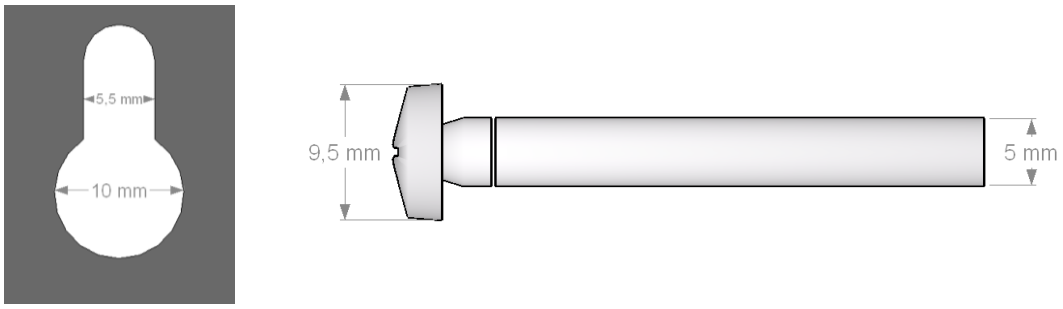
4.2.2 Selection of fasteners

To suspend the device, please use only galvanized steel or stainless steel screws. In order to be able to easily hang and unhang the inverter, please do not use washers.

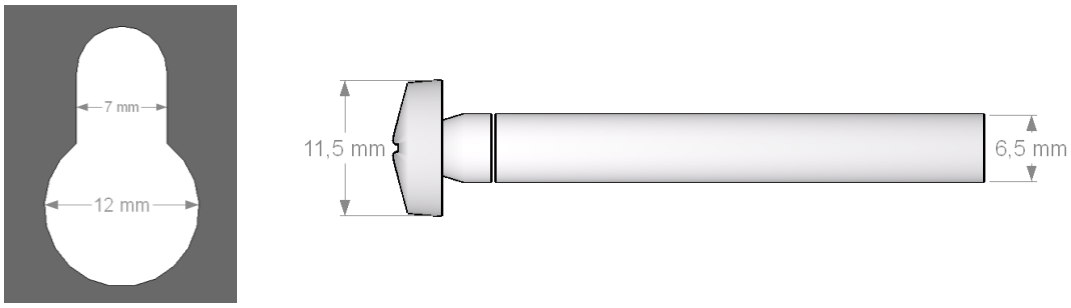
Select the type of screw and, if necessary, the dowels according to the weight (see data sheet) and the substrate on which the device is to be mounted.

The maximum dimensions of the screws vary depending on the device size. The dimensions can be found in the following graphic:

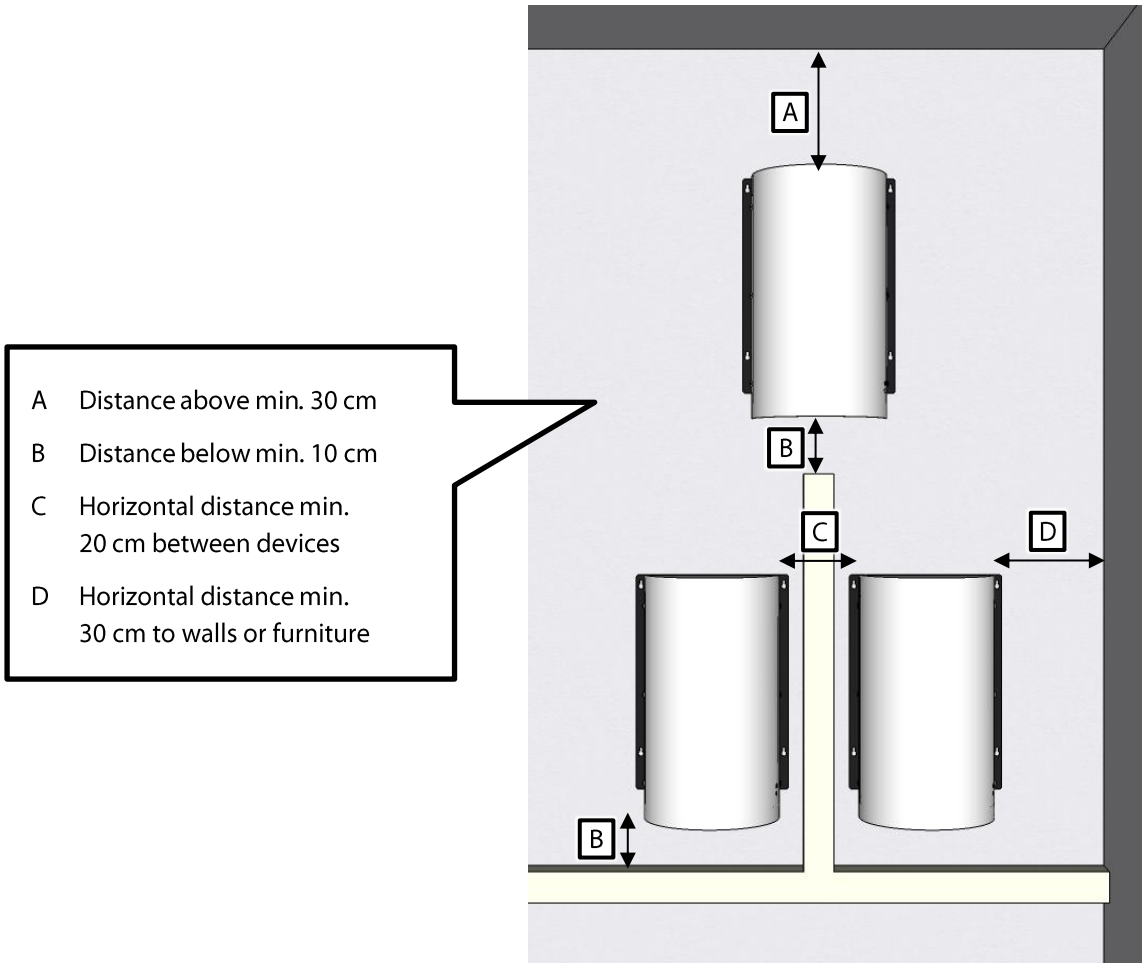
Hole and screw dimensions for housing size S (small)



Hole and screw dimensions for housing sizes M (medium) / L (large)



To ensure sufficient air circulation, certain minimum distances must be observed. Please use the following graphic as a guide for installation:



A Distance above min. 30 cm

B Distance below min. 10 cm

C Horizontal distance min. 20 cm between devices

D Horizontal distance min. 30 cm to walls or furniture

NOTE

Do not cover the devices and do not place any objects directly on, in front of or next to the inverter. Do not mount several inverters directly on top of each other.

This impedes heat dissipation and reduces the performance of the device.

5 Electrical connection

5.1 General connection of the energy source

For simplification, the energy source is understood as the part of the system that is to be connected to the 230V power grid by the inverter. Although in some cases the energy flow may be reversed (e.g. in the case of accumulators or thermoelectric elements), the term also includes them.

5.1.1 Connection cable selection

If these are available, please use the connectors or pre-assembled cables included in the scope of delivery to connect the DC-side power source or sink to your inverter. Please use only original parts. If necessary, you can obtain compatible replacement connectors from customer service.

ATTENTION!

Check the voltage and polarity of the connection cables before connecting them. Make absolutely sure that the voltage does not exceed the permissible limit (see data sheet/type plate) and that the polarity is correct.

Incorrect connection or excessive voltage can irreparably destroy the device and make it unusable.

Use only PV1-F solar cable and select the cable cross-section from the following table:

Typical input voltage at maximum power	Cable cross section	Recommended distance (one way)
120 V (1200 W)	2.5 mm^2 (AWG14)	Until 20 m
120 V (1200 W)	4 mm^2 (AWG12)	Until 30 m
120 V (1200 W)	6 mm^2 (AWG10)	Until 45 m
90 V (900 W)	2.5 mm^2 (AWG14)	Until 10 m
90 V (900 W)	4 mm^2 (AWG12)	Until 25 m
90 V (900 W)	6 mm^2 (AWG10)	Until 35 m
60 V (600 W)	4 mm^2 (AWG12)	Until 20 m
60 V (600 W)	6 mm^2 (AWG10)	Until 35 m
30 V (300 W)	6 mm^2 (AWG10)	Until 10 m

The values given are a rough guideline for a voltage drop of approx. 2-3%.

NOTE

Avoid excessively long cable runs and cable cross sections that are too low. These lead to increased line losses and voltage drop.

This reduces the power of the device and the device switches off when the input voltage falls below the limit.

5.1.2 Laying the connection cables

Lay plus and minus cables as close together as possible and on as direct a path as possible between the inverter and the energy source. If possible, use twin-core cables to reduce the installation effort.

Protect the cables from direct sunlight and mechanical stress. Use UV-resistant cable ties and/or cable hoses to secure them so that they do not rub against surfaces and edges, lie in accumulations of water or are exposed to direct sunlight.

5.1.3 Connector assembly

If the inverter has corresponding mating parts, the scope of delivery includes SUNCLIX connectors from Phoenix Contact.

For outdoor applications, close unused plug connections on the inverter with a sealing plug or the matching counterpart.

Correctly assembled and mated connectors comply with protection class IP67. They are waterproof to a limited extent (up to 1m water depth for max. 30 minutes). Therefore, make sure that you lay the cables in such a way that the connectors cannot lie in accumulations of water.

Mount the connectors on the DC connection cables as described below.

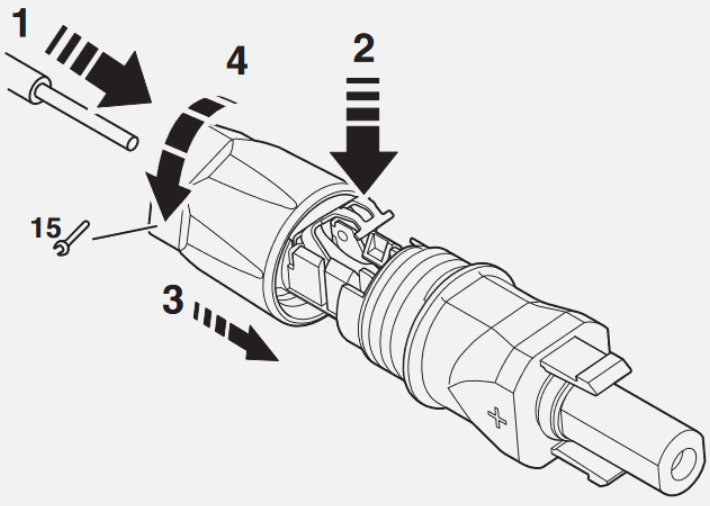
Mounting the connectors*

Step 1: Strip the cable (15mm length) and insert it into the connector.

Step 2: Press the spring clip down until it clicks into place

Step 3: Press the connector together

Step 4: Screw the cable seal with a torque of at least 2 Nm



*Extract from the original instructions of the manufacturer

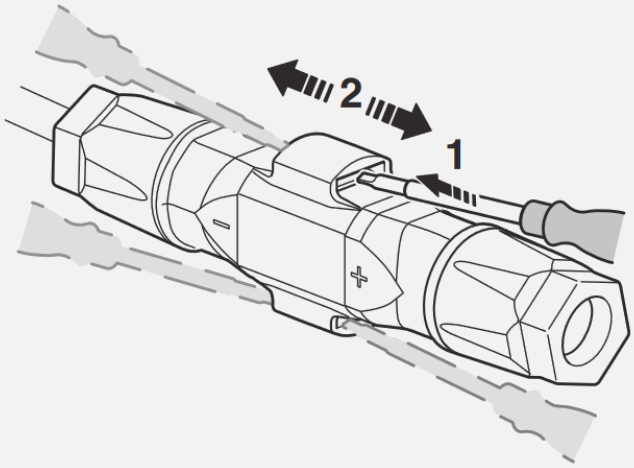
If you use pre-assembled DC cables with connectors already fitted, you can shorten these cables if necessary.

First place the cable close to the source and then cut the cable from the other end. Disconnect the connector as shown below and then reassemble it on the bare cable end.

Disconnecting the connectors*

Step 1: Insert SZF1 screwdriver or phase tester in the position shown.

Step 2: With the screwdriver inserted, disconnect the plug from the socket.



*Extract from the original instructions of the manufacturer

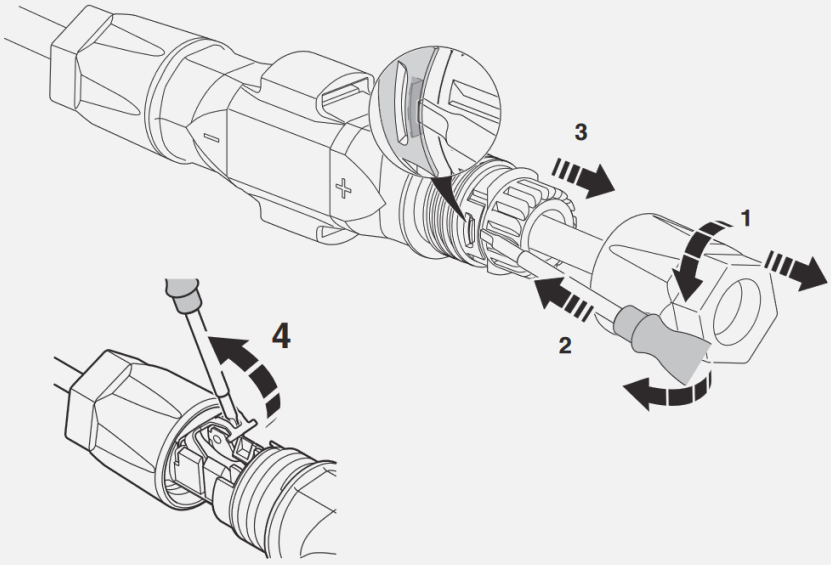
Reuse of the connectors*

Step 1: Screw on the cable seal.

Step 2: Carefully pry open the lock of the connector

Step 3: Pull apart the connector

Step 4: Open spring clamp with screwdriver and remove conductor



*Extract from the original instructions of the manufacturer

ATTENTION!

When mounting the connectors, make sure that the contacts are clean and dry.

Contamination or wetness in the connector can impair the function of the device and/or damage the connector.

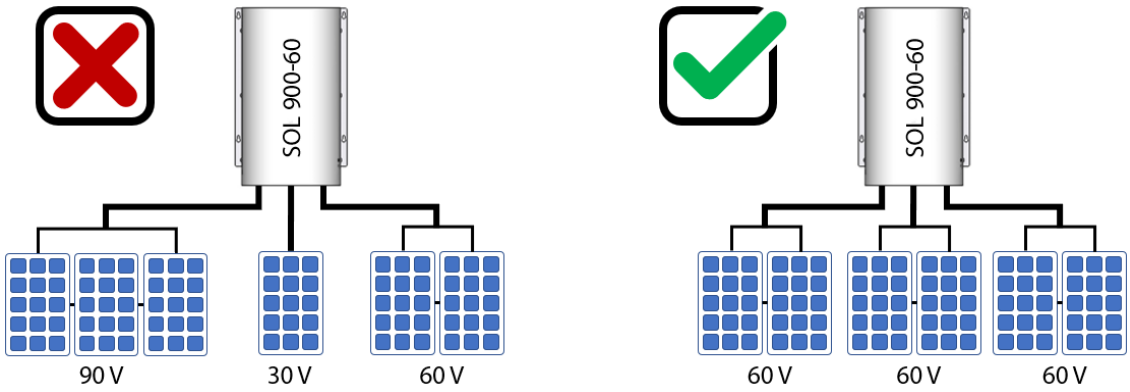
5.2 Solar generator (SOL)

5.2.1 Connection of the solar modules

Connect the photovoltaic modules so that strings of equal length are created. When photovoltaic modules are connected in series, the voltage of the modules adds up. However, the current is limited by the module with the weakest yield.

For this reason, it is important that all modules of a string are irradiated as evenly as possible. Neighboring strings that are connected in parallel to each other do not influence each other and can therefore be oriented differently.

Yield losses, e.g. due to vegetation, pollution, parts of buildings or neighboring buildings that can cast a shadow on the modules, can be largely minimized by the parallel connection.



ATTENTION!

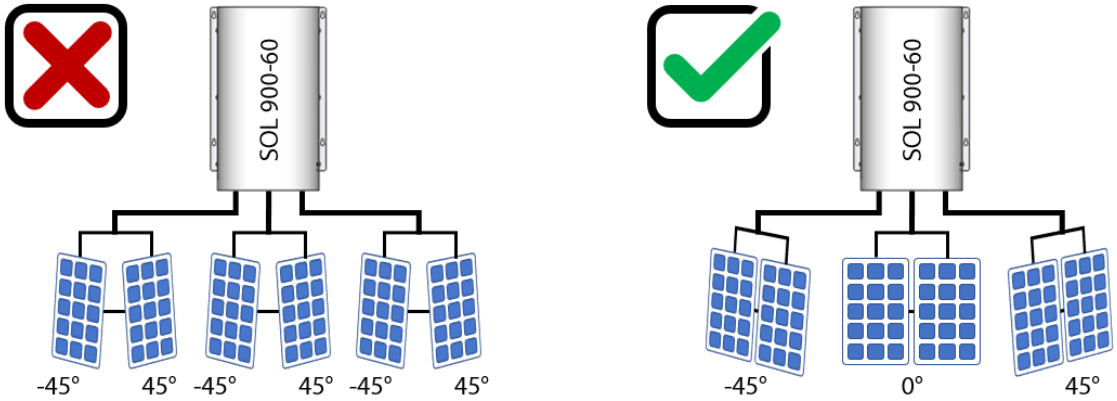
Only connect strings with the same number of modules or string voltage on an inverter. If the voltage difference is greater than the open-circuit voltage of a single module, reverse currents from neighboring strings with higher voltages may occur.

Differing input voltages lead to yield losses (due to MPP mismatch) or, in the case of large differences, to a thermal overload of individual modules.

5.2.2 Design notes

If you plan to use the generated electricity yourself, it is advantageous for the economic efficiency of your system to connect strings with different orientations in parallel on one inverter. You can then effectively run more modules on the inverter because they reach their peak power at different times. This

allows you to distribute energy production more evenly throughout the day and better utilize the power of your inverter.



NOTE

Only connect modules in series that are identically aligned and inclined. If modules are temporarily shaded, try to combine these modules into one string.

Uneven irradiation of the modules within a string reduces the yield.

5.2.3 Reverse current protection for solar modules connected in parallel

When connecting module strings in parallel, reverse currents can occur in unfavorable cases. Here, current from neighboring strings with higher voltage is driven through the "victim string" with lower voltage. This leads to yield losses and heating of the cables and internal conductors, which could possibly be overloaded as a result. For this to happen, the voltage difference must be greater than the open circuit voltage of a single PV module. Therefore, SolarInvert generally rates the parallel connection of strings with up to 2 modules as uncritical.

In addition, it must be weighed up whether protecting the modules against excessive reverse currents, for example by using string diodes or string fuses, is proportionate. This is because these components represent their own sources of error and can either lose their protective function due to a defect or themselves become a source of interference for the function of the system.

Although such safety measures are sensible and important in high-voltage systems, there is no risk of fire from self-sustaining arcs in low-voltage systems due to the low DC voltage. This is because an overloaded module behaves like a self-extinguishing fuse in the event of a fault and safely shuts down the damaged string.

NOTE

SolarInvert recommends not installing string diodes or string fuses in low-voltage systems because the safety and fire protection of the system are sufficient without these measures.

The possible loss of an otherwise intact module is accepted in the event of an error.

5.3 Battery (BAT)

5.3.1 Precharging (Precharging)

The inverter input capacitors are not automatically precharged. Therefore, a short-circuit-like current peak occurs when a current source is connected to the input of the inverter for the first time. Some battery manufacturers prescribe a limitation of this starting current, so that you have to install a so-called precharging resistor in the line. This can then be removed again to avoid unnecessary losses during operation.

ATTENTION!

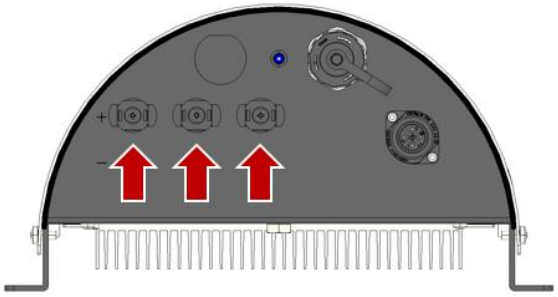
Observe the specifications of the battery manufacturer and, if necessary, use a precharging resistor when connecting a new battery to the inverter.

The battery could be damaged by the short-term current surge.

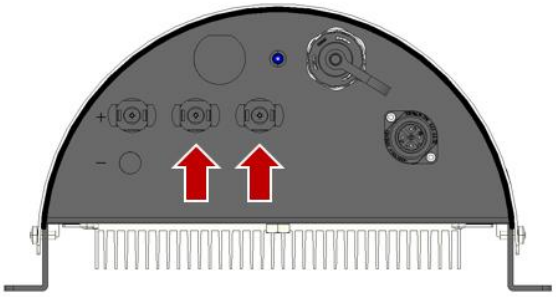
5.4 Wind turbine (WIN)

WIN inverters have an integrated full-bridge rectifier and can be operated with both DC and AC generators. Depending on the type of generator, either three or two of the inputs are occupied. The polarity or sequence of the phases is irrelevant.

AC generator



DC generator



NOTE

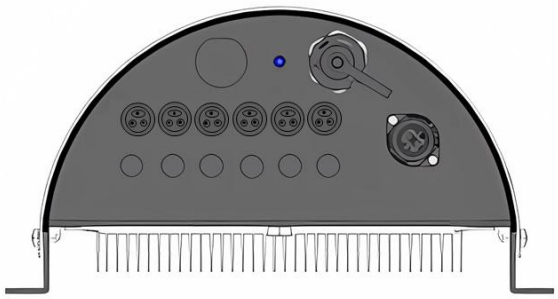
It is strongly recommended to install a manual STOP switch between the inverter and the wind turbine, which can bridge the 3 phases of the generator.

When installing or replacing the device, the inverter cannot brake the generator.

5.4.1 Special version: Quicklock connection 3-pin

With this version of the WIN inverter, it is possible to connect several wind turbines (2 - 6 units) to one inverter. In contrast to the conventional SUNCLIX plug, which only has a single-pole design and only allows the connection of a single 3-pole turbine phase, the three-pole Quicklock plug connector used allows all three wind turbine cables to be connected to one plug (max. 10A) at the same time. This

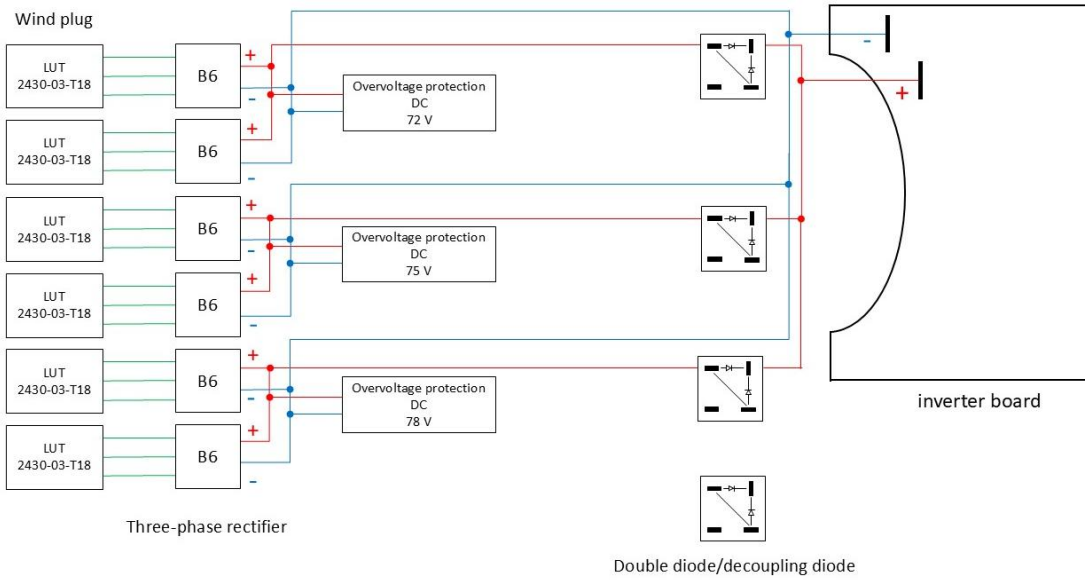
contributes to a more compact system design and increases the number of possible connection options while reducing cabling costs.



The following circuit diagram shows the internal wiring of the three-pole plug connectors within the inverter. The concept enables the simultaneous feed-in and braking of several small wind turbines via a grid inverter.

There are different variants with 2 - 6 turbine connectors.

Example: 6 wind turbines connections 100W in the WIN 600-24 inverter



5.5 Mains connection 230 V

The inverter may only be connected to a fault-free electrical installation that has been set up in accordance with the recognized rules of technology.

ATTENTION!

Contact a competent electrical contractor to check the suitability of your electrical installation and to ensure that the requirements of your network operator are met before commissioning the device.

If the inverter is connected to a faulty or overloaded circuit, the cables or contact points could heat up impermissibly and cause a fire or short circuit.

Only the supplied mains plug is to be used for the mains connection. All work on the AC side that goes beyond operating the unit's plug device must be performed by a qualified electrician.

DANGER!

Work on the electrical installation may only be carried out by a trained electrician (see DIN VDE 1000-10 or accident prevention regulation BGV A3).

The mains connection of the device requires a proper protective grounding (protection class I). Correct grounding must be ensured by a qualified electrician.

An electric shock can be fatal.

The inverter is connected to the utility grid in single-phase. The copper cable cross-section should be at least 1.5 mm^2 (AWG14).

A 16A circuit breaker with C-characteristic is recommended to protect the connecting cable.

Several inverters can be combined on one connection cable. Please note the correct selection of equipment, conductor cross-sections, as well as selectivity and staggering of the circuit breakers.

ATTENTION!

If you install multiple inverters, distribute them evenly across all available outdoor conductors.

If the total power of the system exceeds 13.8 kVA, a sliding load monitor relay may have to be installed or the feed-in power of all inverters coordinated by a suitable control unit.

A phase shift load that is too high can lead to an overload of the neutral conductor and impermissible heating. This may result in fire or damage to other electrical equipment.

NOTE

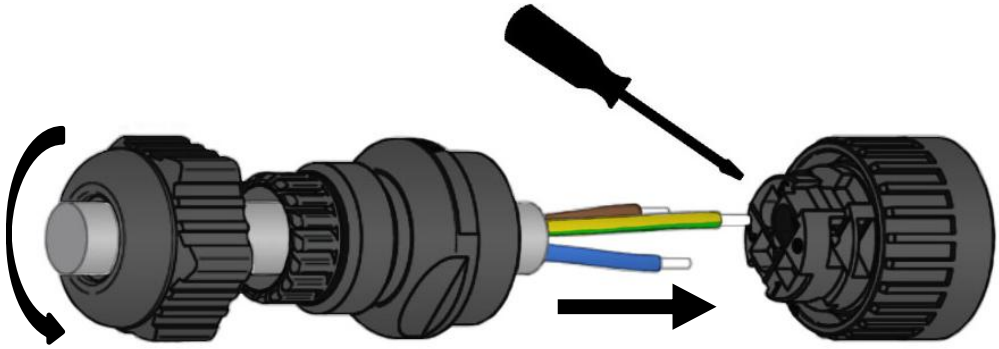
Make sure that the connecting cable is disconnected when you make the connection to the inverter and check that the plug is firmly seated before switching on.

Plugging in the mains plug while the mains voltage is switched on can cause the device's internal microfuse to blow. Replacing this fuse is not covered by the warranty or guarantee.

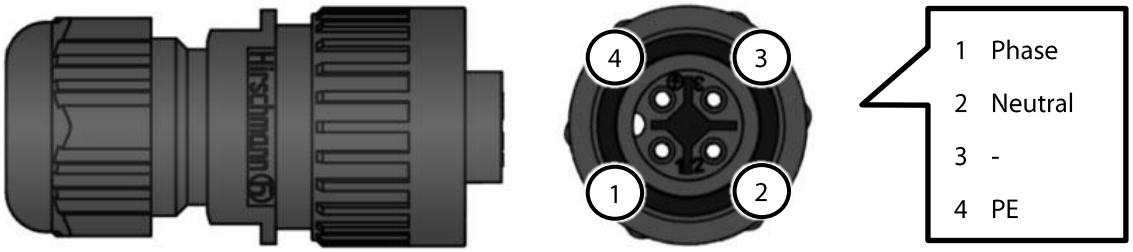
5.5.1 Connection via Hirschmann "CA 3 LD" connector

The inverter is equipped with a 4-pin housing connector as standard. If the plug connection is disconnected, the contact pins on the inverter do not carry any voltage. The connection to the power cable is made contact-proof via the supplied socket plug.

If you do not use a pre-assembled connection cable, mount the enclosed connector on the free cable end as shown in the following figure:



Observe the correct pin assignment of the contact carrier:



NOTE

If you need a replacement for this connector, please use only the original part with manufacturer part number 934125100 (CA 3 LD).

5.5.2 Connection via Neutrik "PowerCON" connectors

Inverters with the abbreviation "WE" in the model designation (e.g. SOL 1300-35-**WE**-NA-DE) are equipped to replace Würth Solarstar inverters with connectors compatible with this system.

Because the matching counterpart is already present in the customer's system, this is not included in the scope of delivery and there is no need to assemble the connection cable.

The connection cables present in the customer's system can be plugged directly into the mains connection plug on the underside of the unit.

NOTE

If you need a replacement for this connector, please use only the original part with the manufacturer part number NAC3FCB.

5.5.3 Connection by cable coupling

Inverters with the abbreviation "K" in the model designation (e.g. SOL 1300-35-K-NA-DE) do not have any connectors and must be permanently connected.

A suitable connection cable is routed out of the housing at the factory for the mains connection.

Connection cable:	Core Assignment:
3m H07RN-F; 3 x 1,5mm^2; black	Brown = L Blue = N Yellow/Green = PE

This type of connection is intended for direct connection to a terminal block or circuit breaker.

5.5.4 Plug-in mains connection to a wall socket

NOTE

The following section refers to devices operated in the territory of the Federal Republic of Germany.

Different requirements and rules may apply in other regions. If necessary, contact a local electrician for more information.

SolarInvert inverters with the abbreviation "PI" in the model designation are plug-in capable power generators for connection to end-user circuits according to DIN VDE V 0100-551-1.

The product complies with the DGS safety standard for pluggable power generation devices (DGS 0001:2017-08) and the requirements and protection goals formulated in VDE V 0628-1 for a "special feed-in plug-in device" through the following technical and organizational measures:

Personal Security:

- Active protection against islanding
- Integrated residual current protection
- Testing for residual stress according to DIN EN 60335-1:2012 section 22.5
- Galvanic isolation between mains and DC side.

Fire Protection:

- Limitation of the feed current to max. 2.6 A (approx. 600 W)
- Permanent safety instructions on inverter and connectors
- Permanent marking of the feed socket with the maximum permissible feed current

The circuit must be suitable for receiving the additional feed-in power and the feed-in socket must be marked with the supplied signal sticker.

⚠ ATTENTION!

The fuse rating of the feeder circuit must be based on the current carrying capacity (I_z) of the installed cables.

This must be at least as large as the sum of the feed current of the inverter (I_g = 2.6 A) and the rated current of the protective device (I)$_n$

This is usually met if there is at least one 16A circuit breaker and the line runs on plaster or in uninsulated walls.

If your house installation is older than 25 years or you are unfamiliar with its condition, have it checked by a qualified electrician before operating the unit. It may be necessary to reduce the circuit breaker to the next smaller size.

The connection must be made via the supplied, special feed plug to a correctly installed CEE7 grounded socket (type F). This may be located both indoors and in a protected outdoor area (IP 55).

⚠ ATTENTION!

Operate only 1 device per circuit and never use the device on multiple power strips or extensions, e.g. cable drums.

If the connecting cable is overloaded, a short circuit may occur due to accelerated aging of the insulation. There is a risk of fire if the plug contacts are overloaded.

Operation of the power supply plug

Units intended for plug-in connection to a wall socket are supplied with a pre-assembled connection cable fitted with a special feed plug.

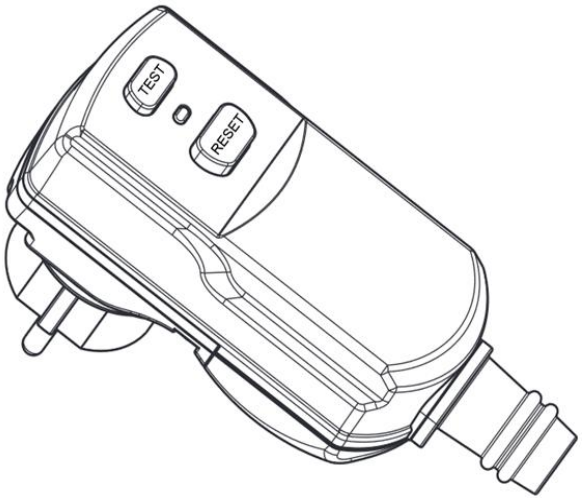
This feed-in plug has an integrated residual current circuit breaker (type A, 30mA) and a disconnecting device. This isolates the touchable contacts of the plug from the output of the inverter as soon as the plug is removed from the socket.

When delivered, the marking in the viewing window of the plug is green and the integrated safety switch is open.

To commission the inverter, insert the feed-in plug into the previously marked feed-in socket.

Press the yellow button (RESET) on the plug so that the red marking becomes visible in the viewing window. This indicates that the contact is closed and the residual current protection is activated.

The device is now ready to feed in.



The function of the integrated residual current circuit breaker should be tested twice a year by pressing the red "Test" button.

If the integrated circuit breaker does not trip during the test, it must be replaced.

NOTE

If the plug is pulled out, the voltage supply from the mains side is interrupted (e.g. power failure) or the internal residual current protection is triggered, the safety switch integrated in the plug is reset.

The plug must be switched on manually again after a power interruption.

NOTE

If you use a "smart socket" or an adapter with a measuring function to monitor the power generation of the inverter, deactivate the switching function of the adapter if necessary.

An interruption of the contact resets the residual current protection of the feeder plug.

5.6 Grounding

5.6.1 Protective grounding

The AC side of the inverter and the device itself are grounded via the protective earth conductor. The DC side of the system is generally under protective extra-low voltage (max. 120 V_{dc}) and does not generate any leakage currents.

Therefore, protective grounding of the metal conductive generator components (for example, the module frame or rack construction) is not required for the purpose of electrical safety.

5.6.2 Functional earthing

Manufacturers of certain solar modules may specify grounding of the positive or negative generator pole to dissipate static charges. Such a functional grounding can be easily implemented because of the isolation transformer in the inverter.

5.6.3 Equipotential bonding

The integration of the inverter into the equipotential bonding of the building may be required as part of a lightning protection or surge protection concept.

For this purpose, the housing of the inverter must be connected to the main grounding busbar, a separate grounding strap or rod earth electrode by means of a potential equalization conductor (at least 6 mm^2 copper).

If no separately marked grounding point is marked on the housing, establish contact with the equipotential bonding conductor via one of the existing housing screws.

NOTE

For reliable metal-to-metal contact, it is necessary that the powder coating of the hood is penetrated and the contact point is protected against oxidation. This is ensured by using a toothed lock washer.

Make sure to reinsert the existing toothed lock washer so that it is in direct contact with the housing.

5.6.4 Lightning protection

If the system consisting of inverter and generator is exposed to a risk of lightning strikes (e.g. exposed location in wind turbines) and is located outside the protection area of a lightning protection system, an effective lightning protection concept is required.

A direct lightning strike must be avoided by setting up appropriate air-termination systems. Care should be taken to ensure that all conductive parts of the system maintain the required separation distance from the lightning protection system.

If the separation distance is undershot, the DC lines at the building entry point must be equipped with a lightning current arrester (type I surge protection) or a combined arrester (type I +II surge protection).

ATTENTION!

Consult a specialist company if necessary. A lightning protection system must be installed professionally and checked at regular intervals to maintain its protective function.

Incorrectly executed or poorly maintained lightning protection is not effective and can cause a fire.

5.6.5 Overvoltage protection

To protect against transient overvoltages caused by indirect lightning strikes or switching operations, SolarInvert inverters have high-power varistors at all inputs and outputs. In the event of an overvoltage event, its energy is dissipated via ground.

The protection level corresponds to either type II (DC) or type II and III (AC) and can be found in the data sheet of the respective device.

The surge protection integrated in the inverter can serve as a substitute for an external surge protection device of the same protection level.

NOTE

The standard-compliant use of the integrated surge protection (type II) requires the integration of the inverter into the equipotential bonding of the building (see 5.6.3).

The full protective effect of the integrated overvoltage protection is only achieved if the device is connected properly.

ATTENTION!

Consult a specialist company if necessary. The introduction of unprotected electrical lines into the building can cause existing surge protection in the house to be impaired.

Incorrectly executed or poorly maintained surge protection is not effective and cannot prevent damage to the electrical system or equipment.

5.7 Communication port

SolarInvert inverters have at least one CONEC brand RJ45 jack for serial communication via RS485.

NOTE

The communication port is protected from the weather by a cover cap. If you use the inverter outdoors and want to connect a communication cable, please use the matching mating connector with sealing sleeve from CONEC with part number 17-10001.

Without the seal, the device is no longer splash-proof according to IP54.

Use a shielded twisted pair cable, for example at least Cat. 6a or a cable with comparable properties. The power supply of the communication bus must be galvanically isolated from the AC mains. Ground the shielding of the cable and provide the bus with a terminating resistor if necessary.

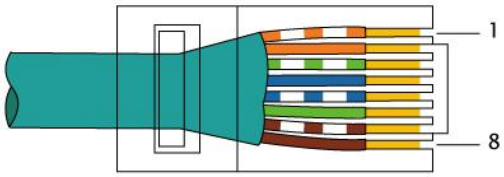
NOTE

For devices with two RJ45 sockets, it is recommended to provide the unused interface with a 120 ohm terminating resistor. For devices with a single RJ45 socket, this resistor is permanently installed and the bus is automatically terminated.

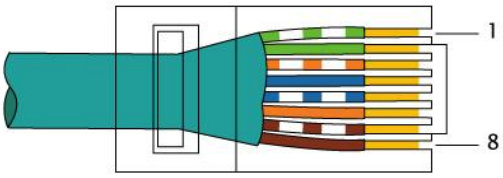
From a total length of approx. 50m, data transmission without a terminating resistor can be disturbed by signal reflection.

The maximum length of the entire bus must not exceed 700m. The maximum number of devices in the bus is 32 (including the master).

The RJ45 connector for connection to the inverter must be assigned as follows:



EIA/TIA-568B



EIA/TIA-568A

Pin	Occupancy
1-6	Not used
7	RS485 A
8	RS485 B

To connect your inverters to a PC, use our USB->RS485 service cable and the "SolarInvert Control Center" (SICC) software.

NOTE

The SICC software, as well as a detailed description of the communication protocol to be used, the control commands and memory registers can be found in the download area of our website at **www.solarinvert.de.**

6 Commissioning

Please check the device for intactness before putting it into operation. Do not put the device into operation if one of the following cases applies:

- The case shows severe deformation and is obviously damaged.
- The connectors on the device are damaged.
- Noises from loose parts can be heard from the casing.
- The device was temporarily submerged in water.

If any of these cases apply, do not attempt to open the device. Please contact our customer service.

6.1 Procedure

1. Unpack the device
2. Check it for external damage
3. Check the scope of delivery for completeness (see section 1.5)
4. Mount the device at a suitable mounting location
5. Check polarity and voltage of the power source
6. Connect the power source to the inverter
7. If necessary, seal unused inputs on the inverter with mating connectors or dummy plugs
8. Check whether the requirements for the mains connection are met (see section 5.4.1)
9. Establish the mains connection and switch on the power.
10. Optional: Connect the inverter to an energy management system or the SolarInvert Control Center for Windows PC via the communication interface.

NOTE

It may be necessary to adapt some of the settings to the specifications of your network operator. These settings can only be changed with a password that is only issued to specialist companies with the appropriate trade certificate.

This password can be requested by emailing service@solarinvert.de.

Instructions on how to change the grid settings for your grid area can be found in the SolarInvert Control Center software for Windows PC (see section 7)

6.2 Troubleshooting

If the inverter is supplied with voltage on the AC and DC sides, it switches on automatically. This is indicated by the status LED lighting up blue.

If, contrary to expectations, this does not happen, please proceed as follows:

1. Is the mains fuse switched on?
2. Is there enough sunlight, wind, etc. and is there sufficient voltage?
   Note: Switch-on voltage see data sheet
3. Is the polarity of the input voltage correct or have plus and minus been reversed?

If you can answer YES to these questions, please reset the device:

1. Switch off mains fuse
2. Remove all cable connections from the inverter
3. Wait at least 3 minutes
   Note: Wind turbines must be short-circuited or otherwise slowed down during this time
4. Reconnect all cable connections to the inverter
5. Switch on the mains fuse again

If the error persists, please contact our customer service. (see section 8.3). Do not attempt to open the device under any circumstances!

NOTE

BAT inverters only switch on when either a control signal is present (0-10 V or RS485) or the inverter has previously been set to the autonomous operating state (see 3.6.2).

7 Using the SolarInvert Control Center Program

The SolarInvert Control Center (SICC) is a free software for Windows PC. The software allows you to adjust the operating parameters of your SolarInvert inverter within a certain range, deviating from the factory settings. It also provides functions for monitoring and diagnosing the devices.

The software is available free of charge in the download area at **www.solarinvert.de.**

8 Service, maintenance and cleaning

8.1 General maintenance instructions

SolarInvert inverters are maintenance-free and should only be cleaned with a damp cloth without additives if necessary. The cooling fins on the back of the housing can be cleaned with compressed air to ensure sufficient heat dissipation.

However, if problems occur and you suspect that your device is defective, please contact your dealer or our customer service.

8.2 Accessibility customer service

In the event of a malfunction or defect, we will help you quickly and without complications.

The best way to reach our customer service is by e-mail (service@solarinvert.de) or by using the contact form on our website:

www.solarinvert.de/kontakt

NOTE

Please never send us unsolicited equipment by parcel service or forwarding agent, as we generally refuse to accept such deliveries. The costs incurred as a result will be borne by the sender.

In the event of service, we will arrange for the collection of your device and provide you with suitable packaging material if required.

8.3 Replacement of a defective inverter

If the inverter is defective, do not attempt to repair it yourself or have a technician do so. Please report the defect to your dealer or SolarInvert customer service.

If your problem cannot be solved otherwise by our customer service, you will usually receive an exchange unit.

How to properly replace the inverter:

1. Switch off mains fuse
2. Remove all cable connections from the inverter
   Note: Wind turbines must be short-circuited or otherwise slowed down during this time
3. Easily loosen retaining screws on the wall
4. Lift the inverter out of the anchorage
5. Mount new inverter
6. Tighten the retaining screws again
7. Reconnect all cable connections to the inverter
8. Switch on the mains fuse again

9 Disposal instructions

Inverters, like all waste electrical equipment, must not be disposed of with household waste under any circumstances and must be taken to a special collection and return system.

Avoiding electrical and electronic waste is an important contribution to environmental protection. Therefore, we always strive to repair or recycle old devices.

If you do not wish to continue using your device, please contact our customer service or your dealer so that we can arrange for the return of your old device.

If this is not possible, please contact the public collection points of your local waste disposal authority.