Quick Installation Guide

Solar inverter
M50A_12s

United Kingdom Europe

This quick installation guide applies for the following inverter models:

- **M50A_12s**

with firmware versions:
DSP: 1.62 / RED: 1.26 / COM: 1.43 or higher

The Delta part number can be found on the type plate of the inverter. The Product Version is shown by the last letters of the serial number, which is also located on the type plate. The firmware versions are listed on the display in the `Inverter Info.` menu.

The Delta manuals undergo continuous revision in order to provide you with complete information regarding the installation and operation of our inverters. Therefore, before starting installation work, **always** consult www.solar-inverter.com to check whether a newer version of the Quick Installation Guide or of the comprehensive Installation and Operation Manual is available.

This manual is intended for installers.

Delta Electronics (Netherlands) B.V.

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Germany

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DANGER

Electric shock

Potentially fatal voltages are present at the inverter during operation. When the inverter is disconnected from all power sources, this voltage remains in the inverter for up to 10 seconds.

Therefore, always carry out the following steps before working on the inverter

1. Turn the AC/DC disconnector to the ***OFF*** position.
2. Disconnect the inverter from all AC and DC voltage sources and make sure that none of the connections can be accidentally restored.
3. Wait at least 10 seconds until the internal capacitors have discharged.

DANGER

Electric shock

Potentially fatal voltages are present at the inverter DC connections. When light falls on the solar modules, they immediately start to generate electricity. This also happens when light does not fall directly on the solar modules.

- ► Never disconnect the inverter from the solar modules when it is under load.
- ► Turn the AC/DC disconnector to the ***OFF*** position.
- ► Disconnect the connection to the mains so that the inverter cannot supply energy to the mains.
- ► Disconnect the inverter from all AC and DC voltage sources. Ensure that none of the connections can be restored accidentally.
- ► Ensure that the DC cables cannot be touched accidentally.

WARNING

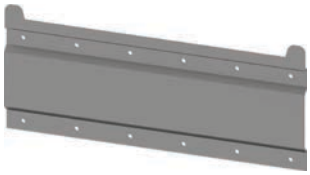
Electric shock

When the cover is removed from the fuse box, this exposes live parts and protection conforming to IP65 is no longer guaranteed.

- ► Remove the cover only when absolutely necessary.
- ► Do not remove the cover if water might enter the inverter.
- ► After work is completed, ensure that the cover is properly replaced and screwed in. Check that the cover is properly sealed.

- To comply with the IEC 62109-5.3.3 safety requirements and avoid injury or material damage, the inverter must be installed and operated in accordance with the safety and operating instructions set out in this manual. Delta Electronics is not responsible for damage resulting from failure to follow the safety and operating instructions set out in this manual.
- The inverter may be installed and commissioned only by installers who have been trained and certified for the installation and operation of mains-based solar inverters.
- All repair work on the inverter must be carried out by Delta Electronics. Otherwise, the warranty will be void.
- Warning instructions and warning symbols attached to the inverter by Delta Energy Systems must not be removed.
- The inverter has a high leakage current value. The grounding cable **must** be connected before commencing operation.
- Do not disconnect any cables while the inverter is under load due to risk of a fault arc.
- To prevent damage due to lightning strikes, follow the provisions that apply in your country.
- The surface of the inverter can get very hot during operation. Wear safety gloves when you touch the inverter (apart from at the display).
- The inverter is very heavy. For hoisting and moving, use a mechanical lifting device (e.g. crane or block and tackle). At least three persons are required for manual hoisting and moving.
- Only equipment in accordance with SELV (EN 60950) may be connected to the RS485 interfaces.
- All connections must be sufficiently insulated in order to ensure the IP65 degree of protection. Seal any unused connection openings with the closure caps supplied.

Scope of supply

Part	Quantity	Description	Part	Quantity	Description
Inverter	1		AC plug	1	China Aviation Optical-Electrical Technology Co. PVE5T125KE36 
Mounting plate	1		Sealing rings for AC plug	1	1 set with 3 sealing rings 
DC plug	12	Multi-Contact MC4-plug for DC + (32.0017P0001-UR for 4/6 mm²) 	Grounding screw	1	To ground the inverter housing; with spring washer, washer and lock washer; mounted on the inverter
	12	Multi-Contact MC4-plug for DC– (32.0016P0001-UR for 4/6 mm²) 	Quick installation guide and basic safety instructions	1	 Installations- und Betriebshandbuch

Check the delivery for completeness and all components for damage before starting installation work.

Do not use any damaged components.

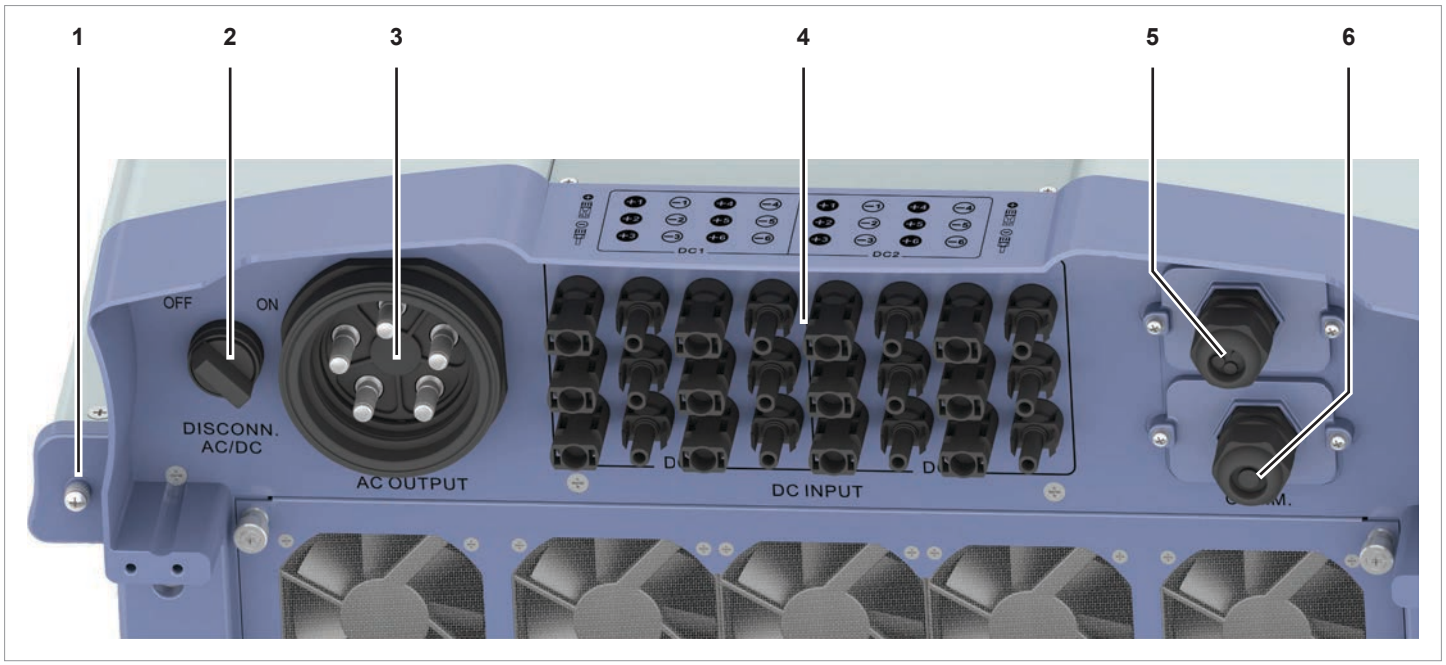
Keep the packaging.

Components of the inverter

Overview

1	Display, buttons, and LED	**4**	Electrical connections
2	Fuse box with string fuses and overvoltage conductors	**5**	Fans
3	Air inlets	**6**	Type plate

Electrical connections



1	Grounding connection	**4**	DC connections
2	AC/DC disconnector	**5**	Communication port 1
3	AC connection	**6**	Communications port 2 (not used)

Display, buttons, and LEDs

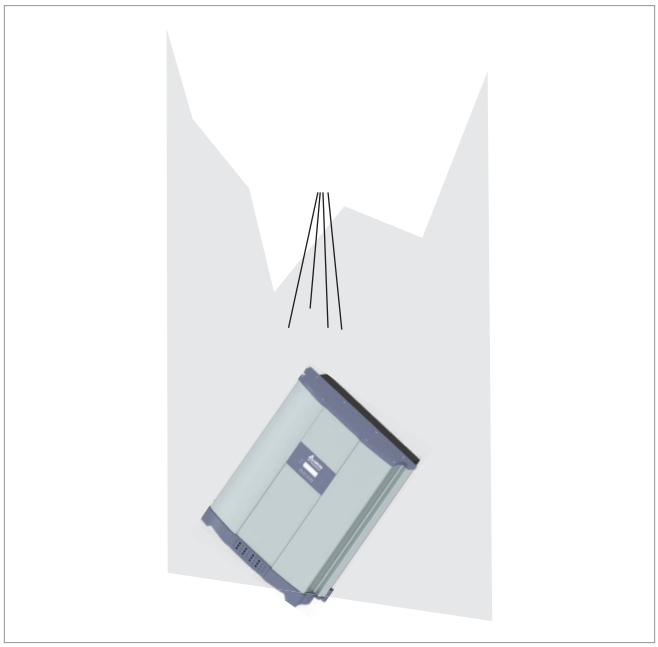
GRID	Mains	Green LED. Lights up when the inverter is supplying electricity to the mains grid.
ALARM	Alarm	Red LED. Indicates an error, a failure or a warning.

EXIT	EXIT	Exit the current menu. Cancel the setting for a parameter. Changes are not applied.
▼	Down	Move downwards in the menu. Reduce the value of a configurable parameter.
▲	Up	Move upwards in the menu. Increase the value of a configurable parameter.
ENT	ENTER	Select menu item. Open a configurable parameter for editing. Cancel the setting for a parameter. Changes are adopted.

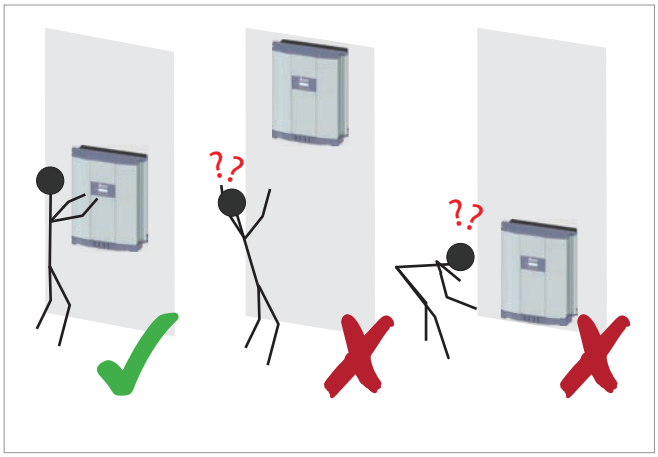
Information on the type plate

 10 seconds	**Danger to life through electric shock** Potentially fatal voltage is present inside the inverter during operation and this voltage remains present for up to 10 seconds after disconnection from the power supply. Only the fuse box may be opened. All other device parts may not be opened.
	Before working on the inverter, read the supplied manual and follow the instructions contained therein.
	This inverter is not separated from the grid by a transformer.
	The housing of the inverter must be grounded if this is required by local regulations.
	WEEE mark The inverter must not be disposed of as standard household waste, but in accordance with the applicable electronic waste disposal regulations of your country or region.

Installation location



- ► The inverter is very heavy. The wall or mounting system must be able to bear the heavy weight of the inverter.
- ► Always use the mounting plate supplied with the inverter.
- ► Use mounting materials (dowels, screws etc.) that are suitable for the wall or the mounting system, as well as the heavy weight of the inverter.
- ► Mount the inverter on a vibration-free wall to avoid malfunctions.
- ► When using the inverter in residential areas or in buildings with animals, possible noise emissions can be disturbing. Therefore, carefully choose the place of installation.
- ► Mount the inverter on a fireproof wall.

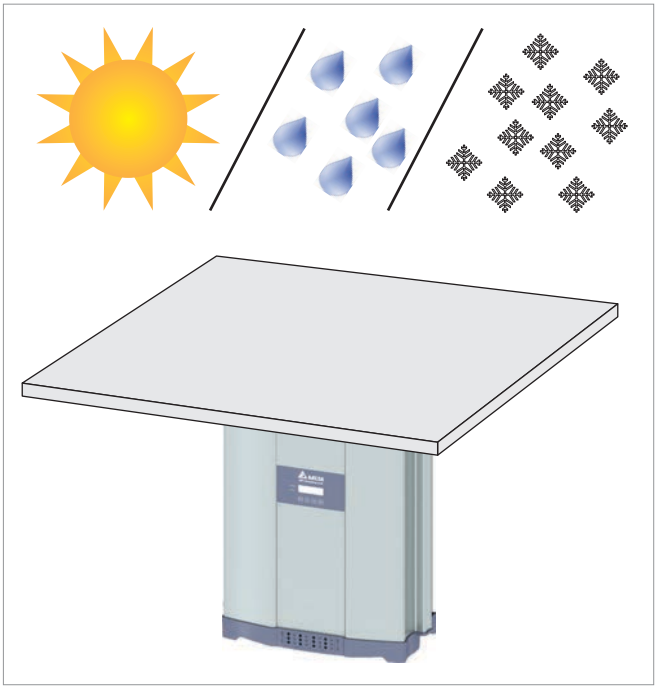


- ► Attach the inverter so that the information on the display can be read and the buttons can be operated without any problems.

Mounting alignment

- ► Mount the inverter vertically.

Outdoor installations



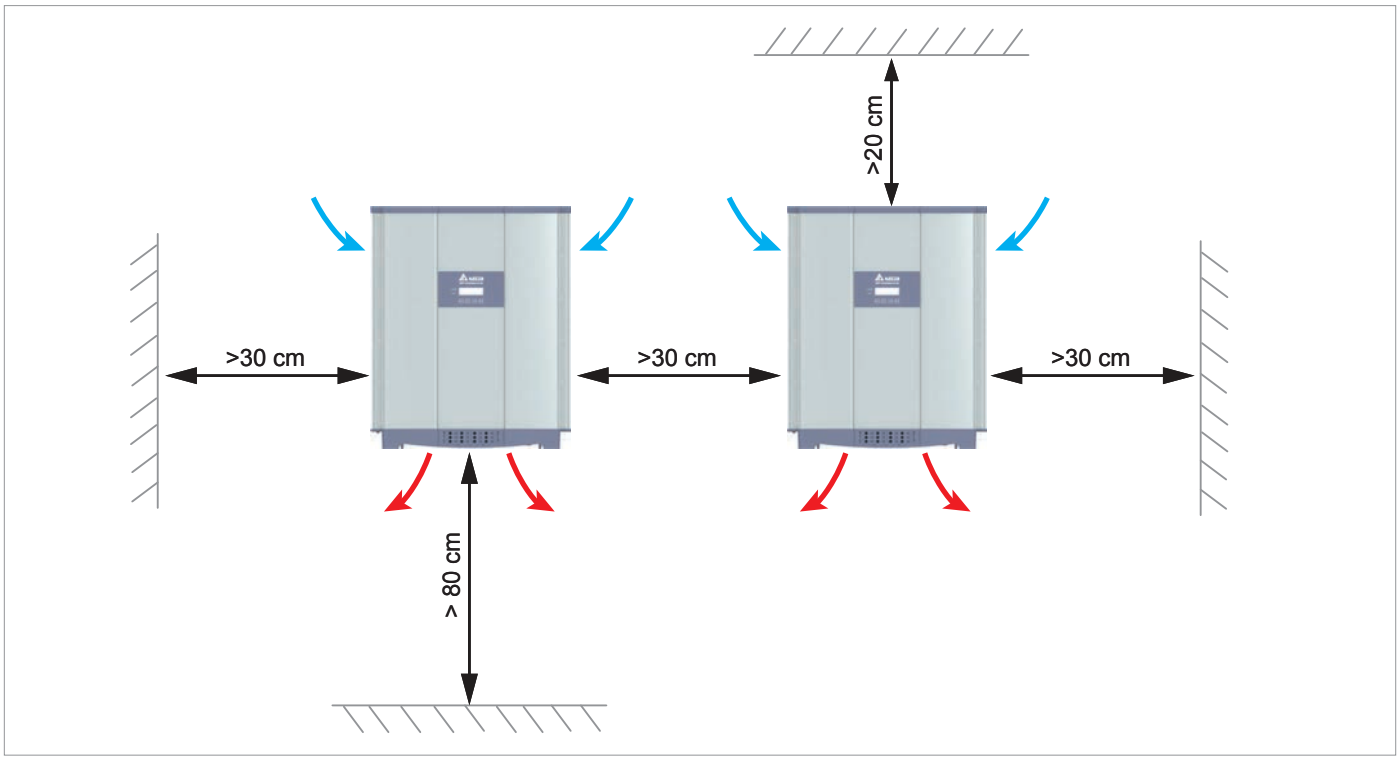
- ► The inverter has a protection degree of IP65 and can be installed indoors and outdoors. Despite this, the inverter should be protected by a roof against direct solar irradiation, rain and snow.

  For example, the power of the inverter will be reduced if it is too heavily heated by solar radiation. This is normal operating behavior for the inverter and is necessary to protect the internal electronics.
- ► In areas with many trees or fields, pollen and other plant material can clog the air inlets or fans.

  In this case, cover the air inlets without impeding the air flow through the inverter. Regularly clean and test the cooling system, see Installation and Operating Instructions.

Planning the installation

Installation clearances and air circulation



- ► Ensure sufficient air circulation. Warm air must be able to escape from below.
- ► Leave enough space around each inverter.
- ► Do not install inverters above one another so that they do not heat each other.
- ► Note the **Operating temperature range without derating** and the **Operating temperature range**.

  When the **Operating temperature range without derating** is exceeded the inverter reduces the AC power fed into the mains.

  When the **Operating temperature range** is exceeded, the inverter stops feeding AC power into the mains.

  This is normal operating behavior for the inverter and is necessary to protect the internal electronics.

Transporting and lifting the inverter

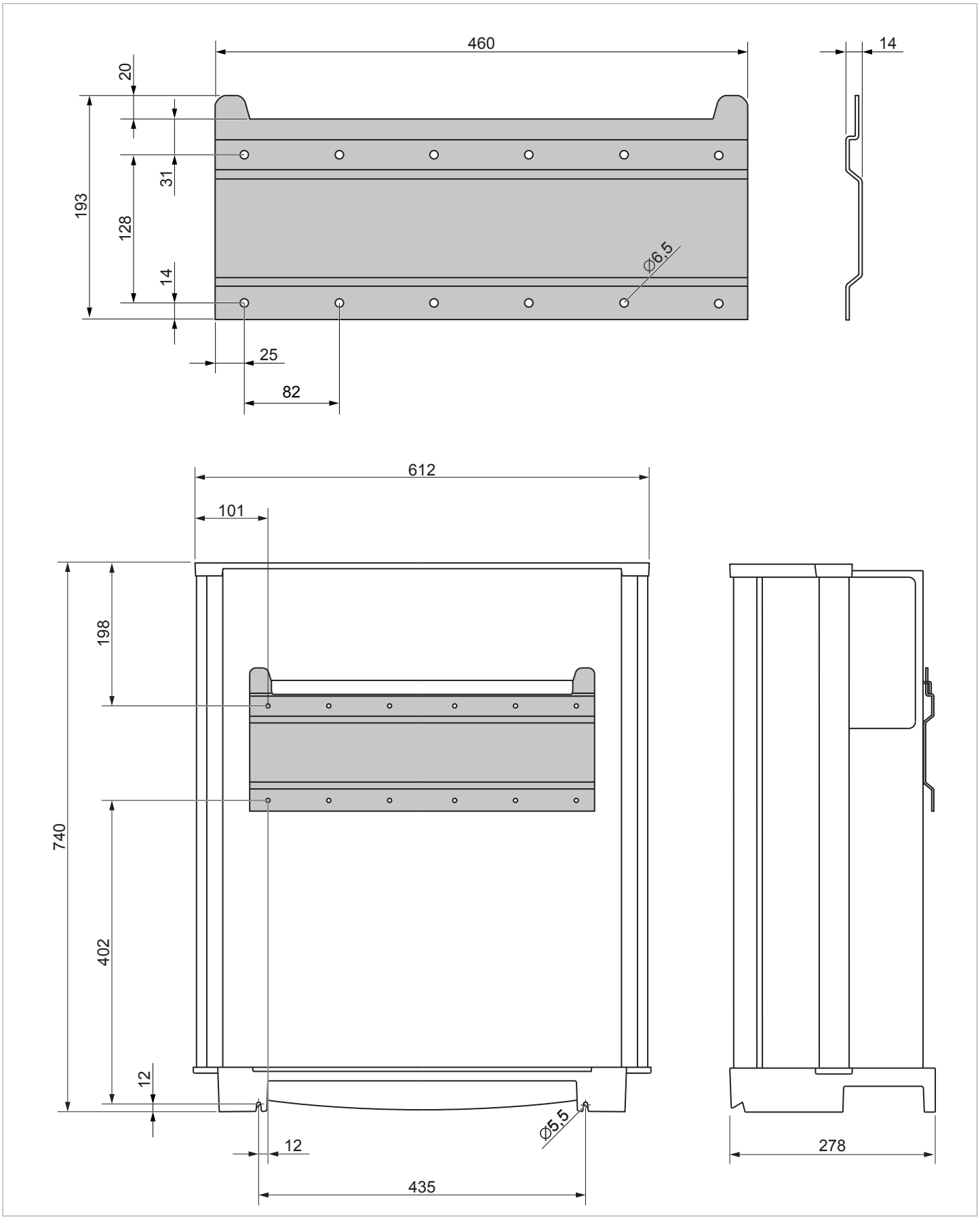
WARNING

Heavy weight

The inverter is very heavy.

- ► The inverter must be lifted and carried by at least 3 people or using appropriate lifting gear.

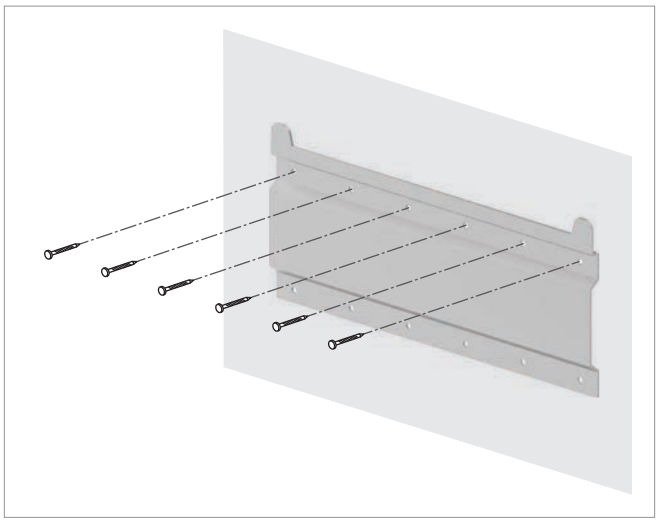
Dimensions

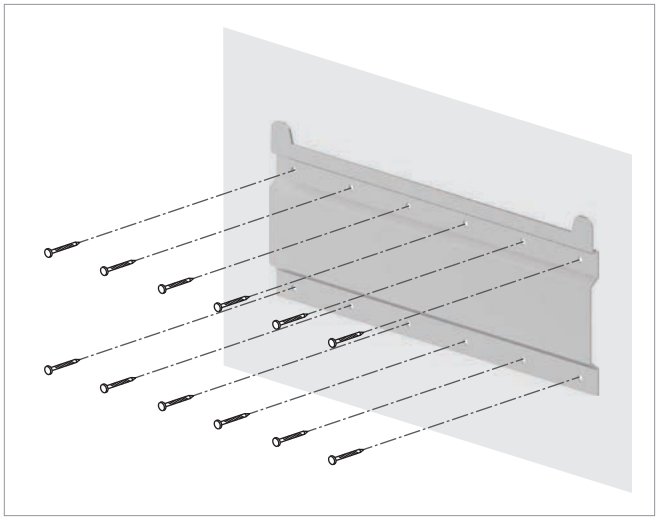

460
14
20
193
31
128
14
Ø6,5
25
82
612
101
198
740
402
12
12
Ø5,5
435
278

Mounting the inverter

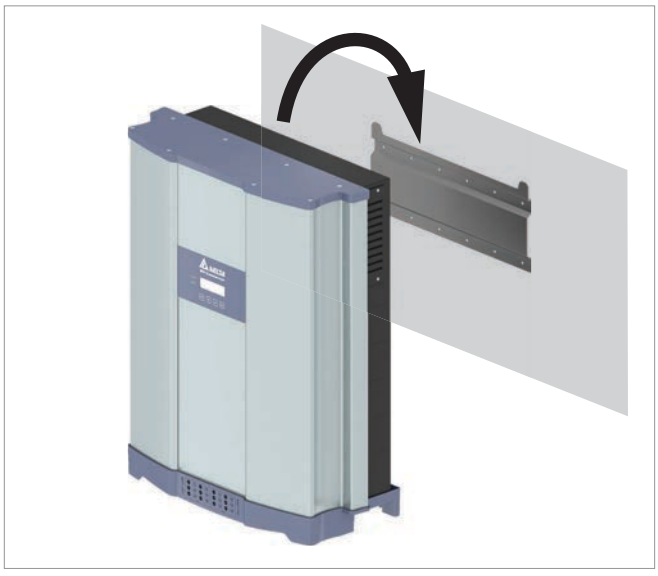
Mounting the inverter on the wall

1. Attach the mounting plate to the wall / the mounting system with 6 or 12 M6 screws.



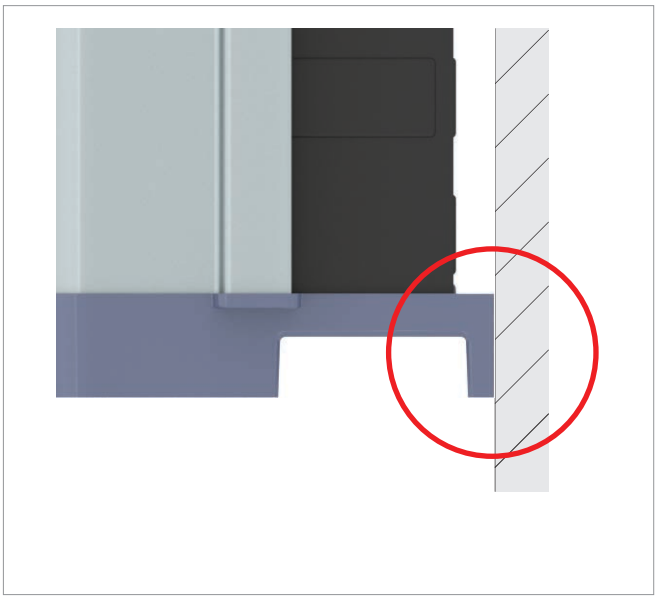


2. Mount the inverter on the mounting plate.

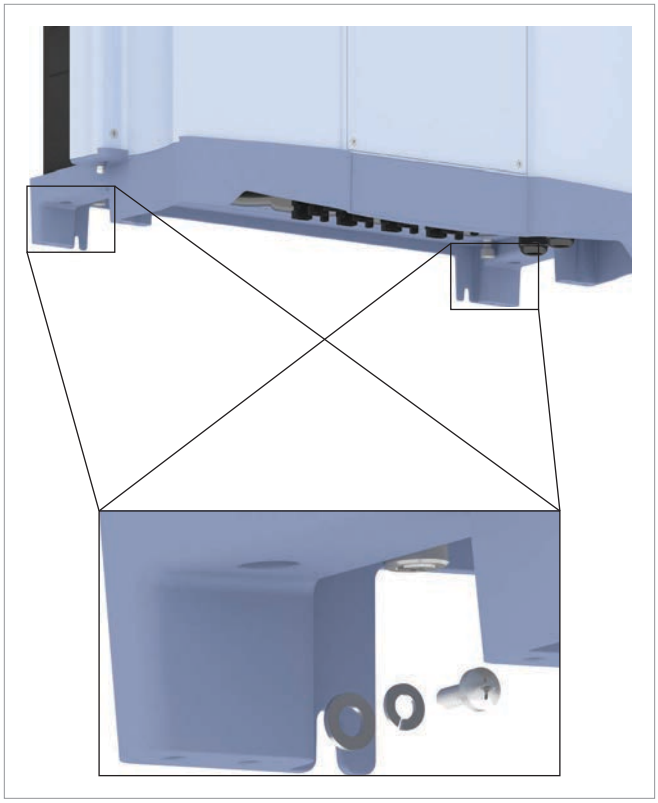


3. Check that the inverter is correctly mounted on the mounting plate.

4. Check that the inverter is correctly positioned at the lower end of the wall / mounting system.

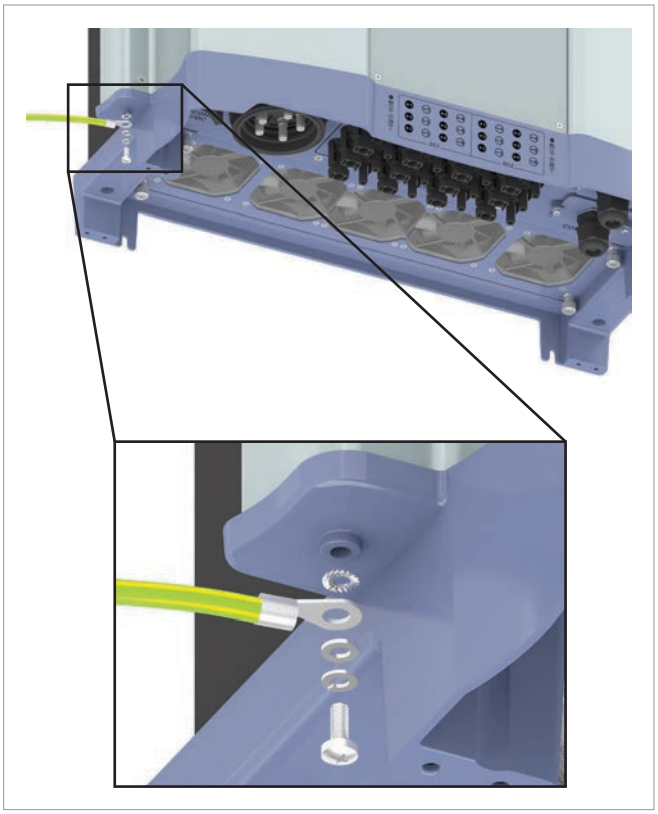


5. Securely screw the inverter to the wall or the mounting system.



Grounding the inverter housing

1. Bolt the grounding cable onto the inverter. M4 screw, spring washer, washer, and lock washer are already mounted on the inverter.



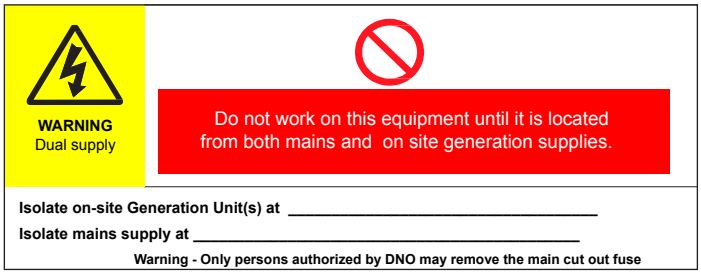
1 Lock washer
2 Grounding cable with cable lug
3 Washer
4 Spring washer
5 M4 screw

2. Perform a continuity check of the grounding connection. If there is insufficient conductive connection, scratch away the paint from the inverter housing under the toothed lock washer to achieve a better electrical contact.

Attaching warning notices to the inverter

► Attach all necessary warning notices to the inverter. Always follow the local regulations.

Some examples of warnings are listed below.



Warning
Two voltage sources
- Distribution network
- PV modules

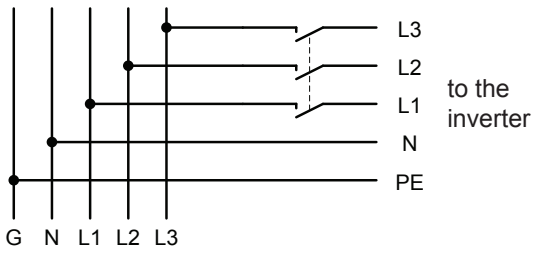
Prior to any work, disconnect both sources

Connecting the mains (AC)

Important safety instructions

- ► Always follow the specific regulations of your country or region.
- ► Always follow the specific regulations of your energy provider.
- ► Install all the stipulated safety and protective devices (such as automatic circuit breakers and/or surge protection devices).
- ► Protect the inverter with a suitable upstream circuit breaker:

Upstream circuit breaker	100 A



Residual current circuit breaker

Due to its design, the inverter cannot supply the mains with DC residual current. This means that the inverter meets the requirements of DIN VDE 0100-712.
Possible error events were assessed by Delta in accordance with the current installation standards. The assessments showed that no hazards arise from operating the inverter in combination with an upstream, type A residual current circuit breaker (FI circuit breaker, RCD). There is no need to use a type B residual current circuit breaker.

Minimum tripping current of the type A residual current circuit breaker	≥300 mA

NOTICE

The required tripping current of the residual current circuit breaker depends first and foremost on the quality of the solar modules, the size of the PV system, and the ambient conditions (e.g. humidity). The tripping current must not, however, be less than the specified minimum tripping current.

Integrated residual current monitoring unit

The integrated, universal current-sensitive residual current monitoring unit (RCMU) is certified in accordance with VDE 0126 1-1:2013-08 §6.6.2.

Integrated string fuses and surge protection devices

- ► Replace damaged string fuses with devices of the same type and from the same manufacturer.
- ► Surge protection devices are available from Delta.

Grounding the inverter

The inverter must be grounded via the PE conductor. To do this, connect the PE conductor of the AC cable to the AC plug pin provided for that purpose.

AC cable requirements

The AC plug provided with the inverter has the following technical characteristics:

AC connection	China Aviation Optical-Electrical Technology Co.
	PVE5T125KE36
Nominal current	100 A
Min./max. Cable diameter	37 ... 44 mm
Min./max. Wire cross-section	25 ... 35 mm²
Recommended torque for terminal screws	3 Nm

The AC plug can only be used with a flexible copper cable.

Consider the following factors when calculating the cable diameter:

- Cable material
- Temperature conditions
- Cable length
- Installation type
- Voltage drop
- Loss of power in the cable

- ► Always follow the applicable installation instructions for AC cables.

France: Follow the installation instructions of UTE 15-712-1. This standard contains the requirements for minimum cable diameters and for avoiding overheating due to high currents.

Germany: Follow the installation instructions of UTE VDE 0100-712. This standard contains the requirements for minimum cable diameters and for avoiding overheating due to high currents.

Australia/New Zealand: Follow the installation instructions of AS/NZS 5033:2005. This standard contains the requirements for minimum cable diameters and for avoiding overheating due to high currents.

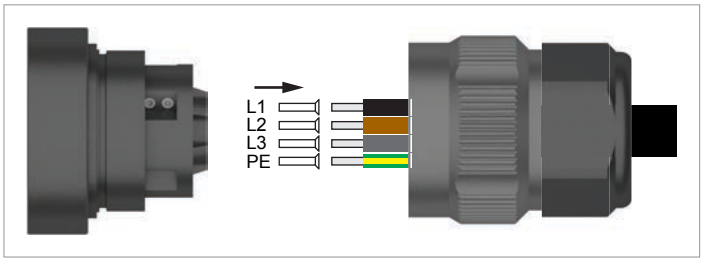
Grounding the inverter

The inverter must be grounded via the PE conductor. To do this, connect the PE conductor of the AC cable to the AC plug pin provided for that purpose.

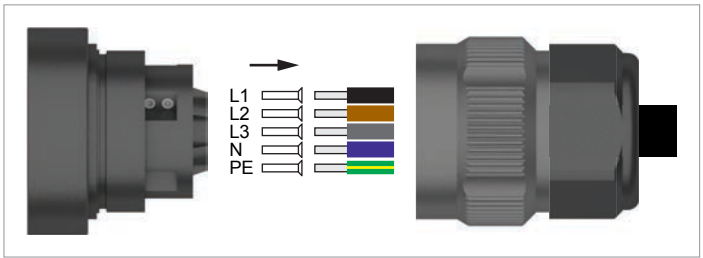
The inverter can be connected to 3-phase grids without neutral conductors (3P3W, 3 phases + PE) and 3-phase grids with neutral conductors (3P4W, 3 phases + N + PE).

- ► If makes no difference which individual wire of the AC cable is connected to which contact.
- ► If the inverter is connected to a grid without a neutral conductor, the AC connection must be changed via the display to 3P3W after commissioning, see “AC connection type”, page 23.

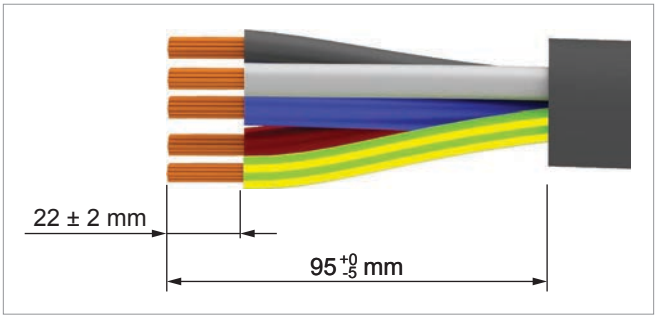
Connecting to a 3-phase grid with a neutral conductor (3P3W)



Connecting to a 3-phase grid without a neutral conductor (3P4W)

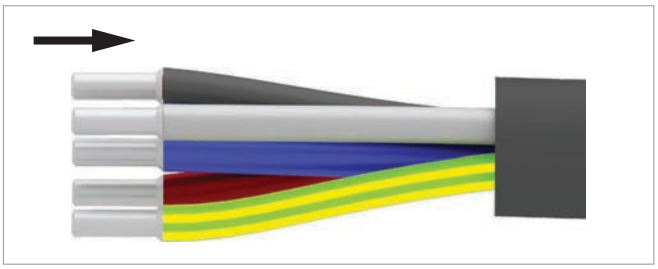


1. Pull all necessary parts of the AC plug over the cable. The parts required depend on the cable diameter, see figure on the following page.
2. Remove the insulation from the cable and wires. Do not twist the wire ends because this reduces the contact surface area with the wire end sleeves.

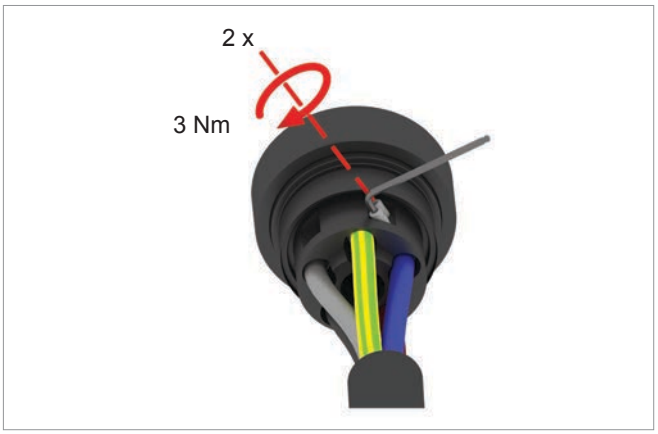


3. Affix ferrules as shown on the following table.

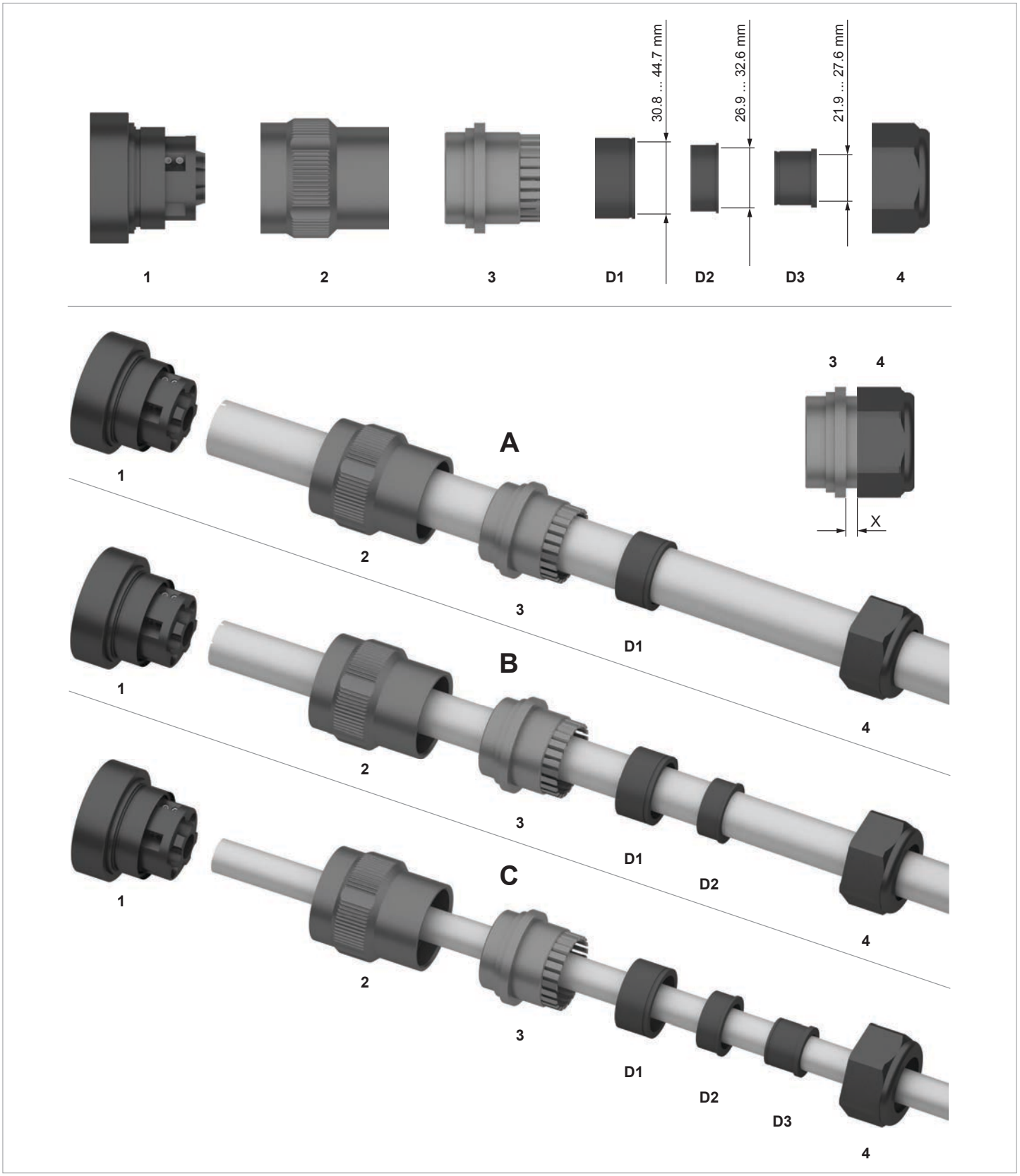
Conductor cross-section	Use wire end-sleeves?
25 mm²	Yes
> 25 mm²	No



4. There are two connecting screws per conductor. **Always** fasten all wires with both connecting screws.

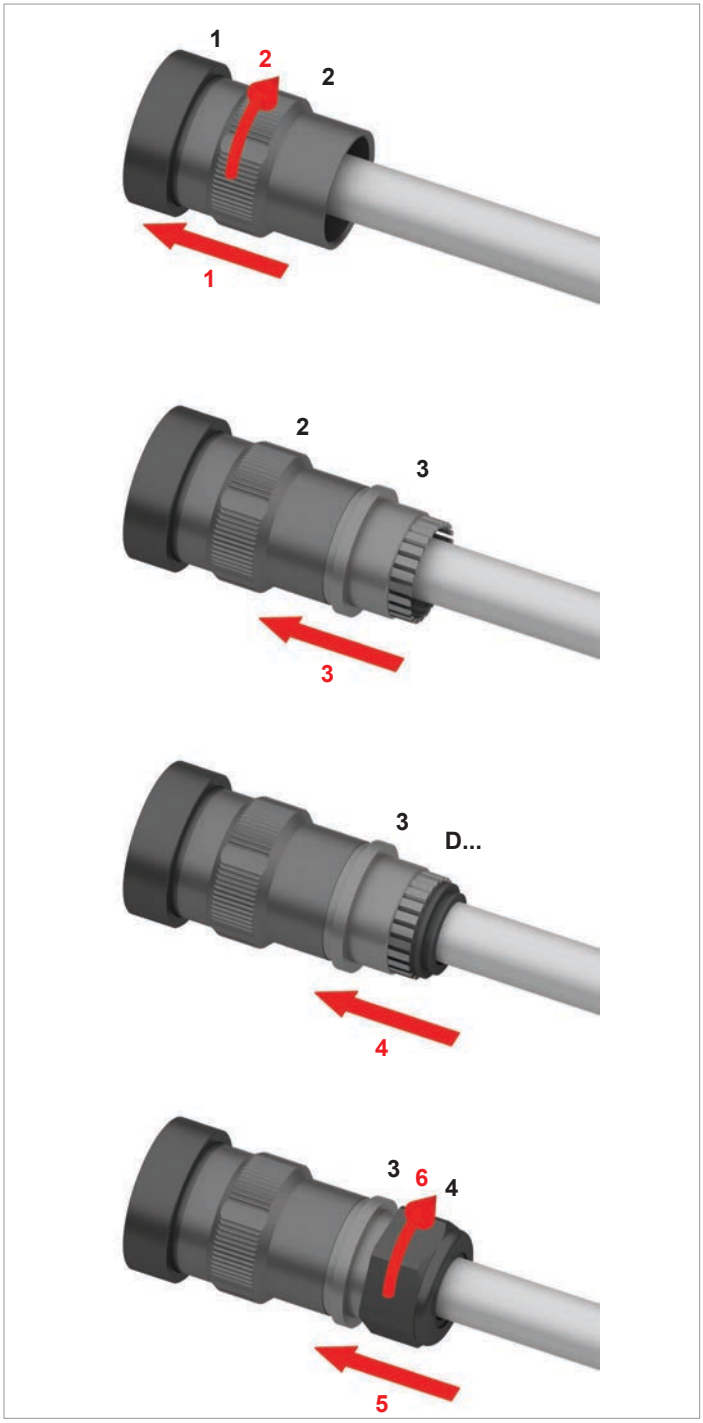


Connecting the mains (AC)



Var.	Cable diameter	Seal	Torque (nut, 4)	Gap X
A	30.8 ... 44.7 mm	D1	6.5 ... 20.0 Nm	1 ... 7.5 mm
B	26.8 ... 35.4 mm	D1 + D2	11.0 ... 17.0 Nm	1 ... 6 mm
C	21.9 ... 27.6 mm	D1 + D2 + D3	13.0 ... 14.0 Nm	1 ... 3.5 mm
	(with 38 mm^2 wire cross-section)	D1 + D2 + D3	12 Nm	3.5 mm

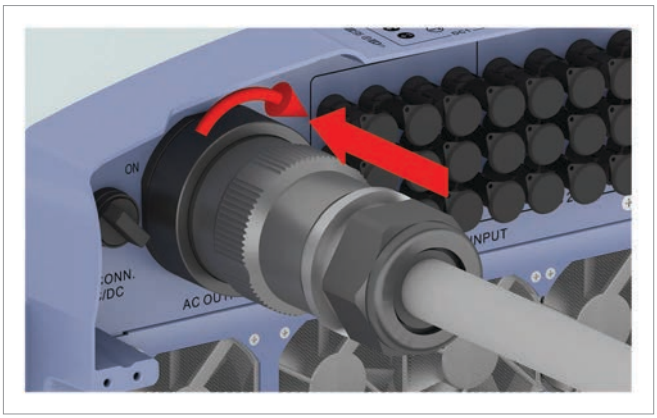
5. Assemble the AC plug.



6. Turn the AC/DC disconnector to the ***OFF*** position.

7. Remove the sealing cap from the AC connection and **store** in a safe place.

8. Plug the AC plug into the AC connection on the inverter and tighten.



9. Fasten the AC cable with a strain relief element.
10. If the inverter is connected to a grid without a neutral conductor, the AC connection type must be changed using the display to 3P3W **after commissioning**, see “AC connection type”, page 23.

Connecting the solar modules (DC)

DANGER

Electric shock

Potentially fatal voltages are present at the inverter DC connections. When light falls on the solar modules, they immediately start to generate electricity. This also happens when light does not shine directly on the solar modules.

- ► Never disconnect the inverter from the solar modules when it is under load.
- ► Turn the AC/DC disconnector to the ***OFF*** position.
- ► Disconnect the connection to the mains so that the inverter cannot supply energy to the mains.
- ► Disconnect the inverter from all AC and DC voltage sources. Ensure that none of the connections can be restored accidentally.
- ► Ensure that the DC cables cannot be touched accidentally.

NOTICE

Maximum power at the DC connections.

Exceeding the maximum current can cause overheating of the DC connections.

- ► Always take into account the maximum current of the DC connections when planning the installation.

NOTICE

Incorrectly dimensioned solar system.

An solar system of the wrong size may cause damage to the inverter.

- ► When calculating the module string, always pay attention to technical specifications (input voltage range, maximum current and maximum input power), see chapter "Technical data".

NOTICE

Ingress of moisture.

Moisture can enter via open DC connections.

- ► To ensure protection degree IP65, close unused DC connections with the rubber plugs that are attached to the DC connections.

- ► In order to start the inverter, DC voltage must run through both DC inputs!

Tools

The protective caps lock the DC plug so that it can only be disconnected from DC connections using the mounting tool.

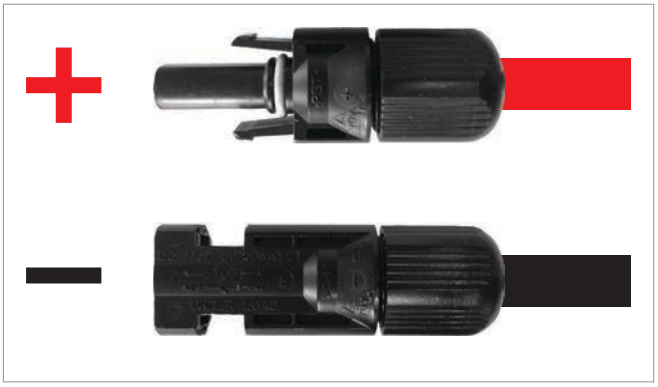
- ► Observe the local regulations with regards to the protective caps.

France: The protective caps must be used.

Mounting tool for disconnecting the DC plug and the protective caps from the DC connections. Available from Multi-Contact.

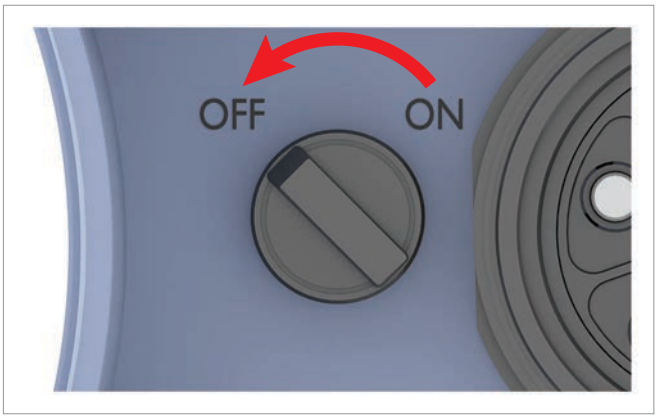
Polarity of the DC voltage

- ► Check the polarity of the DC voltage of the DC strings before connecting the solar modules.



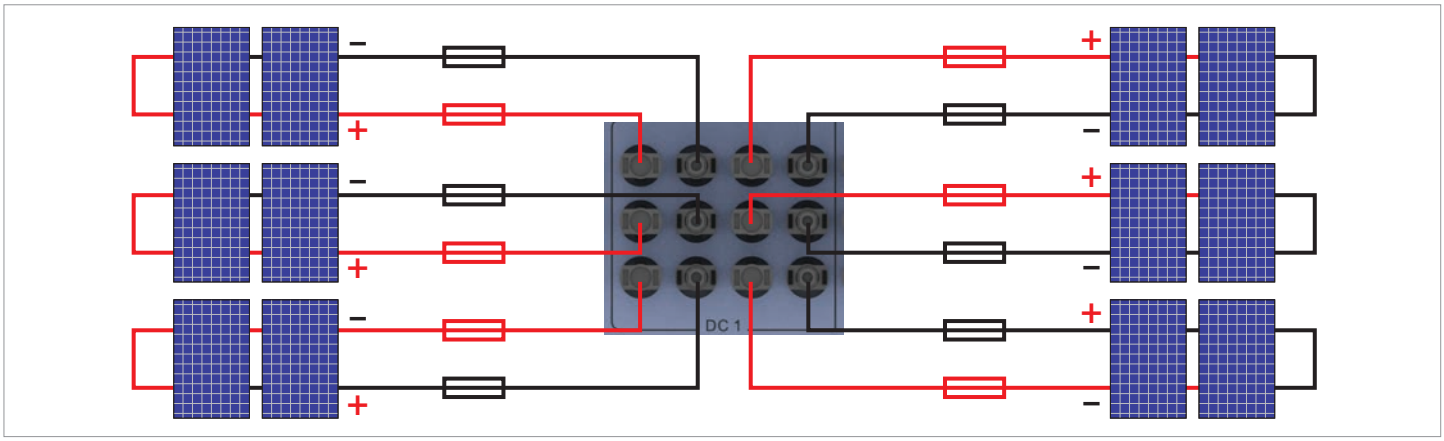
Safety notice

- ► Before connecting the solar modules turn the AC/DC isolating switch to the ***OFF*** position.



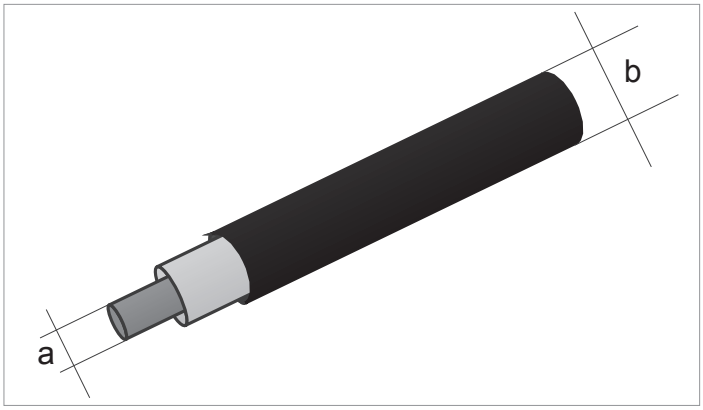
Protective devices

When selecting the necessary protective devices (e.g. fuses) take into account the **Maximum reverse current** of the solar modules.



Cable requirements

The DC plugs for all DC connections are supplied with the inverter.
If you want to order more or need a different size, see the information in the following table.

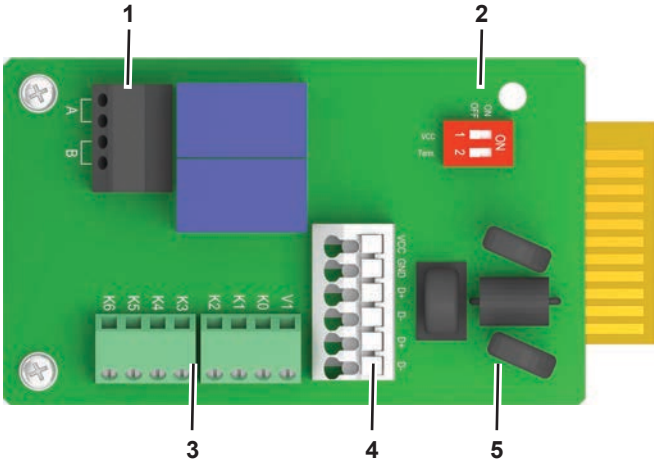


DC connections on the inverter		DC plugs for DC cables			
		a	b	MultiContact	
		mm²	mm		
DC–			1.5/2.5	3-6	32.0010P0001-UR
				5.5-9	32.0012P0001-UR
			4/6	3-6	32.0014P0001-UR
				5.5-9	32.0016P0001-UR [1]
DC+			1.5/2.5	3-6	32.0011P0001-UR
				5.5-9	32.0013P0001-UR
			4/6	3-6	32.0015P0001-UR
				5.5-9	32.0017P0001-UR [1]

1) Included in delivery

Connecting a data logger via RS485

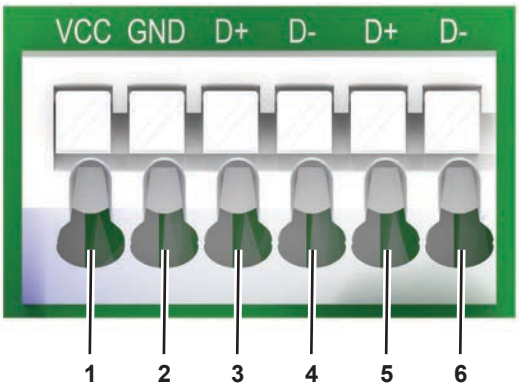
The connections for RS485, the dry contacts, the digital inputs and the external shutdown (EPO) are all on the communications card. This means that the installation work can be combined.



1 2 x dry contacts (terminal box)
2 DIP switch for RS485 termination resistor and VCC
3 Digital inputs and external power-off (terminal block)
4 RS485 (terminal block)
5 Protection against electromagnetic interference (EMI)

Terminal pairs 3/4 or 5/6 can be used. It doesn't matter which terminal pair is used. The second terminal pair is only required when connecting several inverters via RS485.

RS485 terminal block



1 VCC (+12 V; 0.5 A)
2 GND
3 DATA+ (RS485)
4 DATA– (RS485)
5 DATA+ (RS485)
6 DATA– (RS485)

The baud rate can be set on the inverter display after commissioning, see"Baud rate for RS485", page 24.

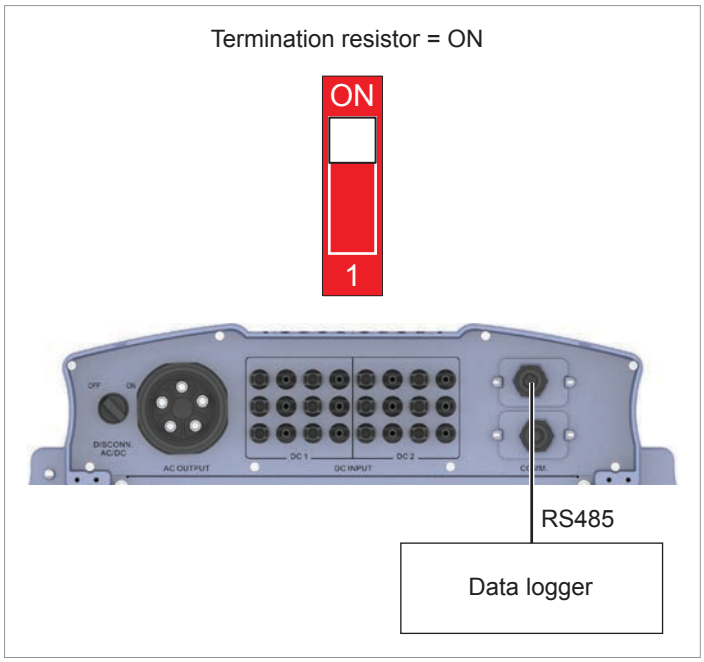
Data format

Baud rate	9600, 19200, 38400; standard: 19200
Data bits	8
Stop bit	1
Parity	Not applicable

DIP switch for RS485 termination resistor and VCC

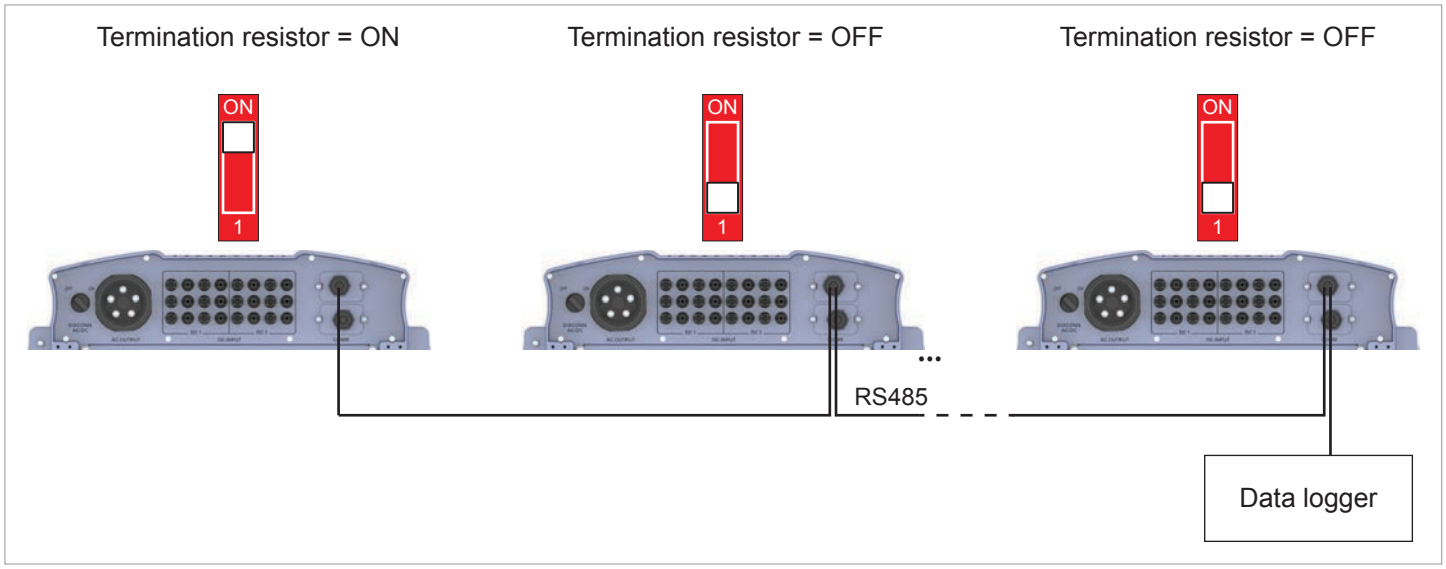
1 VCC (+12 V; 0.5 A)
2 RS485 termination resistor

Connecting a single inverter to a data logger



Connecting multiple inverters to a data logger

- ► If the data logger does not have an integrated RS485 termination resistor, switch on the RS485 termination resistor on the first inverter.
- ► After commissioning the inverters, set a unique inverter ID for each, see “Inverter ID”, page 23.



ATTENTION

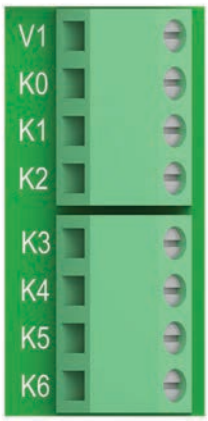
Unwanted currents.
Unwanted currents can flow when multiple inverters are connected via RS485.

- ► Do not use GND and VCC.
- ► If the cable shield is used for providing lightning protection then the housing of only one inverter in the RS485 chain should be grounded.

Connecting digital inputs, external shutdown and dry contacts (optional)

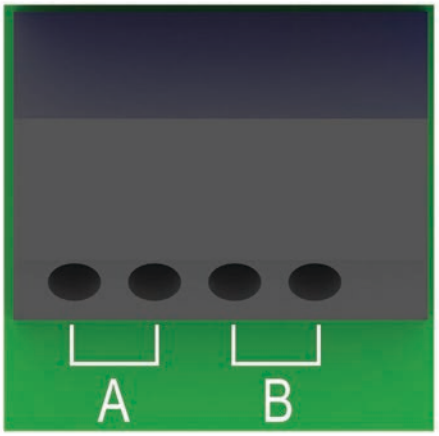
Digital inputs and external shutdown

To control the active power, an external ripple control receiver can be connected to the digital inputs.



Terminal	Des.	Short circuit	Assigned action
1	V1	-	-
2	K0	V1 + K0	External shutdown (E-Power off, EPO)
3	K1	V1 + K1	Set maximum active power to 0%
4	K2	V1 + K2	Set maximum active power to 30 %
5	K3	V1 + K3	Set maximum active power to 60 %
6	K4	V1 + K4	Set maximum active power to 100 %
7	K5	V1 + K5	Reserved
8	K6	V1 + K6	Reserved

Dry contacts



Event	Description
Disable	The function of the dry contacts is disabled.
On Grid	The inverter is connected to the mains.
Fan Fail	The fans are defective.
Insulation	The insulation test has failed.
Alarm	An error event message, fault message or warning has been sent.
Error	An error event message has been sent.
Fault	A fault message has been sent.
Warning	A warning message has been sent.

The default setting for both contacts has been "Disabled".

After commissioning, an event can be assigned to the dry contacts on the display, see “Dry contacts”, page 25

To perform the commissioning steps described in this section the inverter must be supplied with either AC power (grid) or DC power at both DC inputs (solar modules).

1. Turn the AC/DC disconnector to the ***ON*** position.

```
 Select language
►English
 Deutsch
 Français
```

2. Use the ▼ and ▲ buttons to select the **`English`** language and then press the ENT button.

```
►G59-3 230 HV
 GERMANY LV
 GERMANY MV
 INDIA
```

3. Use the ▼ and ▲ buttons to select your country or mains type and then press the ENT button.

```
Are you sure to
set country:
    UK G59-3 230
      ►Yes / No
```

4. Check that the correct country or mains type is selected.

If the correct country is selected, use the ▼ and ▲ buttons to select the **`Yes`** entry and the press the ENT button.

To change the selection, press the EXIT button.

→ The inverter starts a self-test lasting approx. 2 minutes. The remaining time is shown on the display.

```
 Delta/Solivia prot.
►Sunspec prot.
```

NOTICE

The Delta protocol is the Delta Modbus protocol and is intended for utilization with the Delta Service Software.

5. Use the ▼ and ▲ buttons to select SUNSPEC as RS485 protocol option and then press the ENT button.

```
Are you sure to
set protocoll:
   Sunspec prot.
      ►Yes / No
```

6. Check that the correct protocol is selected.

If the protocol is selected, use the ▼ and ▲ buttons to select the **`Yes`** entry and then press the ENT button.

Press the EXIT button to change the selection

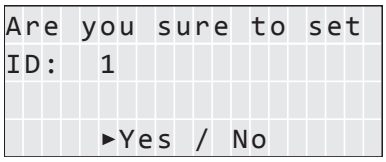
```
    Setting ID:
       ID=001
```

NOTICE

If multiple inverters are connected to the PV system then a different inverter ID must set for each inverter. For example, the inverter ID is used in monitoring systems to uniquely identify each inverter.

7. Use the ▼ and ▲ buttons to set the individual digits and then press the ENT button.

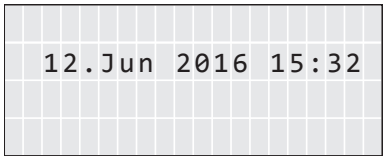
Commissioning – basic settings



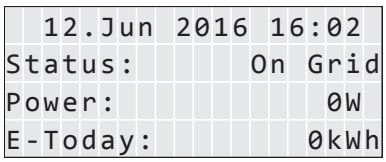
8. Check that the correct inverter ID is set.

If the correct inverter ID is selected, use the ▼ and ▲ buttons to select the **`Yes`** entry and the press the ENT button.

Press the EXIT button to change the selection



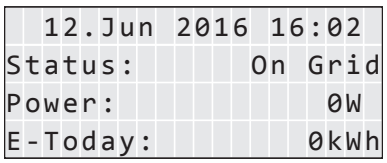
9. Press the ▼ and ▲ buttons to select the entry **`Date and time`** and press the ENT button.



☑ The basic settings are now complete. The standard menu is displayed.

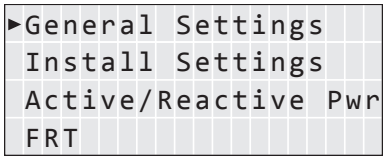
Commissioning – further settings (optional)

Date and time

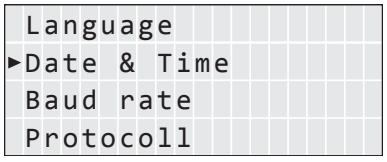


1. If the default information is displayed, press the EXIT button to open the main menu.

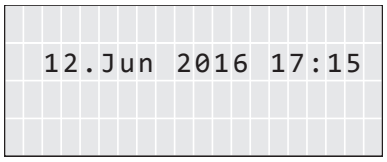
Otherwise, press the EXIT button repeatedly until the main menu is displayed.



2. Use the ▼ and ▲ buttons to select the **`General Settings`** entry and then press the ENT button.



3. Press the ▼ and ▲ buttons to select the entry **`Date and time`** and press the ENT button.

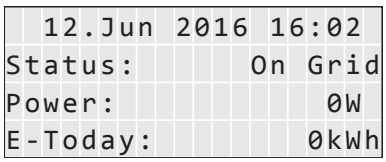


4. Use the ▼ and ▲ buttons to configure the value and then press the ENT button.

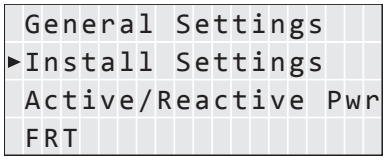
Repeat the procedure for the other settings.

AC connection type

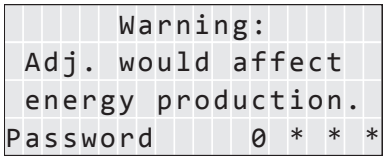
By default, the AC connection type is set to 3P4W (3 phases + N + PE). You only need to change this setting if you are using an AC system with 3 phases + PE (3P3W). For a description of how to connect the inverter to the grid, see “Connecting the mains (AC)”, page 12.



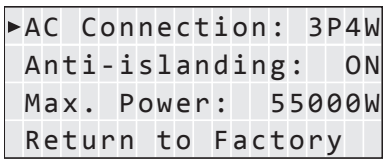
1. If the default information is displayed, press the EXIT button to open the main menu. Otherwise, press the EXIT button repeatedly until the main menu is displayed.



2. Use the ▼ and ▲ buttons to select the **Install Settings** entry and then press the ENT button.



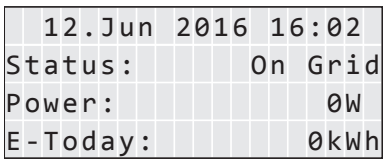
3. This function is protected with password 5555.
   Use the ▼ and ▲ buttons to set the individual numerals.
   Press the ENT button to confirm a numeral.



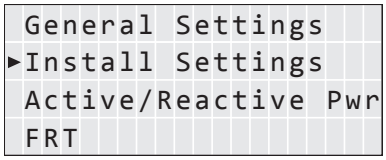
4. Use the buttons ▼ and ▲ to select the entry **AC connection** and press the ENT button.

5. Use the ▼ and ▲ buttons to select the **3P3W** entry and then press the ENT button.

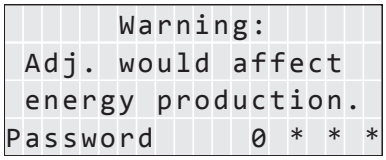
Inverter ID



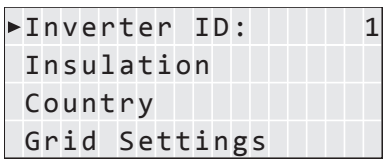
1. If the default information is displayed, press the EXIT button to open the main menu. Otherwise, press the EXIT button repeatedly until the main menu is displayed.



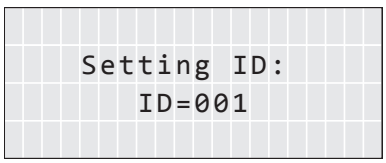
2. Use the ▼ and ▲ buttons to select the **Install Settings** entry and then press the ENT button.



3. This function is protected with password 5555.
   Use the ▼ and ▲ buttons to set the individual numerals.
   Press the ENT button to confirm a numeral.



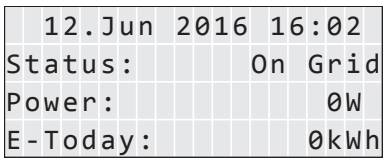
4. Use the ▼ and ▲ buttons to select the **Inverter ID** entry and then press the ENT button.



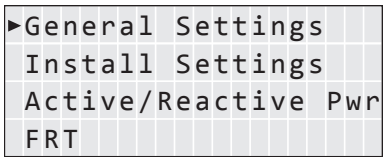
5. Use the ▼ and ▲ buttons to configure the value and then press the ENT button.

Commissioning – further settings (optional)

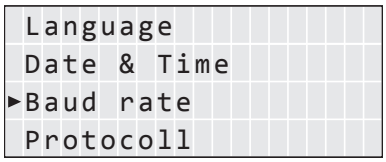
Baud rate for RS485



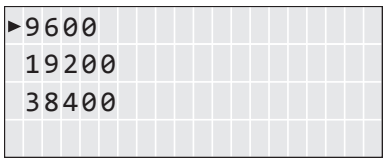
1. If the default information is displayed, press the EXIT button to open the main menu. Otherwise, press the EXIT button repeatedly until the main menu is displayed.



2. Use the ▼ and ▲ buttons to select the **General Settings** entry and then press the ENT button.



3. Use the buttons ▼ and ▲ to select the entry **Baud Rate** and press the ENT button.

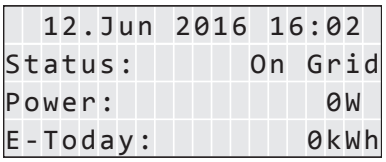


4. Use the ▼ and ▲ buttons to configure a value and then press the ENT button. Repeat the procedure for the other settings.

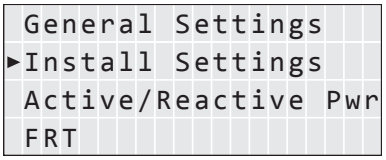
Active power limitation

Change this setting only after consultation with Delta customer service.

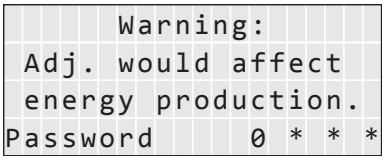
To change this setting, you need a special password that you receive from Delta customer service. You can find the contact information on the back of this document.



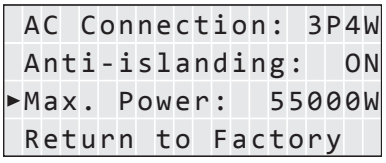
1. If the default information is displayed, press the EXIT button to open the main menu. Otherwise, press the EXIT button repeatedly until the main menu is displayed.



2. Use the ▼ and ▲ buttons to select the **Install Settings** entry and then press the ENT button.



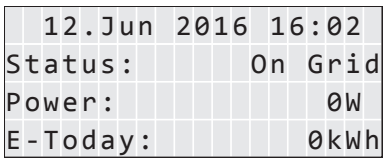
3. Enter the password provided by Delta customer service.
   Use the ▼ and ▲ buttons to set the individual numerals.
   Press the ENT button to confirm a numeral.



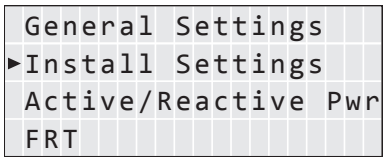
4. Use the ▼ and ▲ buttons to select the **Max. Power** entry and then press the ENT button.

5. Use the ▼ and ▲ buttons to configure a value and then press the ENT button.

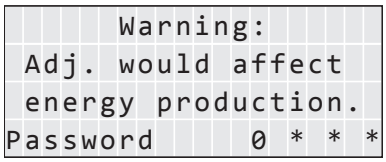
Dry contacts



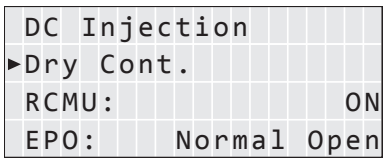
1. If the default information is displayed, press the EXIT button to open the main menu. Otherwise, press the EXIT button repeatedly until the main menu is displayed.



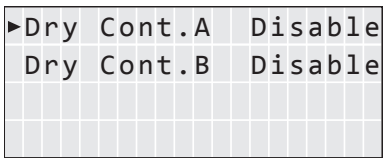
2. Use the ▼ and ▲ buttons to select the **`Install Settings`** entry and then press the ENT button.



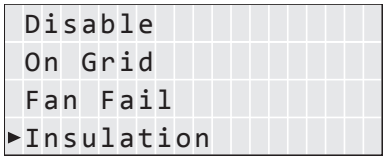
3. This function is protected with password 5555.
Use the ▼ and ▲ buttons to set the individual numerals.
Press the ENT button to confirm a numeral.



4. Use the buttons ▼ and ▲ to select the **`Dry Cont.`** entry and press the ENT button.



5. Use the buttons ▼ and ▲ to select a dry contact and press the ENT button. The current setting is shown after the name of the dry contact.



6. Use the ▼ and ▲ buttons to select an option and then press the ENT button.
See "Connecting digital inputs, external shutdown and dry contacts (optional)", page 20 for the available options.

Technical specifications

Input (DC)	M50A_12s
Maximum recommended PV power	
Symmetrical load	63 kW_P
Asymmetrical load	70 kW_P
Maximum input power (total / per input)	58 kW / 34.8 kW [1)]
Rated power	52 kW
Input voltage range	200 ... 1100 V_{DC} [2)]
Nominal voltage	600 V_{DC}
Cut-in voltage	250 V_{DC}
Cut-in power	40 W
MPP input voltage range	200 ... 1000 V_{DC}
MPP input voltage range with full power	
Symmetrical load	520 ... 800 V_{DC}
Asymmetrical load	620 ... 800 V_{DC}
Asymmetrical load	60/40%; 40/60%
Maximum input power, total (DC1/DC2)	100 A (50 A / 50 A)
Maximum short circuit power upon fault	72 A (12 A per string)
Number of MPP trackers	Parallel inputs: 1 MPP tracker; separate inputs: 2 MPP trackers
Number of DC inputs, total (DC1/DC2)	12 (6 / 6)
Electrical isolation	No
Overvoltage category [3)]	III
String fuses	15 A [4)]
Surge protection devices	Type 2, replaceable

Output (AC)	M50A_12s
Maximum apparent power [5)]	55 kVA [6)]
Rated apparent power [5)]	50 kVA
Nominal voltage [7)]	230 ±20 %/400 V_{AC} ±20 %, 3 phases + PE or 3 phases + N + PE
Nominal current	73 A
Max. current	80 A
Switch-on current	200 A / 100 µs
Nominal frequency	50 / 60 Hz
Frequency range [7)]	45 ... 65 Hz
Configurable power factor	0.8 cap ... 0.8 ind
Total harmonic distortion	<3%
DC injection	<0.5% at nominal current
Power loss in night mode	<2.5 W
Overvoltage category [3)]	II
Surge protection devices	Type 2, replaceable

Technical specifications

Mechanical details	M50A_12s
Dimensions (W x H x D)	612 x 740 x 278 mm
Weight	74 kg
Cooling	5 fans
AC connection type	China Aviation Optical-Electrical Technology Co.
	PVE5T125KE36
DC connection type	12 x multi-contact MC4
Communication interfaces	2x RS485, 2x dry contacts, 1x external power-off, 6x digital inputs

General specifications	M50A_12s
Delta model name	M50A_12s
Delta part number	RPI503M221000
Maximum efficiency	98.6%
EU efficiency	98.4%
Operating temperature range	-25 ... +60 °C
Operating temperature range without derating	-25 ... +48 °C
Storage temperature range	-30 ... +60 °C
Relative humidity	0 ... 100%, non-condensing
Max. operating height	2000 m above sea level

Standards and guidelines	M50A_12s
Safety class as per IEC 60529	IP65
Safety class as per IEC 61140	I
Soiling class as per IEC 60664-1	II
Overload behavior	Current limit, power limit
Safety	IEC 62109-1 / -2, CE-compliance
EMC	EN 61000-6-2, EN 61000-6-3
Fault-free operation	IEC 61000-4-2 / -3 / -4 / -5 / -6 / -8
Harmonic distortion	EN 61000-3-2
Fluctuations and fibrillations	EN 61000-3-3
Mains connection guidelines	You will find the current list at www.solar-inverter.com.

1) Maximum 34.8 kW per DC input with asymmetrical load (60/40 %)
2) 1000 V for inverter with firmware version lower than DPS 1.32
3) IEC 60664-1, IEC 62109-1
4) The specified value applies for a temperature of 25 °C in the **interior of the inverter**. At higher temperatures, the value can drop down to 10 A.
5) For cos phi = 1 (VA = W)
6) Can occur under the following conditions: DC input voltage > 580 V; symmetrical load; ambient temperature < 25 °C.
7) AC voltage and frequency range are programmed using the corresponding country specifications.

Service - Europe

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France	support.france@solar-inverter.com	0800 919 816 (toll free)
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