



## Quick Installation Guide

RPI M50A\_12s



Europe



**This quick installation guide applies for the following inverter models:**

- **RPI M50A\_12s (with string fuses and overvoltage conductor)**

with model number:

**RPI503M221000**

and

with firmware versions:

DSP: 1.41 / RED: 1.22 / COM: 1.22

The model number can be found on the type plate of the inverter. The firmware versions are listed on the view in menu ***Inverter information***.

If you notice discrepancies between the descriptions in this installation guide and the information on the inverter display, to [www.solar-inverter.com](http://www.solar-inverter.com) and download the version of the installation guide that matches the model number and the firmware version of your inverter.

On the website, you will also find the installation and operating instructions with detailed information on the inverter.

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This manual is intended for installers.

The information in this manual is to be treated as confidential and no part of this manual may be reproduced without prior written permission from Delta Energy Systems. The information in this manual may not be used for any purpose not directly connected to use of the inverter.

All information and specifications can be modified without prior notice.

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# 1 Basic safety instructions

## DANGER



### Electrical shock

Potentially fatal voltage is applied to 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. Place the AC/DC isolating switch in 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 for at least 10 seconds until the internal capacitors have discharged.

- To comply with the IEC 62109-5.3.3 safety requirements and avoid injury or damage to property, the inverter must be installed and operated in accordance with the safety and operating instructions set out in this manual. Delta Energy Systems is not responsible for damage resulting from failure to follow the safety and operating instructions set out in this manual.
- The inverter may only be installed and started by installers who have been trained and certified for the installation and operation of grid-based solar inverters.
- All repair work on the inverter must be carried out by Delta Energy Systems. 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. Only touch the inverter (outside of the display) with safety gloves.
- The inverter is very heavy. The inverter must be lifted and carried by at least three people.
- 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 protection class. Unused connections must be closed using cover caps.

## DANGER



### Electrical shock

Potentially fatal voltage is applied to the inverter's DC connections during operation. 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.
- ▶ Place the AC/DC isolating switch in the **OFF** position.
- ▶ Uncouple the connection to the grid so that the inverter cannot supply energy to the grid.
- ▶ 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



### Electrical shock

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

- ▶ Remove the cover only when it is 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.

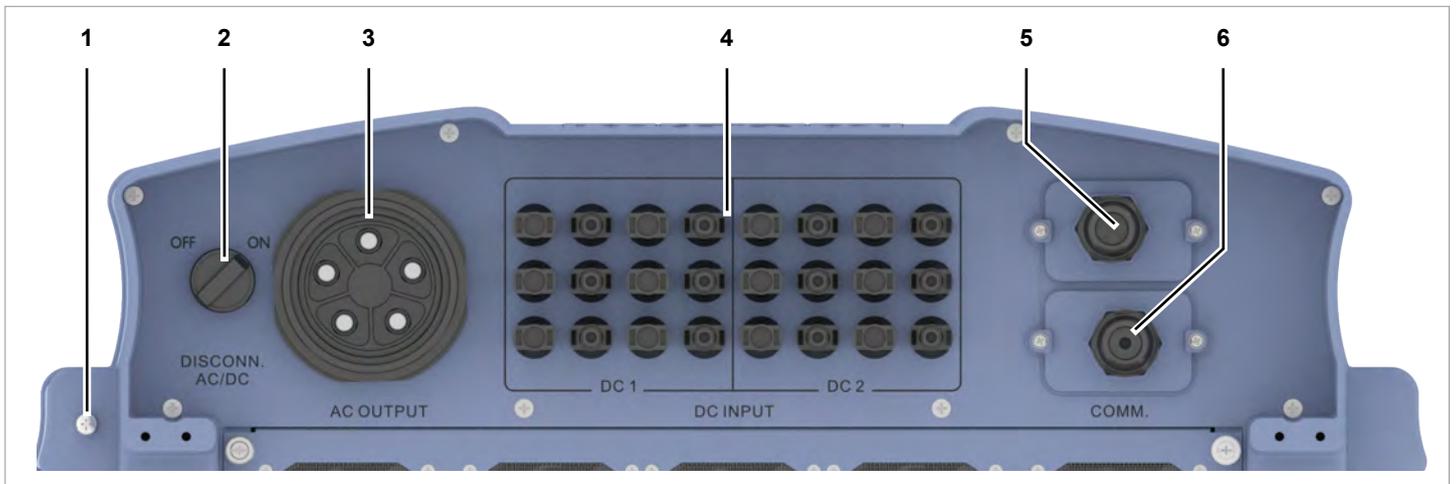
## 2 Components of the inverter

### 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



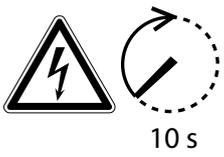
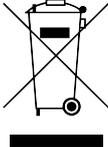
- |                          |                  |                                    |
|--------------------------|------------------|------------------------------------|
| 1 Grounding connection   | 3 AC connection  | 5 Communication port 1             |
| 2 AC/DC isolating switch | 4 DC connections | 6 Communications port 2 (not used) |

## Display, buttons, and LEDs

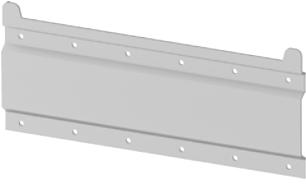


Label	Designation	Use
<b>LEDs</b>		
<b>GRID</b>	Grid	Green LED; lights up when the inverter is supplying power to the grid.
<b>ALARM</b>	Alarm	Red LED; displays a warning, an error or a fault.
<b>Buttons</b>		
	Exit	Exit the current menu. Cancel the setting for a parameter. Changes are not adopted.
	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.
	Enter	Select menu item. Open a configurable parameter for editing. Cancel the setting for a parameter. Changes are adopted.

## Information on the Type Plate

	<p><b>Danger to life through electric shock</b></p> <p>Potentially fatal voltage is applied to the inverter during operation. This voltage persists even 10 seconds after disconnection of the power supply.</p> <p>Never open the inverter. The inverter contains no components that must be maintained or repaired by the operator or installer. Opening the housing will void the warranty.</p>
	<p>Before working with the inverter, you must read the supplied manual and follow the instructions contained therein.</p>
	<p>This inverter is not separated from the grid with a transformer.</p>
	<p>The housing of the inverter must be grounded if this is required by local regulations.</p>
	<p>WEEE marking</p> <p>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.</p>

### 3 Scope of delivery

Part	Quantity	Description	Part	Quantity	Description
Inverter	1		AC plug	1	China Aviation Optical-Electrical Technology Co. PVE5T125KE36 
Mounting plate	1		Grounding screw	1	To ground the inverter housing; with spring washer, washer and lock washer; mounted on the inverter
DC plug	12	Multi-contact MC4-plug for DC + (32.0017P0001-UR for 4/6 mm <sup>2</sup> ) 	Quick installation guide and basic safety instructions	1	 <small>Installationskurzanleitung</small> <small>RPI M50A_12s</small> 
	12	Multi-contact MC4-plug for DC- (32.0016P0001-UR for 4/6 mm <sup>2</sup> ) 			



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

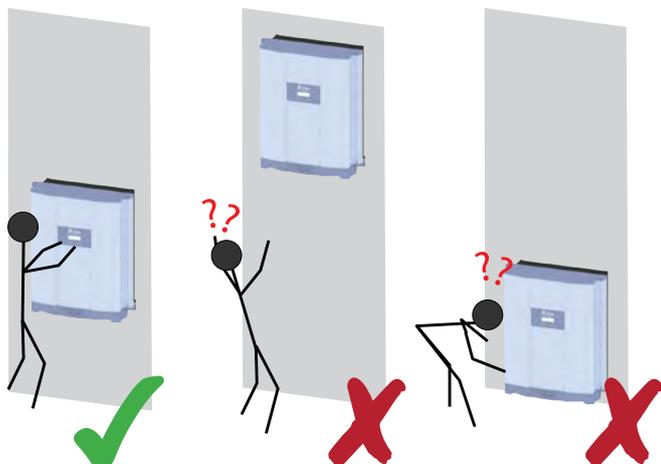
Do not use any damaged components.



Keep the packaging.

# 4 Planning installation

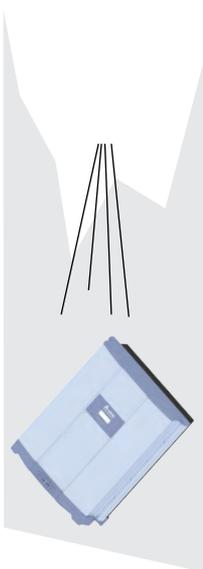
## Mounting location for the inverter



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



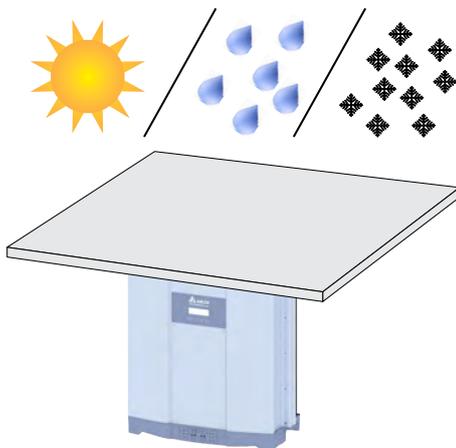
- ▶ The inverter is very heavy, see [“Technical data”, page 22](#) (Technical Data, page 22). The inverter must be lifted and carried by at least three people.



- ▶ The inverter is very heavy. The wall has to be able to bear the weight of the inverter.
- ▶ Always use the mounting plate supplied with the inverter.
- ▶ Use mounting material (dowels, screws etc.) that are suitable for the wall or the mounting system, as well as the heavy weight.
- ▶ Mount the inverter on a vibration-free wall to avoid disruptions.
- ▶ 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.

## Outdoor installations

- ▶ The inverter is designed in accordance with protection class IP65 and can be installed indoors or in protected outdoor areas (i.e. outside but protected by a roof from direct sun, rain and snow).

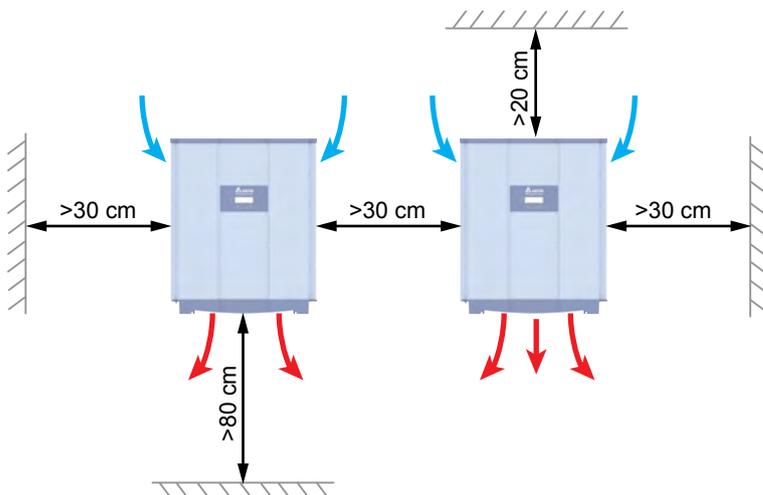


## Mounting alignment

- ▶ Mount the inverter vertically.



## Ambient temperature and air circulation

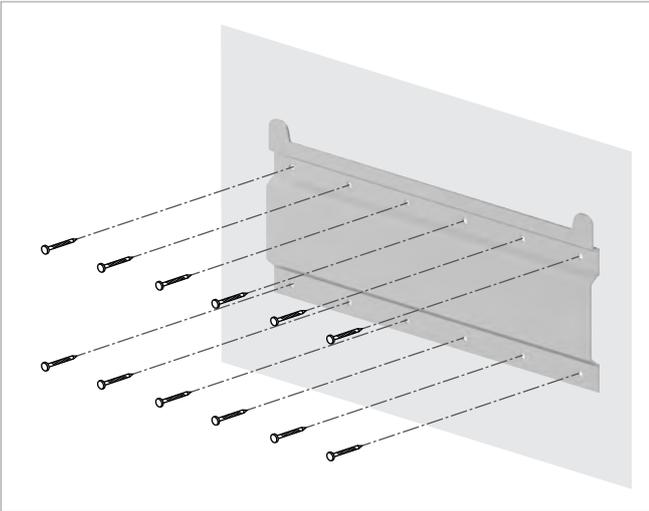
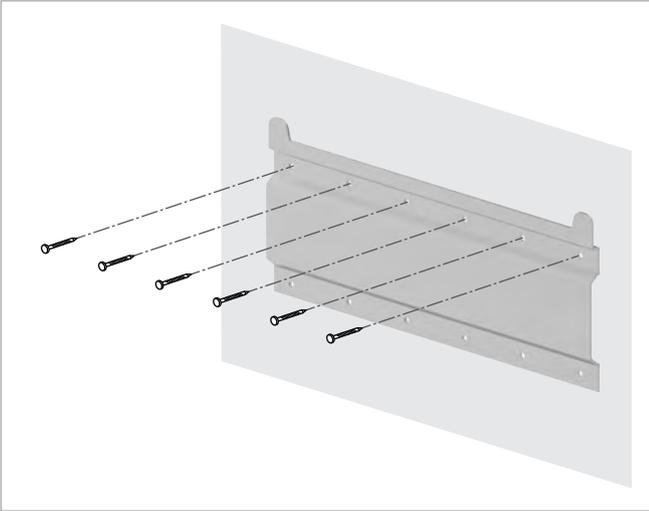


- ▶ Ensure sufficient air circulation. Warm air must be able to escape from below. Leave enough space around each inverter.
- ▶ Do not mount the inverters one above the other. This would result in the upper inverter heating the lower inverter.
- ▶ Note the **Betriebstemperaturbereich ohne Abregelung (Operating temperature range without derating)** and the **Gesamt-Betriebstemperaturbereich (Total operating temperature range)**. When the **Temperaturbereich ohne Abregelung (Temperature range without derating)** is exceeded, the inverter reduces output. When the **Gesamt-Betriebstemperaturbereich (Total operating temperature range)** is exceeded, the inverter switches off. This is normal operating behavior for the inverter and is necessary to protect the internal electronics.
- ▶ In areas with many trees or fields, pollen can clog the air inlets and outlets, hindering the air flow.

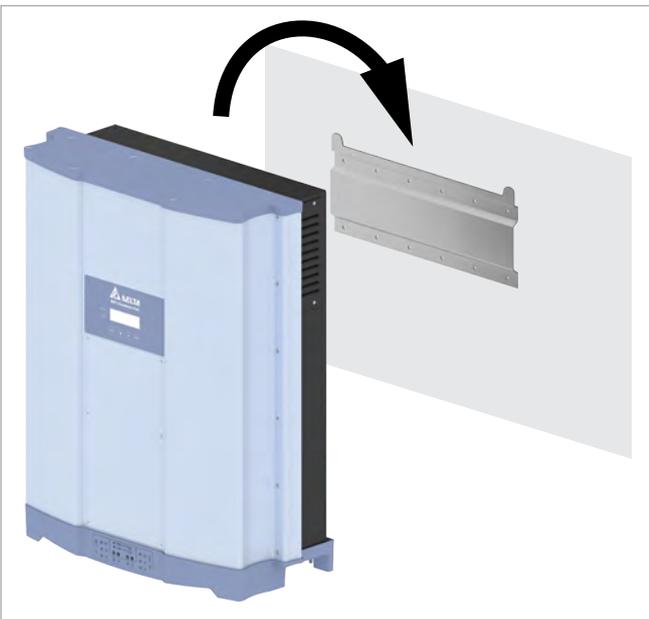
# 5 Mounting the inverter

## Mounting the inverter on the wall

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



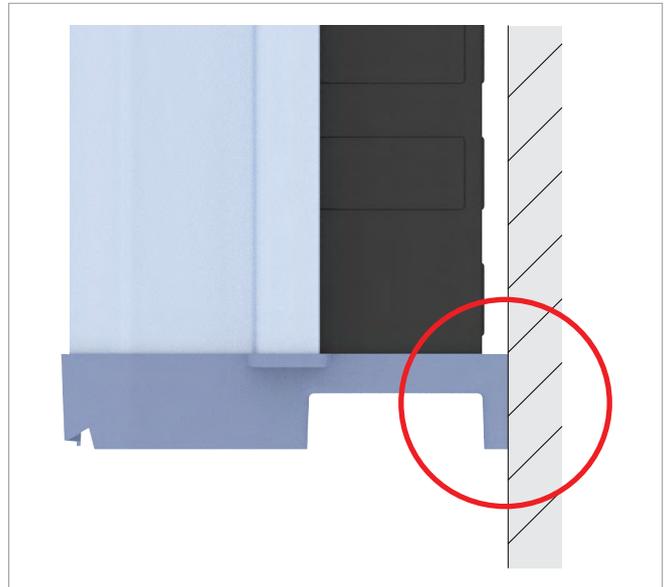
2. Mount the inverter on the mounting plate.



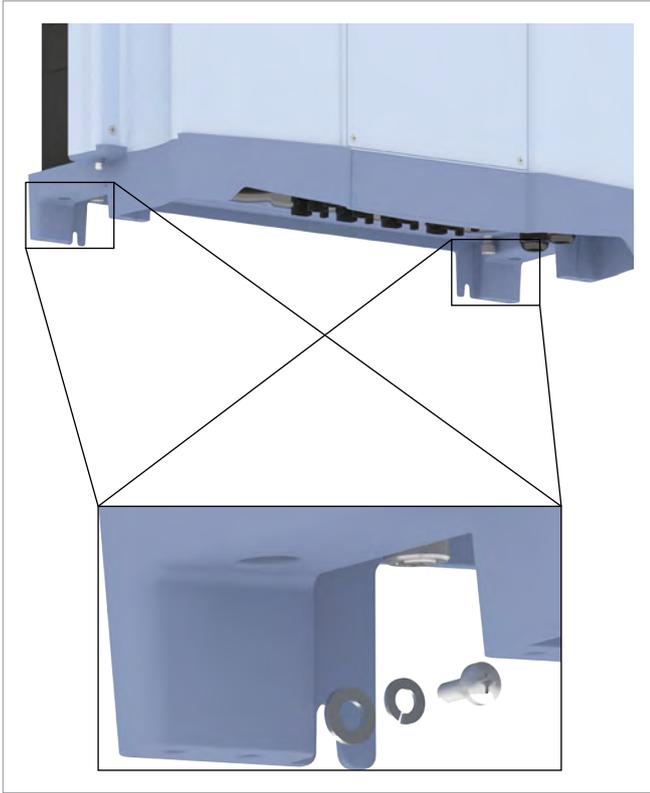
3. Check that the inverter is correctly mounted on the mounting plate.



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



5. Secure the inverter to the wall or the mounting system.

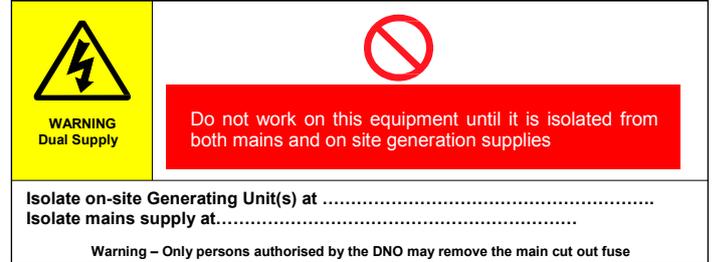


7. Perform a continuity check of the grounding connection. If there is no sufficient conductive connection, scratch away the paint from the inverter housing under the lock washer to achieve a better electrical contact.

### 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.



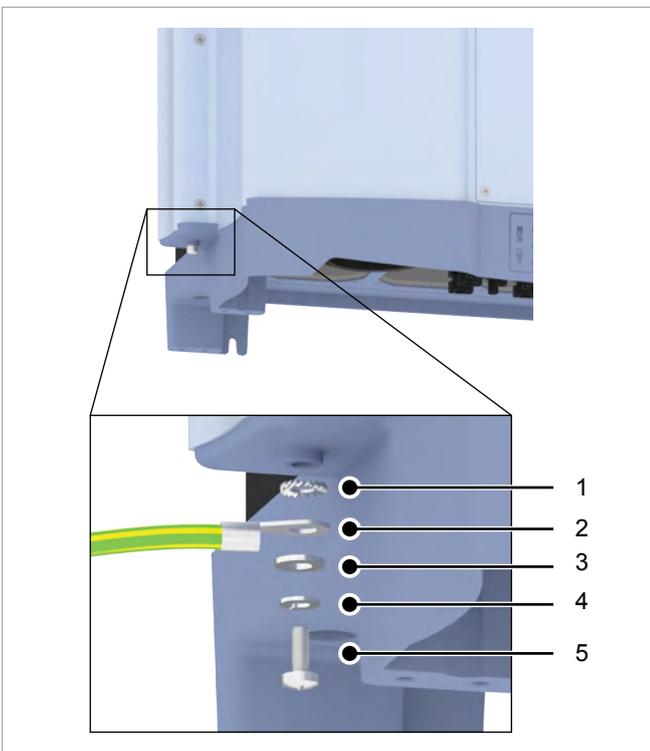
Warning  
Two voltage sources  
- Distribution network  
- PV modules



Prior to any work, disconnect both sources

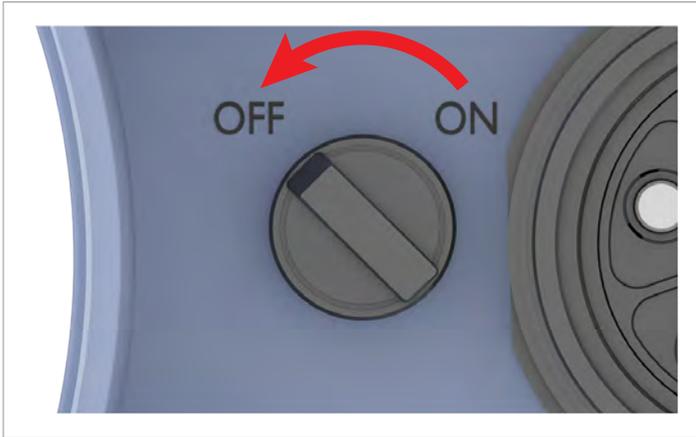
### Grounding the inverter housing

6. Screw 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

# 6 Connecting to the grid (AC)

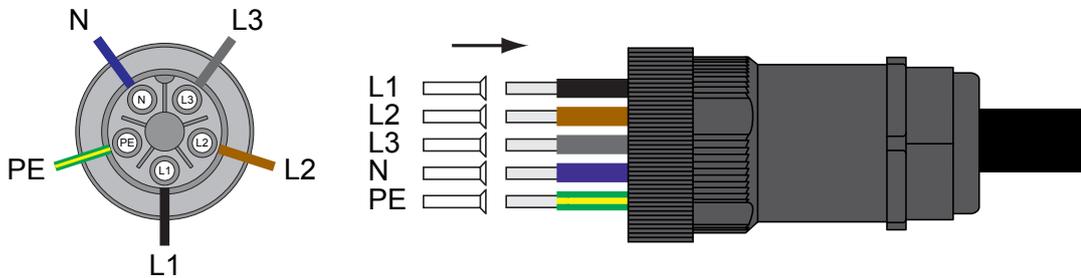


The inverter can be connected to 3-phase grids without neutral conductor (3P3W, 3 phases + PE) and 3-phase grids with neutral conductor (3P4W, 3 phases + N + PE).

- ▶ If the inverter is connected to a grid without neutral conductor, after operation on the display, the AC connection must be changed to 3P3W, see "[AC connection type](#)" (AC connection type, page).

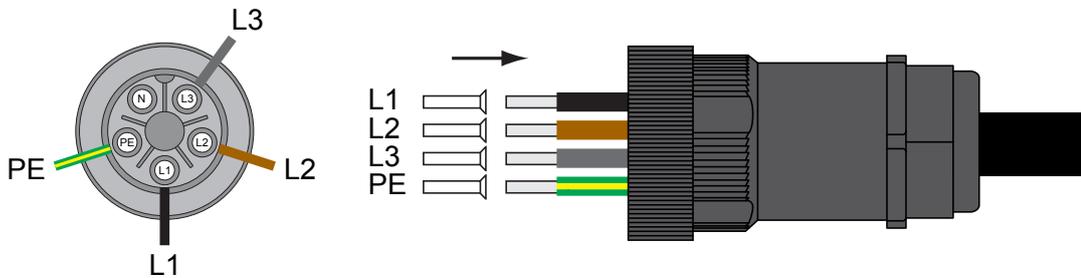
## Wiring for 3-phase grids with neutral conductor (L1, L2, L3, N + PE)

Use cable end sleeves on every wire.



## Wiring for 3-phase grids without neutral conductor (L1, L2, L3, N + PE)

Use cable end sleeves on every wire.



## Allowable grounding systems

Grounding system	TN-S	TN-C	TN-C-S	TT	IT
Allowed	Yes	Yes	Yes	Yes	No



TT is not recommended. The voltage of N must be very close to the grounding voltage (difference  $<20 V_{rms}$ )

## Requirements for the grid voltage

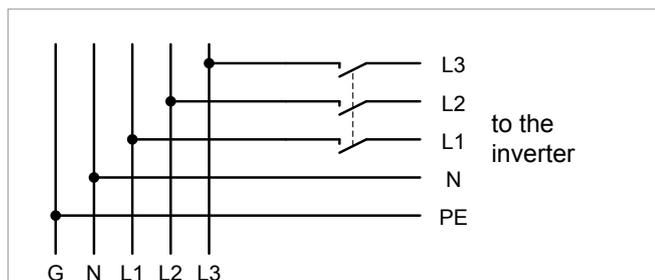
3-phases without neutral conductor (3P3W)		3-phases without neutral conductor (3P4W)	
L1-L2	$400 V_{AC} \pm 20\%$	L1-N	$230 V_{AC} \pm 20\%$
L1-L3	$400 V_{AC} \pm 20\%$	L2-N	$230 V_{AC} \pm 20\%$
L2-L3	$400 V_{AC} \pm 20\%$	L3-N	$230 V_{AC} \pm 20\%$

## Important safety instructions

### Always follow the specific regulations of your country or region.

- ▶ Always follow the specific regulations of your energy provider.
- ▶ Install all stipulated safety and protective devices (e.g. 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 grid 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
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### Integrated residual current monitoring unit

The integrated, universal current-sensitive residual current monitoring unit (RCMU) is certified in accordance with VDE 0126 1-1/ A1:2012-02, section 6.6.2, for a tripping current of 300 mA.

#### NOTE



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 string fuses and overvoltage conductors



If the fuse box cover is removed, the protection class is no longer IP65.

- ▶ Only remove the cover when the inverter is in a dry environment.

- ▶ Replace damaged string fuses and overvoltage conductors with devices of the same type and from the same manufacturer.

### AC cable requirements

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

AC connection	China Aviation Optical-Electrical Technology Co. PVE5T125KE36
Rated current	100 A
Min./max. cable diameter	37 ... 44 mm
Min./max. wire cross-section	25 ... 35 mm <sup>2</sup>
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.

### 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.

# 7 Connecting solar modules (DC)

## **! DANGER**



### **Electrical shock**

Potentially fatal voltage is applied to the inverter's DC connections during operation. 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.
- ▶ Place the AC/DC isolating switch in the **OFF** position.
- ▶ Uncouple the connection to the grid so that the inverter cannot supply energy to the grid.
- ▶ 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.

## **NOTE**



### **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.

## **NOTE**



### **Incorrectly dimensioned solar plant.**

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".

## **NOTE**



### **Ingress of moisture.**

Moisture can enter via open DC connections.

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



- ▶ In order to start the inverter, DC voltage 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.



Mounting tool for disconnecting the DC plug and the protective caps from the DC connections. Available from multi-contact.

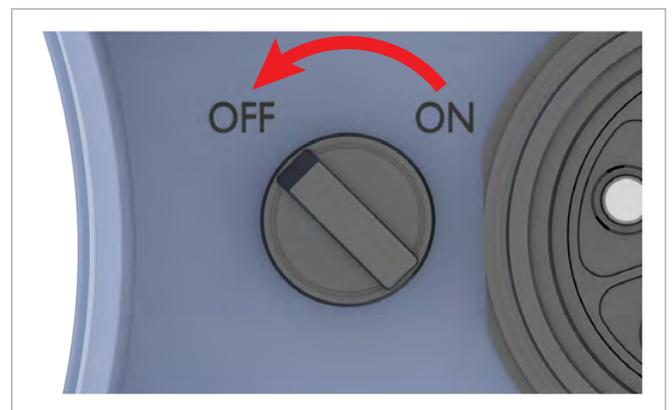
## **Polarity of the DC voltage**

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



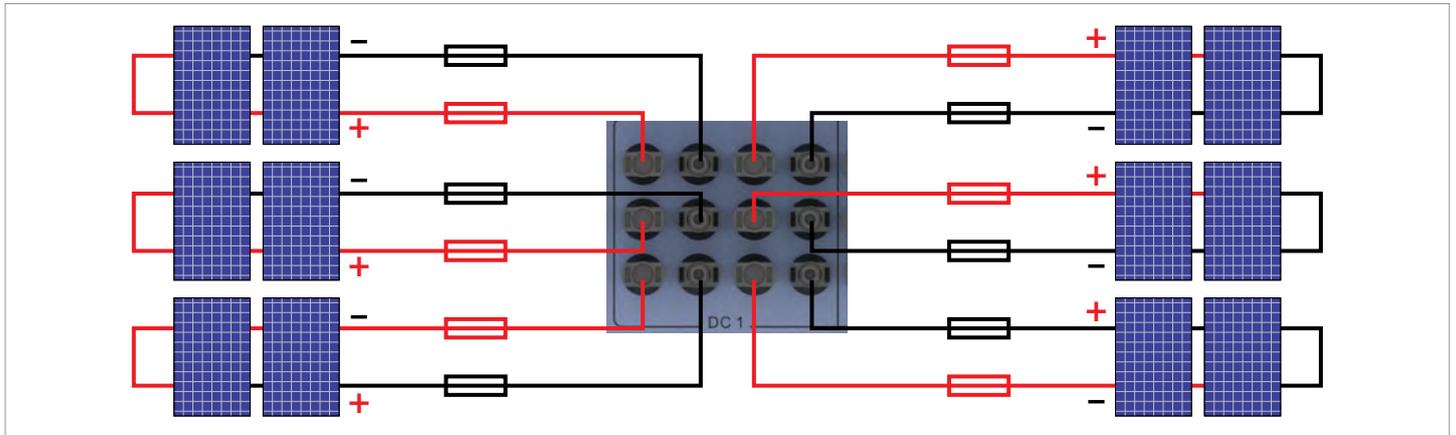
## **Note on security**

- ▶ Before connecting the solar modules turn the DC connection switch to the **OFF** position.



## Protective devices

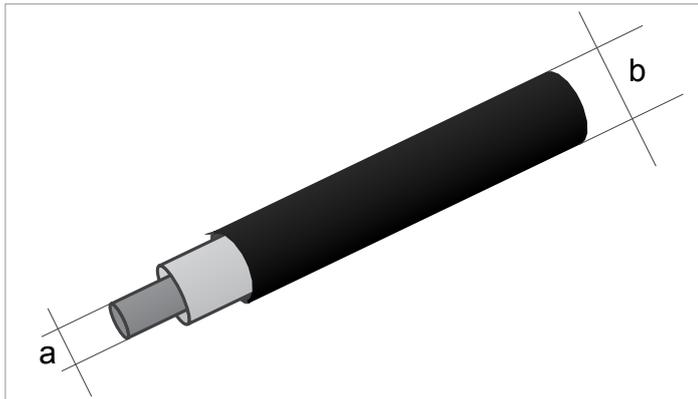
When selecting the necessary protective devices (e.g. fuses) take into account the **Maximale Rückstrombelastbarkeit (Maximum reverse current)** of the solar modules.



## DC plugs and DC cables

The DC plugs for all DC connections are provided along with the inverter.

If you want to order more or need a different size, see the information in the following table.



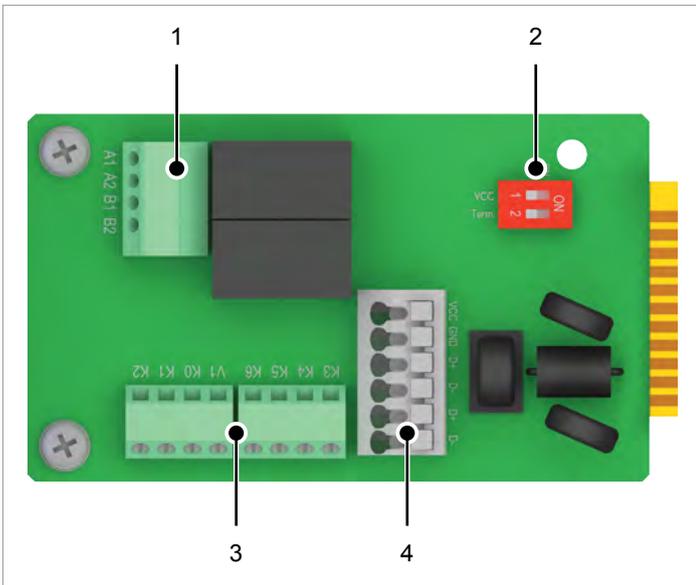
DC connections on the inverter		DC plugs for DC cables			
		a	b	MultiContact	
		mm <sup>2</sup>	mm		
DC-			4/6	3-6	32.0014P0001-UR
				5.5-9	32.0016P0001-UR <sup>1)</sup>
			10	5.5-9	32.0034P0001
DC+			4/6	3-6	32.0015P0001-UR
				5.5-9	32.0017P0001-UR <sup>1)</sup>
			10	5.5-9	32.0035P0001

<sup>1)</sup> Included in delivery

# 8 Connect to a data logger via RS485



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

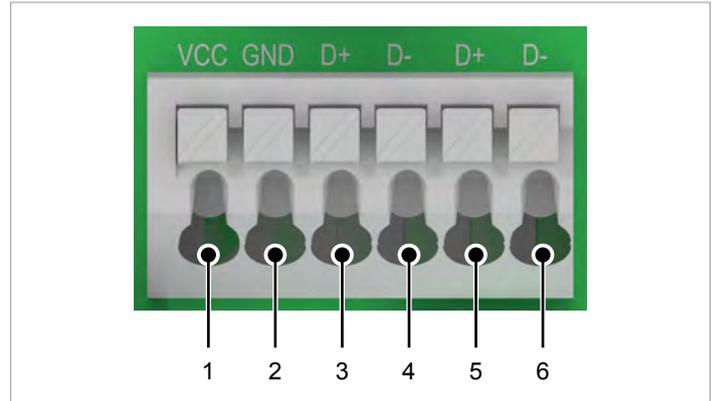


- 1 Terminal block for dry contacts
- 2 DIP switch for VCC and RS485 termination resistor
- 3 Terminal block for external shutdown (EPO) and digital inputs
- 4 Terminal block for VCC and RS485

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.

If you want to use SOLIVIA Monitor, Delta's Internet-based monitoring system, you also need a SOLIVIA Gateway M1 G2.

## Terminal assignments of the RS485 terminal block



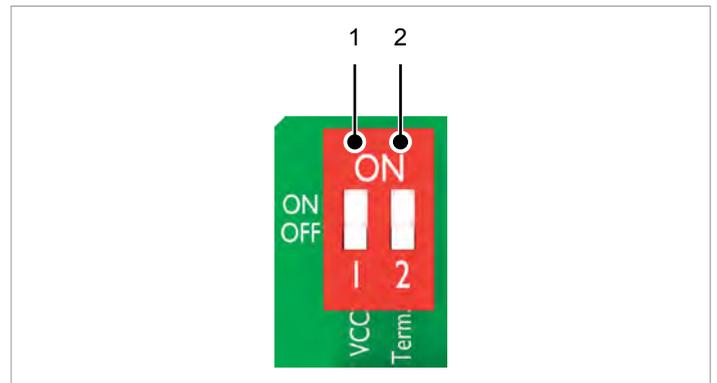
- 1 VCC (+12 V; 0.5 A)
- 2 GND
- 3 DATA+ (RS485)
- 4 DATA- (RS485)
- 5 DATA+ (RS485)
- 6 DATA- (RS485)

The baud rate can be set on the inverter display after startup, see [“Baud rate for RS485”](#), page 19 (Baud rate for RS485, page).

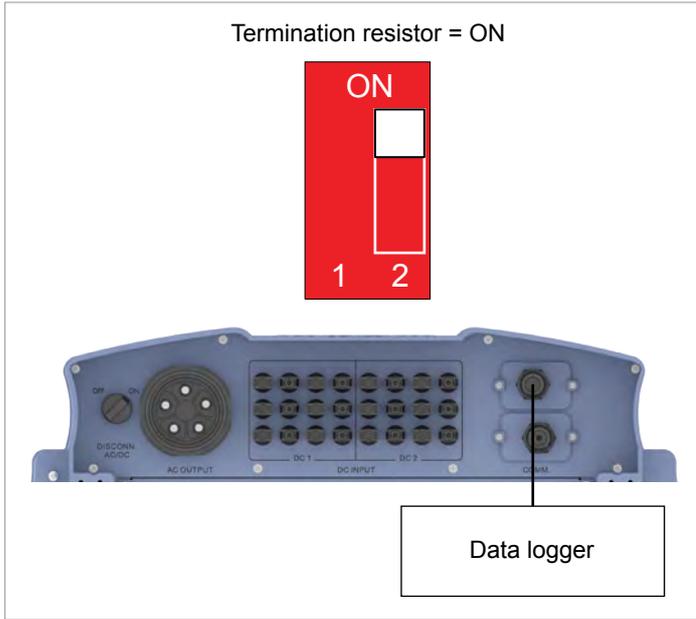
## Data format

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

## DIP switch for VCC and RS485 termination resistor

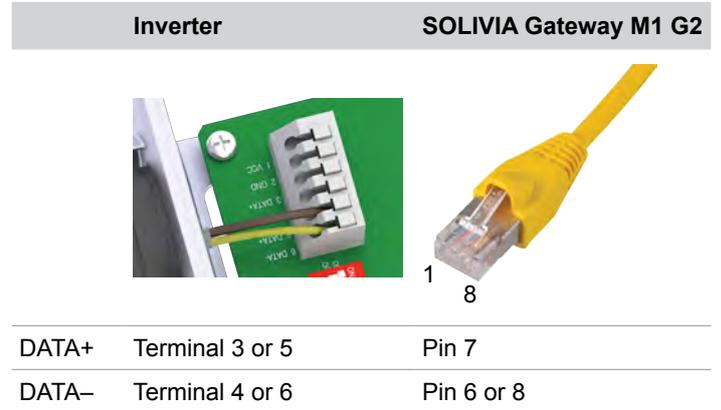


### Wiring diagram for a single inverter



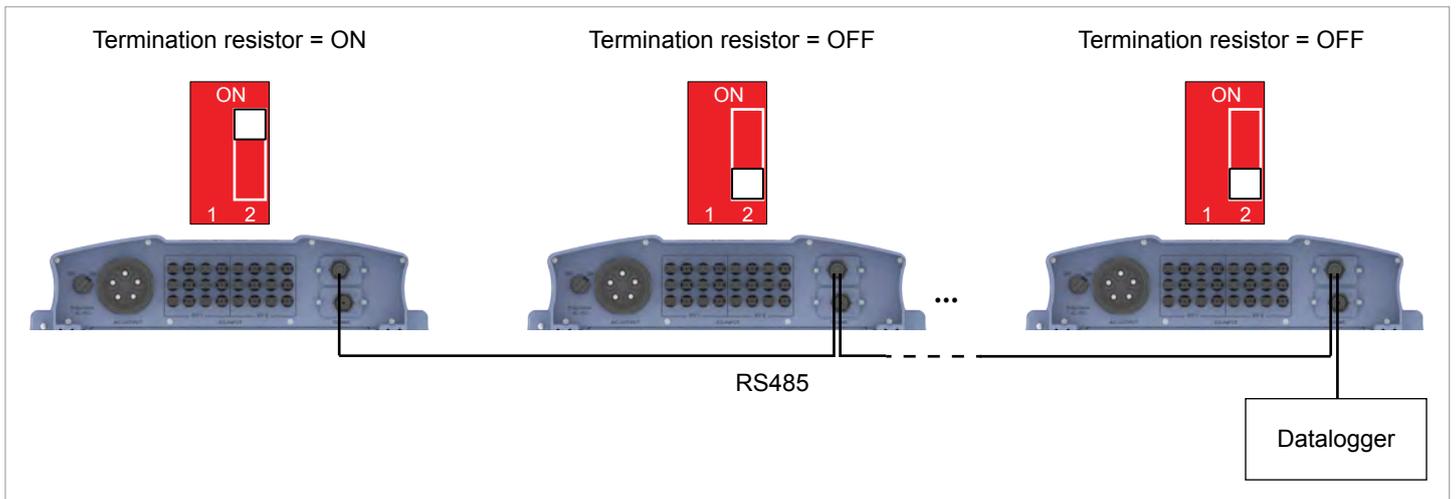
### Connection to a Delta SOLIVIA Gateway M1 G2

Requirements include a CAT5 cable with RJ45 plugs on one side and an open end on the other side.

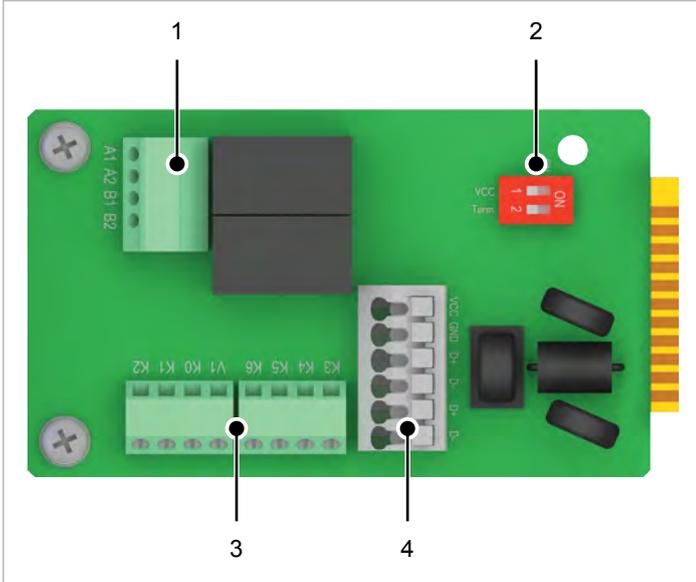


### Wiring diagram for several inverters

- ▶ If the data logger does not have an integrated RS485 termination resistor, switch on the RS485 termination resistor on the first inverter.
- ▶ After the startup of each inverter, configure another inverter ID, see "Inverter ID", page 19 (Inverter ID, page).

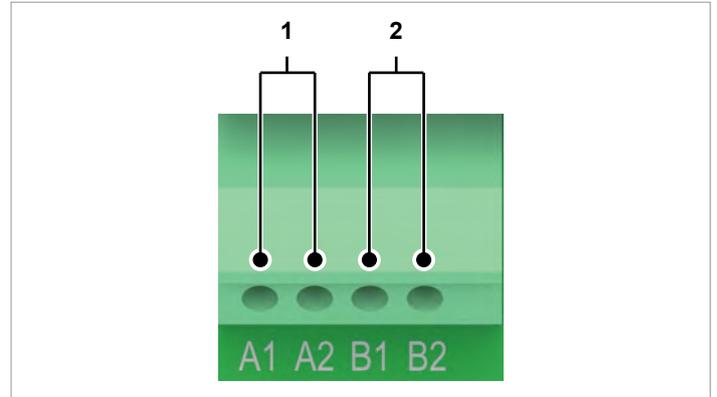


# 9 Connecting digital inputs, external shutdown and dry contacts (optional)



After startup, the relays can be defined as make-contact or break-contact for the external shutdown on the display. (See “External shutdown”, page 20 (External Shutdown, page)).

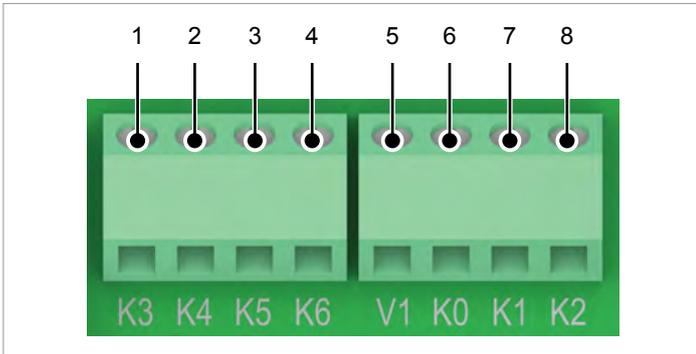
## Dry contacts



- 1 Terminal block for dry contacts
- 2 DIP switch for VCC and RS485 termination resistor
- 3 Terminal block for external shutdown (EPO) and digital inputs
- 4 Terminal block for VCC and RS485 termination resistor

- 1 Dry contact A
- 2 Dry contact B

## Digital inputs and external shutdown



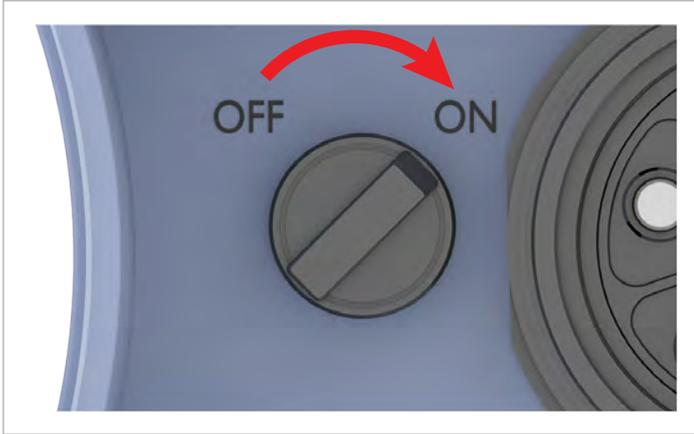
Event	Description
Deactivated	The function of the dry contacts is disabled.
On grid	The inverter has connected to the grid.
Fan failure	The fans are defective.
Insulation	The insulation test has failed.
Alarm	A message has been sent about an error, a fault or a warning.
Error	An error message was sent.
Fault	A fault message was sent.
Warning	A warning was sent.

The default setting for both contacts has been "Disabled". After startup, an event can be assigned to the dry contacts on the display, see “Dry contacts”.

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

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

# 10 Startup – basic settings



To make the settings as described in this chapter, the inverter must be powered with alternating current (power supply).

The inverter also needs a DC voltage in order to operate fully from the energy provider.

```
Select language
▶English
Deutsch
Français
```

1. Use the buttons  and  to select the language **English**. Press the  button to confirm.

```
▶UK G59-3 230
```

2. Use the buttons  and  to select your country or grid type. Press the  button to confirm.

```
Are you sure to
set country:
UK G59-3 230
▶YES / NO
```

3. If the correct country is selected, use the buttons  and  to choose entry **Yes**. Press the  button to confirm. To change the selection, press the  button.

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

```
10.Sep 2014 15:32
Status:      On Grid
Power:       0W
E-Today:    0kWh
```

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



▶ Use the next chapter to check whether you need to make additional settings.

# 11 Startup - further settings (optional)

## Date and time

```
10.Sep 2014 15:32
Status:      On Grid
Power:       0W
E-Today:    0kWh
```

```
►General Settings
Install Settings
Active/Reactive Pwr
FRT
```

```
Language
►Date & Time
Baud rate
```

```
16.Sep 2014 14:55
```

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

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

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

→ The day is marked.

4. Press the **▼** and **▲** buttons to configure the value and 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 to the grid \(AC\)”](#), page 10 (Connecting to the grid (AC)).

```
10.Sep 2014 15:32
Status:      On Grid
Power:       0W
E-Today:    0kWh
```

```
General Settings
►Install Settings
Active/Reactive Pwr
FRT
```

```
Warning:
Adj. would affect
energy production.
Password  0 * * *
```

```
►AC Connection: 3P4W
Anti-islanding: ON
Max. Power:    100%
Return to Factory
```

```
►AC Connection: 3P4W
Anti-islanding: ON
Max. Power:    100%
Return to Factory
```

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

2. Use the buttons **▼** and **▲** to select the **Installation Settings** button and press the **ENT** button.

3. This function is protected with password 5555.

Use the buttons **▼** and **▲** to configure the individual numbers.

Press the **ENT** button to confirm a number.

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

5. Press the **▼** and **▲** buttons to configure an option and press the **ENT** button.

## Inverter ID

```
10.Sep 2014 15:32
Status:      On Grid
Power:       0W
E-Today:    0kWh
```

```
General Settings
▶Install Settings
Active/Reactive Pwr
FRT
```

```
Warning:
Adj. would affect
energy production.
Password 0 * * *
```

```
▶Inverter ID: 001
Insulation
Country
Grid Settings
```

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

1. If the default information is displayed, press the **ESC** button to open the main menu. Otherwise, press the **ESC** button repeatedly until the main menu is displayed.
2. Use the buttons **▼** and **▲** to select the **Installation Settings** button and press the **ENT** button.
3. This function is protected with password 5555. Use the buttons **▼** and **▲** to configure the individual numbers. Press the **ENT** button to confirm a number.
4. Use the buttons **▼** and **▲** to select the entry **Inverter ID** and press the **ENT** button.
5. Press the **▼** and **▲** buttons to configure the value and press the **ENT** button.

## Baud rate for RS485

```
10.Sep 2014 15:32
Status:      On Grid
Power:       0W
E-Today:    0kWh
```

```
▶General Settings
Install Settings
Active/Reactive Pwr
FRT
```

```
Language
Date & Time
▶Baud rate
```

```
9600
▶19200
38400
```

1. If the default information is displayed, press the **ESC** button to open the main menu. Otherwise, press the **ESC** button repeatedly until the main menu is displayed.
2. Use the buttons **▼** and **▲** to select the entry **General Settings** and press the **ENT** button.
3. Use the buttons **▼** and **▲** to select the **Baud rate** button and press the **ENT** button.
4. Press the **▼** and **▲** buttons to configure the value and press the **ENT** button.

# 11 Startup – further settings (update)

## 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.

```
10.Sep 2014 15:32
Status:      On Grid
Power:       0W
E-Today:    0kWh
```

```
General Settings
►Install Settings
Active/Reactive Pwr
FRT
```

```
Warning:
Adj. would affect
energy production.
Password    0 * * *
```

```
AC Connection: 3P4W
Anti-islanding: ON
►Max. Power: 50000W
Return to Factory
```

1. If the default information is displayed, press the **ESC** button to open the main menu. Otherwise, press the **ESC** button repeatedly until the main menu is displayed.
2. Use the buttons **▼** and **▲** to select the **Installation Settings** button and press the **ENT** button.
3. Enter the password you were given by Delta customer service. Use the buttons **▼** and **▲** to configure the individual numbers. Press the **ENT** button to confirm a number.
4. Use the buttons **▼** and **▲** to select the entry **Max. Power** and press the **ENT** button.
5. Press the **▼** and **▲** buttons to configure the value and press the **ENT** button.

## External shutdown

```
10.Sep 2014 15:32
Status:      On Grid
Power:       0W
E-Today:    0kWh
```

```
General Settings
►Install Settings
Active/Reactive Pwr
FRT
```

```
Warning:
Adj. would affect
energy production.
Password    0 * * *
```

```
DC Injection
Dry Contact
RCMU:       ON
►EPO:      Normal Close
```

1. If the default information is displayed, press the **ESC** button to open the main menu. Otherwise, press the **ESC** button repeatedly until the main menu is displayed.
2. Use the buttons **▼** and **▲** to select the **Installation Settings** button and press the **ENT** button.
3. This function is protected with password 5555. Use the buttons **▼** and **▲** to configure the individual numbers. Press the **ENT** button to confirm a number.
4. Use the buttons **▼** and **▲** to select the **EPO** button and press the **ENT** button.
5. Press the **▼** and **▲** buttons to configure an option and press the **ENT** button.

## Dry contacts



For a description of how to connect the dry contacts, see [“Connecting digital inputs, external shutdown and dry contacts \(optional\)”](#), page 16 (Connecting digital inputs, external shutdown and dry contacts (optional)).

```
10.Sep 2014 15:32
Status:      On Grid
Power:       0W
E-Today:    0kWh
```

```
General Settings
▶Install Settings
Active/Reactive Pwr
FRT
```

```
Warning:
Adj. would affect
energy production.
Password  0 * * *
```

```
DC Injection
▶Dry Contact
RCMU:      ON
EPO:      Normal Close
```

```
▶Dry Cont.A  Disable
Dry Cont.B  Disable
```

```
▶Disable
On Grid
Fan Fail
Insulation
```

1. If the default information is displayed, press the **ESC** button to open the main menu. Otherwise, press the **ESC** button repeatedly until the main menu is displayed.
2. Use the buttons **▼** and **▲** to select the **Installation Settings** button and press the **ENT** button.
3. This function is protected with password 5555. Use the buttons **▼** and **▲** to configure the individual numbers. Press the **ENT** button to confirm a number.
4. Use the buttons **▼** and **▲** to select the **Dry Contact** button 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. Press the **▼** and **▲** buttons to configure an option and press the **ENT** button.

# 12 Technical data

Input (DC)	RPI M50A_12s
Maximum recommended PV power	
Symmetrical load	63 kW <sub>P</sub>
Asymmetrical load	70 kW <sub>P</sub>
Maximum input power (total / per input)	58 kW / 34.8 kW <sup>1)</sup>
Rated power	52 kW
Input voltage range	200 ... 1100 V <sub>DC</sub> <sup>2)</sup>
Rated voltage	600 V <sub>DC</sub>
Cut-in voltage	250 V <sub>DC</sub>
Cut-in power	40 W
MPP input voltage range	200 ... 1000 V <sub>DC</sub>
MPP input voltage range with full power	
Symmetrical load	520 ... 800 V <sub>DC</sub>
Asymmetrical load	620 ... 800 V <sub>DC</sub>
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 tracker
Number of DC inputs, total (DC1/DC2)	12 (6 / 6)
Electrical isolation	No
Overvoltage category <sup>3)</sup>	III
String fuses	15 A <sup>4)</sup>
Overvoltage conductors	Type 2, interchangeable
Output (AC)	RPI M50A_12s
Maximum apparent power <sup>5)</sup>	55 kVA <sup>6)</sup>
Rated apparent power <sup>5)</sup>	50 kVA
Rated voltage <sup>7)</sup>	230 ±20 %/400 V <sub>AC</sub> ±20 %, 3 phases + PE or 3 phases + N + PE
Rated current	73 A
Max. current	80 A
Switch-on current	200 A / 100 µs
Rated frequency	50 / 60 Hz
Frequency range <sup>7)</sup>	45 ... 65 Hz
Configurable power factor	0.8 cap ... 0.8 ind
Total harmonic distortion	<3%
DC infeed	<0.5% for rated current
Power loss in night mode	<2.5 W
Overvoltage category <sup>3)</sup>	II
Overvoltage conductors	Type 2, interchangeable

Mechanical details	RPI M50A_12s
Dimensions (W x L 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	2 x RS485, 2 x dry contacts, 1 x external shutdown, 6 x digital inputs

General specifications	RPI M50A_12s
Delta model name	RPI 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	RPI M50A_12s
Protection type	IP65
Protection rating	I
Pollution level	II
Overload behavior	Current limiting, power limiting
Safety	IEC 62109-1 / -2, CE-compliance
EMV	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
Grid connection guidelines	You will find the current list at <a href="http://www.solar-inverter.com">www.solar-inverter.com</a> .

<sup>1)</sup> Maximum 34.8 kW per DC input with asymmetrical load (60/40 %)

<sup>2)</sup> 1000 V for inverter with firmware version less than DPS 1.32

<sup>3)</sup> IEC 60664-1, IEC 62109-1

<sup>4)</sup> The specified value applies for a temperature of 25 °C **in the interior** of the inverter. At higher temperatures, the value can drop up to 10 A.

<sup>5)</sup> For  $\cos \phi = 1$  (VA = W)

<sup>6)</sup> Possible under the following conditions: DC input voltage > 580 V; symmetrical load; ambient temperature < 25 °C.

<sup>7)</sup> AC voltage and frequency range are programmed using the corresponding country specifications.

## Service - Europe

Austria	service.oesterreich@solar-inverter.com	0800 291 512 (toll free)
Belgium	support.belgium@solar-inverter.com	0800 711 35 (toll free)
Bulgaria	support.bulgaria@solar-inverter.com	+421 42 4661 333
Czech Republic	podpora.czechia@solar-inverter.com	800 143 047 (toll free)
Denmark	support.danmark@solar-inverter.com	8025 0986 (toll free)
France	support.france@solar-inverter.com	0800 919 816 (toll free)
Germany	service.deutschland@solar-inverter.com	0800 800 9323 (toll free)
Great Britain	support.uk@solar-inverter.com	0800 051 4281 (toll free)
Greece	support.greece@solar-inverter.com	+49 7641 455 549
Israel	supporto.israel@solar-inverter.com	800 787 920 (toll free)
Italy	supporto.italia@solar-inverter.com	800 787 920 (toll free)
Netherlands	ondersteuning.nederland@solar-inverter.com	0800 022 1104 (toll free)
Poland	serwis.polska@solar-inverter.com	+48 22 335 26 00
Portugal	suporte.portugal@solar-inverter.com	+49 7641 455 549
Slovakia	podpora.slovensko@solar-inverter.com	0800 005 193 (toll free)
Slovenia	podpora.slovenija@solar-inverter.com	+421 42 4661 333
Spain	soporto.espana@solar-inverter.com	900 958 300 (toll free)
Switzerland	support.switzerland@solar-inverter.com	0800 838 173 (toll free)
Turkey	support.turkey@solar-inverter.com	+421 42 4661 333
Other European countries	support.europe@solar-inverter.com	+49 7641 455 549



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