SUNSYS B15-B20

Installations- und bedienungsanleitung DE
Manuel d'installation et d'utilisation FR
Installation and operating manual GB
Manuale di installazione e uso IT

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MANUFACTURER'S WARRANTY

Warranty on products in the *SUNSYS B* series

Sicon S.r.l., which is part of the SOCOMEC group with registered headquarters at Via Sila 1/3 – Z. I. Scovizze, 36033 Isola Vicentina (Vicenza), guarantees that its***SUNSYS B*** series products are compliant with technical specifications and applicable quality standards.

1) Conditions of Warranty

Sicon S.r.l. guarantees***SUNSYS B*** series products for a period of 5 years following purchase for manufacturing or material defects only.

The warranty commences on the date the new product was purchased by the end user at the showroom of an official dealer (date as shown on the receipt).

This warranty applies only to products installed in Italy.

The warranty covers:

a) the repair or replacement of the defective product or component free of charge, whereas the cost of installing the replacement product or component is the responsibility of the customer or end user;

b) the shipment of the defective product to Sicon S.r.l. (or to an authorised centre), with the cost of dismantling and transport and related expenses borne by the customer or end user.

The decision to repair or replace the defective product or component will be taken at the complete discretion of Sicon S.r.l.

Replacement or repair of parts and any modifications to the product or components during the warranty period shall not extend the duration of the warranty.

This standard warranty supplements, but does not replace, all other rights of the consumer or purchaser of the product and, in particular, does not affect statutory consumer rights under Italian Legislative Decree no. 206 of 06/09/2005 (Consumer Code).

Sicon S.r.l. reserves the right to extend this warranty, which must be agreed in writing

2) Procedure

I. Defects must be reported to Sicon S.r.l., SOCOMEC after sales service (via Sila 1/3 – Zona Industriale Scovizze – 36033 Isola Vicentina - VI), in writing by registered post or electronic mail (assistenza@socomec.com), or fax (+390444-598626).

In all cases the report submitted to the above Department must be accompanied by a brief description indicating the type of fault, product serial number, and all details on the ID plate.

A copy of the proof-of-purchase document must be attached to the written report (delivery note, invoice, till receipt, stating the purchase date and product ID information — model, serial number etc.). If it is not possible to provide proof of purchase, the serial number and date of manufacture will be used to calculate the probable warranty expiry date.

The defective product can only be returned to Sicon S.r.l. after the acceptance number has been received; this will be issued by the service centre on receipt of the written report.

II. The defective product must be returned to Sicon S.r.l. in the original packaging, or equivalent, attaching the return acceptance number.

III. If the goods are acknowledged as being defective and under warranty, Sicon S.r.l. will send the new or repaired product and/or component to the end user at the address provided in the fault report or, if no address was provided, to the location where the goods were delivered originally when new, as specified in the sales contract.

IV. Sicon S.r.l will cover the cost of shipping the replacement product and/or component.

V. Installation of the replacement product and/or component must be carried out by a skilled person or authorised service centre and the relative cost borne by the customer or end user.

VI. Sicon S.r.l. shall be reimbursed for all activities carried out on products and/or components not covered by the warranty, in accordance with standard company rates and conditions.

VII. Sicon S.r.l. reserves the right to supply a different product and/or component model provided it offers equivalent performance, if the original defective model under warranty is out of production.

VIII. If on-site assistance from qualified Sicon S.r.l. personnel is requested, labour costs and travel expenses will be borne by the customer/end user, applying current Sicon S.r.l. rates.

3) Warranty Exclusions

a) The warranty does not cover product and/or component defects consisting of and/or resulting from:

I. accidental damage.

II. negligent, improper or inadequate use of the product or component (for example, use outside tolerance limits: temperature, humidity, poor ventilation).

III. failure to comply with instructions for installation, use and maintenance described in the Installation and Operating Manuals.

IV. modifications or repairs attempted by persons not authorised by the Sicon S.r.l. After Sales Service.

V. damage due to atmospheric discharges, floods, fires, earthquakes, uprisings, wars or other instances of force majeure or resulting from any circumstances other than normal inverter operating conditions and beyond the control of Sicon S.r.l..

VI. damage caused by overvoltages.

VII. damage due to corrosion.

VIII. inadequate transport.

IX. failure of the user to comply with current regulations and standards.

b) Similarly, the warranty will be invalidated:

I. if the defective product and/or component is not returned to Sicon S.r.l. in its original packaging or equivalent.

II. if the serial number identifying the products has been tampered with or is not clearly identifiable.

III. if the defect concerns aesthetic or construction aspects that do not affect normal product operation.

c) The warranty does not cover claims not included under warranty conditions, and in particular, claims for the refund of damages due to loss of production, loss of earnings, or attributable to product defects or installation/dismantling costs.

INDEX

1. GENERAL INFORMATION

This user manual specifies installation and maintenance procedures, technical data and safety instructions for SOCOMEC solar inverters. For further information visit the Socomec website: www.socomec.com.

Any work carried out on the equipment must be performed by skilled, qualified technicians.

1.1. SAFETY SYMBOLS AND INSTRUCTIONS

WARNING!
Failure to observe safety standards could result in fatal accidents or serious injury, and damage equipment or the environment.

WARNING! RISK OF ELECTRIC SHOCK!
The equipment includes capacitors that store energy. After disconnecting all power sources wait for the capacitors to discharge.

WARNING! RISK OF BURNS!
During operation the temperature of the casing may exceed 70 °C. Do not touch the surfaces!

Keep this manual safe for future reference.

Before carrying out any operations on the inverter read the Installation and Operating Manual carefully.

The following precautions must be taken in order to avoid risks of overheating, fire. electric shock, mechanical shock, and collateral damage (persons and/or property):

- Do not cover or obstruct the air outlet vents.
- Do not install the inverter inside a cabinet in an enclosed, non-ventilated area.
- When installing the inverter comply the recommended clearances (see chapter 4.2).
- Only use accessories recommended or sold by the manufacturer.
- Ensure the wiring is in good condition and not undersized.
- Do not operate the inverter with damaged or substandard wiring.
- Do not operate the inverter if it has suffered a violent mechanical shock of any kind (fall, impact, etc.)
- Before cleaning or performing maintenance work on the inverter or connected appliances, disconnect the power sources. After disconnecting wait for the internal capacitors to discharge completely (15 minutes approx).
- Inverter earth connection. See Chapter 5.

2. UNPACKING

2.1. REMOVAL OF PACKAGING

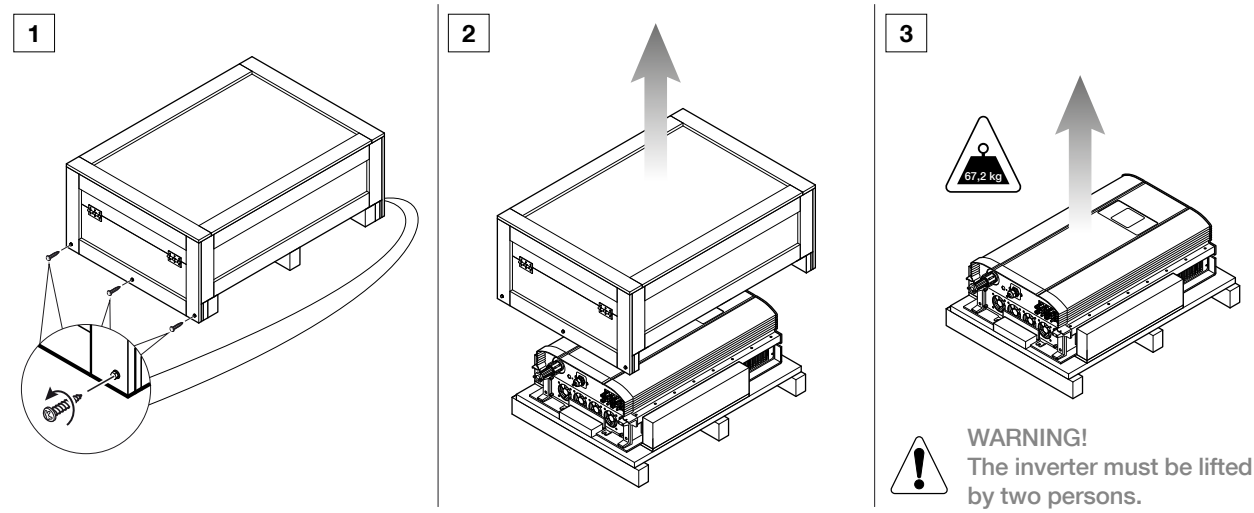
Materials can be disturbed during transport. Check the packaging is not damaged.

After removing the packaging ensure that:

- the data plate details on the left hand side of the inverter correspond to those of the model purchased;
- all accessories are included in the package.

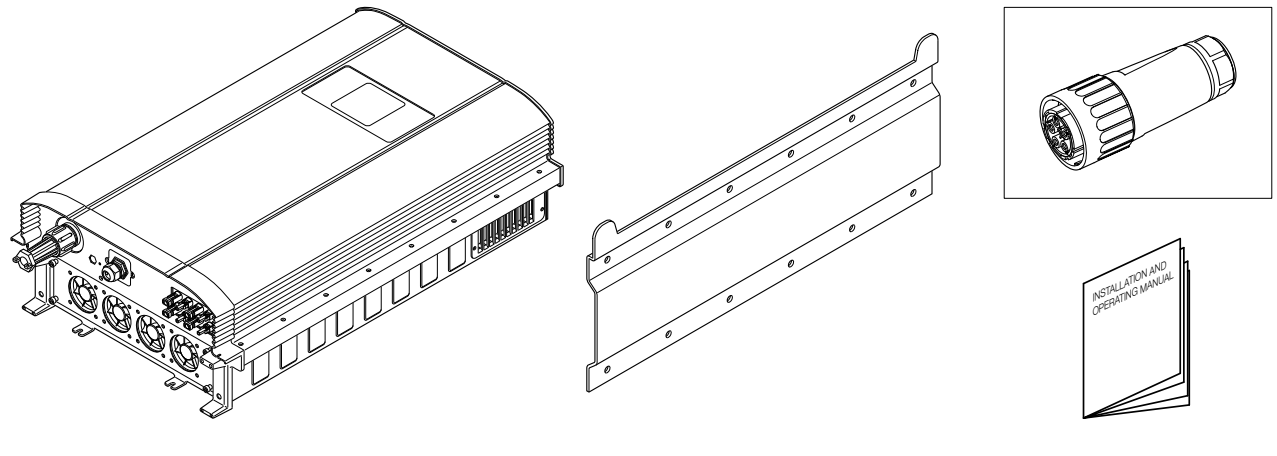
WARNING!
If the inverter is found to be damaged externally or internally, or any of the accessories are damaged or missing, contact SOCOMEC.

2.1-1



2.2. CONTENTS

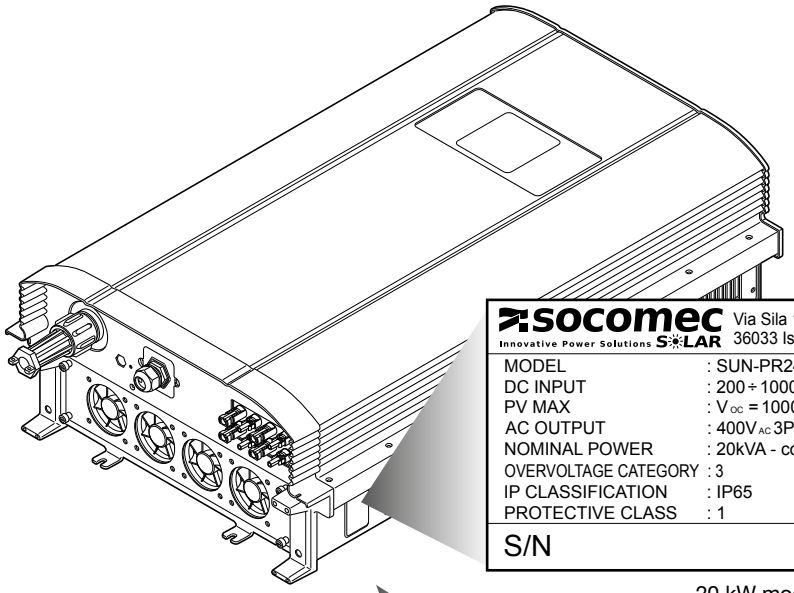
2.2-1



ENGLISH

2.3. IDENTIFICATION DATA PLATE

2.3-1



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Via Sila 1/3 - Zona Industriale Scovizze
36033 Isola Vicentina (VI) Italy

MODEL	: SUN-PR24KTL65RP
DC INPUT	: 200÷1000V$_{DC}$ - I$_{MAX}$ = 2x30A$_{DC}$
PV MAX	: V$_{OC}$ = 1000V - I$_{SC}$ = 2x33A
AC OUTPUT	: 400V$_{AC}$ 3PH - 50Hz - I$_{MAX}$ = 32A$_{RMS}$
NOMINAL POWER	: 20kVA - cosö: 0,8÷1
OVERVOLTAGE CATEGORY	: 3
IP CLASSIFICATION	: IP65
PROTECTIVE CLASS	: 1

Assembled in China

S/N CE

20 kW model

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Via Sila 1/3 - Zona Industriale Scovizze
36033 Isola Vicentina (VI) Italy

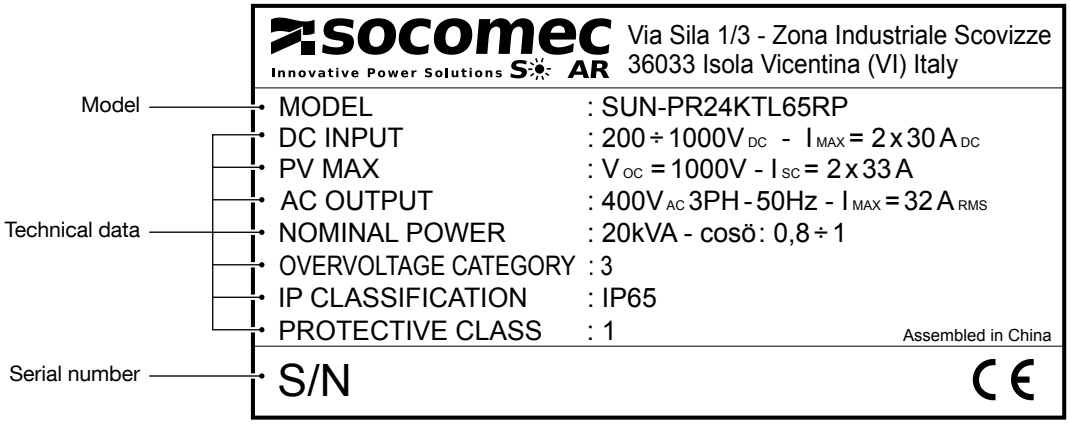
MODEL	: SUN-PR18KTL65RP
DC INPUT	: 200÷1000V$_{DC}$ - I$_{MAX}$ = 2x23A$_{DC}$
PV MAX	: V$_{OC}$ = 1000V - I$_{SC}$ = 2x25A
AC OUTPUT	: 400V$_{AC}$ 3PH - 50Hz - I$_{MAX}$ = 25A$_{RMS}$
NOMINAL POWER	: 15kVA - cosö: 0,8÷1
OVERVOLTAGE CATEGORY	: 3
IP CLASSIFICATION	: IP65
PROTECTIVE CLASS	: 1

Assembled in China

S/N CE

15 kW model

2.3-2



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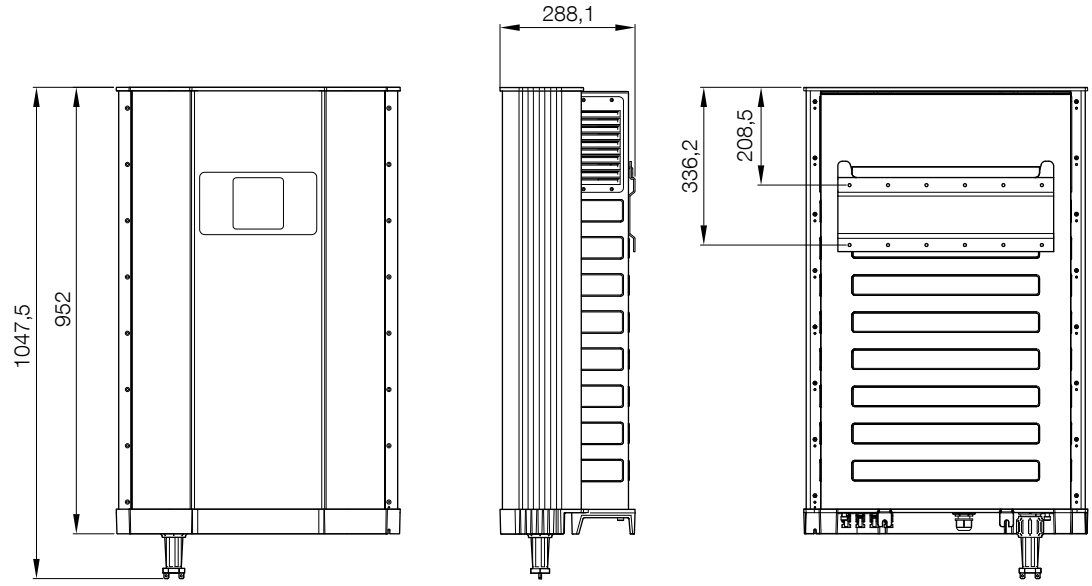
3. DESCRIPTION

3.1. DIMENSIONS

3.1-1



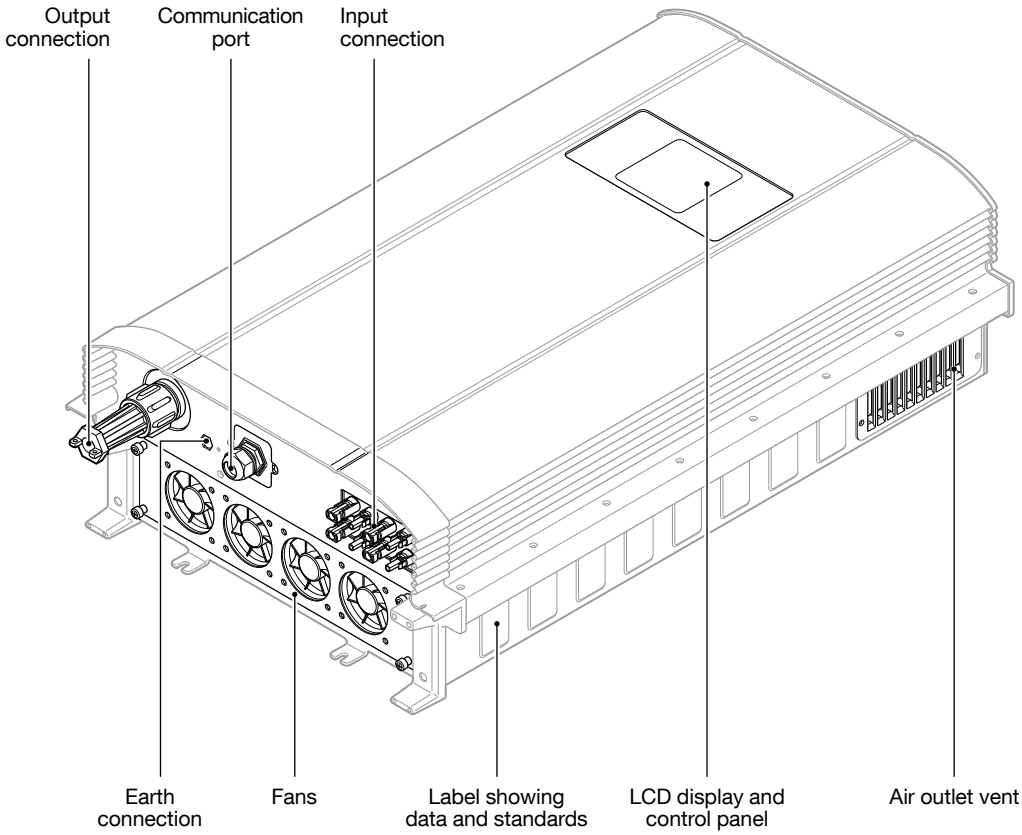
Front view | Side view | Rear view

View from above | View from below

ENGLISH

3.2. GENERAL DESCRIPTION OF COMPONENTS

3.2-1



4. INSTALLATION

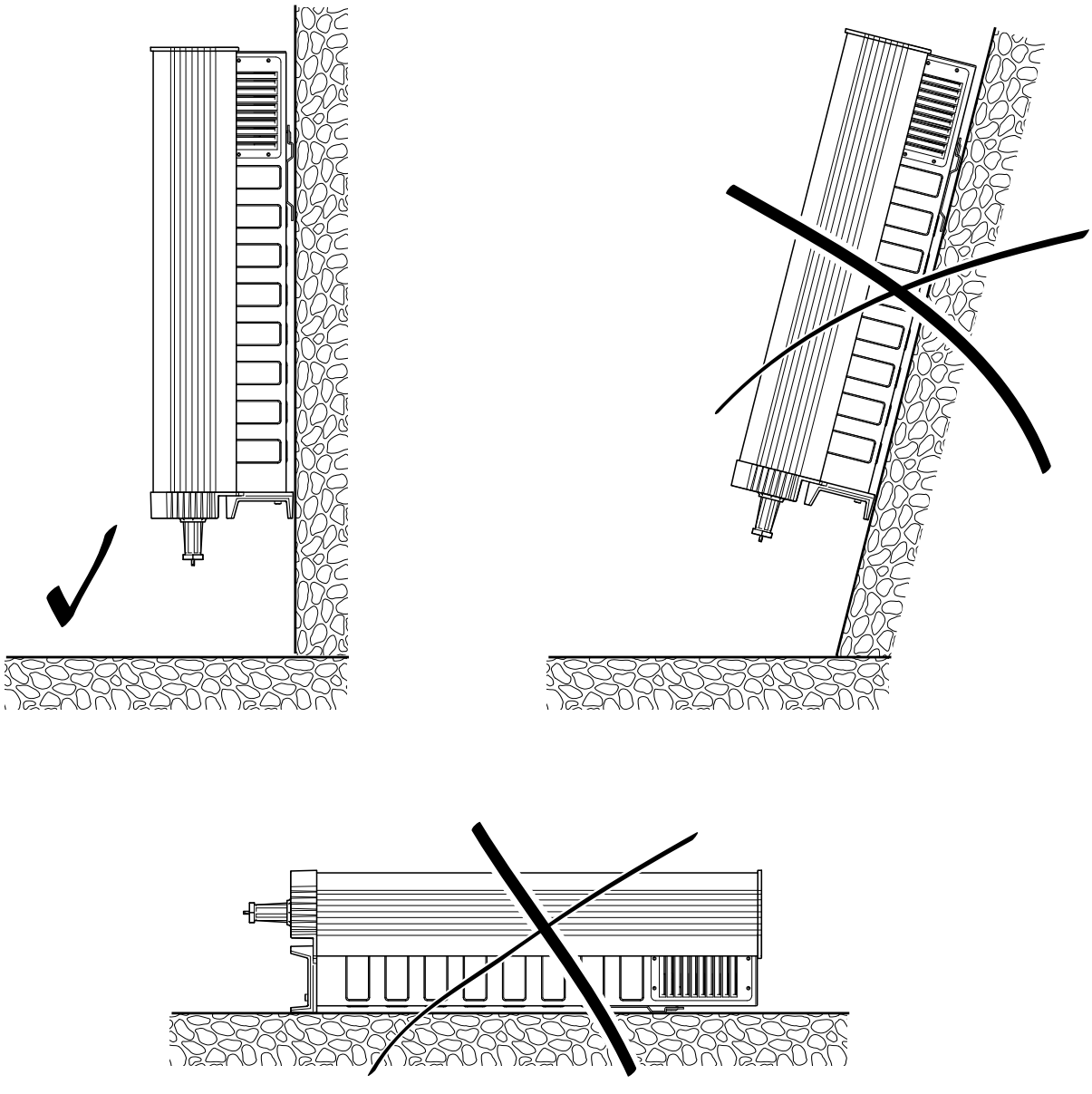
4.1. WARNINGS

The inverter is designed for wall-mounting. The wall must be sound and completely smooth.
Install the inverter in an equipment room where only skilled technicians have access. The room must be:

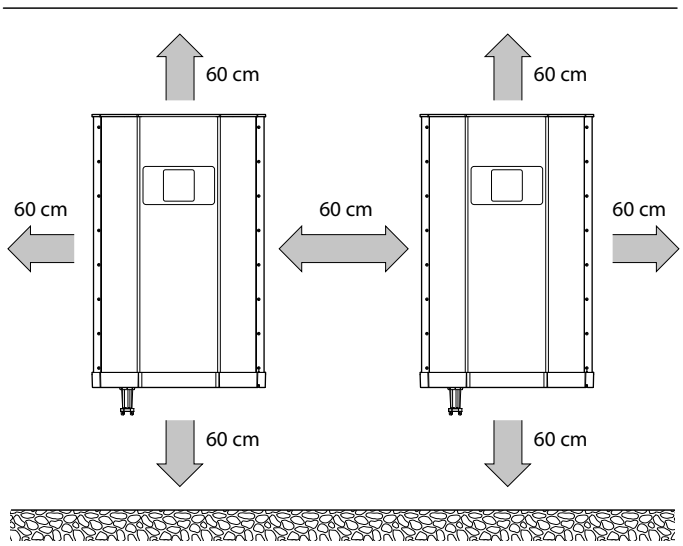
- of a suitable size;
- clean;
- free from inflammable items;
- not exposed directly to sunlight;
- maintained at a temperature between -18 °C and 40 °C.

4.2. CONDITIONS FOR INSTALLATION

4.2-1

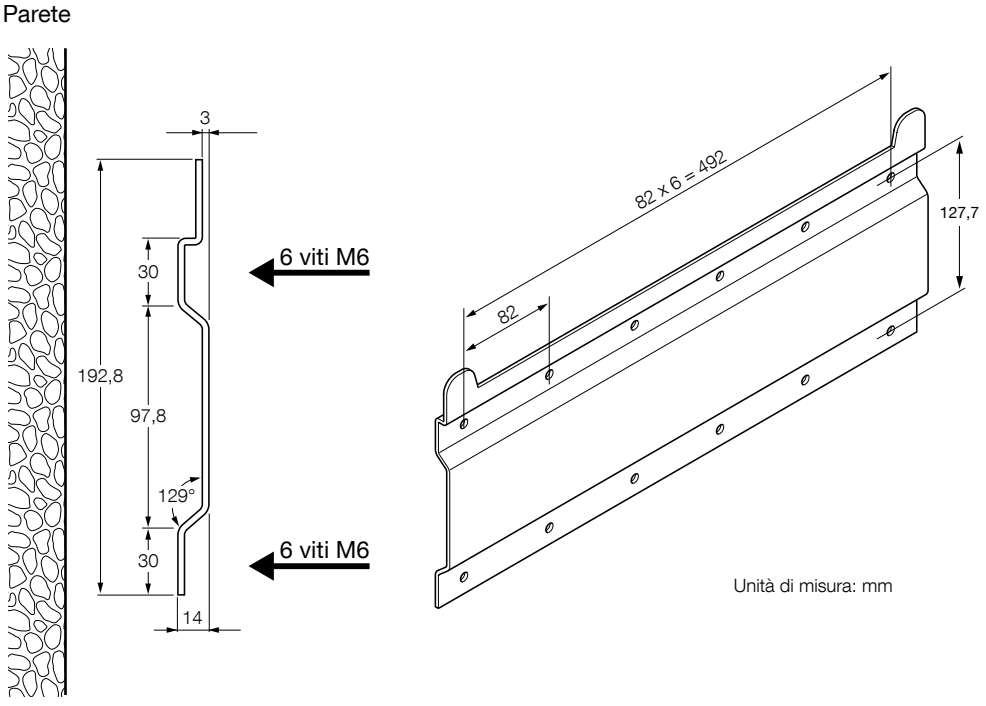


4.2-2 Suitable installation clearances



4.3. WALL FIXING

4.3-1



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5. CONNECTIONS

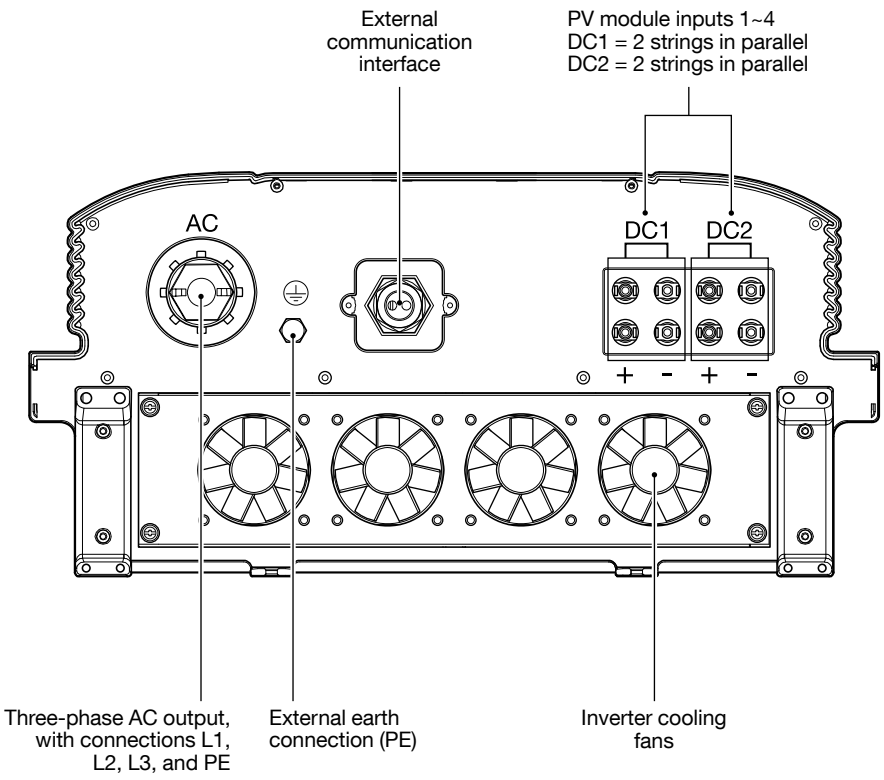
WARNING!
Before connecting the power supply connect the earth cable (PE).

Before connecting any cables to the inverter, check that the polarity, voltage and sequence of the phases are correct.

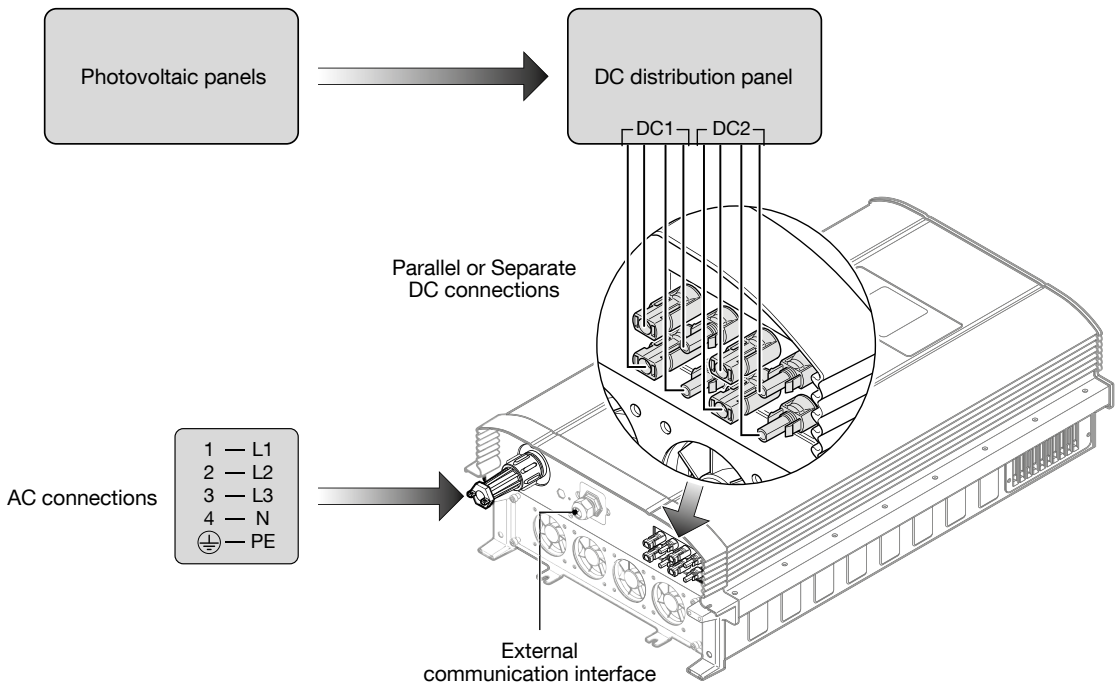
Check that the input and output cables of the photovoltaic system are clearly identified.

5.1. DESCRIPTION

5.1-1

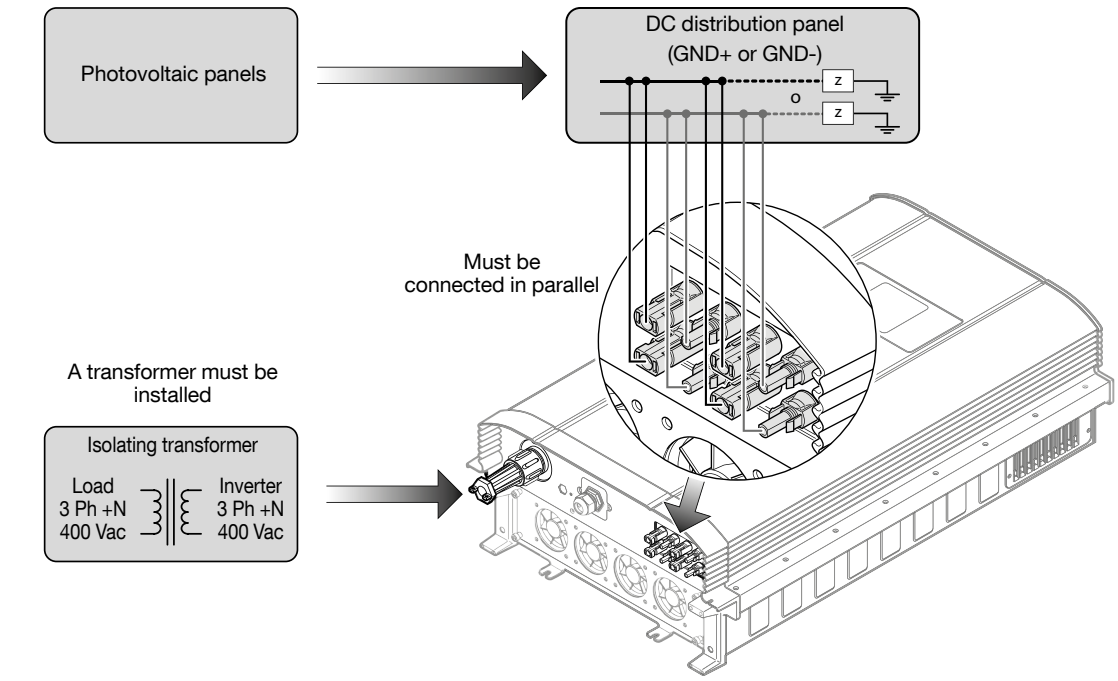


5.1-2 Connection of the system without earth terminal



Note: with a floating DC input (no earth connection) no isolating transformer is required.
The inverter can be configured either with parallel inputs (1 MPPT) or with two separate inputs (2 MPPT).

5.1-3 Connecting the system to positive or negative earth



Note: with a floating DC input (no earth connection) no isolating transformer is required.
All strings of the photovoltaic field must be connected in parallel (1 MPPT).

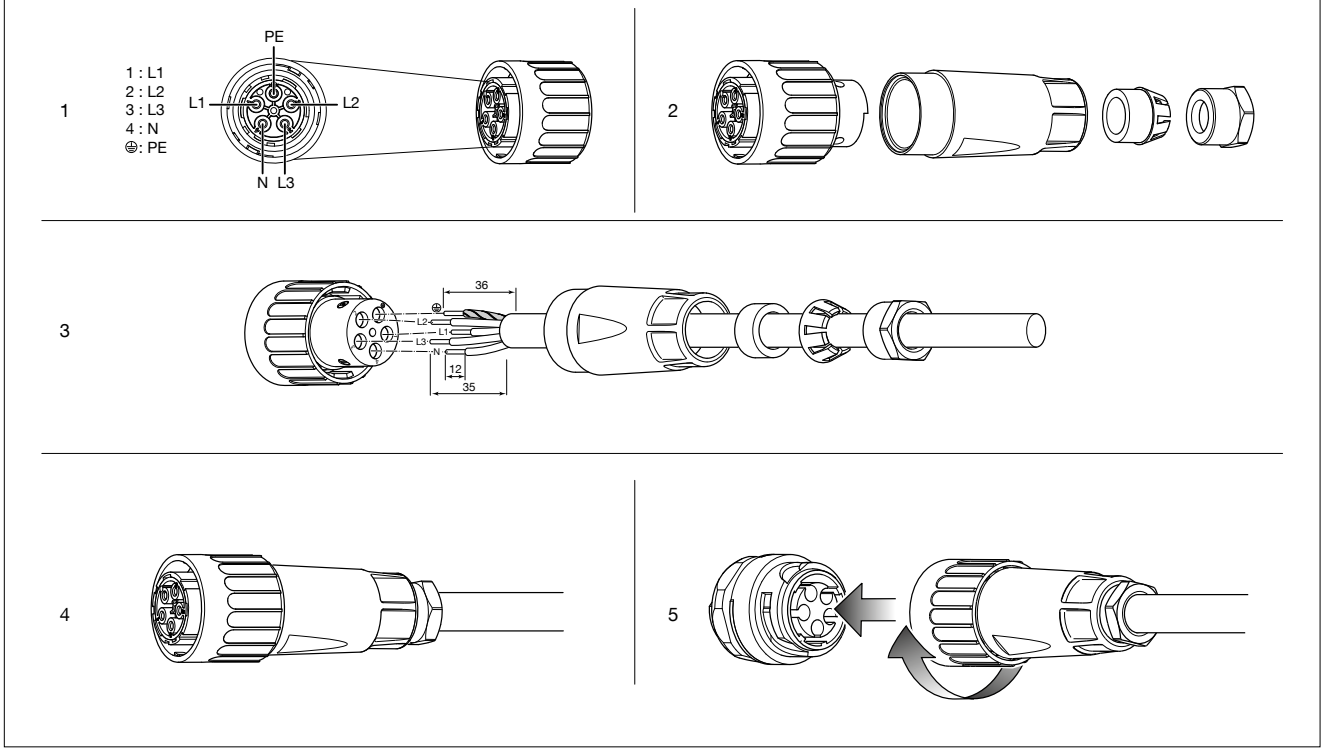
5.2. AC CONNECTION

- Before wiring the AC side ensure the three-phase AC mains supply is disconnected.
- Check that the connection cable used matches the specifications in the table.

Sizing of AC cables					
Model	Rated current	Cross-section	Fastening	Circuit breaker	Residual current protection
SUNSYS-B15	22 A	6 mm^2	≥ 0.9 Nm	MCCB rated 32 A 3P+N curve C	0.3 A type A or AC
SUNSYS-B20	29 A	6 mm^2	≥ 0.9 Nm	MCCB rated 40 A 3P+N curve C	0.3 A type A or AC

The AC connection is made with a three-phase plug (L1, L2, L3, N, PE - see drawing).

5.2-1



ENGLISH

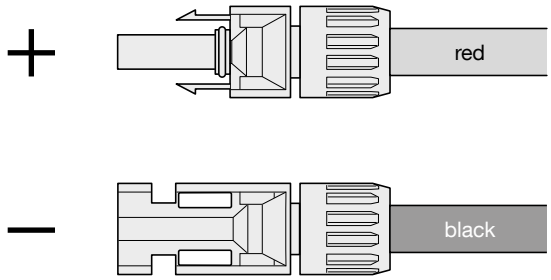
5.3. DC CONNECTION

• Before wiring the DC side ensure the three-phase AC power supply is disconnected.
• Check that the connection cable used matches the specifications in the table.

Sizing of DC cables		
Model	Rated current	Cross-section
SUNSYS-B15	2 x 23 ADC	6 mm^2
SUNSYS-B20	2 x 30 ADC	6 mm^2

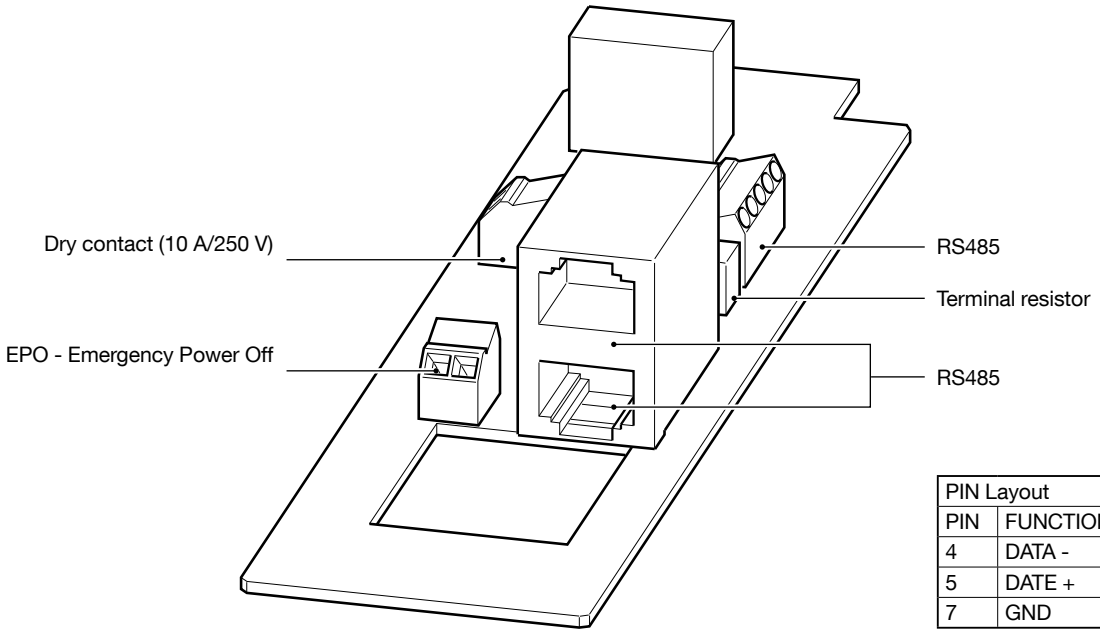
DC connections are divided into positive and negative poles.

5.3-1



5.4. COMMUNICATION MODULE CONNECTIONS

5.4-1 Communication module



PIN Layout	
PIN	FUNCTION
4	DATA -
5	DATE +
7	GND

5.4.1. EPO

Connector CNS3 performs an emergency power-off function (EPO).
When the external breaker is short-circuited the inverter shuts down immediately.

5.4.2. Dry contact

The voltage-free contact is available on connector CNS2 (Dry Contact) With the inverter connected to the grid, the contact is closed.

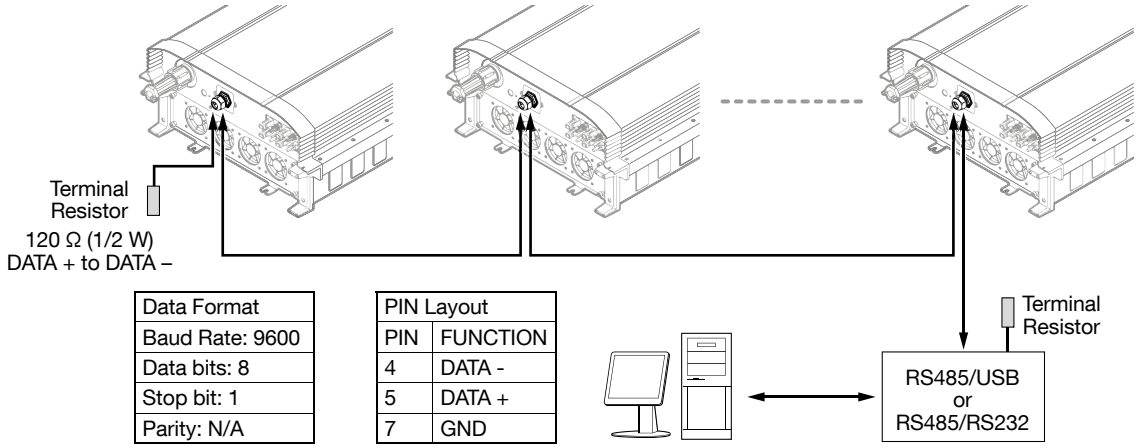
5.4.3. RS-485

The RS-485 function enables connection of the inverter in parallel.
Installation:

- set the dip-switch SWS1 of the first and last machine in the series to the ON position;
- this same dip switch must be set to the OFF position on all other machines.

WARNING!
If the terminal resistor is installed in the converter do not set the inverter.

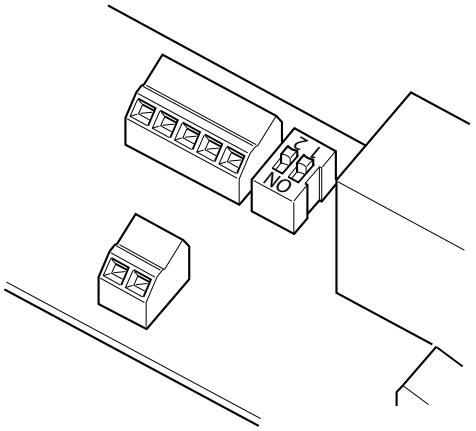
5.4.3-1



Data Format
Baud Rate: 9600
Data bits: 8
Stop bit: 1
Parity: N/A

PIN Layout	
PIN	FUNCTION
4	DATA -
5	DATA +
7	GND

5.4.3-2 Connection



RS485

Pin	1	2	3	4	5
Function	DATA -	DATA +	⏚	GND	

Terminal resistor

Resistor	Pin	
	1	2
ON	ON	OFF
OFF	OFF	OFF

ENGLISH

6. COMMISSIONING

6.1. PHOTOVOLTAIC MODULE SETUP

- The maximum no-load DC voltage of the photovoltaic field must be no higher than 1000 V.
- The maximum connection power going to the inverter must be no greater than 24 kW (***SUNSYS B20***) or 18 kW (***SUNSYS B15***).
- The breaker device must have a maximum rated voltage of > 1000 Vdc and maximum short-circuit current > 32 A (***SUNSYS-B20***) or > 24 A (***SUNSYS-B15***).
- The voltage range of the MPPTs must be between 350 V and 800 V.

6.2. AC GRID VOLTAGE REQUIREMENTS

Nominal voltage and current. See Chapter 5.

- An AC[1] automatic circuit breaker must be installed and allocated to each of the solar inverters, independently of the system (see heading 5.2).

Grid voltage values			
L1-L2	**400 Vac**	L1-N	**230 Vac**
L1-L3	**400 Vac**	L2-N	**230 Vac**
L2-L3	**400 Vac**	L3-N	**230 Vac**

- Type B output residual current device integrated into inverter.

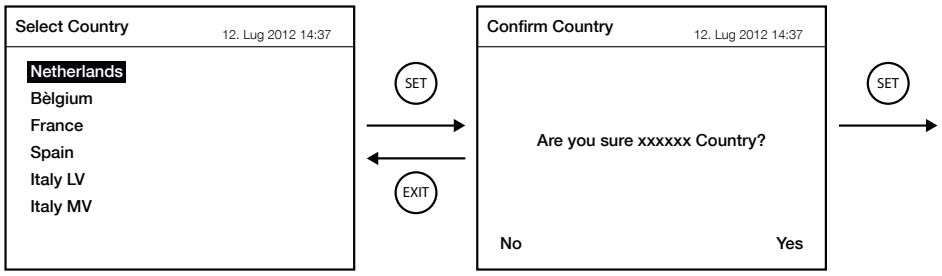
1. or similar protection on the basis of current regulations

6.3. FIRST START-UP

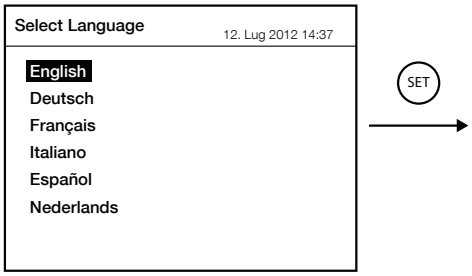
Check that the AC, DC and communication connections are made and secured correctly.

1. Power up the inverter
2. Set the country (confirm twice).
   Note: low voltage (LV) and medium voltage (MV) systems are mutually distinct.
3. Set the language (confirm once)

6.3-1 Country selection menu



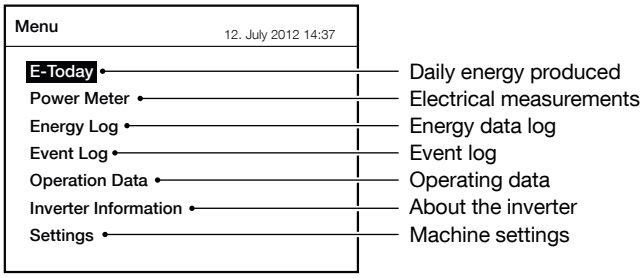
6.3-2 Language selection menu



WARNING!
If the country setting is wrong SOCOMEC must be contacted for assistance.

If the level of sunlight is sufficient the inverter will come into operation.
After the first kWh produced the installation date is updated automatically.
During subsequent start-ups the device will show the main page of the menu.

6.3-3 Main menu

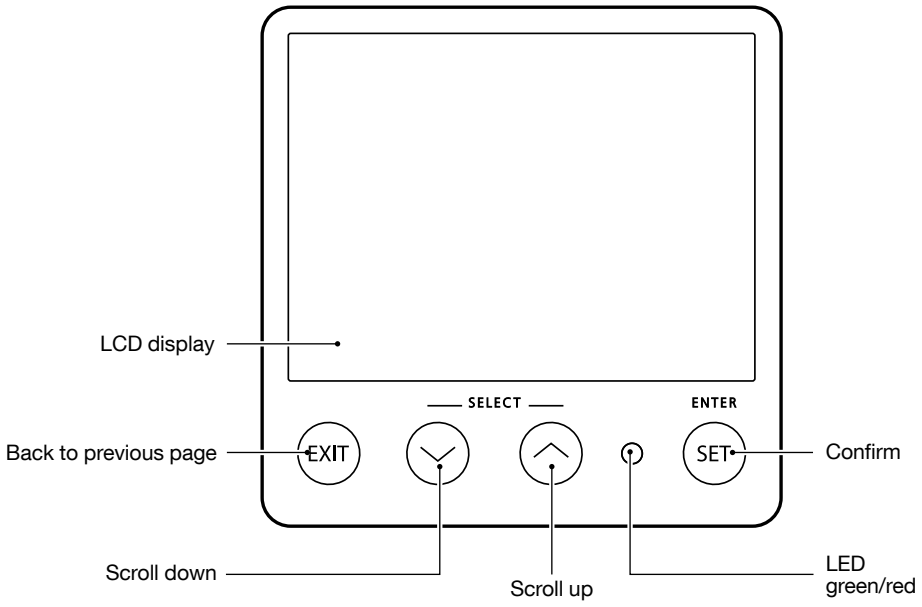


Description of menus and settings. See Chapter 8.

7. CONTROL PANEL

WARNING! RISK OF ACCIDENT OR SERIOUS INJURY!
Do not touch the terminal of the photovoltaic module when exposed to sunlight

7.1-1



LED indicator		
Condition	Green LED	Red LED
Countdown	FLASHING	OFF
On grid	LIT	OFF
Error or fault	OFF	LIT
Standby or night-time (no DC supply)	OFF	OFF
One DC input only (during countdown)[1]	OFF	FLASHING
One DC input only (inverter delivering)	LIT	FLASHING
Fan fault[2]	LIT	FLASHING
FW update	FLASHING	FLASHING

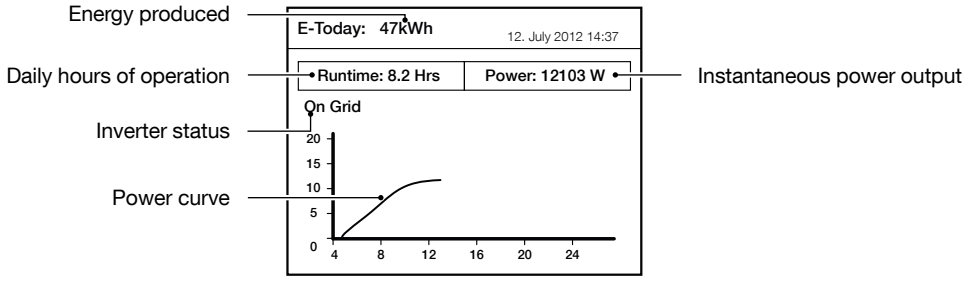
1. Solar Low alert (inverter not connected to grid)
2. HW Fan alert

8. MENU

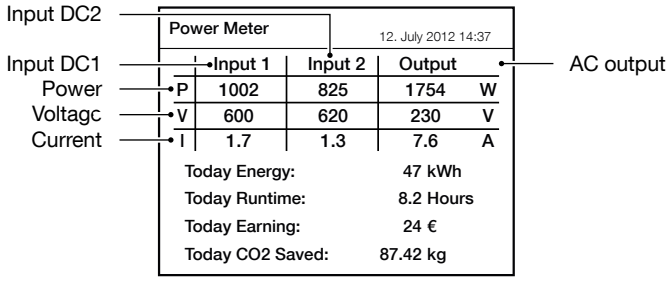
WARNING!
The menus and settings described are visible only after the appliance has been started up for the first time. See Chapter 6.

8.1. DESCRIPTION

8.1-1 Daily energy

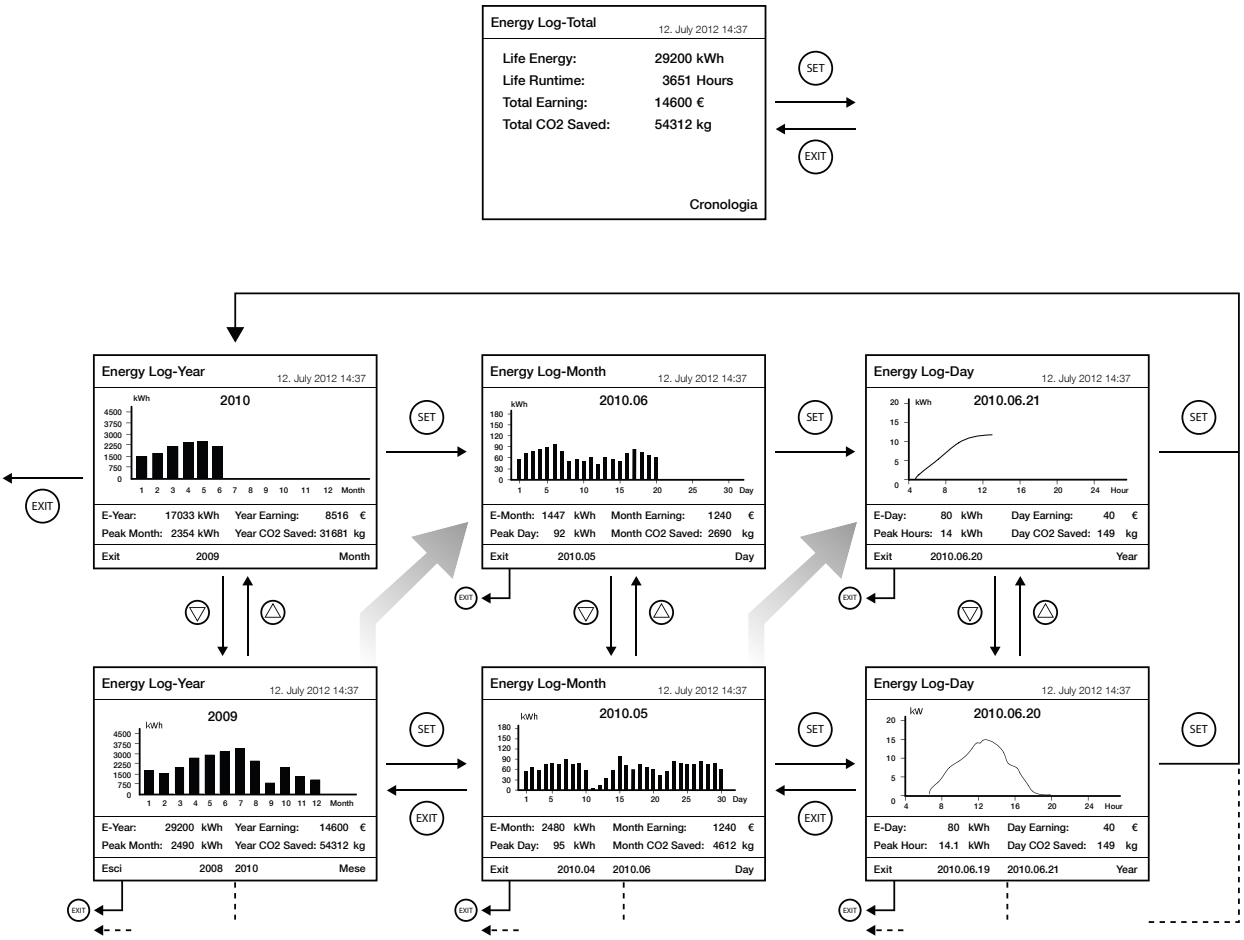


8.1-2 Measurements



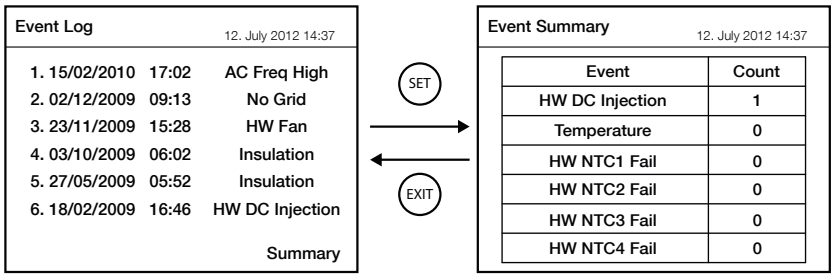
ENGLISH

8.1-3 Annual, monthly and daily energy generation log



This page displays the last thirty events (error or fault) recorded by the system. The first event displayed is the most recent. The statistics of the selected event can be displayed by pressing SET.

8.1-4 Event log



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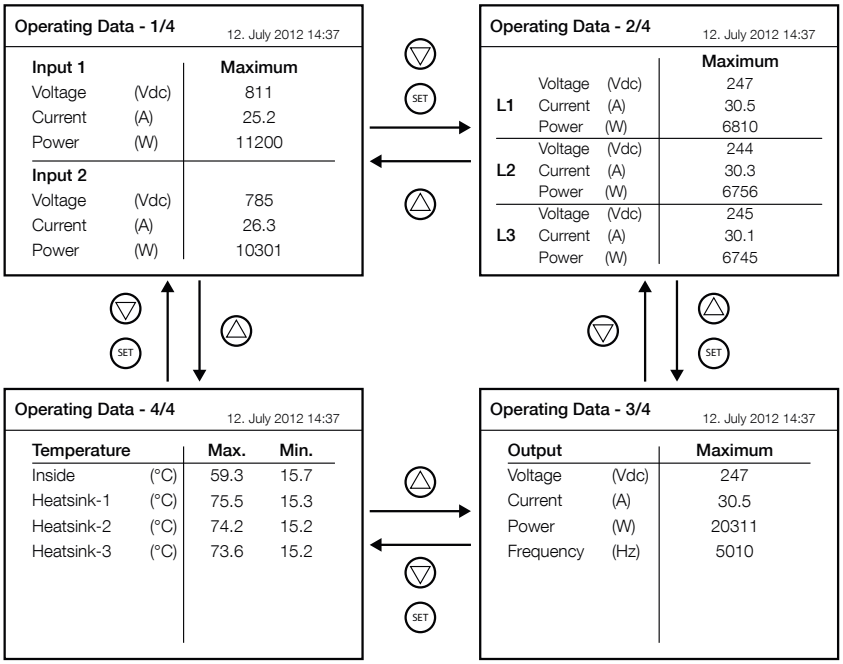
8.1-5 Operating data (maximum values measured)



To reset the data on this menu press ▽ △ SET simultaneously and hold for approximately 10 seconds.

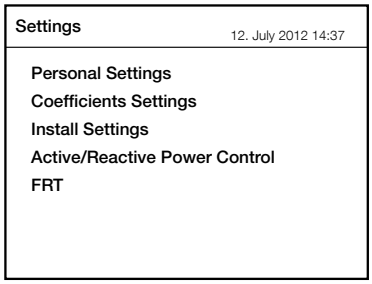
8.1-6 Inverter information

Inverter Information	12. July 2012 14:37
Serial Number	WE08450003
DSP-Version	1.80
Red.-Version	1.17
Comm.-Version	91.23
Installation Date	19.Apr.2012
Inverter ID	001
Country	Italy LV

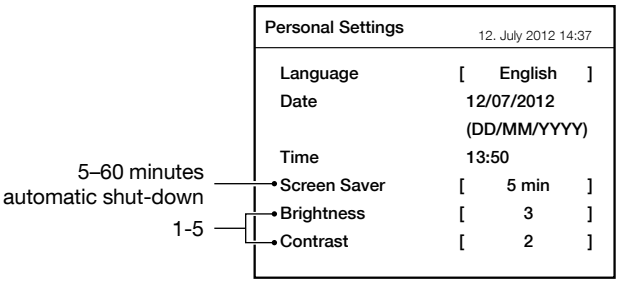
ENGLISH

8.2. SETTINGS

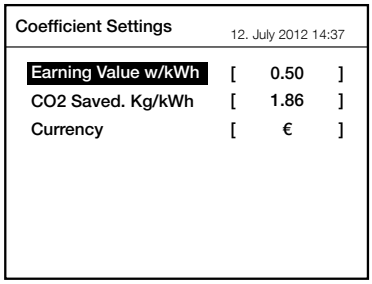
8.2-1



8.2-2 Personal settings



8.2-3 Coefficient settings



8.2.1. Installation settings

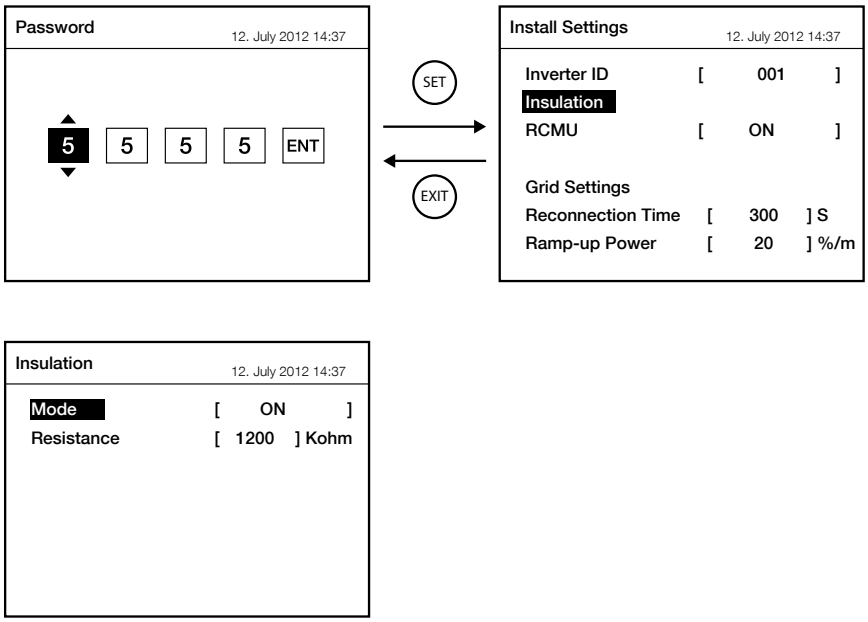
WARNING! DAMAGE CAN BE CAUSED TO THE MACHINE AND SYSTEM!

The following settings are enabled and managed by the grid operator, installer or specialist technician. Wrong settings are liable to damage the photovoltaic system.

To access the Installation Settings menu enter the password 5555 (the password cannot be changed).

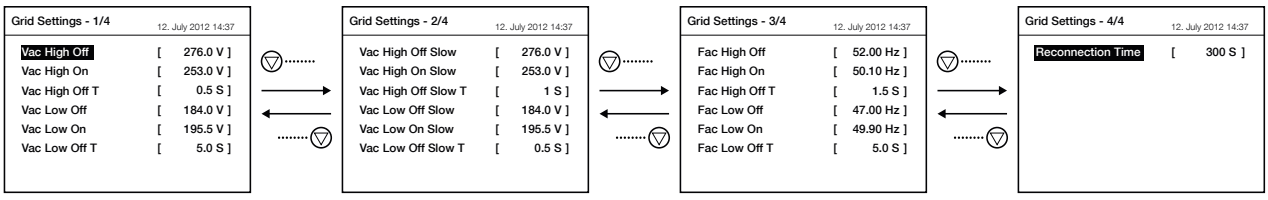
- **Inverter ID**
  Address of each inverter.
- **Insulation**
  This function measures the impedance between grid and earth. In the event of a fault, prevents connection to the grid. The following insulation measurement methods can be adopted depending on the type of photovoltaic system: positive to earth, negative to earth, DC1 only, DC2 only, not active.
- **RCMU**
  This function monitors current leakage to earth. If the set limit is exceeded the inverter shuts down.

8.2.1-1 Installation settings - User mode



- **Grid setting**
  The operating voltage and frequency thresholds of the inverter are displayed.

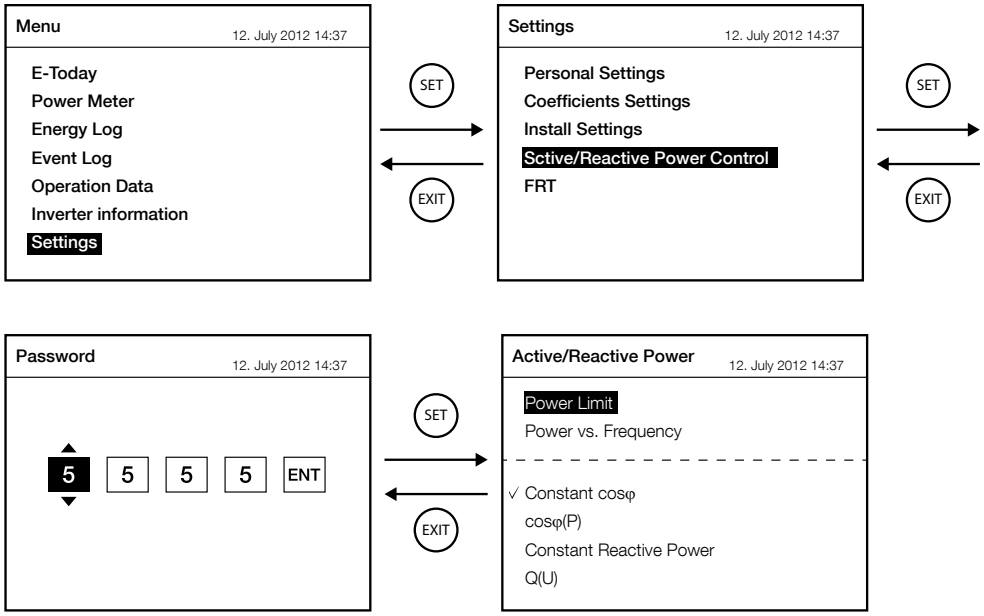
8.2.1-2 Grid settings



- **Reconnection time**
  This function varies the waiting time for the inverter to restart (factory setting 300 s).
- **Ramp up Power**
  Percentage of rated power put onto the grid during start-up (factory setting 20%).

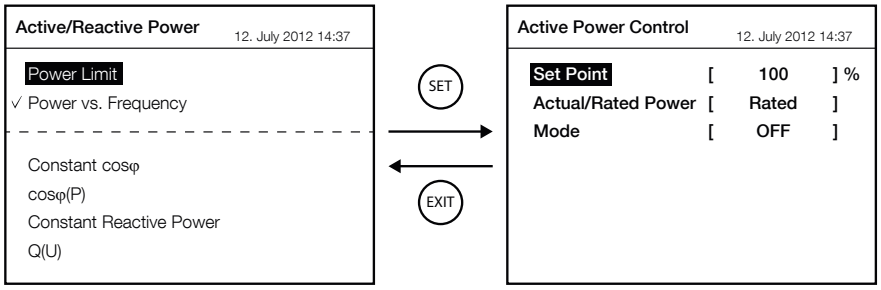
8.2.2. Active/Reactive Power

8.2.2-1



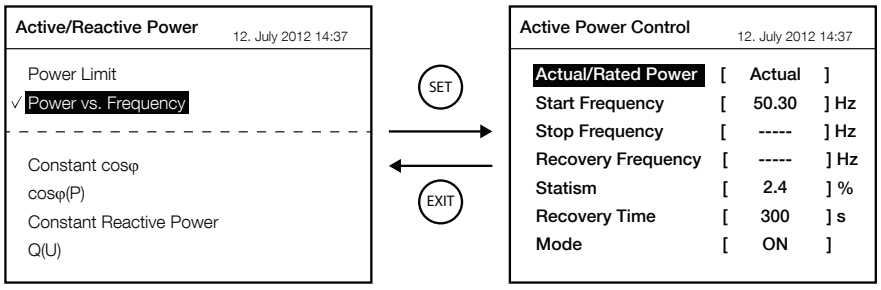
- **Active Power Control**
  If activated, the Active Power Limitation function will reduce the power output.
  This depends on:
  - the configured Set Point percentage;
  - sunlight conditions.

8.2.2-2



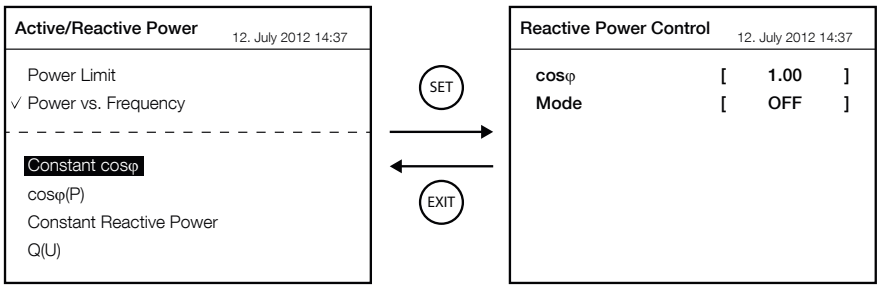
- **Frequency-determined Active Power Control**
  This function limits the active power output level automatically (in the event of frequency transients higher than the set value).

8.2.2-3



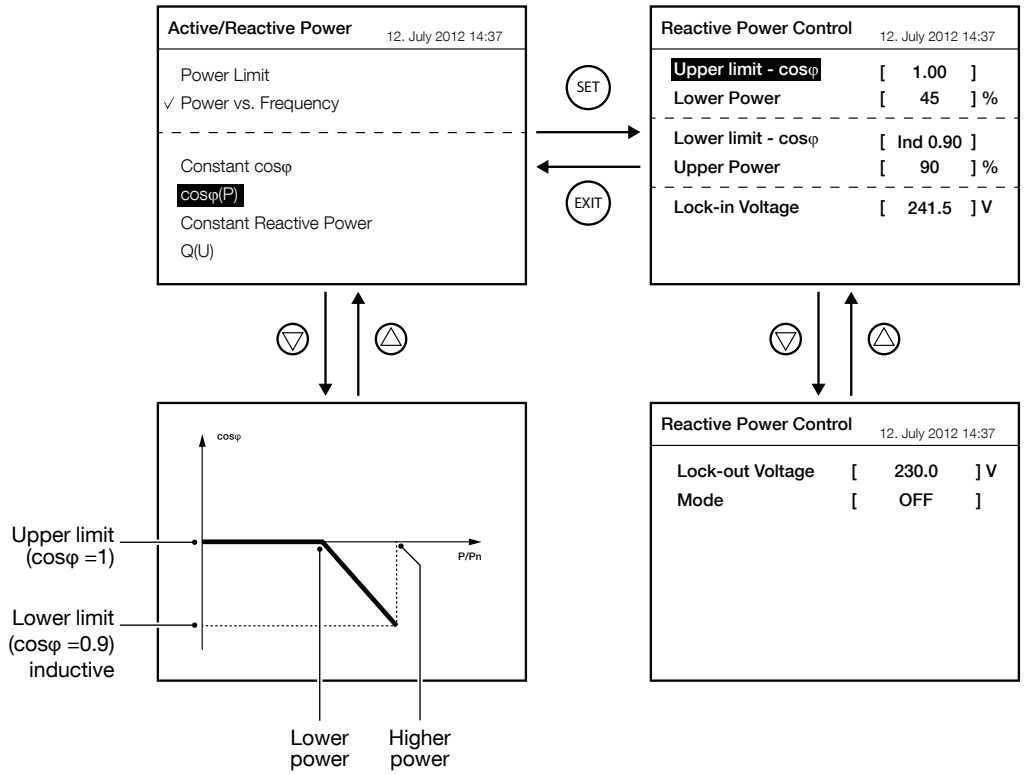
• **Operation at constant cosφ**
This function selects a fixed cosφ setting between 0.8 inductive and 0.8 capacitive.

8.2.2-4



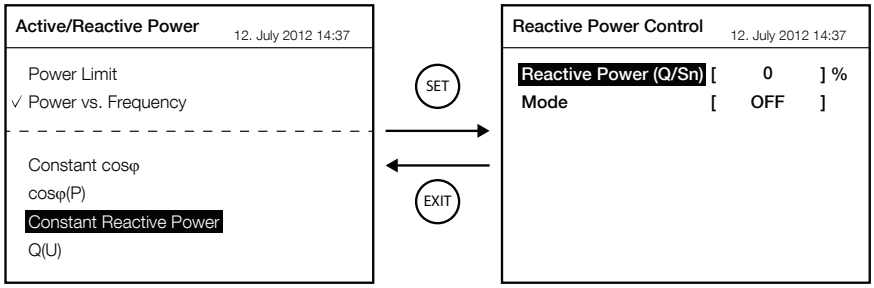
• **Power-regulated Cosφ monitoring**
If activated, this function generates a cosφ variable as a function of power (instantaneous power factor regulated automatically by the inverter).

8.2.2-5



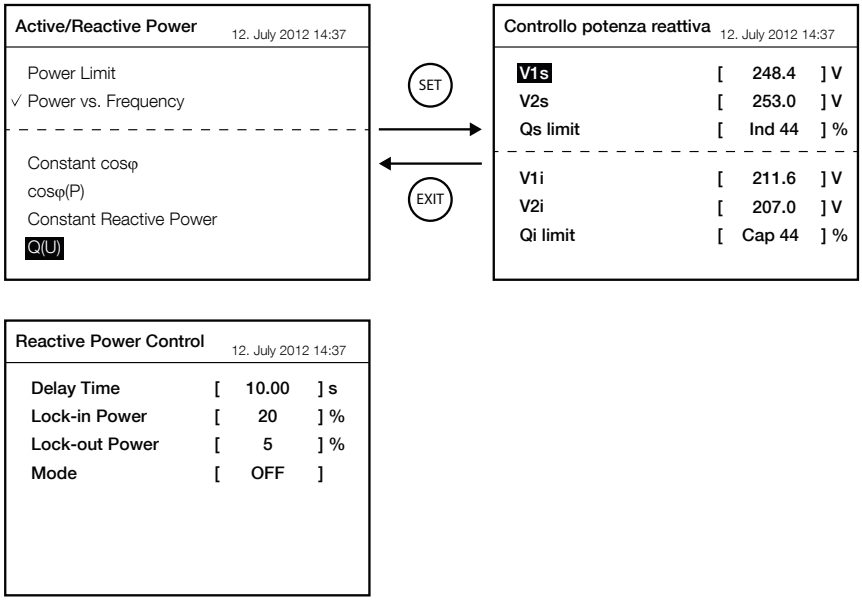
• **Operation at constant reactive power**
This function selects a reactive power percentage up to 48.43 % of the rated power.

8.2.2-6



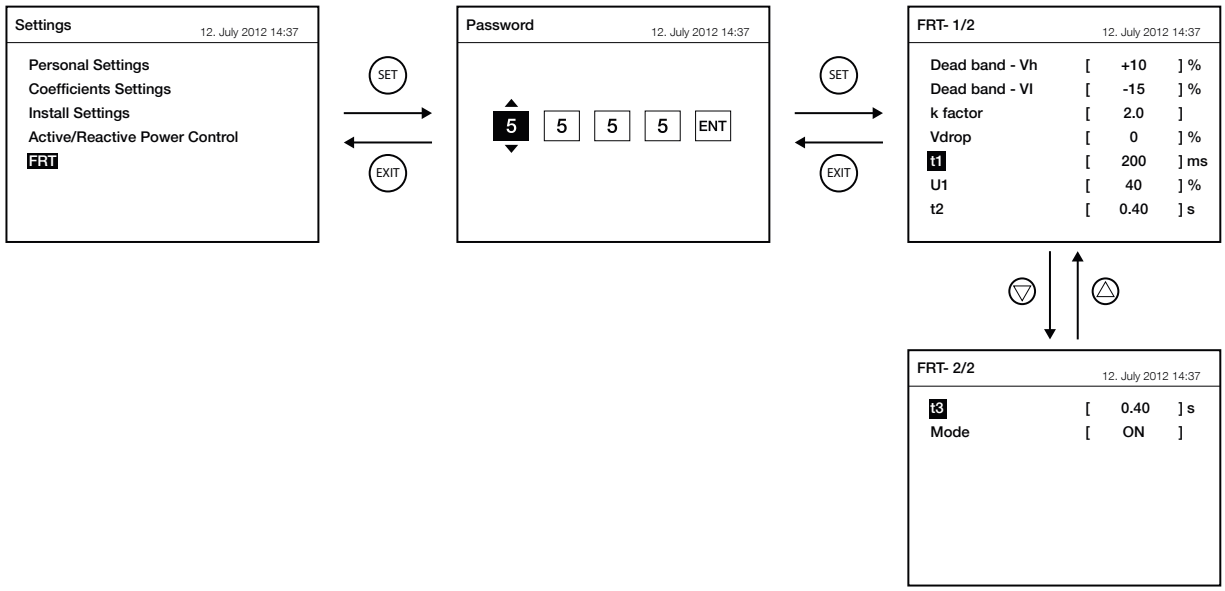
• **Operation at voltage-regulated reactive power (Q)**
This function generates reactive power determined by the voltage registered at the output terminals.

8.2.2-7



• **FRT (Low Voltage Fault Ride Through)**
This function ensures that the inverter will not shut down during dips in grid voltage.

8.2.2-8



9. MEASUREMENTS AND MESSAGES

9.1. MEASUREMENTS

Description of measurement messages	
Measurement	**Description**
Energy today	Total energy generated during the day
Op time	Total PV inverter operating time during the day
Power	Actual power generated
Input 1 P	Power at DC input 1
Input 1 V	Voltage at DC input 1
Input 1 I	Current at DC input 1
Input 2 P	Power at DC input 2
Input 2 V	Voltage at DC input 2
Input 2 I	Current at DC input 2
P output	Power at AC output 1
V output	Voltage at AC output (star voltage)
I output	Current at AC output (current of one phase)
Energy today	Total energy generated today
Op time today	Total operating time today
Earnings today	Total amount earned today (US dollars)
CO2 saved today	Total reduction in CO2 emissions today
Tot Energy Prod.	Total energy generated since the system went into operation
Total op time	Total operating time since the system went into operation
Total earnings	Total earnings since the system went into operation
Total CO2 saved	Total reduction in CO2 emissions since the system went into operation
Energy/year	Total energy produced in one year
Earnings/year	Total earnings in one year
Monthly peak	Peak production per month
CO2/year	Total reduction in CO2 emissions over one year
Energy/month	Total energy produced in one month
Earnings/month	Total earnings in one month
Daily peak	Peak production per day
CO2/month	Total reduction in CO2 emissions over one month
Energy/day	Total energy produced in one day
Earnings today	Total earnings in one day
Peak today	Peak production per hour
CO2 saved today	Total reduction in CO2 emissions on one day
Max voltage input 1	Maximum voltage registering at input 1
Max current input 1	Maximum current registering at input 1
Max power input 1	Maximum power registering at input 1
Max voltage input 2	Maximum voltage registering at input 2
Max current input 2	Maximum current registering at input 2
Max power input 2	Maximum power registering at input 2
Max voltage L1	Maximum output voltage on L1
Max current L1	Maximum output current on L1
Max power L1	Maximum output power on L1
Max voltage L2	Maximum output voltage on L2
Max current L2	Maximum output current on L2

Max power L2	Maximum output power on L2
Max voltage L3	Maximum output voltage on L3
Max current L3	Maximum output current on L3
Max power L3	Maximum output power on L3
Max output voltage	Maximum output voltage
Max output current	Maximum output current
Max output power	Maximum output power
Temperature	
Max internal	Maximum internal temperature of the inverter
Min internal	Minimum internal temperature of the inverter
Max heatsink 1	Maximum temperature at heatsink 1
Min heatsink 1	Minimum temperature at heatsink 1
Max heatsink 2	Maximum temperature at heatsink 2
Min heatsink 2	Minimum temperature at heatsink 2
Max heatsink 3	Maximum temperature at heatsink 3
Min heatsink 3	Minimum temperature at heatsink 3

9.2. ERROR MESSAGES

Description of error messages		
Message	**Description**	**Solutions**
AC Freq High	1) Grid frequency higher than nominal 2) Country configuration incorrect 3) Measuring circuit failure	1) Check the grid frequency value 2) Check the country setting 3) Contact the technician
AC Freq Low	1) Grid frequency lower than nominal 2) Country configuration incorrect 3) Measuring circuit failure	1) Check the grid frequency value 2) Check the country setting 3) Contact the product technician
Grid Quality	1) Excessive distortion caused by loads connected to grid or near inverter 2) Measuring circuit failure	1) Check for the existence of non-linear loads connected to the grid 2) Contact the technician
HW Connected Fail	1) AC plug wrongly connected 2) Measuring circuit failure	1) Check the wiring as described in the manual 2) Contact the technician
No Grid	1) No AC power 2) AC switch contacts open 3) Plug not connected 4) Internal fuses blown	1) Check the grid voltage value 2) Close the AC breaker contacts 3) Check the connection and wiring 4) Contact the product technician
AC Volt Low	1) AC voltage lower than nominal 2) Country configuration or grid setting incorrect 3) AC plug wrongly connected 4) Internal fuses blown	1) Check the grid voltage value 2) Check the country/voltage limits setting 3) Check wiring in the manual 4) Contact the technician
AC Volt High	1) AC voltage higher than nominal 2) Country configuration or grid setting incorrect 3) AC plug wrongly connected 4) Internal fuses blown	1) Check the grid voltage value 2) Check the country/voltage limits setting 3) Check wiring in the manual 4) Contact the technician
Solar1 High	1) Input voltage 1 higher than 1000 V 2) Measuring circuit failure	1) Reduce the no. of panels to obtain an open circuit voltage VOC < 1000 V 2) Contact the technician
Solar2 High	1) Input voltage 2 higher than 1000 V 2) Measuring circuit failure	1) Reduce the no. of panels to obtain an open circuit voltage VOC < 1000 V 2) Contact the technician

9.3. WARNING MESSAGES

Description of error messages		
Message	**Description**	**Solutions**
Solar1 Low	1) Input voltage 1 below limits 2) Measuring circuit failure	1) Check the DC voltage value 2) Contact the product technician
Solar2 Low	1) Input voltage 2 below limits 2) Measuring circuit failure	1) Check the DC voltage value 2) Contact the technician
HW FAN	1) One or more fans jammed 2) One or more fans faulty 3) One or more fans disconnected 4) Measuring circuit failure	1) Remove the object obstructing the fan 2) Remove the faulty fan 3) Check the fan connections 4) Contact the chnician

9.4. FAULT MESSAGES

Description of error messages		
Message	**Description**	**Solutions**
HW DC Injection	1) Abnormal grid voltage 2) Measuring circuit failure	1) Check for the existence of non-linear loads connected to the grid 2) Contact the technician
Temperature	1) Ambient temperature > 60 °C or < -30 °C 2) Measuring circuit failure	1) Check the installation environment and ventilation 2) Contact the technician
HW NTC1 Fail	1) Ambient temperature > 90 °C or < -30 °C 2) Measuring circuit failure NTC1	1) Check the installation environment 2) Contact the technician
HW NTC2 Fail	1) Ambient temperature > 90 °C or < -30 °C 2) Measuring circuit failure NTC2	1) Check the installation environment 2) Contact the technician
HW NTC3 Fail	1) Ambient temperature > 90 °C or < -30 °C 2) Measuring circuit failure NTC3	1) Check the installation environment 2) Contact the technician
HW NTC4 Fail	1) Ambient temperature > 90 °C or < -30 °C 2) Measuring circuit failure NTC4	1) Check the installation environment 2) Contact the technician
HW DSP ADC1	1) Insufficient input power 2) Measuring circuit failure	1) Check that DC voltage > 150 V 2) Contact the technician
HW DSP ADC2	1) Insufficient input power 2) Measuring circuit failure	1) Check that DC voltage > 150 V 2) Contact the technician
HW DSP ADC3	1) Insufficient input power 2) Measuring circuit failure	1) Check that DC voltage > 150 V 2) Contact the technician
HW RED ADC1	1) Insufficient input power - Input 1 2) Measuring circuit failure	1) Input power too low 2) Contact the technician
HW RED ADC2	1) Insufficient input power - Input 2 2) Measuring circuit failure	1) Input power too low 2) Contact the technician
HW Efficiency	1) Calibration incorrect 2) Measuring circuit failure	1) Check the current measurements between inverter and system 2) Contact the technician
HW COMM2	1) Problems with internal communication between RED and CPU	1) Switch off the inverter and switch on again 2) Contact the technician
HW COMM1	1) Problems with internal communication between DSP and COMM	1) Switch off the inverter and switch on again 2) Contact the technician

GROUND CURRENT	1) Problems with PV field insulation 2) High stray capacitance of PV field 3) High level of current leakage to earth	1) Check PV field insulation 2) Check that the stray capacitance of each input to earth is < 2.5 µF. 3) Check system wiring
INSULATION	1) Problems with PV field insulation 2) High stray capacitance of PV field	1) Check PV field insulation 2) Check that the stray capacitance of each input to earth is < 2.5 µF.
HW Connect Fail	1) No internal power supply to the machine 2) Internal control circuits not working	1) Contact the technician
RCMU Fail	1) Internal control circuits not working	1) Contact the technician
Relay Test Short	1) Output relays with contacts closed 2) Internal control circuits not working	1) Contact the technician 2) Contact the technician
Relay Test Open	1) Output relays faulty 2) Internal control circuits not working 3) Grid voltage measurements abnormal	1) Contact the technician 2) Contact the technician 3) Compare machine and grid measurement values
Bus Unbalance	1) Problems with wiring of strings 2) String short-circuiting to earth 3) Internal control circuits not working	1) Check the parallel string setup connected to the inverter 2) Check the system 3) Contact the technician
HW Bus OVR	1) Problems with wiring of strings 2) String short-circuiting to earth 3) Internal control circuits not working	1) Check the parallel string setup connected to the inverter 2) Check the system 3) Contact the technician
AC Current High	1) AC grid overvoltage 2) Internal control circuits not working	1) Switch off/switch on again 2) Contact the technician
HW CT A Fail	1) Internal control circuits not working	1) Contact the technician
HW CT B Fail	1) Internal control circuits not working	1) Contact the technician
HW CT C Fail	1) Internal control circuits not working	1) Contact the technician
HW AC OCR	1) High levels of power system harmonics 2) Internal control circuits not working	1) Check for the existence of non-linear loads connected to the grid 2) Contact the technician
HW ZC Fail	1) Internal control circuits not working	1) Contact the technician
DC Current High	1) Internal control circuits not working	1) Contact the technician

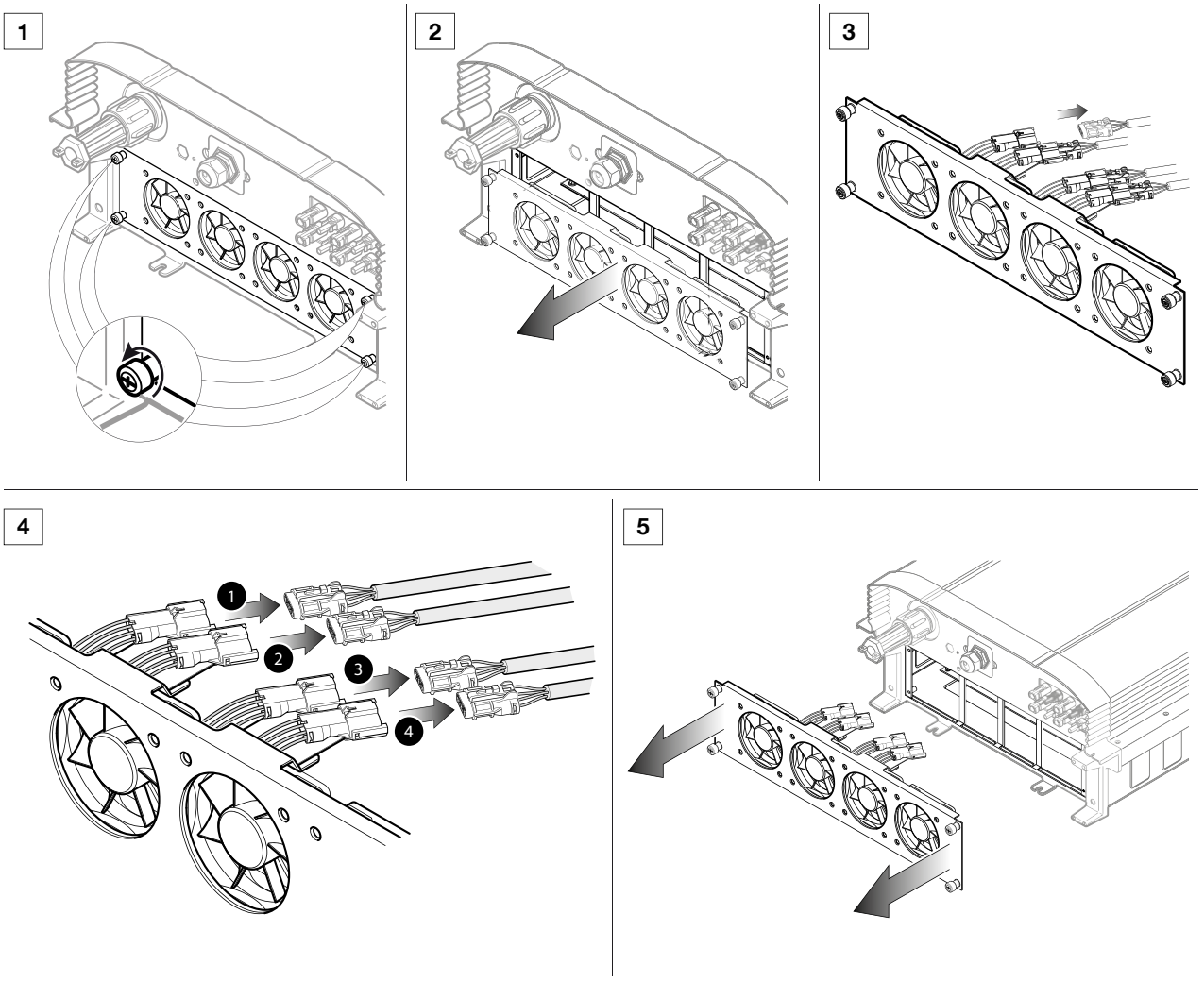
10. MAINTENANCE

WARNING!
Follow the instructions in section 1.2.

The solar inverter should be inspected at six-monthly intervals to ensure continued trouble-free operation.
To ensure the appliance is properly ventilated check the fans are operating correctly and the protective air vent grilles are clean.

10.1. REMOVAL OF FAN MOUNTING PLATE

10.1-1



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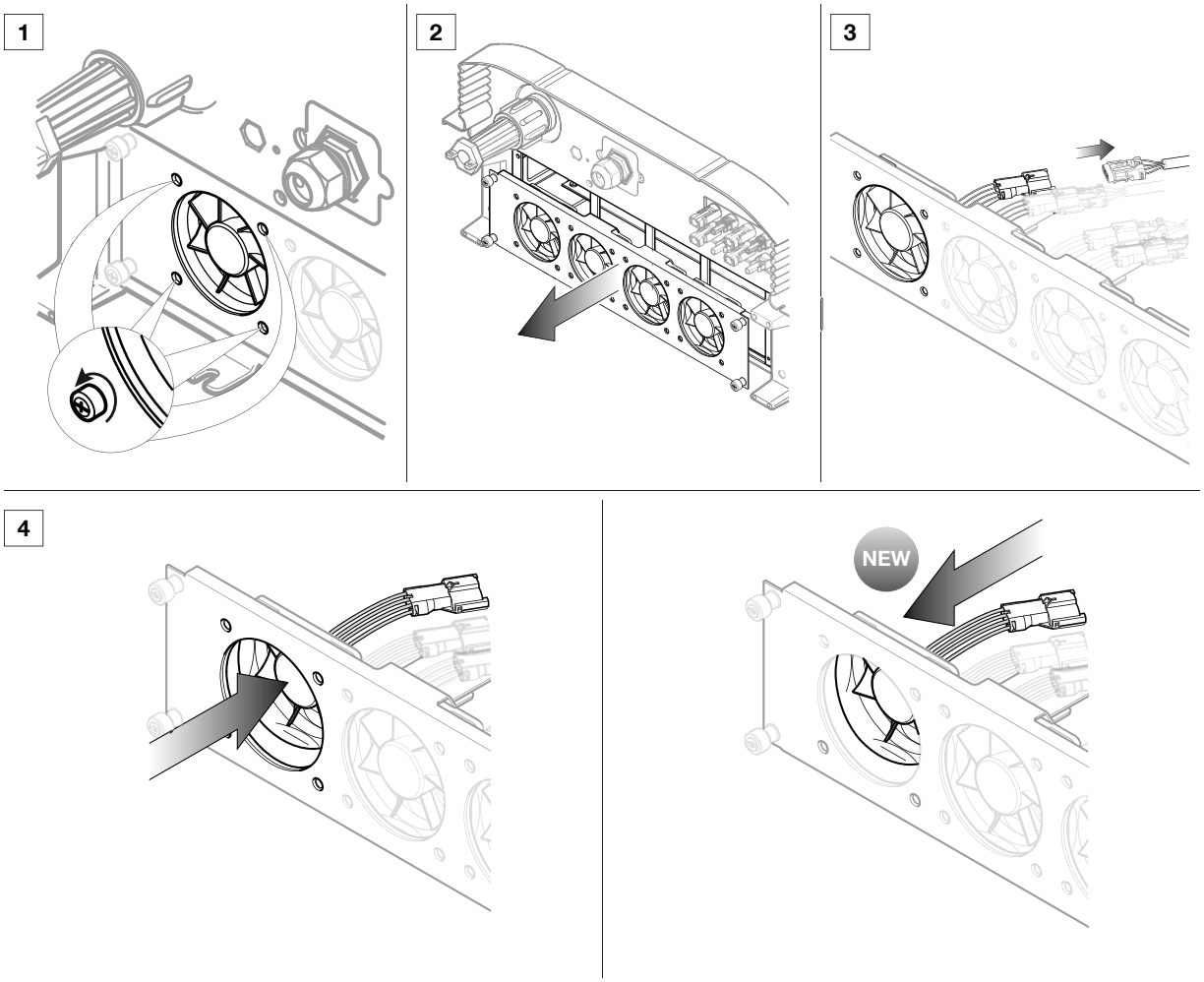
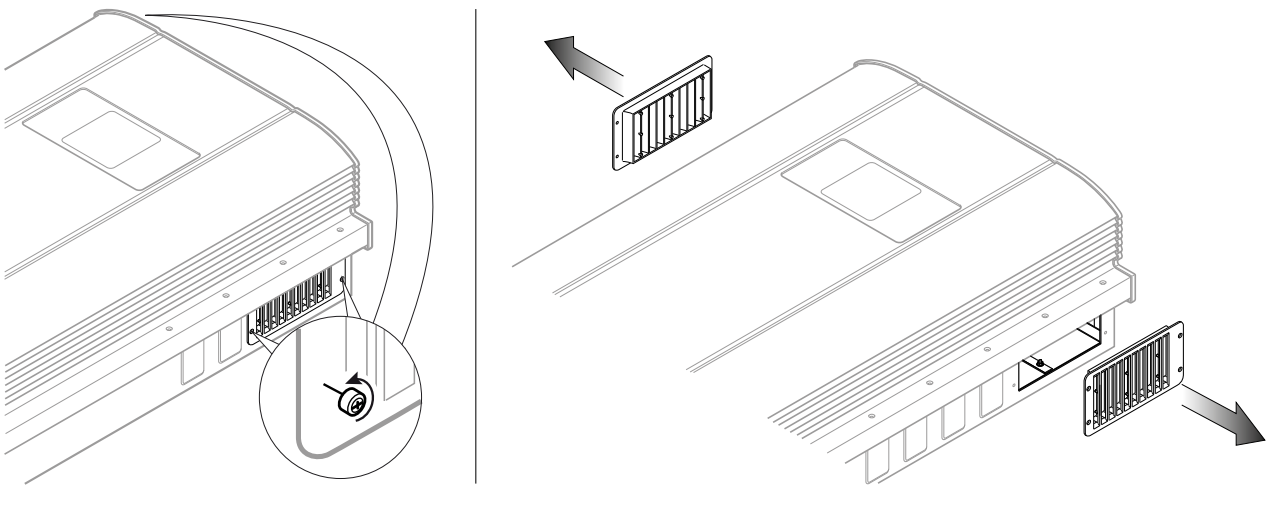
10.2. FAN REPLACEMENT

10.2-1



10.3. REMOVAL OF AIR OUTLET VENT GRILLES

10.3-1



11. REMOVAL OF INVERTER

If it is necessary to remove the inverter proceed as follows:

1. Open the AC breaker contacts to disconnect the electricity.
2. Isolate the power feed from the photovoltaic field
3. Use a suitable meter to verify the absence of AC and DC voltages.
4. Remove the AC connections immediately
5. Remove the DC connections to isolate the PV field.
6. Remove the RS485 communication module with the computer connection.

Once these steps have been completed remove the inverter.

12. TECHNICAL SPECIFICATIONS

Model	*SUNSYS B20*	*SUNSYS B15*
Enclosure	Powder coated aluminum	
Operating temperature	-20–60 °C	
At maximum power: up to 40 °C	0-90% non-condensing	
Relative humidity	0-90% non-condensing	
Protection level	IP65 (electronic components)	
IP54 (other parts)		
Galvanic insulation	NO	
Safety class	Class I metal casing	
with protective earth connection	965 × 610 × 287.5 mm	
Overvoltage category	III	
Weight	67.2 kg	
Dimensions	960 × 612 × 278 mm	
Connectors	Weather resistant connectors	
DC input (solar side)		
Maximum input power	24 kWp	18 kWp
Rated voltage	630 VDC	
Operating voltage	200–1000 VDC	
Start-up voltage	> 250 V	
Start-up power	> 40 W	
Absolute maximum voltage	1000 VDC	
MPP voltage range at rated power	350–800 Vdc	
Number of inputs	4 (2MPPT)	
MPPT	Parallel inputs: 1MPPT Separate inputs: 2MPPT	
Separate inputs: 2MPPT	< 30 A	< 23 A
Rated current	2 x 30 A	2 x 23 A
AC output (grid side)		
Rated power at 400 V ±10%	20 kVA	15 kVA
Rated power at Cosφ=0.9	18 kW	13.5 kW
Maximum power	21 kVA	15.75 kVA
Voltage	230–400 ±20%	
Rated current	29 A	22 A
Max current	32 A	25 A
Frequency	47-52 Hz	
Total Harmonic Distortion	< 3% at rated power	
Power factor	> 0.99 at rated power Cosφ = 0.8 inductive and capacitive	
DC current injection	Disconnect: 0.5% In in 1 s, 1 A in 200 ms	
Night time power	< 2 W	
Maximum efficiency	> 98.05%	
European efficiency	> 97.5%	
AC connector	3 Phases + Neutral + PE	
Recommended protection	Thermal-magnetic with I = 1.25 x Inom	Thermal-magnetic with I = 1.25 x Inom

System information / communication		
User interface		LCD graphic display, 5” (320 x 240 pixels)
		Data logger with 10 year capacity and real time clock
		30 events
External communication		2 x RS-485 connection
Standards and Directives		
CE compliance		Yes
Emissions		IEC61000-6-4, IEC61000-6-3
Harmonics		EN 61000-3-12
Fluctuations and flicker		EN 61000-3-11
Grid interface		VDE0126-1-1; RD1663
Immunity	ESD	IEC 61000-4-2
	RS	IEC 61000-4-3
	EFT	IEC 61000-4-4
	SURGE	IEC 61000-4-5
	CS	IEC 61000-4-6
	PFMF	IEC 61000-4-8
Electrical safety		EN 60950, Draft IEC62109 -1& -2

SOCOMEC GROUP
S.A. SOCOMEC capital 11 302 300 € - R.C.S. Strasbourg B 548 500 149
B.P. 60010 - 1, rue de Westhouse - F-67235 Benfeld Cedex

SOCOMEC Strasbourg
11, route de Strasbourg - B.P. 10050 - F-67235 Huttenheim Cedex- FRANCE
Tel. +33 (0)3 88 57 45 45 - Fax +33 (0)3 88 74 07 90

SOCOMEC Isola Vicentina
Via Sila, 1/3 - I - 36033 Isola Vicentina (VI) - ITALY
Tel. +39 0444 598611 - Fax +39 0444 598622
it.pvconsult@socomec.com

www.socomec.com

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