

SUNSYS H50

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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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!

Device with several power supply sources.



In the event of system maintenance, carry out the following steps beforehand:

- Open the AC switch.
- Open the DC switch.
- Make sure the system cannot be restarted.
- Make sure the electricity supply has been disconnected.



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.



Do not dispose of the inverter with normal household waste.

At the end of its working life, the inverter must be disposed of in accordance with local regulations for the disposal of electronic components applicable to the installation site at the moment of disposal.

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 inverter.
- Do not install the inverter inside a cabinet in an enclosed, non-ventilated area.
- When installing the inverter comply with 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 (5 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.

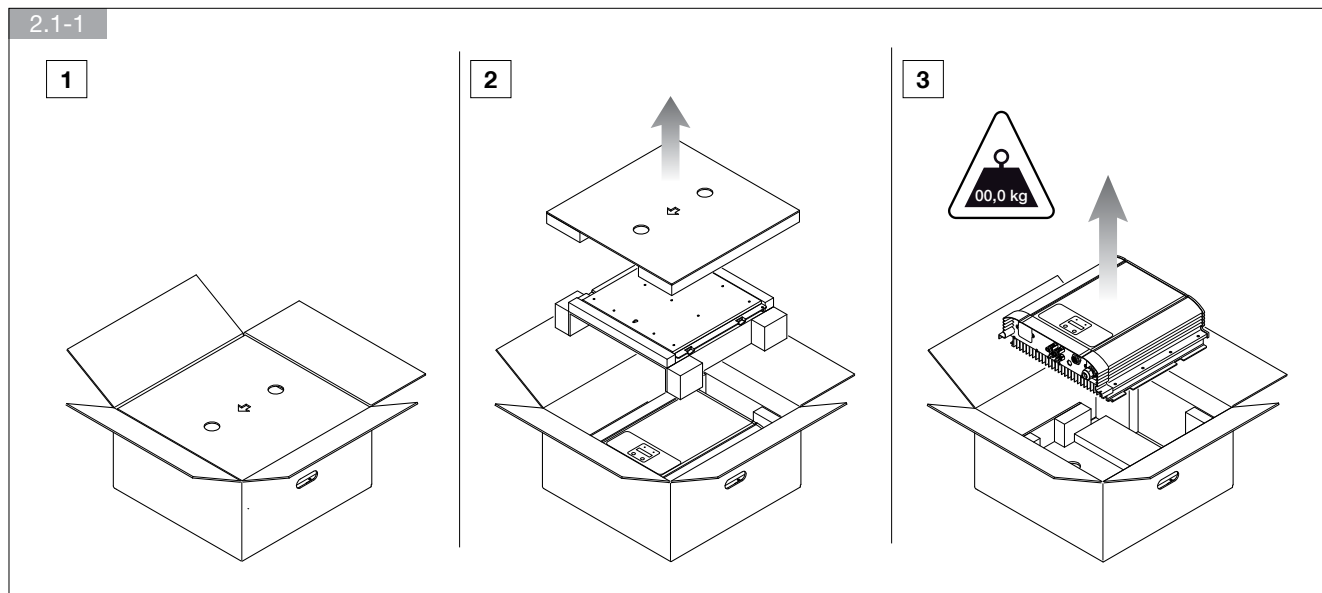
After removing the packaging ensure that:

- 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.

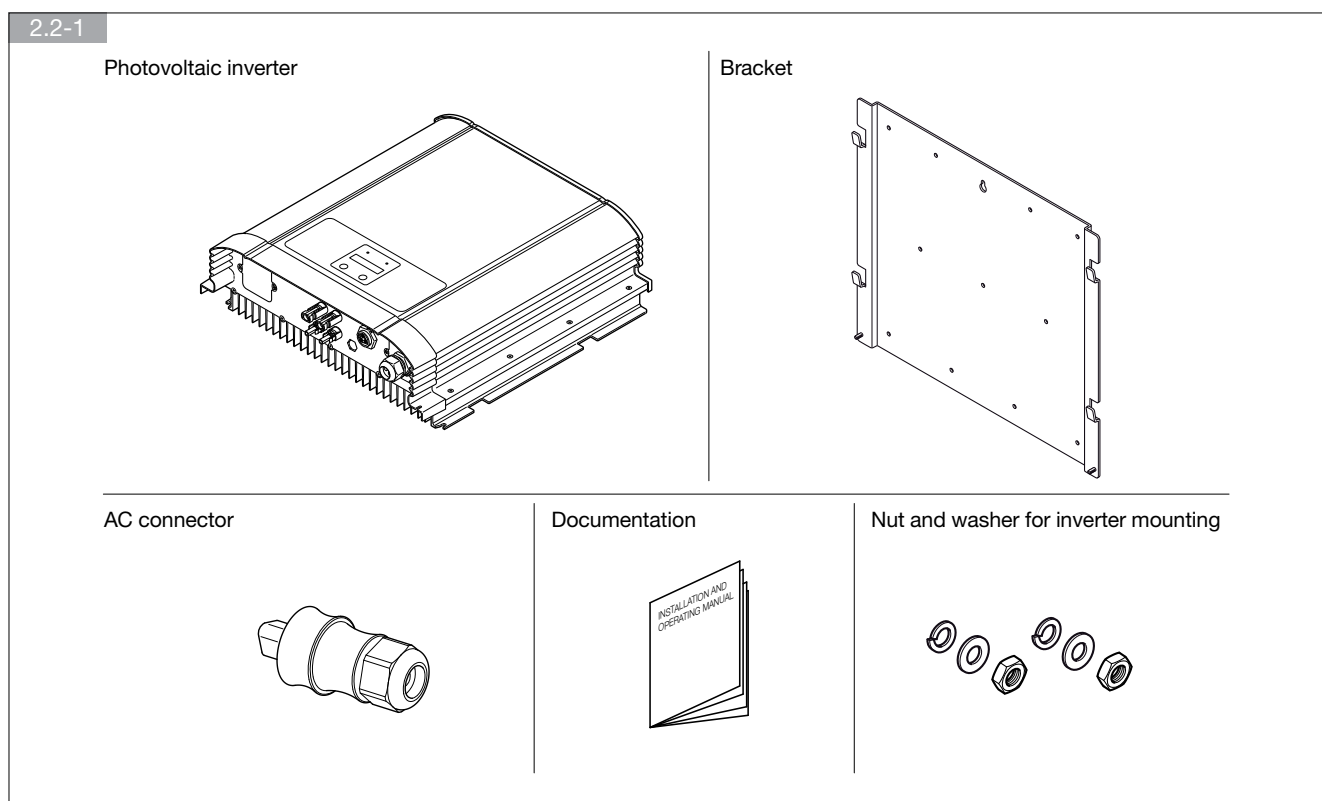


WARNING!

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

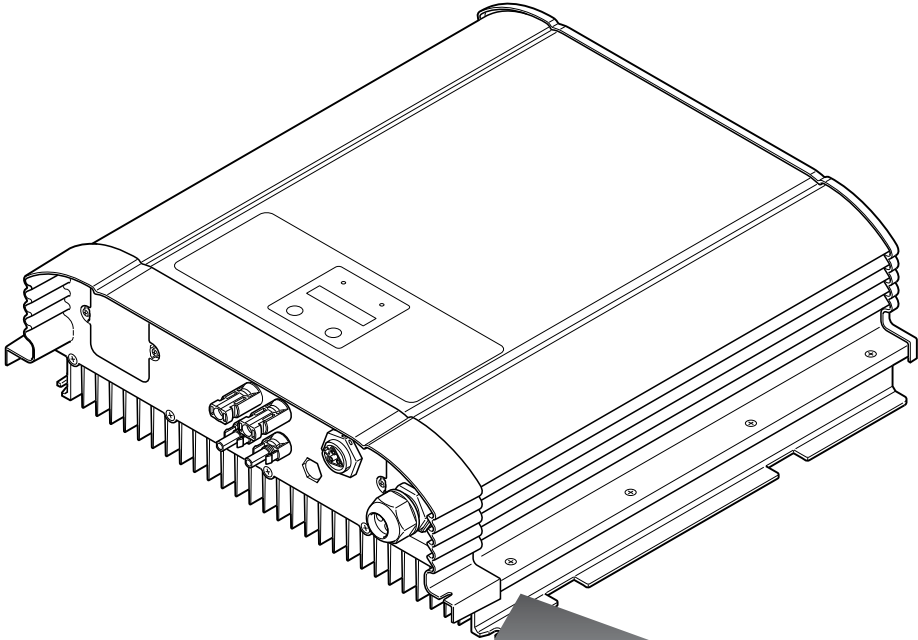





2.2. CONTENTS



2.3. IDENTIFICATION DATA PLATE

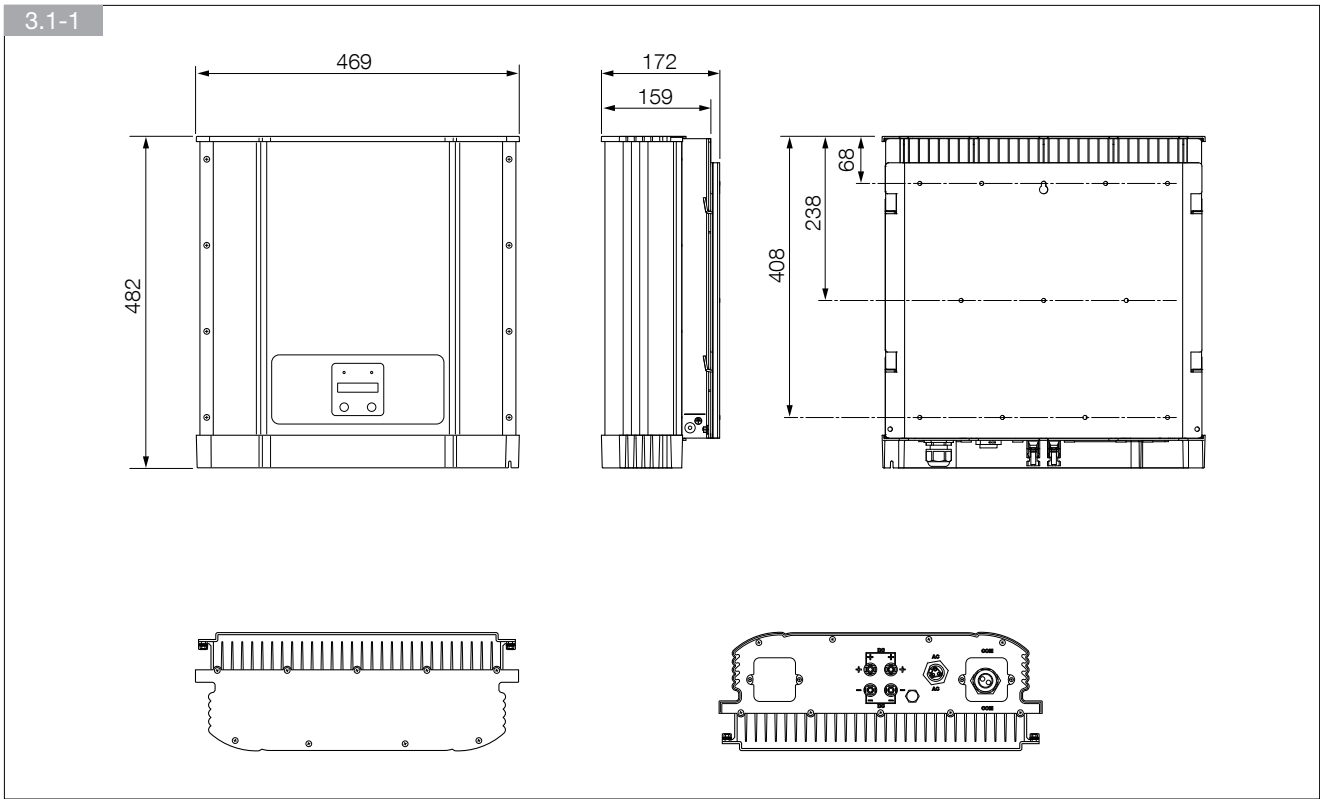
2.3-1



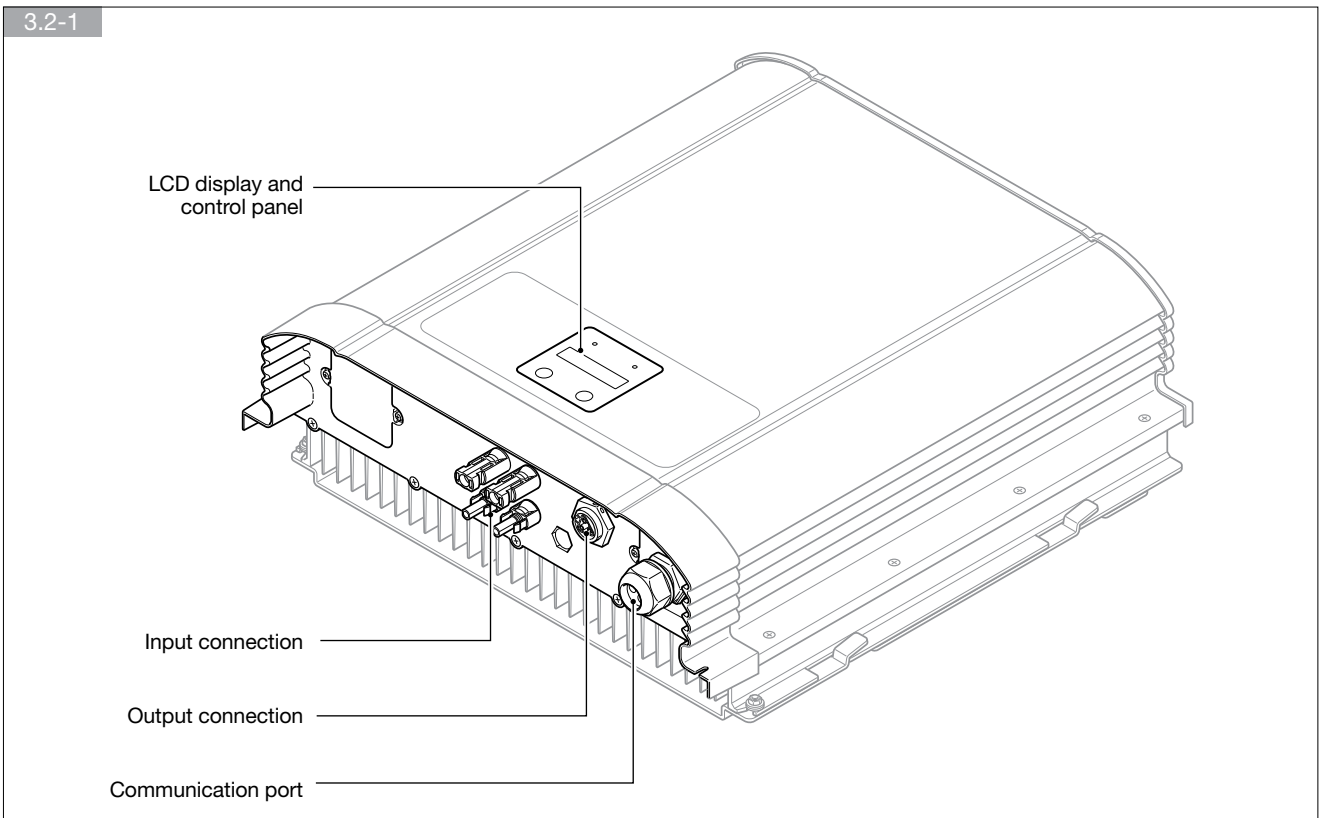
		 Via Sila 1/3 - Zona Industriale Scovizze 36033 Isola Vicentina (VI) Italy	
Model	MODEL	:	SUN-HO6K0TL65RP
Technical data	DC INPUT	:	200 ÷ 1000V _{DC} - I _{MAX} = 17,5A _{DC}
	PV MAX	:	V _{OC} = 1000V - I _{SC} = 19 A
	AC OUTPUT	:	230V _{AC} - 50Hz/60Hz - I _{MAX} = 24,5 A _{RMS}
	NOMINAL POWER	:	5kVA - cosφ: 0,8 ÷ 1
	OVERVOLTAGE CATEGORY	:	3
	IP CLASSIFICATION	:	IP65
Serial number	PROTECTIVE CLASS	:	1
	S/N		
		Assembled in China  	

3. DESCRIPTION

3.1. DIMENSIONS



3.2. GENERAL DESCRIPTION OF COMPONENTS



4. INSTALLATION

4.1. WARNINGS

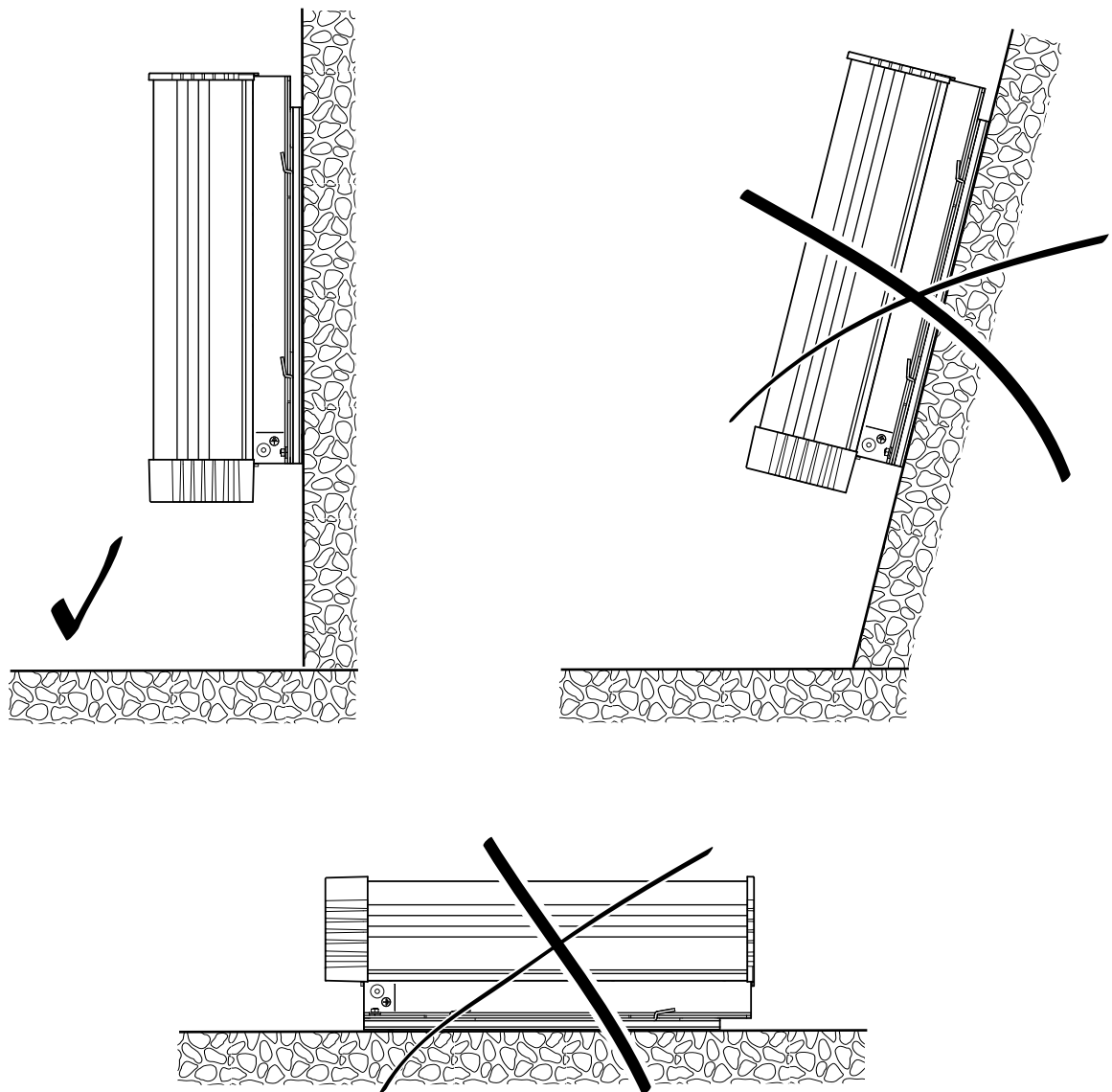
The inverter is designed for mounting on masonry walls. If the walls are made using different materials, the installer must use suitable mounting supports.

Install the inverter in an equipment room where only skilled technicians have access. The room must be:

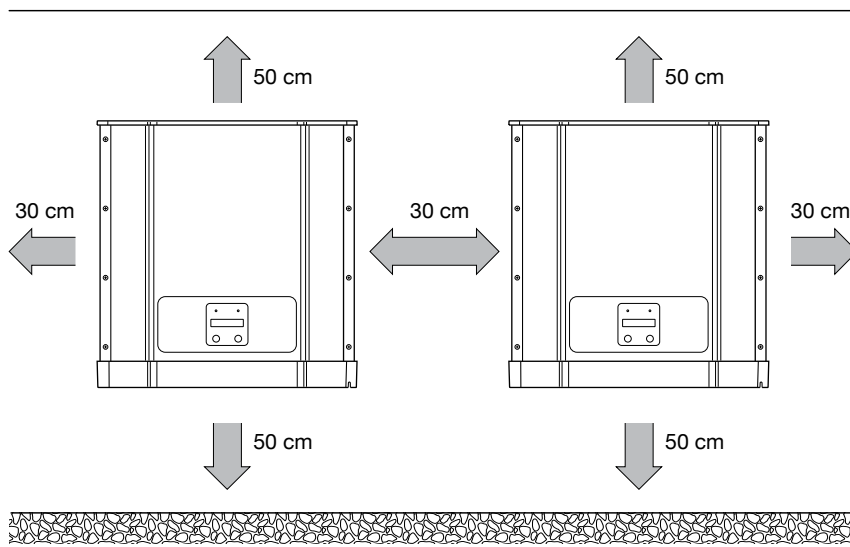
- of a suitable size;
- clean;
- free from inflammable items;
- not exposed directly to sunlight;
- maintained at a temperature between $-20\text{ }^{\circ}\text{C}$ and $40\text{ }^{\circ}\text{C}$.

4.2. CONDITIONS FOR INSTALLATION

4.2-1

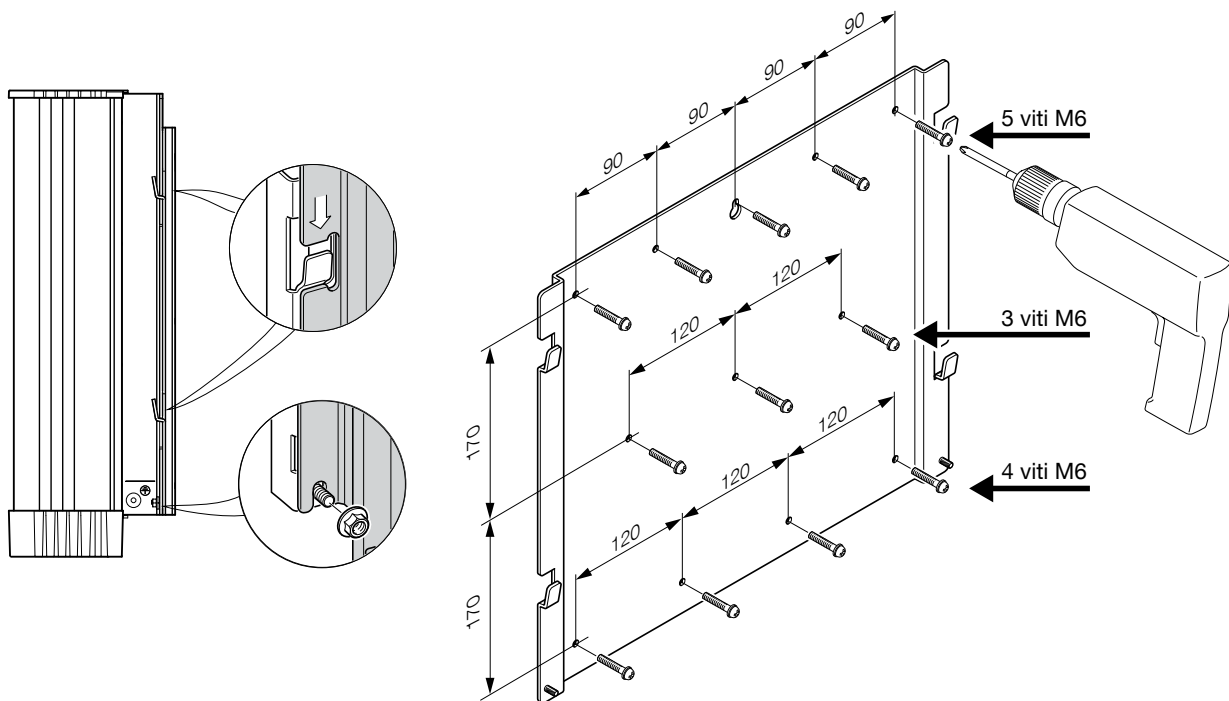


4.2-2 Suitable installation clearances



4.3. WALL FIXING

4.3-1



5. CONNECTIONS



WARNING!

carry out the following steps beforehand:

- Open the AC switch.
- Open the DC switch.
- Make sure the system cannot be restarted.
- Make sure the electricity supply has been disconnected.



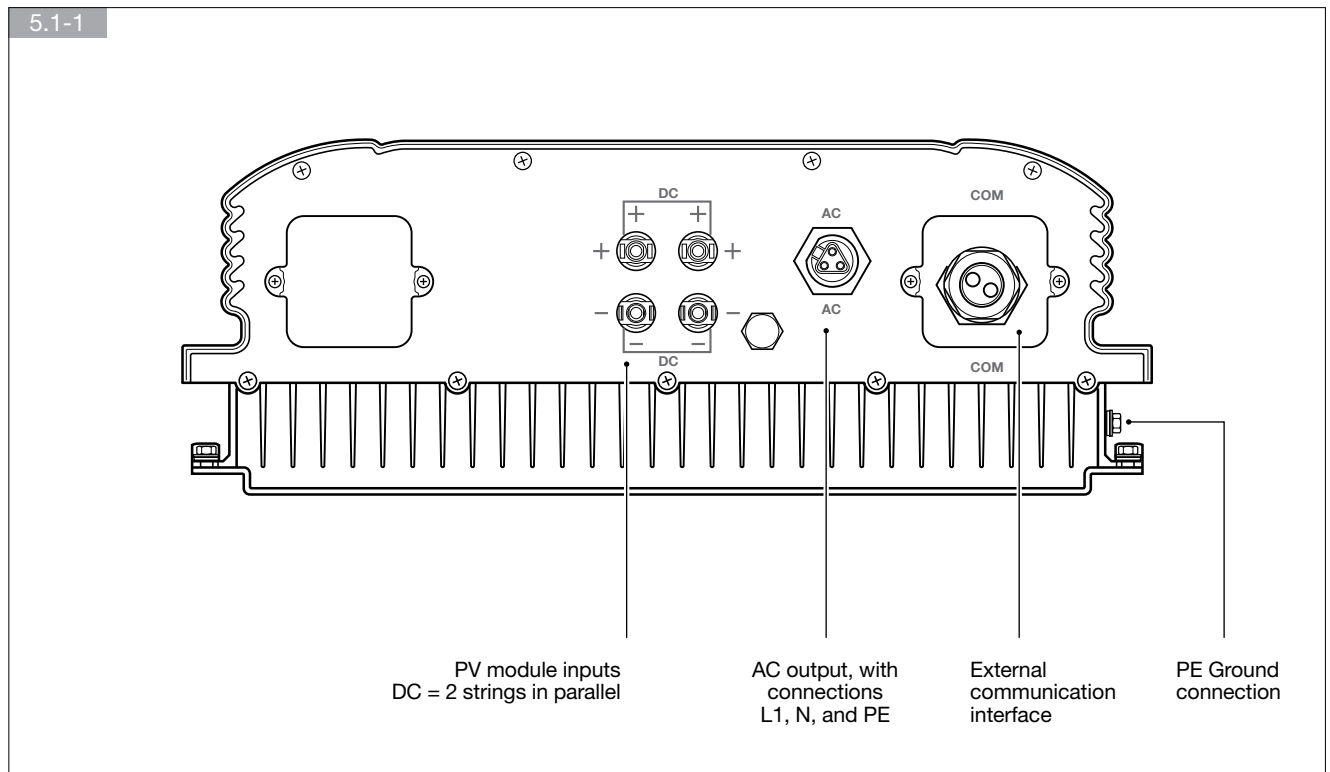
Before connecting the power supply connect the earth cable (PE).

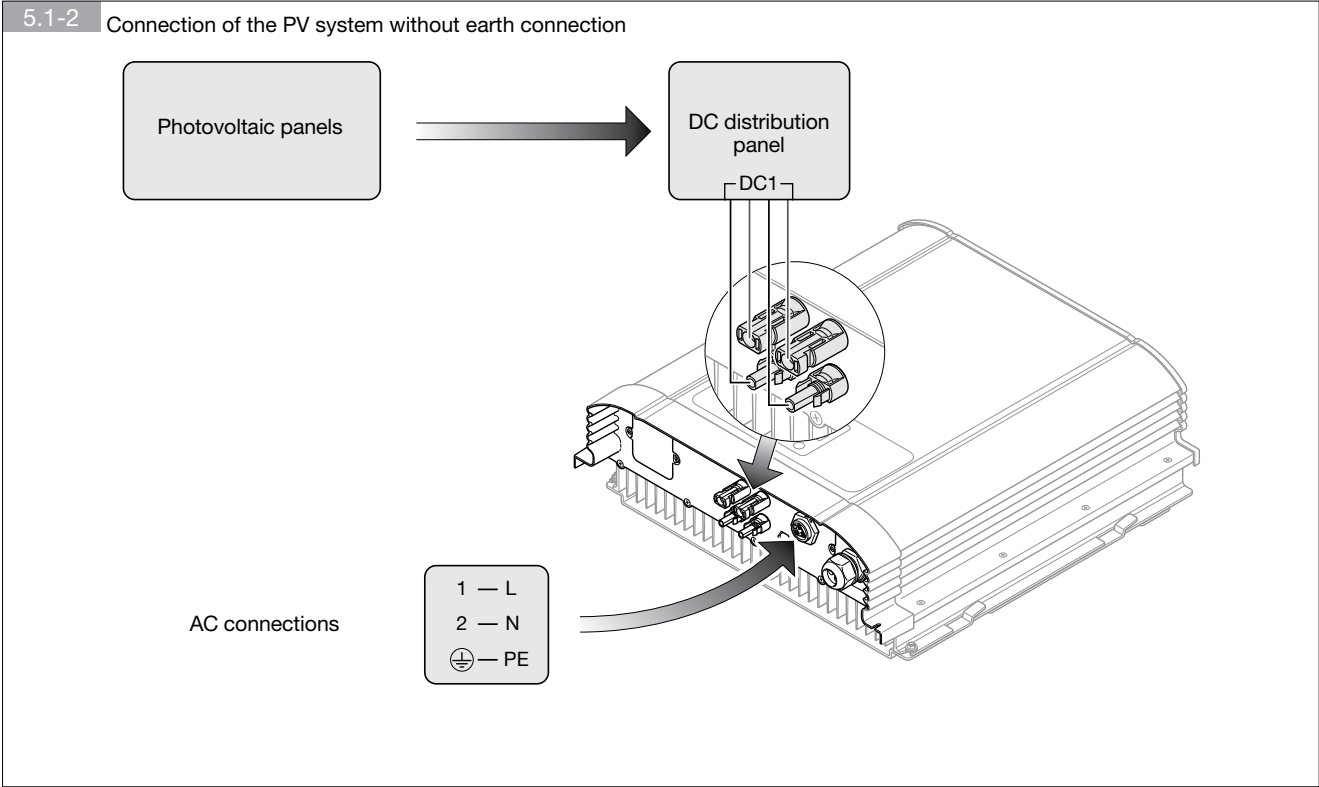


Before connecting any cables to the inverter, check that the polarity, voltage and sequence of the phases are correct.

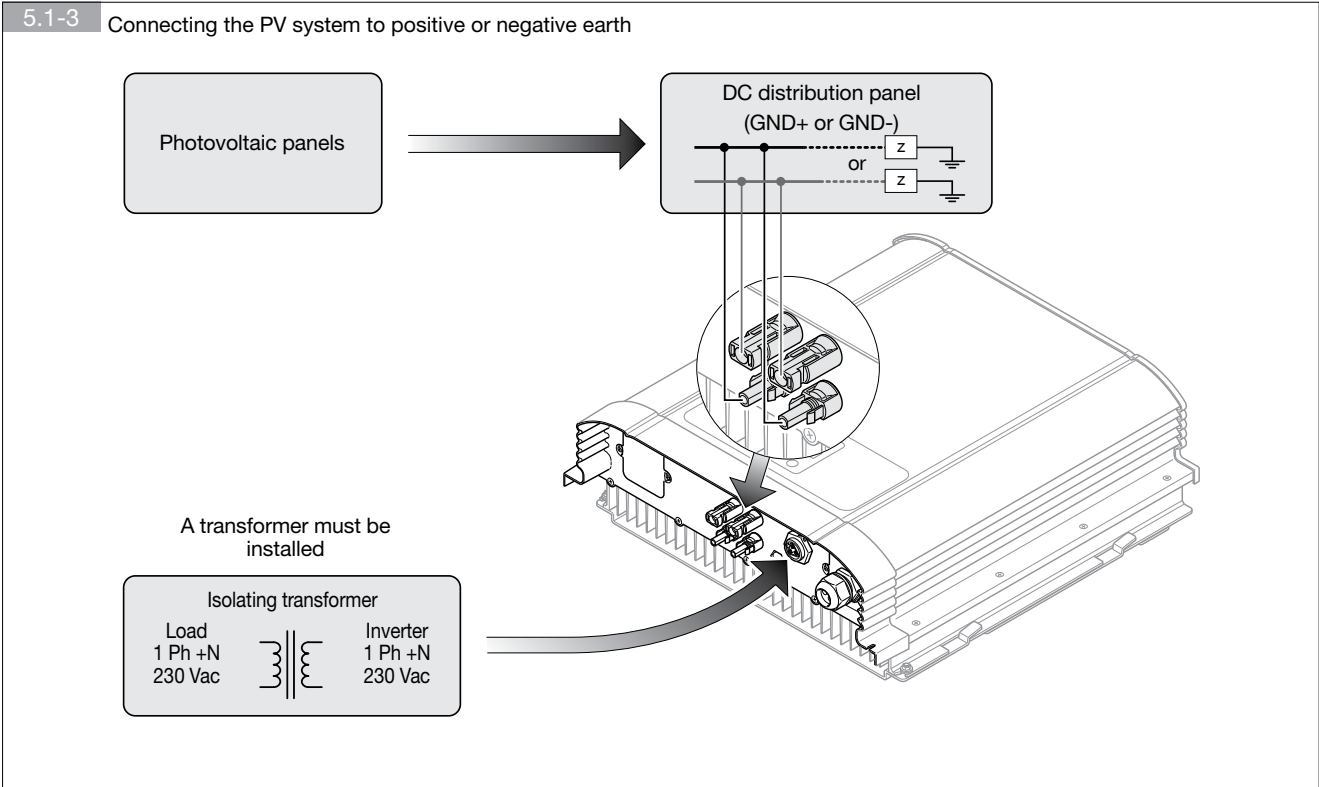
Check that the input and output cables of the photovoltaic system are clearly identified.

5.1. DESCRIPTION





Note
with a floating DC input (no earth connection) no isolating transformer is required.



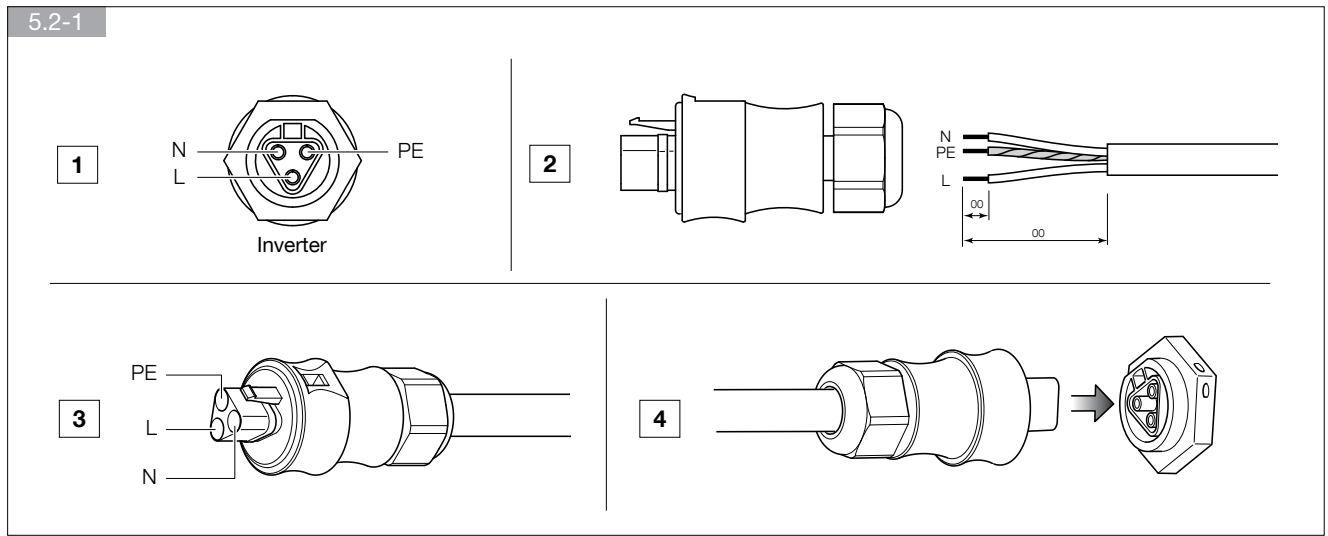
Note
With DC input connected to earth (one pole connected to earth) isolating transformer is required.
Refer to par 6.3 for ground option setting

5.2. AC CONNECTION

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

Sizing of AC cables					
Model	Max current	Cross-section	Fastening	Circuit breaker	Residual current protection
SUNSYS-H50	25 A	4 mm ²	≥ 0.8 Nm	MCCB rated 32 A 1P+N curve C	0.3 A type A or AC

The AC connection is made with a single pole plug (L1, N, PE - see diagram).

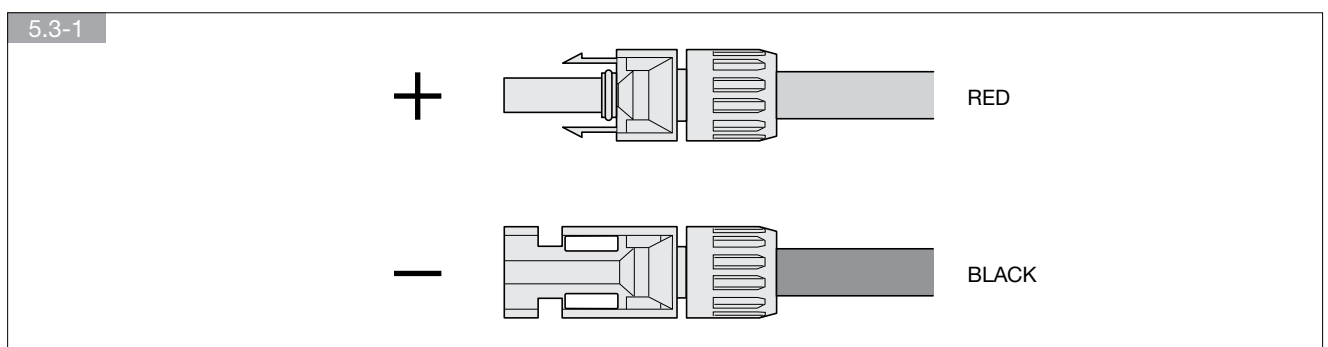


5.3. DC CONNECTION

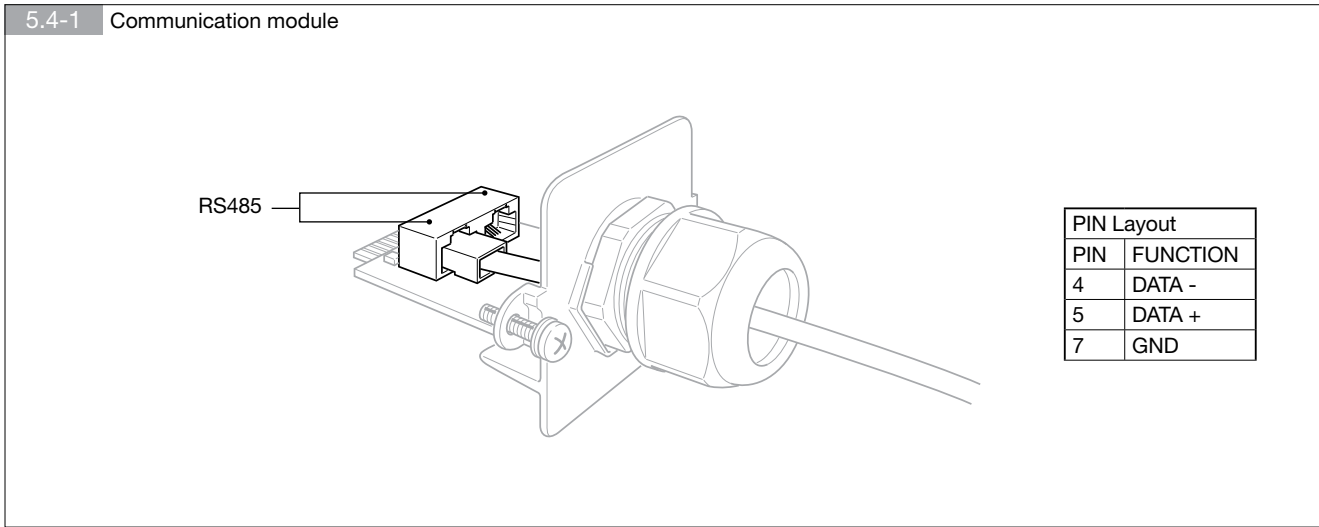
- Before wiring the DC side ensure the DC power supply is disconnected.
- Check that the connection cable used matches the specifications in the table.

Sizing of DC cables		
Model	Max current	Cross-section
SUNSYS-H50	17.5 ADC	4 mm ²

DC connections are divided into positive and negative poles.

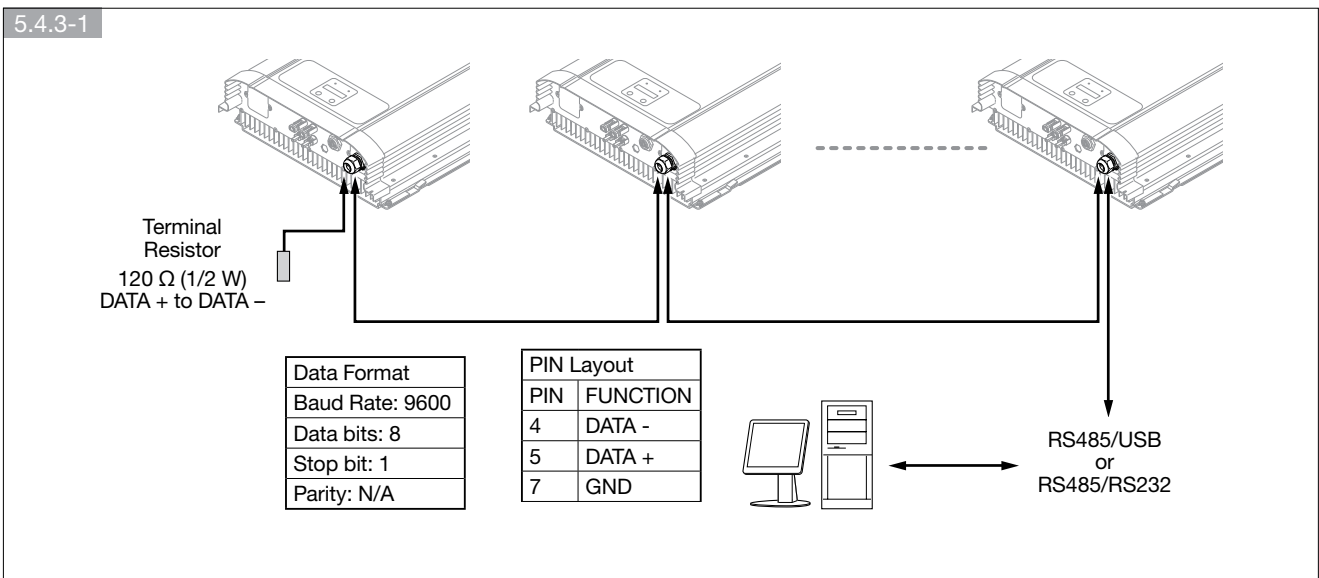


5.4. COMMUNICATION MODULE CONNECTIONS



5.3.1. RS-485 serial port

The communication terminal block allows connection to one or more inverter units.



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 5600 W.
- The breaker device must have a maximum rated voltage of > 1000 Vdc and maximum short-circuit current > 17.5 A.
- The voltage range of the MPPTs must be between 310 V and 850 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-N	230 Vac

The inverter is fitted with a unit which monitors and detects fault currents; this is sensitive to all types of ground fault current. We recommend the application of an external type A or AC 30 mA differential protection device with low sensitivity (S).

(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.



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

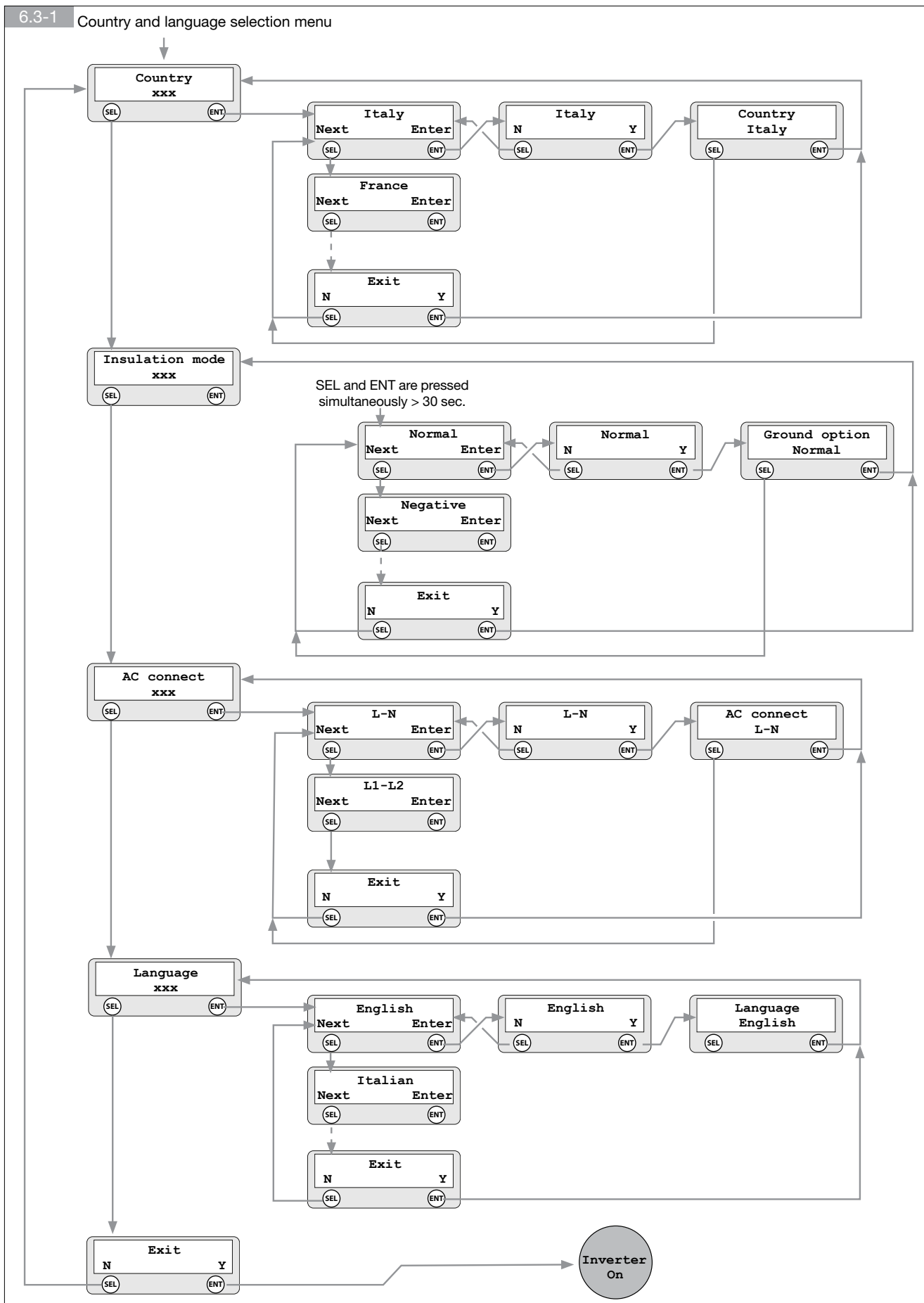
1. Power up the inverter (AC or DC)
2. Set the country.
 - use ent button to enter the country selection menu
 - use sel button to find your country⁽¹⁾
 - use ent button to select the country
 - use ent button to set the chosen country
 - use sel button for next menu.
3. Set insulation mode.
 - use ent button to enter the insulation mode selection menu
 - use sel button to find the plant insulation mode
 - use ent button to select this insulation mode
 - use ent button to set the chosen insulation mode
 - use sel button for next menu.
4. Set the language.
 - use ent button to enter the language selection menu
 - use sel button to find your language
 - use ent button to select this language
 - use ent button to set the chosen language
 - use ent button to confirm and start the inverter.

If the level of sunlight is sufficient the inverter will come into operation.

During subsequent start-ups the device will show the main page of the menu.

(1) select "ITALY NO SPI" for Italian installation where the plant power is > 6 kw (an external SPI is mandatory)

6.3-1 Country and language selection menu



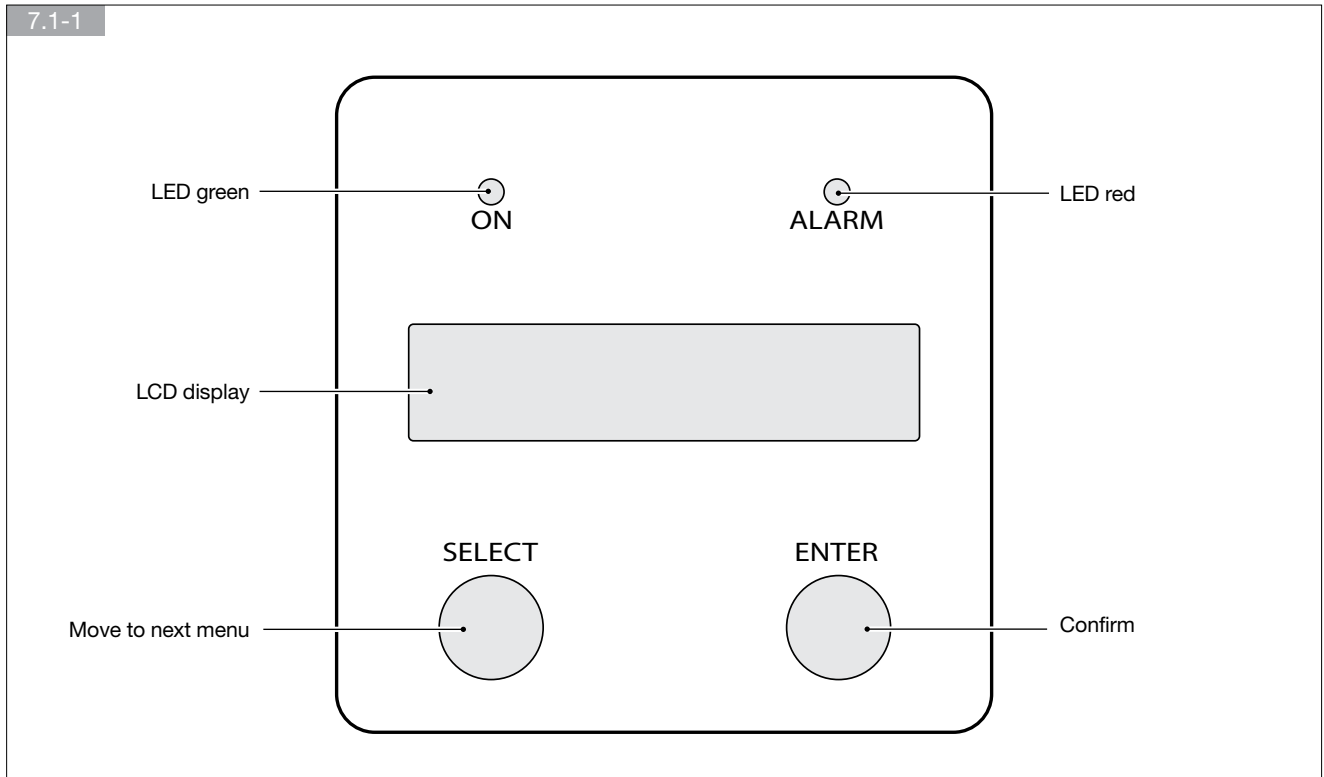
ENGLISH

7. CONTROL PANEL



WARNING! RISK OF ACCIDENT OR SERIOUS INJURY!

Do not touch the terminal of the photovoltaic module when exposed to sunlight



LED indicator		
Condition	Green LED	Red LED
Countdown	FLASHING	OFF
On grid	ON	OFF
Error or Fault	OFF	ON
Standby or night-time (no DC supply)	OFF	OFF
FW update	FLASHING	FLASHING

8. MENU

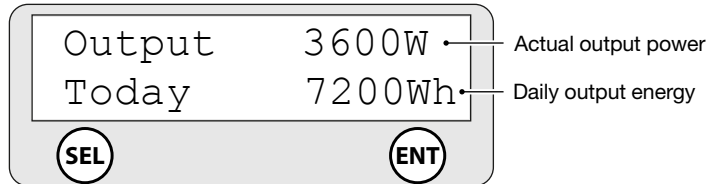


WARNING!

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

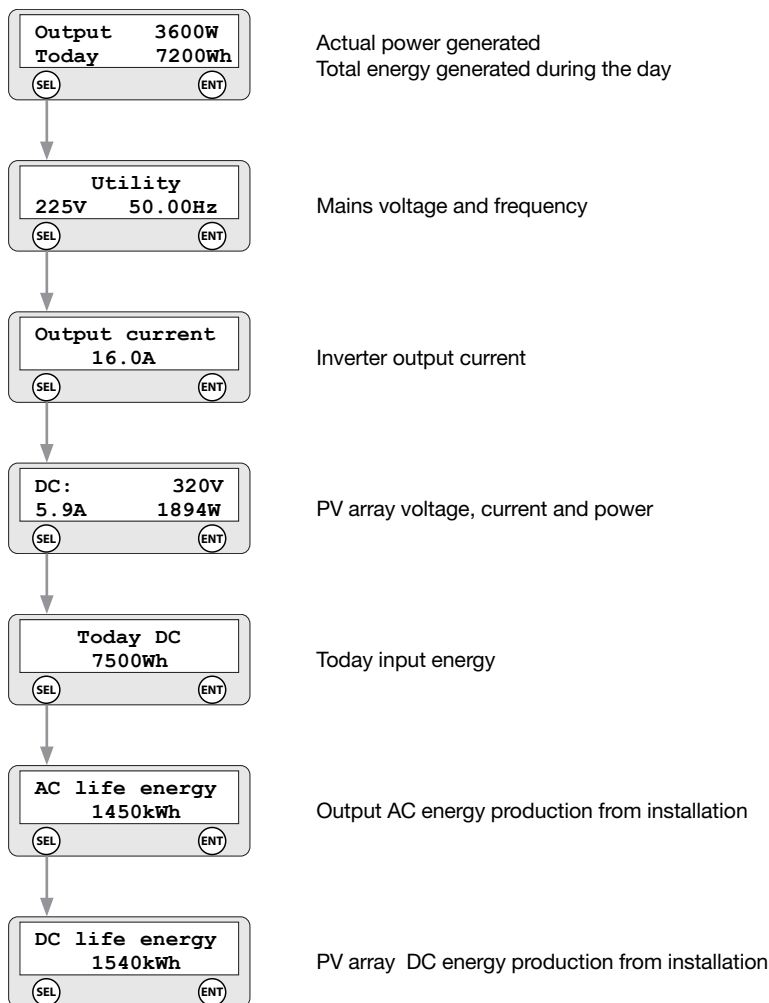
8.1. DESCRIPTION

8.1-1 Daily energy (main menu)

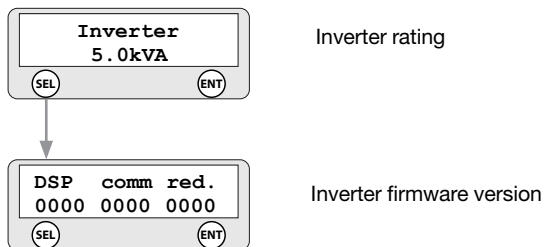


Use sel button to move through the menu available

8.1-2 Measurements

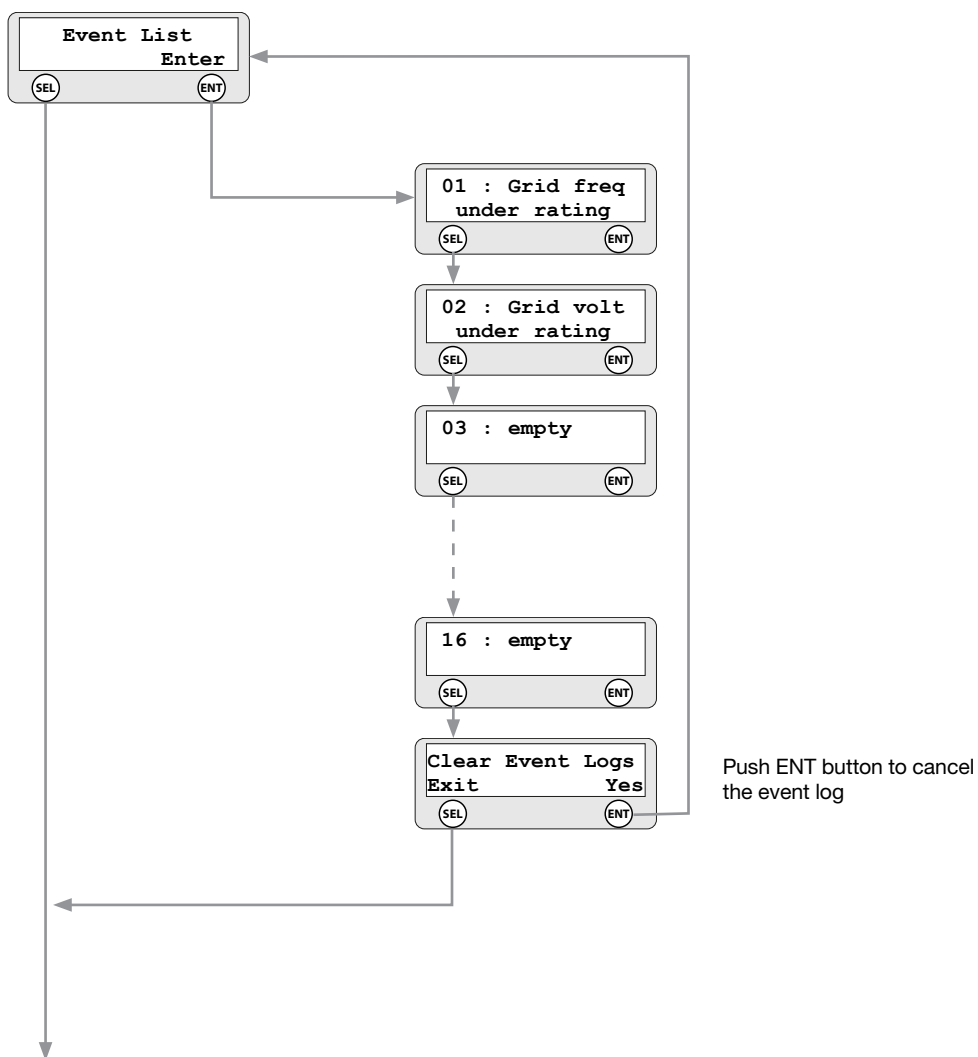


8.1-3 Inverter information



This page displays the last sixteen events (error or fault) recorded by the system. The first event displayed is the most recent.

8.1-4 Event log



Push ENT button to cancel the event log

8.2. SETTINGS

8.2.1. Installation settings

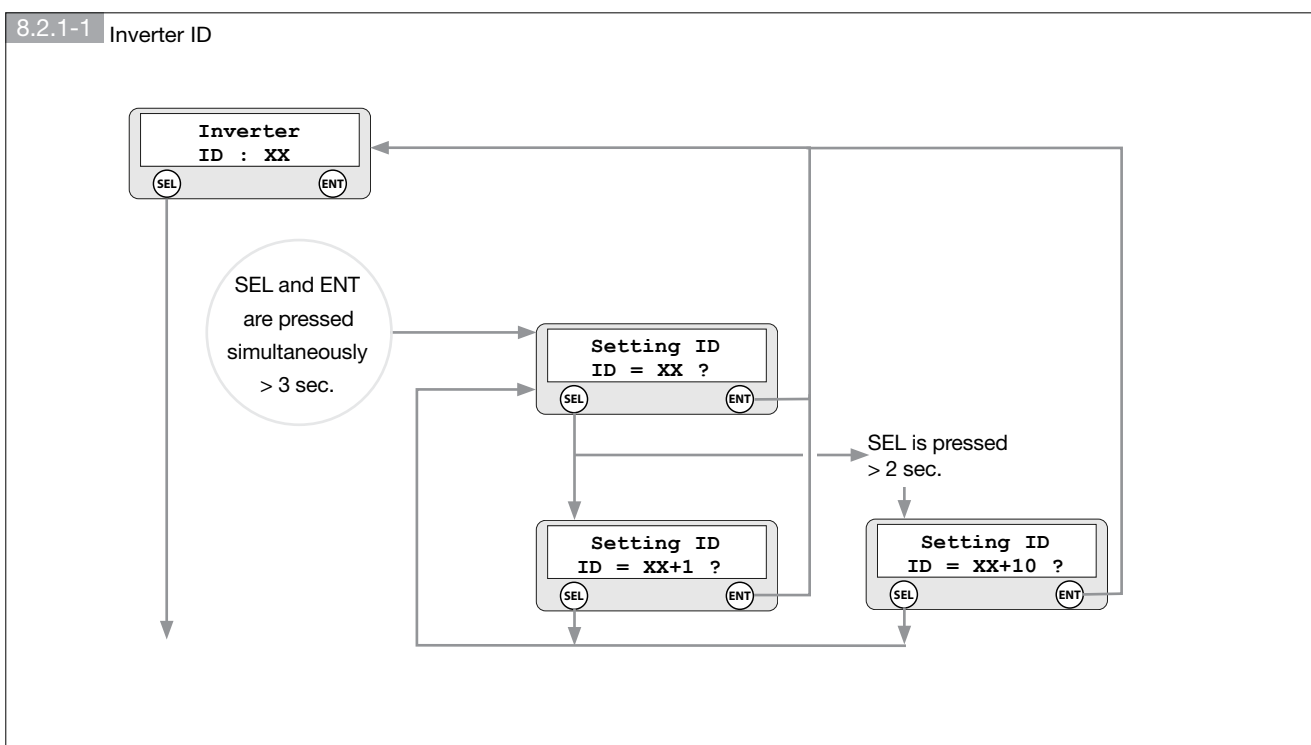


WARNING! DAMAGE CAN BE CAUSED TO THE MACHINE AND SYSTEM!

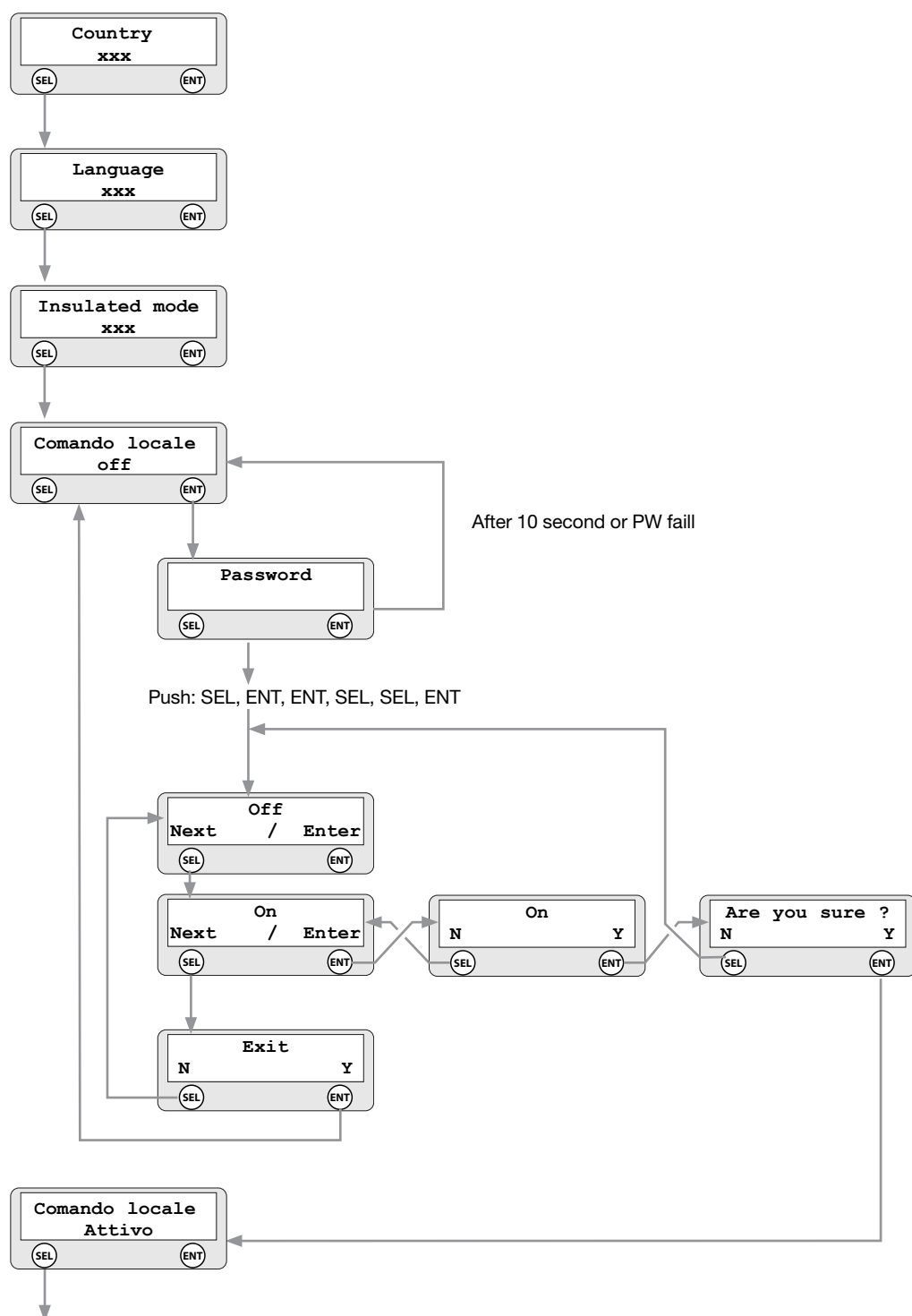
The following settings are enabled and managed by the grid operator, installer or specialist technician. Wrong settings are liable to damage the photovoltaic system. For any modification requested by the grid operator, or special configuration, please contact Socomec for assistance

- **Inverter ID**

Address of each inverter.



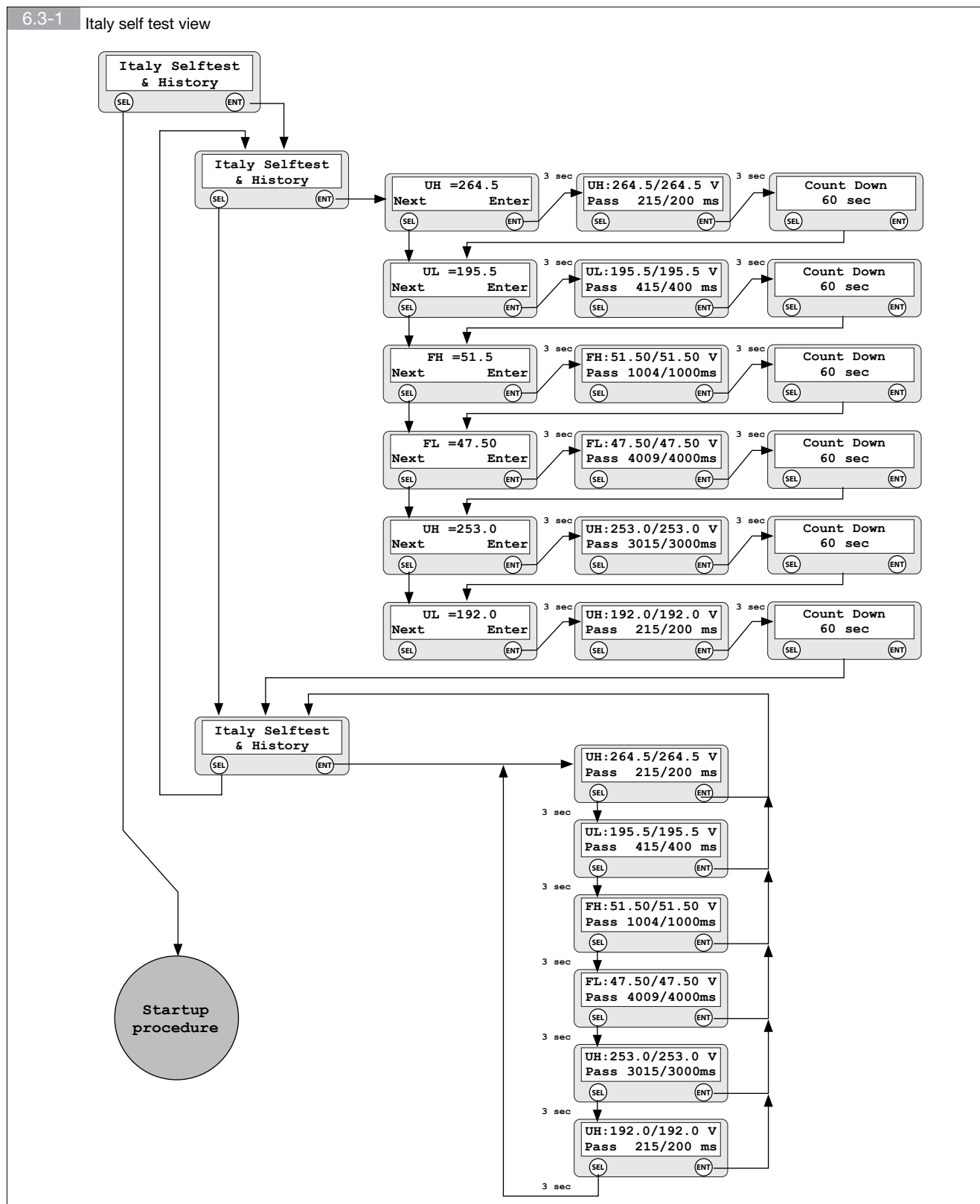
8.2.1-2 Local command only for Italy as country



8.3. SELF-TEST



WARNING!
This menu is available only if Italy is set as Country.
During each test the inverter switched off and on.



9. MESSAGES

9.1. ERROR MESSAGES

Description of error messages		
Message	Description	Solutions
E01: Grid Freq Over Rating	<ol style="list-style-type: none"> 1. Grid frequency higher than nominal 2. Country configuration incorrect 3. Measuring circuit failure 	<ol style="list-style-type: none"> 1. Check the grid frequency value 2. Check the country setting 3. Contact the technician
E02: Grid Freq Under Rating	<ol style="list-style-type: none"> 1. Grid frequency lower than nominal 2. Country configuration incorrect 3. Measuring circuit failure 	<ol style="list-style-type: none"> 1. Check the grid frequency value 2. Check the country setting 3. Contact the product technician
E07: Grid Quality	<ol style="list-style-type: none"> 1. Excessive distortion caused by loads connected to grid or near inverter 2. Measuring circuit failure 	<ol style="list-style-type: none"> 1. Check for the existence of non-linear loads connected to the grid 2. Contact the technician
E09: No Grid	<ol style="list-style-type: none"> 1. No AC power 2. AC switch contacts open 3. Plug not connected 4. Internal fuses blown 	<ol style="list-style-type: none"> 1. Check the grid voltage value 2. Close the AC breaker contacts 3. Check the connection and wiring 4. Contact the product technician
E10: Grid Volt Under Rating	<ol style="list-style-type: none"> 1. AC voltage lower than nominal 2. Country configuration or grid setting incorrect 3. AC plug wrongly connected 4. Internal fuses blown 	<ol style="list-style-type: none"> 1. Check the grid voltage value 2. Check the country/voltage limits setting 3. Check wiring in the manual 4. Contact the technician
E11: Grid Volt Over Rating	<ol style="list-style-type: none"> 1. AC voltage higher than nominal 2. Country configuration or grid setting incorrect 3. AC plug wrongly connected 4. Internal fuses blown 	<ol style="list-style-type: none"> 1. Check the grid voltage value 2. Check the country/voltage limits setting 3. Check wiring in the manual 4. Contact the technician
E30: DC Volt Over Rating	<ol style="list-style-type: none"> 1. Input voltage 1 higher than 1000 V 2. Measuring circuit failure 	<ol style="list-style-type: none"> 1. Reduce the no. of panels to obtain an open circuit voltage $V_{OC} < 1000$ V 2. Contact the technician
E13: Slow Over Voltage Range	<ol style="list-style-type: none"> 1. AC voltage higher than nominal 2. Country configuration or grid setting incorrect 3. AC plug wrongly connected 4. Internal fuses blown 	<ol style="list-style-type: none"> 1. Check the grid voltage value 2. Check the country/voltage limits setting 3. Check wiring in the manual 4. Contact the technician
E26: Slow Over Frequency Range	<ol style="list-style-type: none"> 1. AC frequency higher than nominal 2. Country configuration or grid setting incorrect 3. Measuring circuit failure 	<ol style="list-style-type: none"> 1. Check the grid frequency value 2. Check the country/frequency limits setting 3. Contact the technician
E27: Slow Under Frequency Range	<ol style="list-style-type: none"> 1. AC frequency lower than nominal 2. Country configuration or grid setting incorrect 3. Measuring circuit failure 	<ol style="list-style-type: none"> 1. Check the grid frequency value 2. Check the country/frequency limits setting 3. Contact the technician
E28: Slow Under Voltage Range	<ol style="list-style-type: none"> 1. AC voltage lower than nominal 2. Country configuration or grid setting incorrect 3. Measuring circuit failure 	<ol style="list-style-type: none"> 1. Check the grid frequency value 2. Check the country/frequency limits setting 3. Contact the technician

9.2. FAULT MESSAGES

Description of error messages		
Message	Description	Solutions
A01: DC Offset Over Rating	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
A05: NTC Over Temp	1. Ambient temperature > 60 °C or < -30 °C 2. Measuring circuit failure	1. Check the installation environment and ventilation 2. Contact the technician
A06: Inside NTC Circuit Fail	1. Ambient temperature > 100 °C or < -24 °C 2. Measuring circuit failure NTC	1. Check the installation environment 2. Contact the technician
A08: Heat Sink NTC1 Fail	1. Boost heatsink temperature > 100 °C or < -24 °C 2. Measuring circuit failure NTC1	1. Check the installation environment 2. Contact the technician
A09: Heat Sink NTC2 Fail	1. Inverter heatsink temperature > 100 °C or < -24 °C 2. Measuring circuit failure NTC2	1. Check the installation environment 2. Contact the technician
A15: DSP ADC Vgrid/Iout Fail	1. Insufficient input power 2. Measuring circuit failure	1. Check that DC voltage > 150 V 2. Contact the technician
A16: DSP ADC Vin/Vbus Fail	1. Insufficient input power 2. Measuring circuit failure	1. Check that DC voltage > 150 V 2. Contact the technician
A17: DSP ADC Iin/Iboost Fail	1. Insufficient input power 2. Measuring circuit failure	1. Check that DC voltage > 150 V 2. Contact the technician
A18:RED. ADC Vgrid Fail	1. Insufficient input power 2. Measuring circuit failure	1. Check that DC voltage > 150 V 2. Contact the technician
A19:DSP ADC Iout_dc Fail	1. Insufficient input power 2. Measuring circuit failure	1. Check that DC voltage > 150 V 2. Contact the technician
A20: Efficiency Inconsistent	1. Calibration incorrect 2. Measuring circuit failure	1. Check the current measurements between inverter and system 2. Contact the technician
A22: Internal Comm Fault_R	1. Problems with internal communication between RED and CPU	1. Switch off the inverter and switch on again 2. Contact the technician
A23: Internal Comm Fault_D	1. Problems with internal communication between DSP and COMM	1. Switch off the inverter and switch on again 2. Contact the technician
A24: Residual Curr Over Rating	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
A25: Ground Fault	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.
A27: RCMU Circuit Fail	1. Internal control circuits not working	1. Contact the technician
A28: Relay Short	1. Output relays with contacts closed 2. Internal control circuits not working	1. Contact the technician 2. Contact the technician
A29: Relay 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

A30: Bus Unbalance	<ol style="list-style-type: none"> 1. Not totally independent or parallel between inputs 2. PV Array short to Ground 3. Driver for boost is defective or disconnected 4. Detection circuit malfunction 	<ol style="list-style-type: none"> 1. Check the input connections 2. Check the PV Array insulation 3. Check the driver circuit for boost inside the inverter 4. Check the detection circuit inside the inverter
A31: Bus_P Over Volt Rating	<ol style="list-style-type: none"> 1. Problems with wiring of strings 2. String short-circuiting to earth 3. Internal control circuits not working 	<ol style="list-style-type: none"> 1. Check the parallel string setup connected to the inverter 2. Check the system 3. Contact the technician
A33: Bus_N Over Volt Rating	<ol style="list-style-type: none"> 1. Problems with wiring of strings 2. String short-circuiting to earth 3. Internal control circuits not working 	<ol style="list-style-type: none"> 1. Check the parallel string setup connected to the inverter 2. Check the system 3. Contact the technician
A35: Bus Volt Over Rating	<ol style="list-style-type: none"> 1. Driver for boost is defective 2. Voc of PV array is over 1000Vdc 3. Surge occurs during operation 4. Detection circuit malfunction 	<ol style="list-style-type: none"> 1. Check the driver circuit for boost inside the inverter 2. Modify the solar array setting, and make the Voc less than 1000Vdc 3. N/A 4. Check the detection circuit inside the inverter
A36:Output Curr Transient Over	<ol style="list-style-type: none"> 1. Surge occurs during operation 2. Driver for inverter stage is defective 3. Switching device is defective 4. Detection circuit malfunction 	<ol style="list-style-type: none"> 1. N/A 2. Check the driver circuit in inverter stage 3. Check all switching devices in inverter stage 4. Check the detect circuit inside the inverter
A37: AC Curr Over Rating	<ol style="list-style-type: none"> 1. AC grid overvoltage 2. Internal control circuits not working 	<ol style="list-style-type: none"> 1. Switch off/switch on again 2. Contact the technician
A45: HW OOC	<ol style="list-style-type: none"> 1. WB1 WB2 misconnection. 2. Detection circuit malfunction 	<ol style="list-style-type: none"> 1. Check the connection of WB1 and WB2. 2. Check the detection circuit inside the inverter
A50:Zero Cross Circuit Fail	The detection circuit for synchronal signal malfunction	Check the detection circuit for synchronal signal inside the inverter
A56:Hardware Incompatibility	Firmware version incorrect	Update the firmware
A60: DC Curr Over Rating	<ol style="list-style-type: none"> 1. Switching device in boost is defective 2. Driver for boost is defective 3. Input current detection circuit malfunction 	<ol style="list-style-type: none"> 1. Check all switching device in boost 2. Check the driver circuit for boost inside the inverter 3. Check input current detection circuit
A70: DC Curr Transient Over	<ol style="list-style-type: none"> 1. Switching device in boost is defective 2. Driver for boost is defective 3. Input current detection circuit malfunction 	<ol style="list-style-type: none"> 1. Check all switching device in boost 2. Check the driver circuit for boost inside the inverter 3. Check input current detection circuit

10. REMOVAL OF INVERTER



WARNING!

carry out the following steps beforehand:

- Open the AC switch.
- Open the DC switch.
- Make sure the system cannot be restarted.
- Make sure the electricity supply has been disconnected.

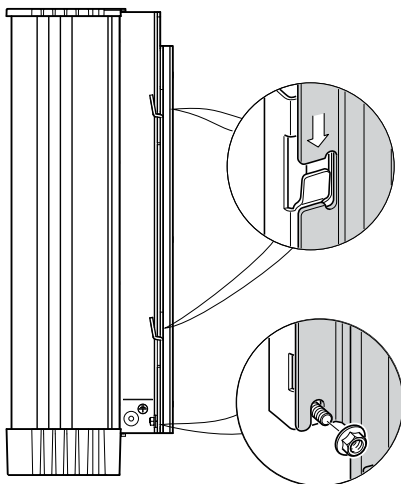


If it is necessary to remove the inverter proceed as follows:

1. Open the AC breaker on main distribution panel to disconnect main supply.
2. Open the DC breaker to 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
5. Remove the DC connections to isolate the PV field.
6. Remove the RS485 communication cable connection.

Once these steps have been completed, remove the nut and washer on the lower part of the inverter then remove the inverter by sliding it up from the bracket.

10.1-1 Italy self test view



11. TECHNICAL SPECIFICATIONS

Model	SUNSYS H50
Enclosure	Powder coated aluminum
Operating temperature	-20 to +60 °C, full power up to 40 °C
Relative humidity	0 to 95% non-condensing
Cooling	Natural cooling
Protection level	IP65
Galvanic insulation	NO
Safety class	Class I metal casing with protective earth connection
Overvoltage category	III
Weight	24 kg
Dimensions	482 × 470 × 167 mm
Connectors	Weather resistant connectors
AC output (grid side)	
Rated power	5000 VA
Maximum power	5000 VA
Voltage	230 Vac
Rated current	21.7 A
Max current	24.5 A
Frequency	50 Hz
Total Harmonic Distortion	< 3% at rated power*
Power factor	> 0.99 at rated power*
Night time power	< 2 W
Maximum efficiency	> 97.50%
European efficiency	> 97.00%
AC connector	IP67 single-phase + Neutral + PE
Recommended protection	Thermal-magnetic with I = 1.25 x Inom
DC input (solar side)	
Maximum input power	5600 Wp
Rated voltage	650 Vdc
Operating voltage	200 to 1000 Vdc
Start-up voltage	> 250 Vdc
Absolute maximum voltage	1000 Vdc
MPP voltage range at rated power	310 to 850 Vdc
Number of inputs	2 (1 MPPT)
MPPT	1
Rated current	17.5 A
System information / communication	
User interface	LCD alphanumeric display, (16 x 2 characters)
	Data logger with 10 year capacity and real time clock
	30 events
External communication	RS-485 connection

11. TECHNICAL SPECIFICATIONS

Standards and Directives		
Safety		IEC62109-1; IEC62109-2
CE compliance		Yes
Emissions		EN 61000-6-3: 2007 + A1: 2011
Harmonics		EN 61000-3-12:2005
Fluctuations and flicker		EN 61000-3-11:2000
Grid interface		VDE AR-N 4105, CEI-021, VDE126-1-1/A1
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
	VOLTAGE DIP	IEC 61000-4-11

* *Disable reactive power control*

HEAD OFFICE

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