

SUNSYS PCS²

Power Conversion System and Storage

Manuel d'installation et d'utilisation (FR)

Installation and operating manual (GB)

Manuale di installazione e uso (IT)

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1. SAFETY STANDARDS

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



NOTE!

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



NOTE!

Before carrying out any operations on the PCS² read the installation and operating manual carefully. Keep this manual safe for future reference.



DANGER!

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



CAUTION!

If the PCS² is found to be damaged externally or internally, or any of the accessories are damaged or missing, contact SOCOMEC.

Do not operate the PCS² if it has suffered a violent mechanical shock of any kind.



NOTE!

Install the PCS² in accordance with clearances in order to prevent access to handling devices and guarantee sufficient ventilation (see Environmental requirements chapter).



NOTE!

Only use accessories recommended or sold by the manufacturer.



NOTE!

When the equipment is transferred from a cold to a warm place wait approx. two hours before putting the unit into operation.



NOTE!

When carrying out electrical installation, all standards specified by the IEC and the electricity supplier must be observed. All national standards applicable to batteries must be observed.



DANGER! LIVE DEVICE! RISK OF ELECTRIC SHOCK!

PCS² is connected to three separately protected power supplies:

- 1 DC cable - Battery power supply
- 2 AC cable - Power from the mains network, supplied by the electricity company
- 3 AC cable - Auxiliary power supply



NOTE!

Before cleaning, performing maintenance work or connecting appliances to the PCS² disconnect all power sources.



DANGER! LIVE DEVICE! RISK OF ELECTRIC SHOCK!

Carry out the following steps before system maintenance:

- Disconnect the batteries.
- Disconnect the AC power supplies.
- Disconnect the DC disconnection switches.
- Make sure the cable is fixed in position securely.
- Make sure the system cannot be restarted.
- Make sure the electricity supply (AC and DC voltages) has been disconnected.
- Cover or separate nearby live device units.



DANGER! RISK OF ELECTRIC SHOCK!

After disconnecting all power sources wait approx. 5 minutes for the complete discharge of the PCS².



CAUTION! RISK OF BURNS!

During operation the casing can reach high temperatures. Do not touch the surfaces!



NOTE!

Any use other than the specified purpose will be considered improper. The manufacturer/supplier shall not be held responsible for damage resulting from this. Risk and responsibility lies with the system manager.

2. ENVIRONMENTAL REQUIREMENTS AND MOVING

2.1. ENVIRONMENTAL REQUIREMENTS

Install the PCS² in an equipment room where only skilled technicians have access. The room must be:

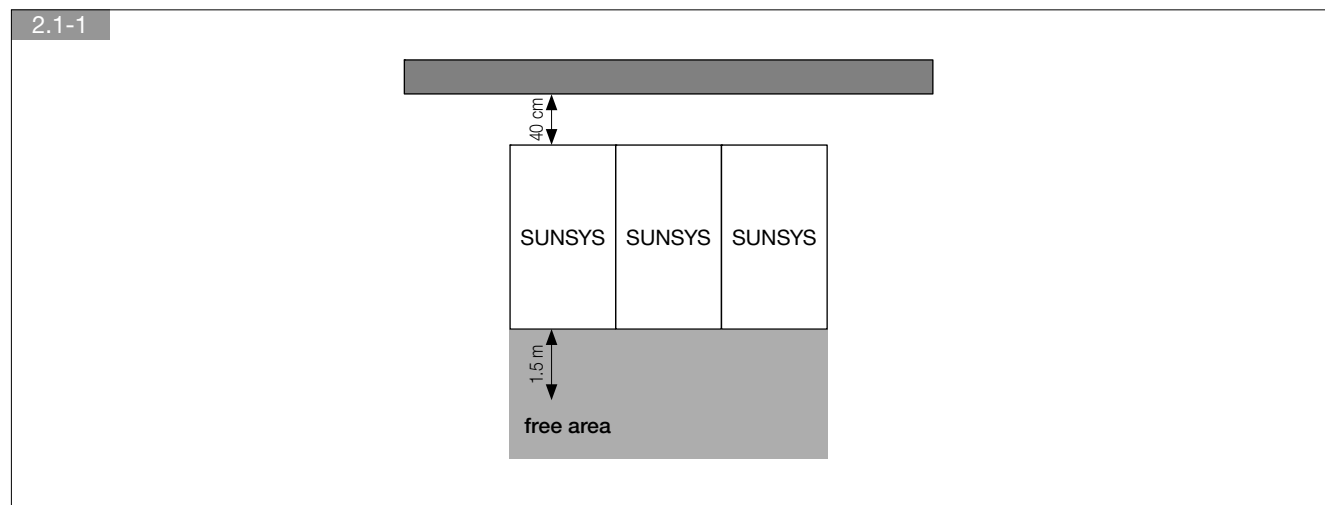
- of a suitable size;
- free from conductive, inflammable and corrosive items;
- not exposed directly to sunlight.

The floor must support the weight of the PCS² and guarantee its stability.

The PCS² is designed for indoor non-air-conditioned rooms only.

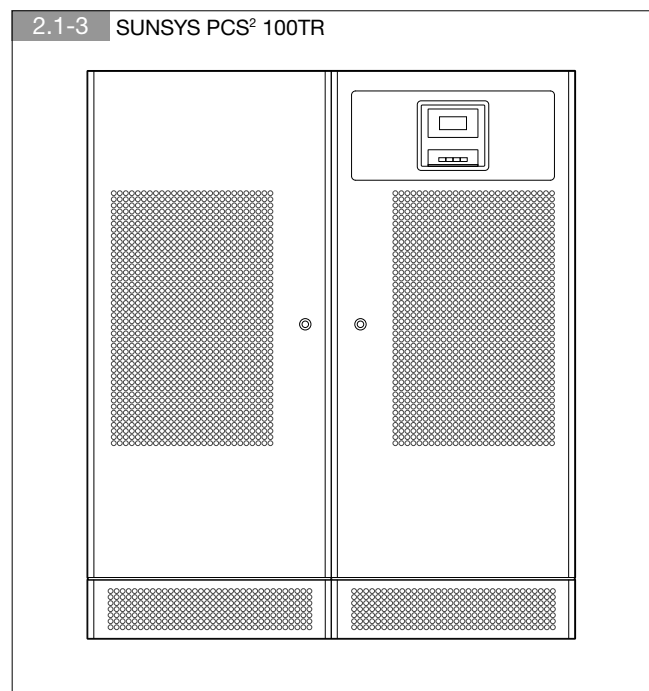
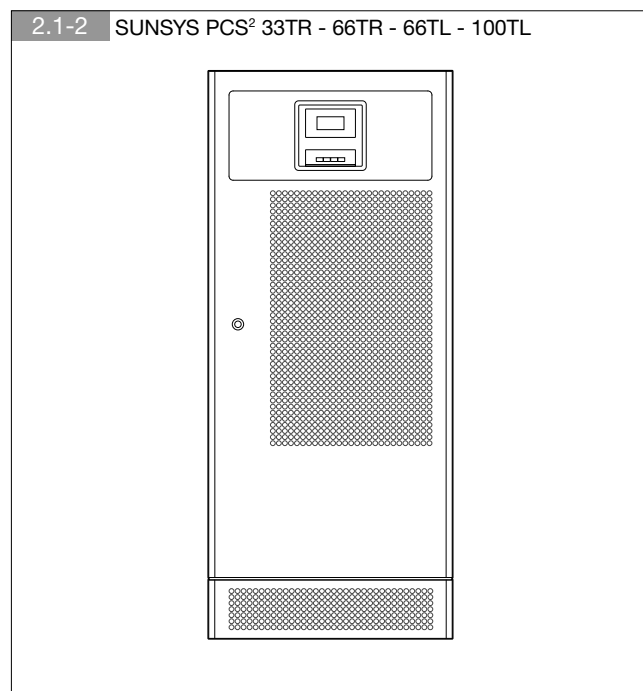
For information regarding ambient temperature, dimensions and weights refer to Technical specification chapter.

To position the PCS² correctly see the diagrams below.



ENGLISH

CABINET LAYOUT



2.2. MOVING



WARNING!

The unit must remain in a vertical position during all shipping and moving operations.



NOTE!

The unit **MUST** be handled by at least two people.



NOTE!

Do not move the unit by putting pressure on the front door.



WARNING! HEAVY WEIGHT!

Move the unit using a fork lift truck taking the utmost care at all times.

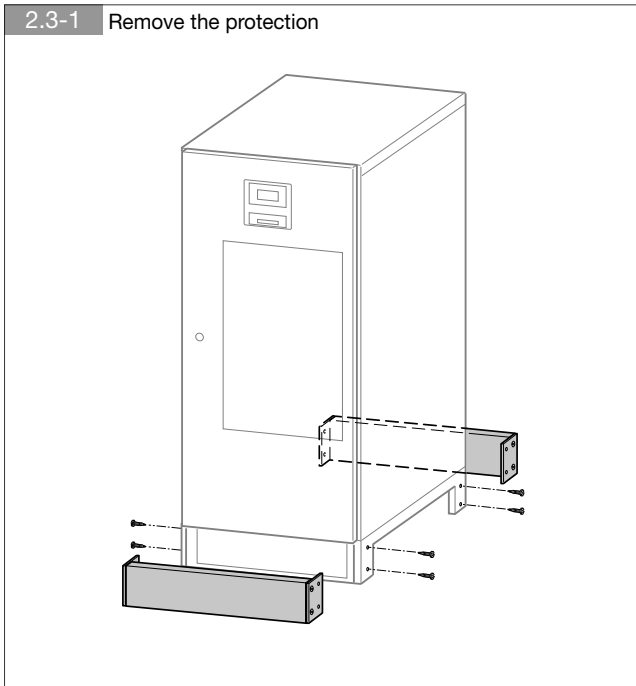


WARNING!

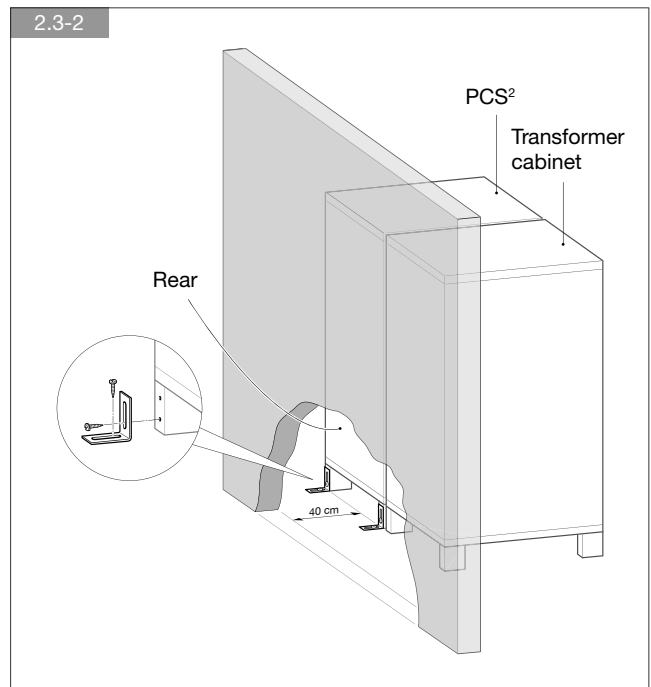
When moving the unit on even slightly sloping surfaces, use the locking equipment and braking devices to ensure that the unit does not fall over.

2.3. FLOOR MOUNTING

2.3-1 Remove the protection



2.3-2



3. ELECTRICAL INSTALLATION



NOTE!

Before carrying out any operations on the PCS² read the Safety standards chapter carefully.

3.1. ELECTRICAL REQUIREMENTS

The installation and system must comply with national plant regulations.

The electrical distribution panel must have a sectioning and protection system installed for input and auxiliary mains.

The table below shows the size of the input protection devices recommended for correct installation.

Size of input protection devices				
SUNSYS PCS ² models	Magneto-thermal input main protection	Differential AC protection (optional)	Main AC cable cross-section ⁽²⁾	
	A	A	mm ²	
			min	max
33TR	63 A type D ⁽¹⁾	0.3 A type AC or A	16	120
66TR	125 A type D ⁽¹⁾	0.3 A type AC or A	35	120
100TR	200 A type D ⁽¹⁾	0.3 A type AC or A	70	120
66TL	200 A type C	0.3 A type AC or A	70	120
100TL	250 A type C	0.3 A type AC or A	120	

The auxiliary power supply socket must be protected with a 16 A magneto-thermal switch, curve C, and from category 2 overvoltages or greater.

Size of battery protection devices			
SUNSYS PCS ² models	DC cable cross-section ⁽²⁾		Battery input: protection fuses for each battery cabinet ⁽³⁾
	mm ²		
	min	max	
33TR	25	120	80 A ultrafast 1000 VDC 2 poles
66TR	25	120	
100TR	95	120	
66TL	50	120	
100TL	95	120	

(1) Recommended magneto-thermal switch: three poles with intervention threshold ≥ 10 In.

(2) Determined by the size of the terminals.

(3) On SOCOMEC battery cabinets the fuses are installed internally.



WARNING!

The PCS² is designed for transient over-voltages in category II installations for AC terminals. If the PCS² could be subjected to transient over-voltages in category III installations, protective SPDs must be provided for the AC power supply network. The SPDO option, designed to protect against category III over-voltages, can be fitted directly to the PCS². If this is used the distance between the PCS² and type I centralised SPD protection must be ≥ 15 m.



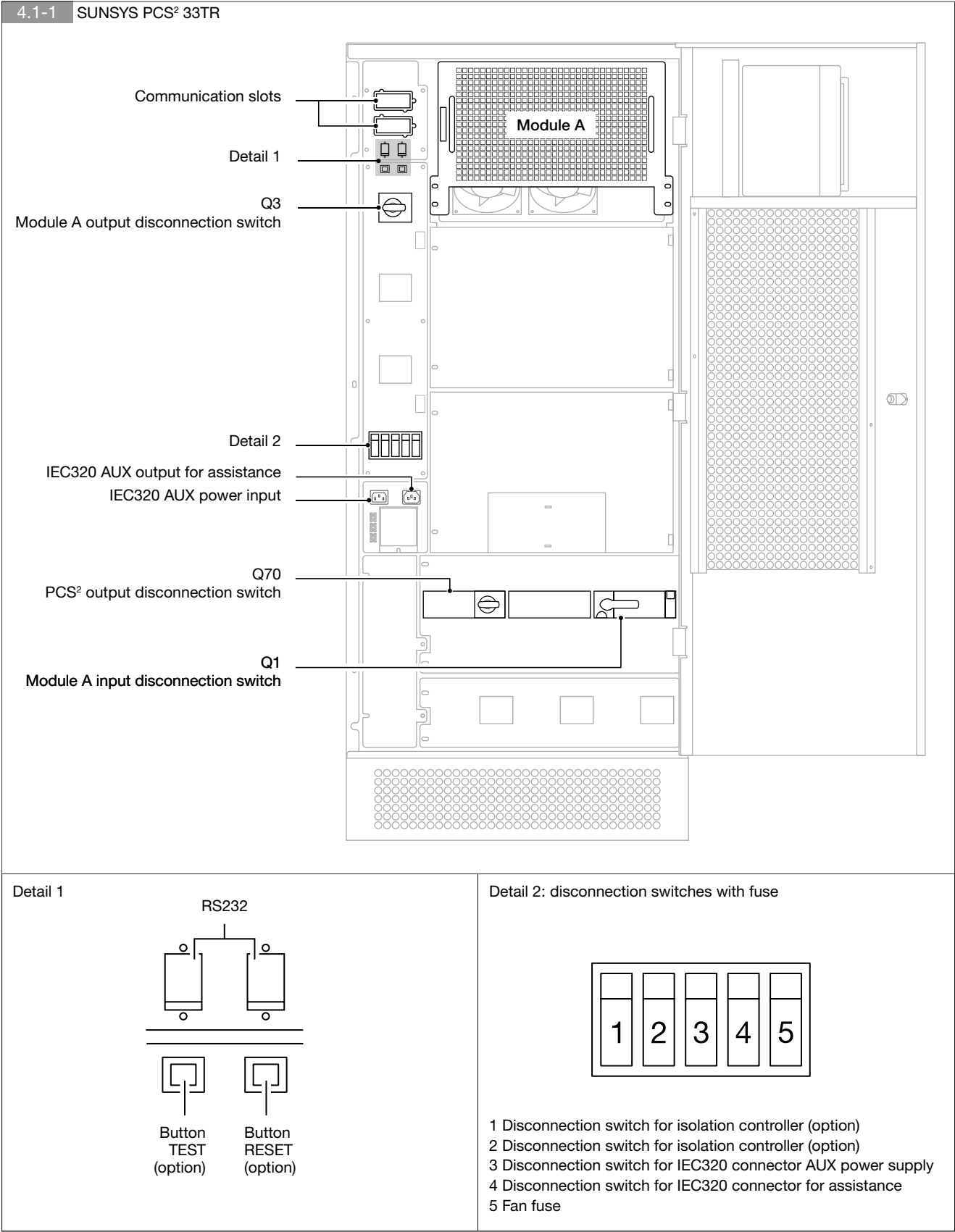
WARNING!

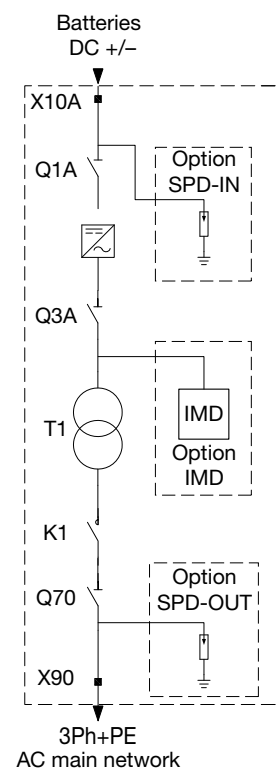
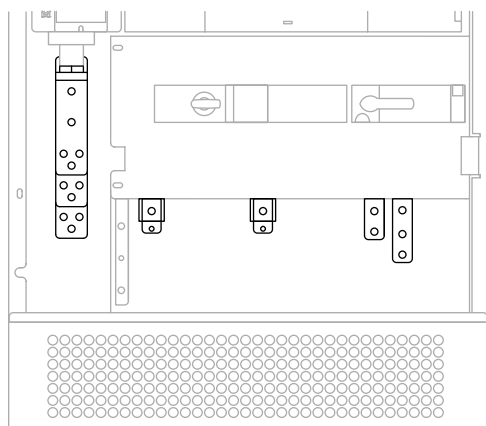
The PCS² is designed for transient over-voltages in category II installations for DC terminals. If the PCS² could be subject to transient over-voltages in category III installations, or if the distance from the SPDs of the battery cabinet is excessive, protective SPDs must be fitted near the PCS². The SPDI option can be fitted to the PCS² directly.

Note: batteries and PCS² are configured like an IT system. We therefore recommend a permanent isolation controller be used in the system or built into the PCS² (IMD option).

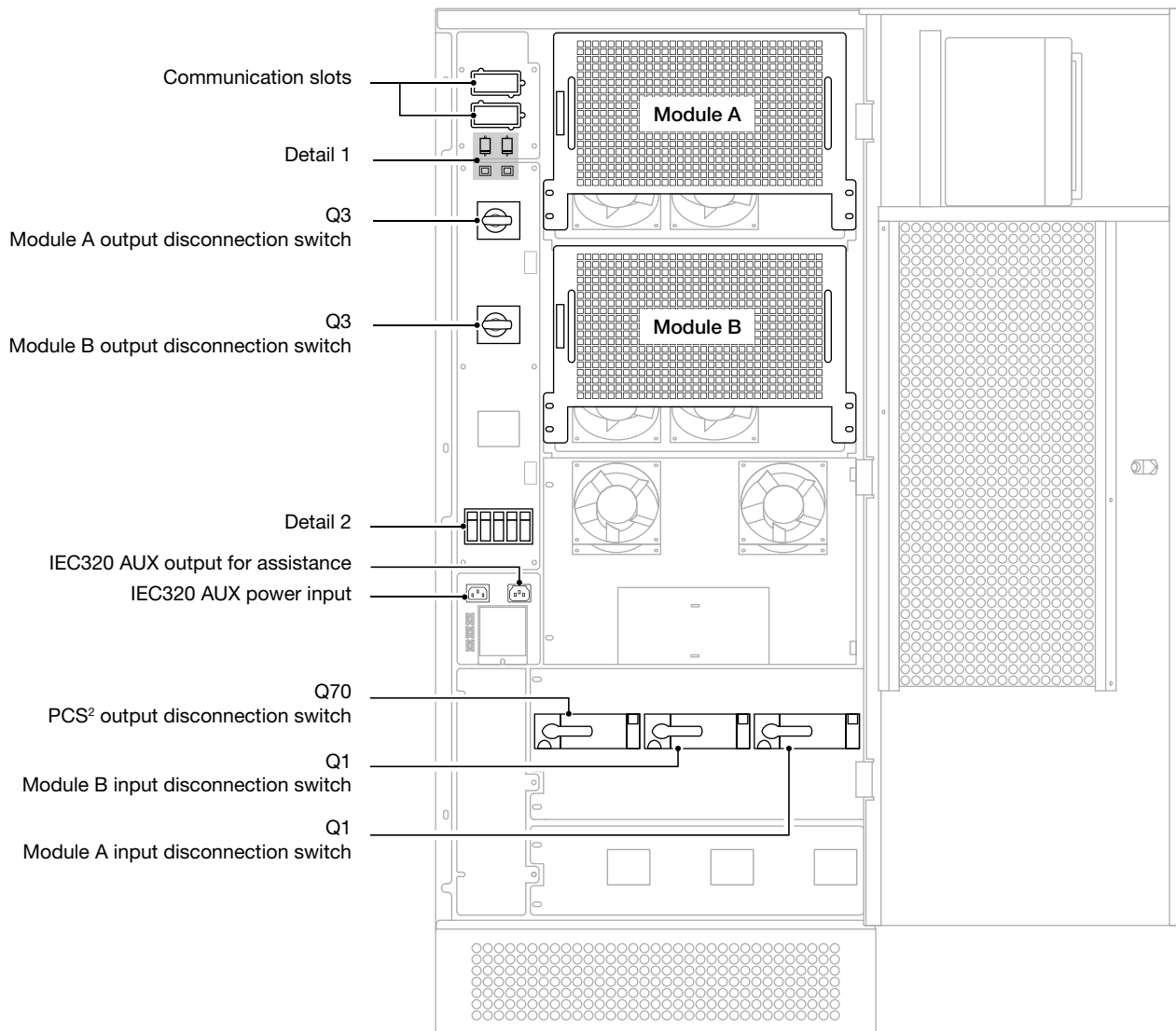
4. OVERVIEW

4.1. SWITCHCES AND INTERFACES

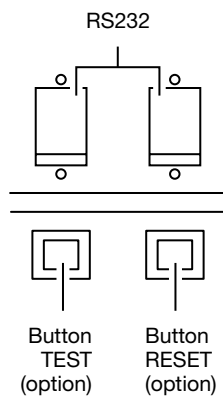


4.1-2 Wiring diagram of SUNSYS PCS² 33TR

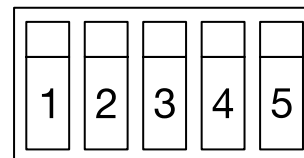
4.1-3 SUNSYS PCS² 66TR



Detail 1

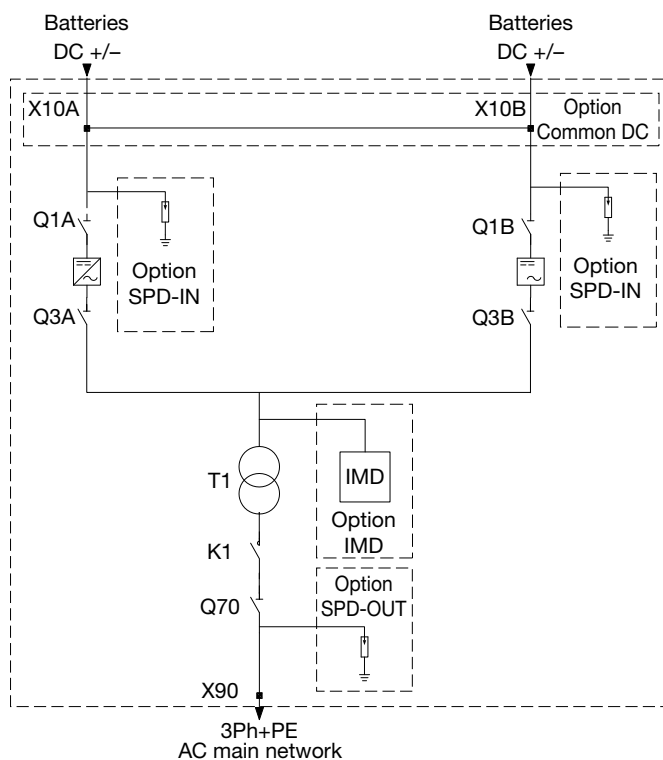
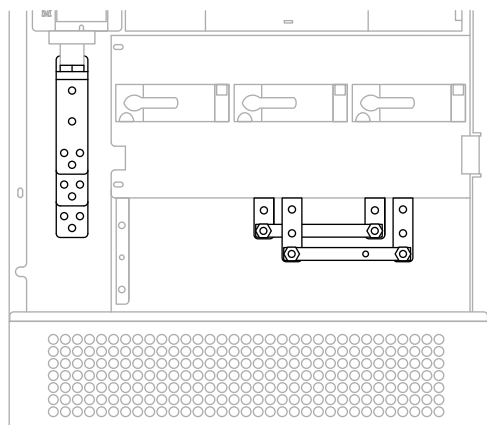


Detail 2: disconnection switches with fuse

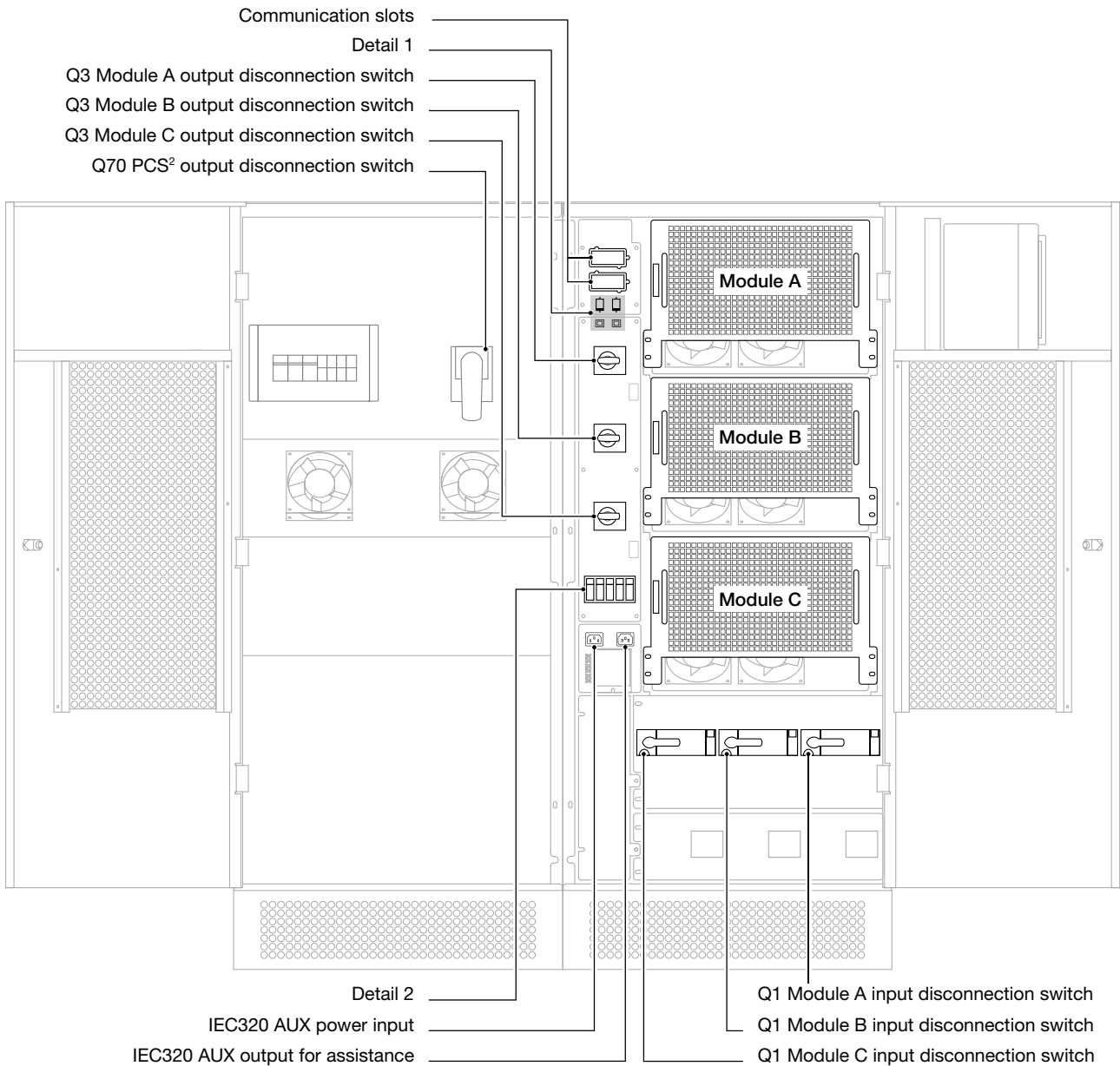


- 1 Disconnection switch for isolation controller (option)
- 2 Disconnection switch for isolation controller (option)
- 3 Disconnection switch for IEC320 connector AUX power supply
- 4 Disconnection switch for IEC320 connector for assistance
- 5 Fan fuse

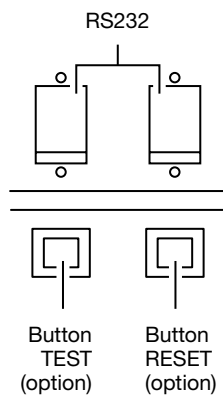
4.1-4 Wiring diagram of SUNSYS PCS² 66TR



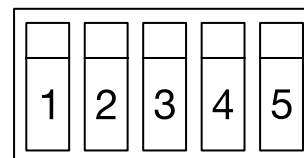
4.1-5 SUNSYS PCS² 100TR



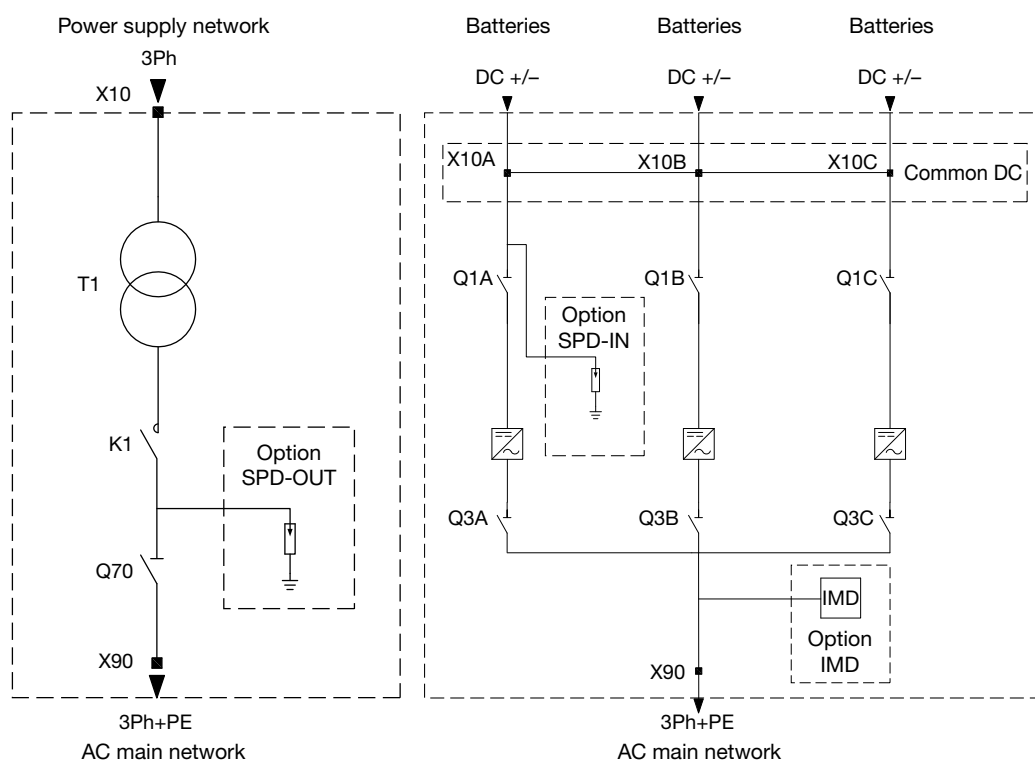
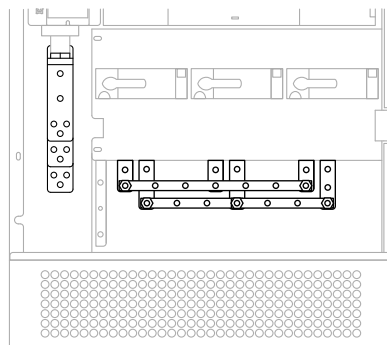
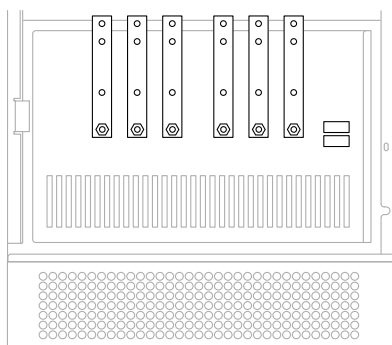
Detail 1



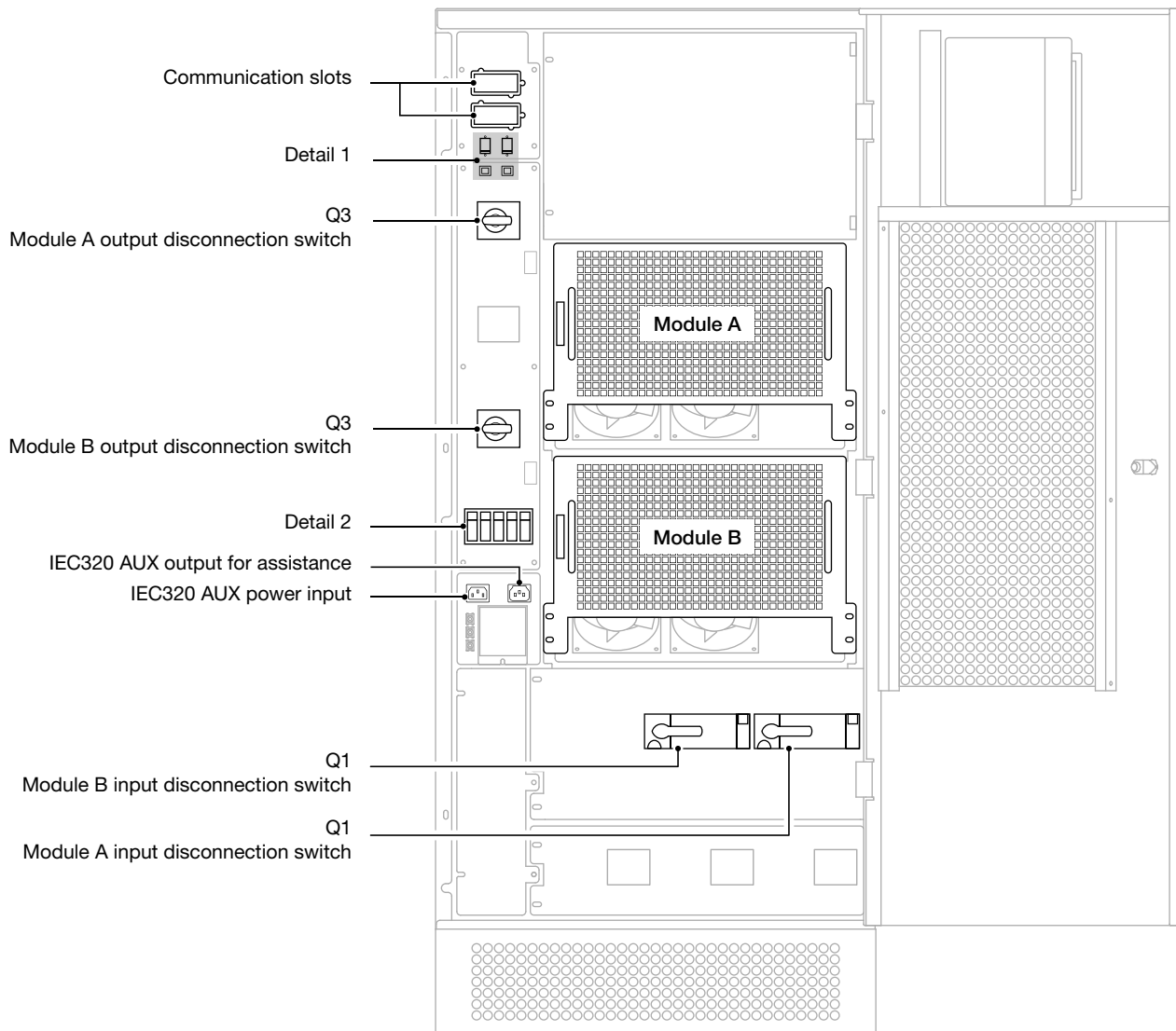
Detail 2: disconnection switches with fuse



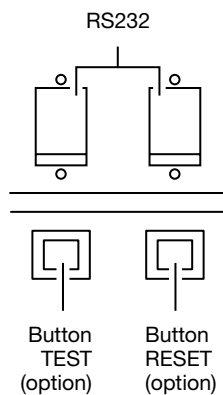
- 1 Disconnection switch for isolation controller (option)
- 2 Disconnection switch for isolation controller (option)
- 3 Disconnection switch for IEC320 connector AUX power supply
- 4 Disconnection switch for IEC320 connector for assistance
- 5 Fan fuse

4.1-6 Wiring diagram of SUNSYS PCS² 100TR

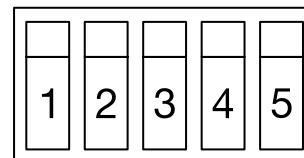
4.1-7 SUNSYS PCS² 66TL



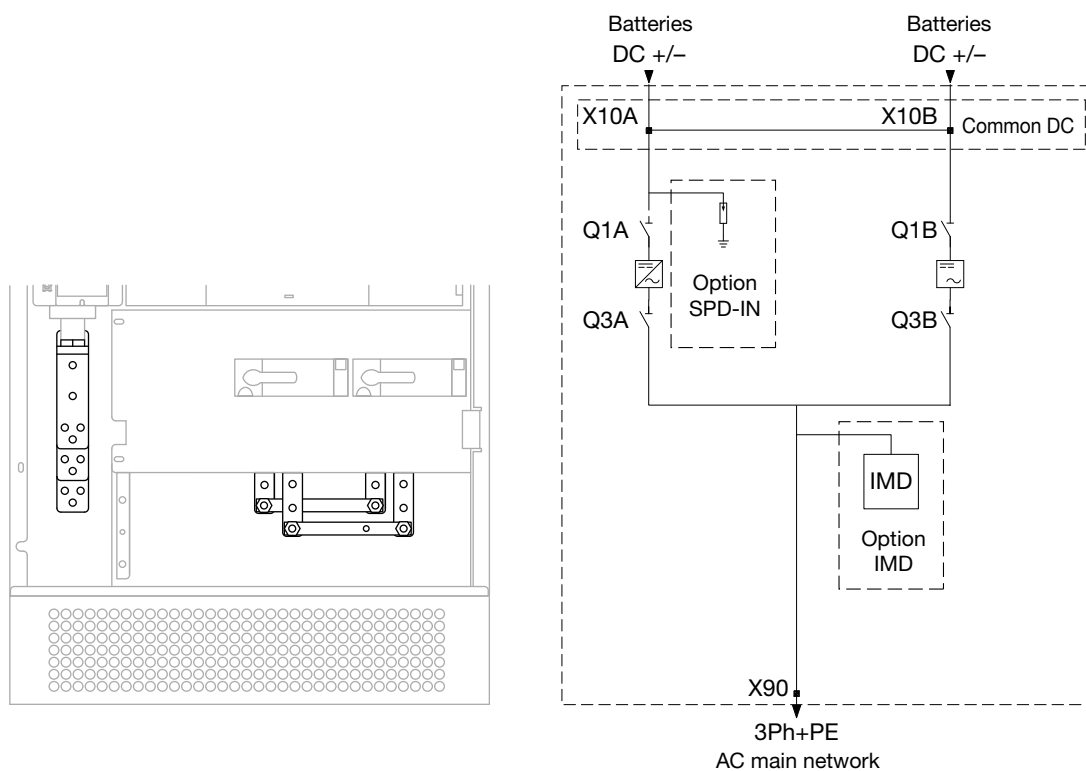
Detail 1



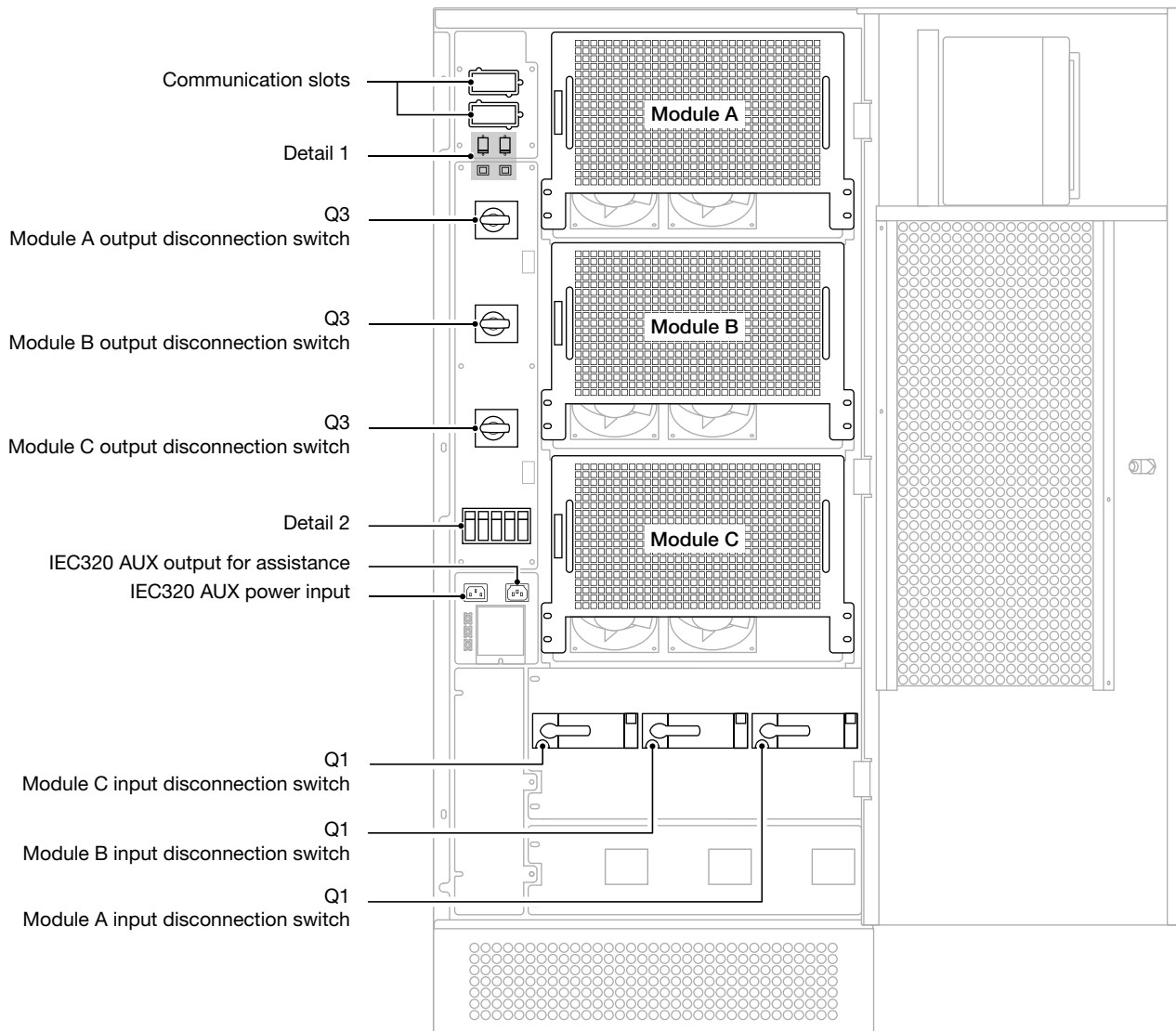
Detail 2: disconnection switches with fuse



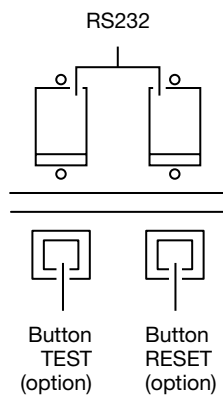
- 1 Disconnection switch for isolation controller (option)
- 2 Disconnection switch for isolation controller (option)
- 3 Disconnection switch for IEC320 connector AUX power supply
- 4 Disconnection switch for IEC320 connector for assistance
- 5 Fan fuse

4.1-8 Wiring diagram of SUNSYS PCS² 66TL

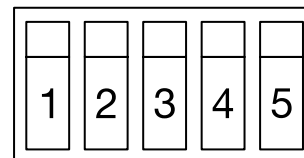
4.1-9 SUNSYS PCS² 100TL



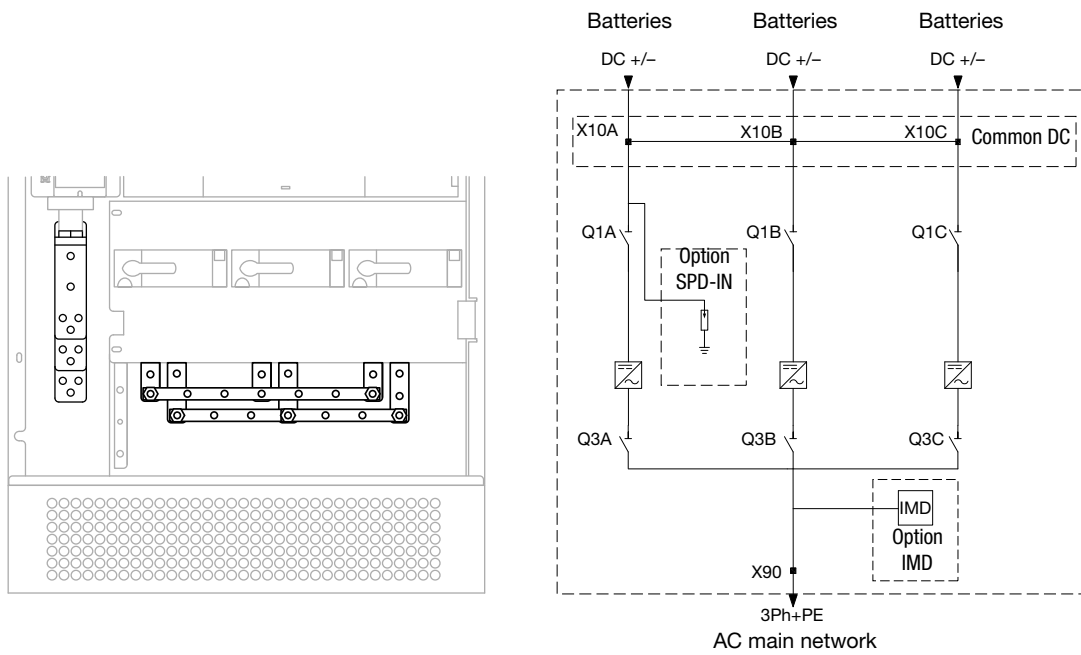
Detail 1



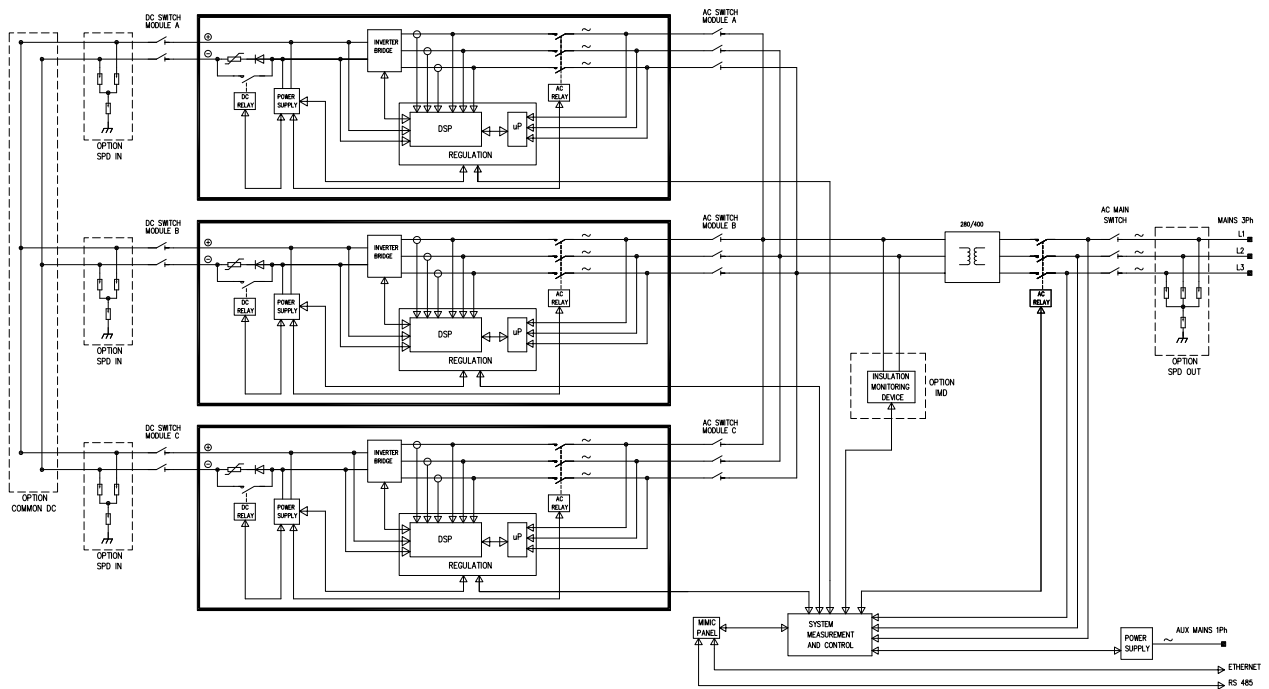
Detail 2: disconnection switches with fuse



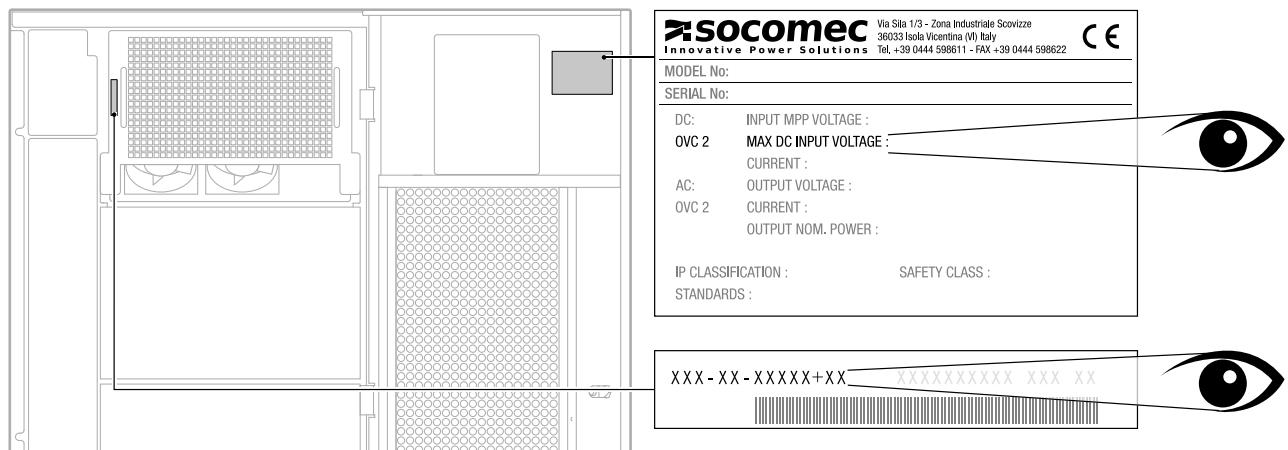
- 1 Disconnection switch for isolation controller (option)
- 2 Disconnection switch for isolation controller (option)
- 3 Disconnection switch for IEC320 connector AUX power supply
- 4 Disconnection switch for IEC320 connector for assistance
- 5 Fan fuse

4.1-10 Wiring diagram of SUNSYS PCS² 100TL

4.1-11 Diagram of principle system (SUNSYS PCS² 100TR)



4.1-12



5. CONNECTIONS



NOTE!
Before carrying out any operations on the PCS² read the Safety standards chapter carefully.

5.1. INPUT CONNECTION

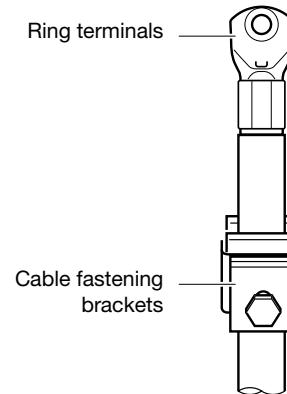
The PCS² is connected to the batteries via the DC terminals.

The PCS² is connected to the main AC network via the AC power terminals.

- Attach the ring terminals to the cables.
- Remove the panels protecting the connection area in front of the terminals.
- Fix the protection wire **PE** to the connection terminal.
- Fix the wires **L1, L2, L3** to the connection terminals.
- Fix the wires **L+,L-** to the connection terminals.
- Fix the power cables supplied between the transformer cabinet and the PCS² (only for 100 kW).
- Fix the signal cables supplied between the transformer cabinet and the PCS² (only for 100 kW).
- Fix the cables to the cable support guide using cable fastening brackets.
- Reposition the panels protecting the connection area in front of the terminals.

Note: torque for the DC and AC power terminals: 20 Nm

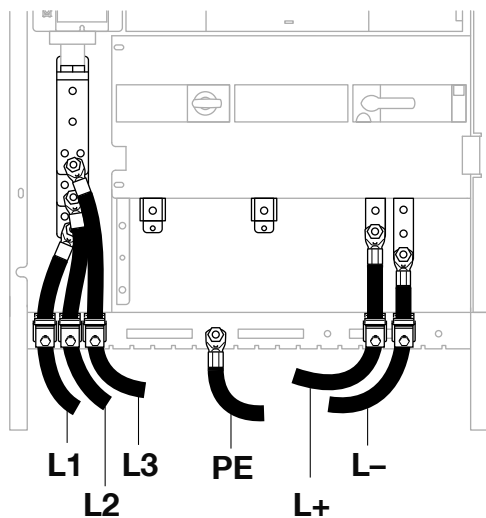
5.1-1



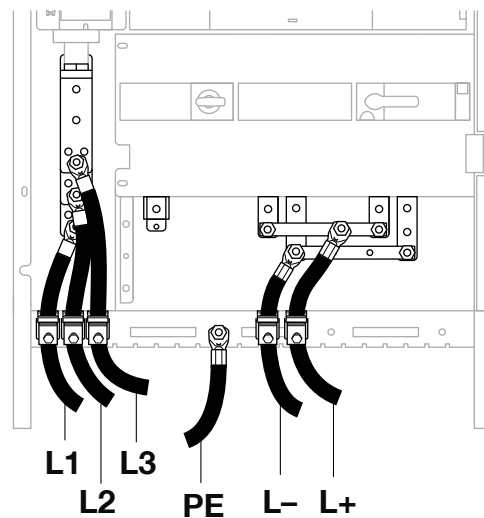
ENGLISH

5.1-2

SUNSYS PCS² 33TR



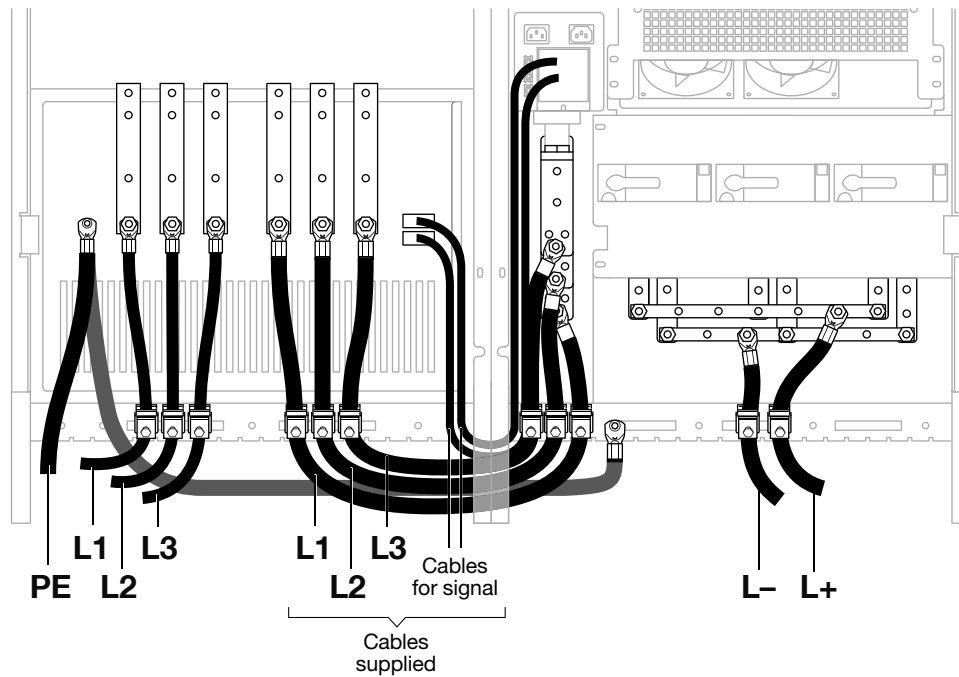
SUNSYS PCS² 66TR





Key

- L1, L2, L3** Connection terminals for the main AC network 3N~
- PE** Connection terminal for the protective earth wire ⊕
- L+, L-** DC connection terminals for the batteries — — —

5.1-3

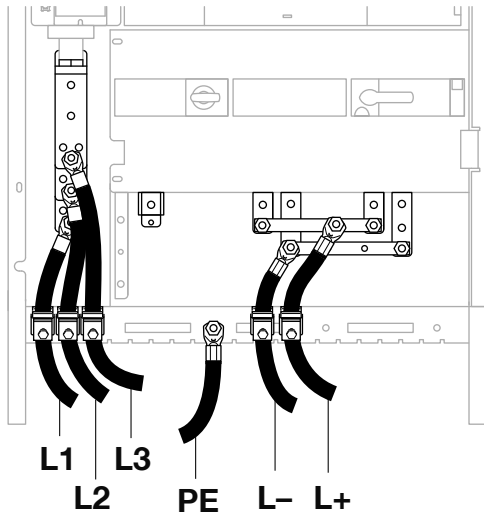
SUNSYS PCS² 100TR

Key

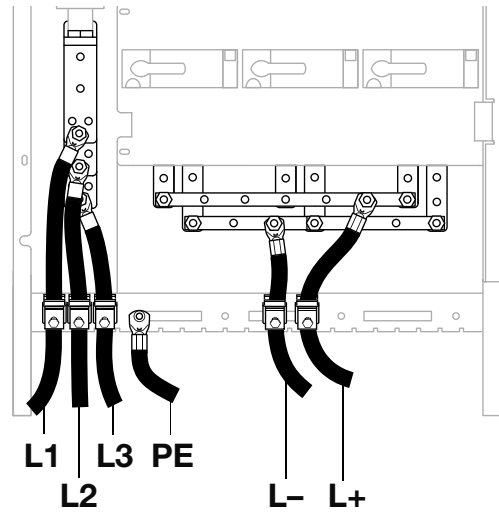
- L1, L2, L3 Connection terminals for the main AC network 3N~
 PE Connection terminal for the protective earth wire 
 L+, L- DC connection terminals for the batteries 

5.1-4

SUNSYS PCS² 66TL



SUNSYS PCS² 100TL



Key

- L1, L2, L3 Connection terminals for the main AC network 3N~
- PE Connection terminal for the protective earth wire ⚡
- L+, L- DC connection terminals for the batteries —

AUXILIARY CONNECTION

The PCS² equipment is powered by a special 230 V single-phase line.

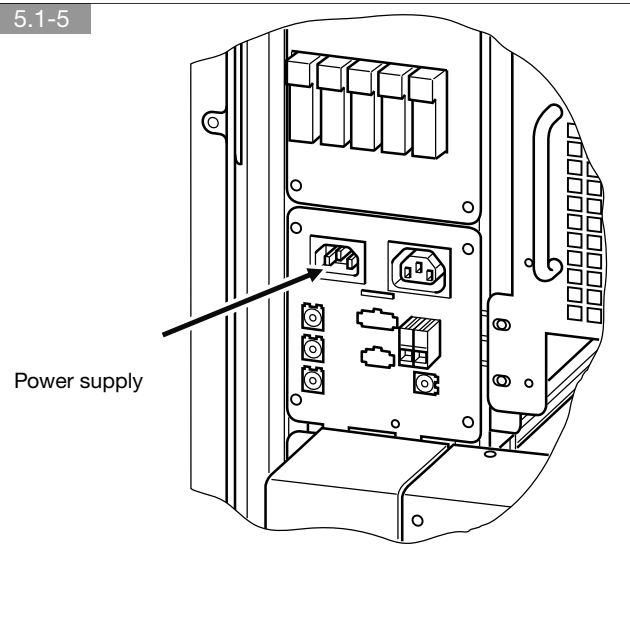
The auxiliary voltage must be connected to the relevant socket.



WARNING!
Risk of damage to the system if not observed!

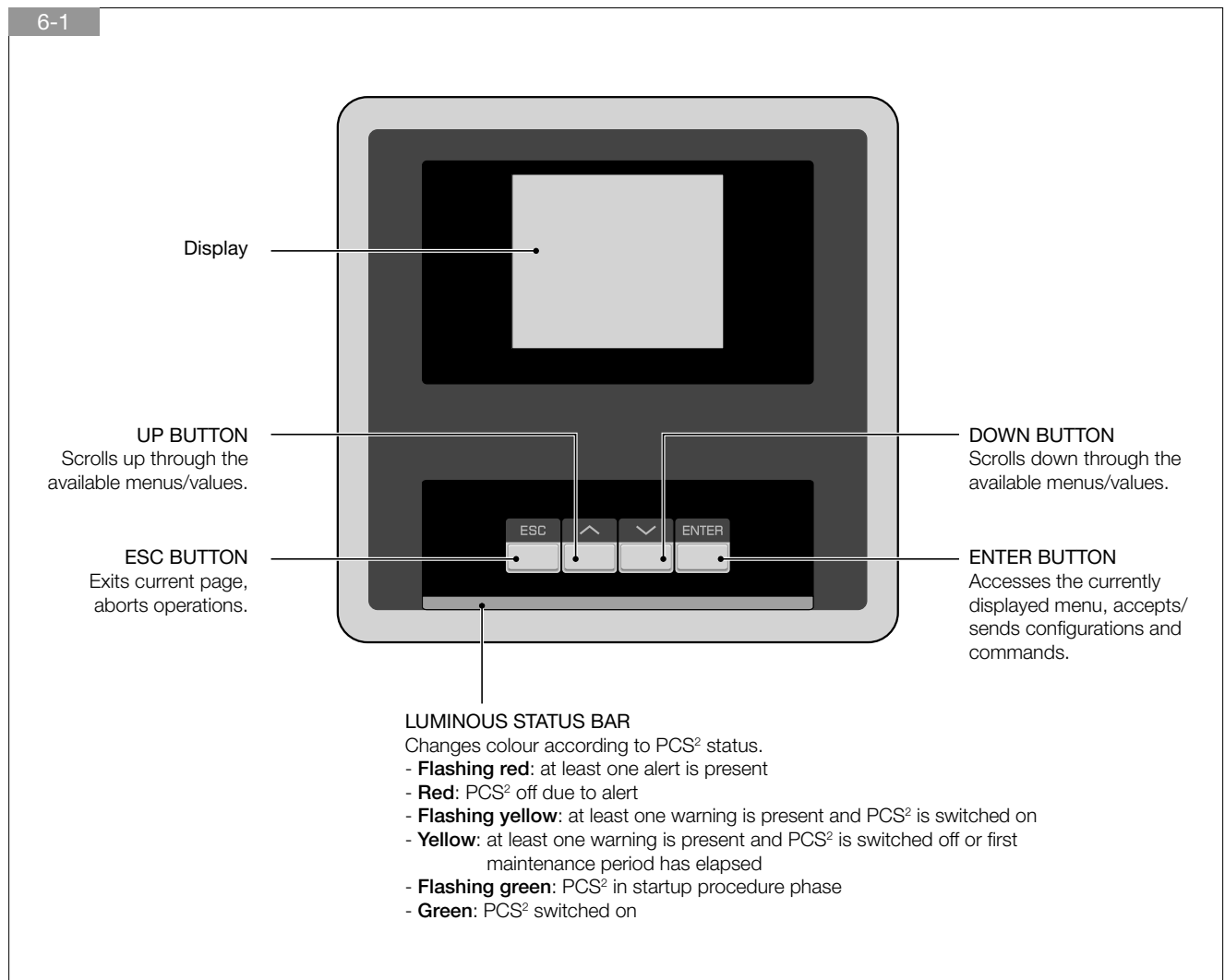
The auxiliary power supply cable must be fitted with a 16 A max. protection device.

5.1-5



6. CONTROL PANEL

The control panel displays information regarding operating status, electrical measurements, access to control functions and configuration parameters. It includes a colour graphic display and a luminous status bar.



7. FIRST START-UP



Before carrying out any operations on the unit read the safety standards chapter carefully.

When the PCS² is switched on for the first time the commissioning wizard is activated.

The commissioning wizard is an interactive procedure that guides the user through the PCS²'s first start-up procedure.

The most important steps are described below.

LANGUAGE SETTING

7-1



ENGLISH

ACTIVATION CODE

The Activation code - four-digit code - must be entered to allow operation of the PCS².



WARNING!

If the code is not entered the 'initial startup' procedure cannot be completed and the equipment will be prevented from operating.

To get the activation code call the Service Centre and give the Serial Number, displayed in the control panel.

7-2



To insert the Activation Code:

- press INSERT (a screen keyboard appears);
- insert the Activation Code;
- press ✓;
- press ENTER.

DATE & TIME

7-3

COMMISSIONING WIZARD

Set date:

Date 06/12/2010

BACK EDIT APPLY

Press UP/DOWN to change selected item

COMMISSIONING WIZARD

Set time:

Time 08:30:00

BACK EDIT APPLY

Press UP/DOWN to change selected item

SYSTEM SETUP

Set the number of modules installed (1, 2 or 3).

7-4

COMMISSIONING WIZARD

Please enter No. of modules

No. of modules 3

BACK EDIT APPLY

Press ENTER to use selected key

TRANSFORMER CONFIGURATION

Set **SOCOME**C when the machine is fitted with a SOCOME C transformer.

Set **EXTERNAL** when the machine is not fitted with a SOCOME C transformer.

7-5

COMMISSIONING WIZARD

Transformer type

Transformer type SOCOME C

BACK EDIT APPLY

Press ENTER to use selected key

BATTERY TYPE

Set the type of battery connected to the PCS² (Lead, Lithio, ecc.). Depending on the type of battery, some specific menus will be shown to guarantee the correct PCS² set up.



BATTERY TEMPERATURE PROBE SETTING

Set the type of temperature sensor used for voltage battery compensation (none - Temp. Sensor - Inv. Temp.).

OPTIMISATION MODE SETTING

Set the battery mode of use. It is possible to choose between:

- best performance;
- lifetime performance.

CONTROL MODE SETTING

Set the PCS² control mode. It is possible to choose between:

- local (using the control panel);
- external EMS (Energy Manager System);
- integrated EMS.

COUNTRY SETTING

Set the country where the PCS² is installed.



NOTE!

Once the country has been set the PCS² will automatically configure in compliance with the standards in force in that country.

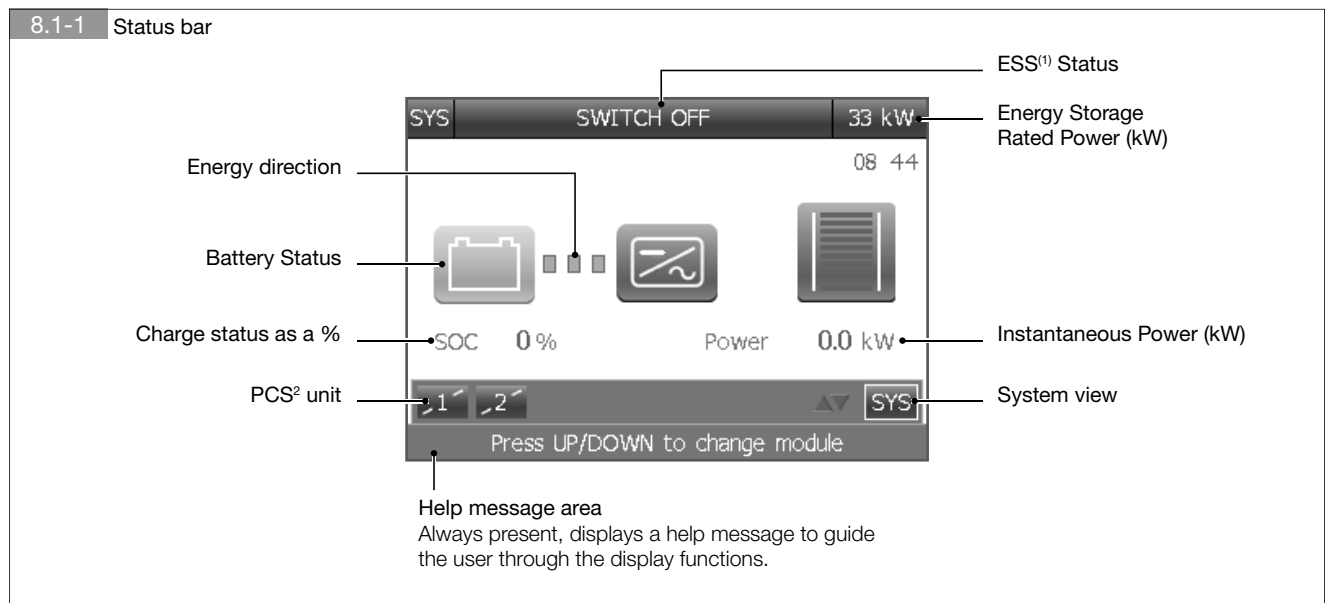


CAUTION!

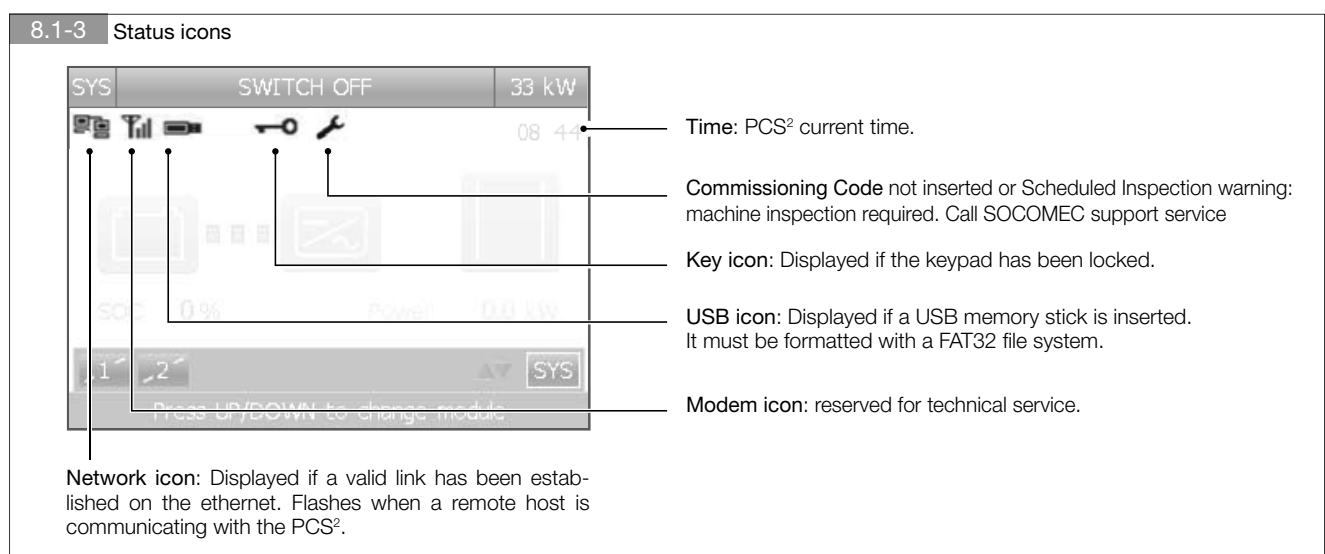
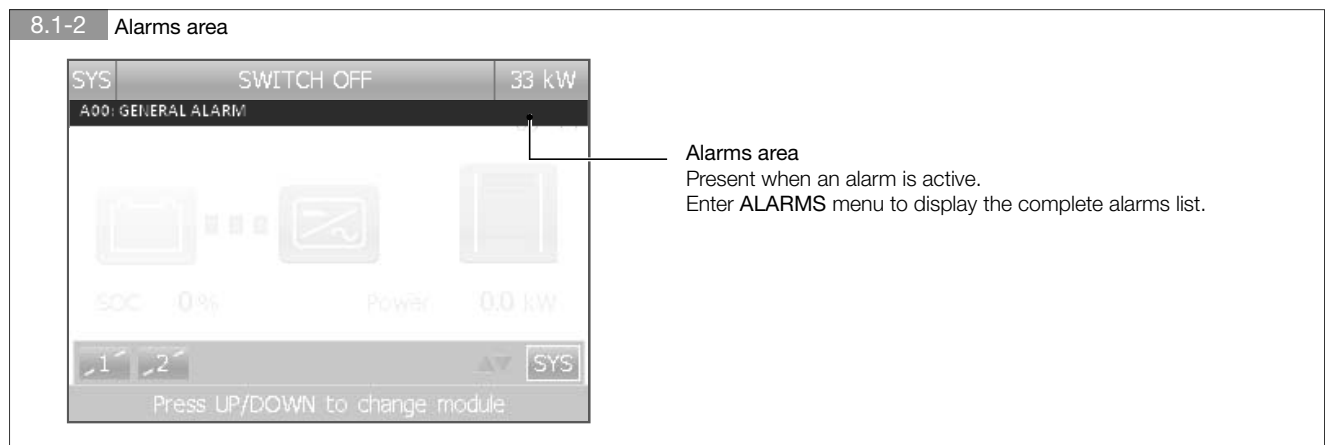
If the country setting is wrong SOCOMEC must be contacted for assistance.

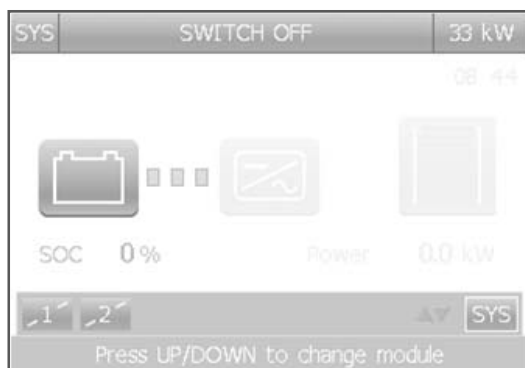
8. MENU

8.1. DISPLAY OVERVIEW



(1) Energy Storage System (includes PCS and Battery System)

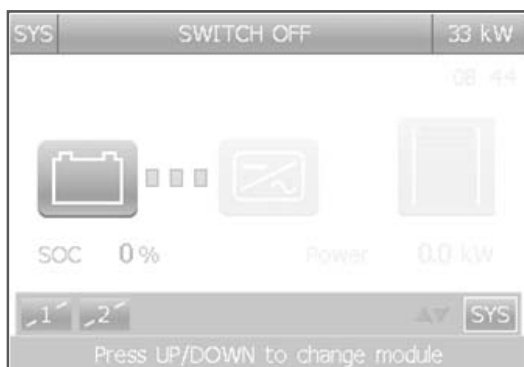


8.1-4 PCS² Status

(grey icon) Battery not present

(green icon) PCS² normal operation(yellow icon) PCS² warning flagged(red icon) PCS² alert flagged

8.1-5 Battery status



SOC ≥ 87,5 %



62.5 % ≤ SOC ≤ 87.5 %



37.5% ≤ SOC ≤ 62.5 %



12.5 % ≤ SOC ≤ 37.5 %



SOC ≤ 12.5 %

8.1-6 Instant power level



≤ 10%



≤ 20%



≤ 30%



≤ 40%



≤ 50%



≤ 60%



≤ 70%



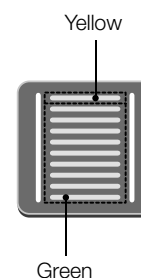
≤ 80%



≤ 90%



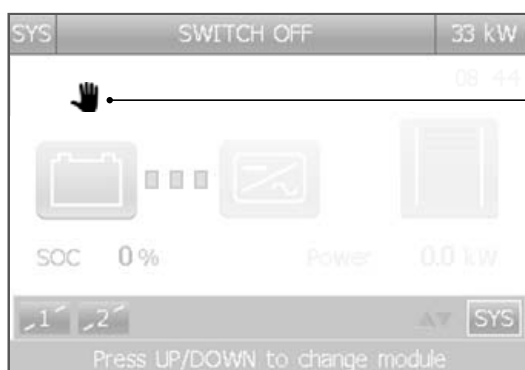
> 90%



Yellow

Green

8.1-7 Local command



Local Command

- charge/discharge sequence
- PCS² calibration
- stop sequence

8.2. MENU TREE

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL
STATISTICS	COUNTERS	
	PRODUCTION GRAPHS	DAILY TREND
		DOD DISTRIBUTION
		DISCHARGE DURATION
		BATTERY TEMPERATURE
MESUREMENTS	PCS POWER	
	AC MEASURES	
	BATTERY MEASURES	
	SENSORS	
ALARMS AND WARNINGS	ALARMS	
	WARNINGS	
HISTORY LOG		
COMMANDS	LOCAL COMMANDS	
	ALARM RESET	
	TEST PROCEDURES	
	RESET STATISTICS	
	RESTART DISPLAY	
	SYSTEM CONFIG	
SETTINGS	PREFERENCES	LANGUAGE
		DATE AND TIME
		BUZZER
		DISPLAY
		PASSWORDS
	SYSTEM CONFIGURATION ⁽²⁾	
	PCS SETTINGS ⁽²⁾	COUNTRY/NETWORK CODE
		CONNECTION PARAMETERS
		AC INTERFACE PROTECTION
		ACTIVE POWER
		REACTIVE POWER
	BATTERY SETTINGS ⁽²⁾	BATTERY TYPE
		BATTERY PARAMETERS ⁽¹⁾
		CHARGE THRESHOLDS
		DISCHARGE THRESHOLDS
		MAINTENANCE PARAMETERS ⁽¹⁾
		SOH CALCULATION ⁽¹⁾
	OPTIONAL DEVICES	
	CONNECTIVITY	PERIPHERALS
		SERVICES

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL
SERVICE	PCS DESCRIPTION	
	FIRMWARE VERSION	SYSTEM
		MODULE1
		MODULE2
		MODULE3
	SERIAL NUMBER	
	COMMISSIONING CODE	
	UPGRDAE FIRMWARE	UPGRADE HMI FIRMWARE
		UPGRADE LANGUAGES

(1) shown only if setting Lead Acid Battery Type

(2) password protected

KEYPAD LOCKING

The keypad can be locked by pressing the buttons in the following sequence:

ESC → UP → DOWN → ENTER

To unlock the keypad the buttons must be pressed in the reverse sequence:

ENTER → DOWN → UP → ESC

These sequences only work on the Mimic Panel page.

ENTERING PASSWORDS

Some operations and settings require a password in order to be performed.

If this is the case, a padlock is displayed. When a password is required, a virtual keyboard is displayed. After inserting a valid password, the padlock opens and the operation can be performed. The default password is SUNS.



WARNING!

The password protects important settings and parameters which are essential for correct PCS² operation. Only skilled and qualified technicians are allowed accessing the protected parameters. Wrong settings may damage the equipment.



NOTICE!

It is advisable to change the password to prevent unauthorised access.

8.3. MENU DESCRIPTION

DISPLAY MENU

It is possible to view information corresponding to individual modules on the mimic panel by selecting the PCS² serial number.

LANGUAGE UPGRADE

Text translations in several languages are held in files with the *.lng extension which are provided by SOCOMEC. Language upgrades must be performed through the USB port, using a standard USB memory stick. The USB device must be formatted with FAT16 or FAT32.

Step 1

The language file to be installed must be copied onto a USB stick and placed in the standard folder:

{USB stick}\sunsys\uwhi

Step 2

Insert the USB stick into the USB port on the back of the PCS² door.

Step 3

Enter the menu: SERVICE > UPGRADE FIRMWARE > UPGRADE LANGUAGES. The SYS PCS² has to be selected beforehand on the main page.

Step 4

The list of files in the \sunsys\uwhi folder in the USB memory stick is shown. Select the file you want to install and follow the instructions displayed.

Step 5

At the end of the process select Yes to restart the display.

Step 6

Remove the USB stick when requested.

Step 7

The new language is available after restarting.

To change the language go to the SYSTEM menu: SETTINGS > PREFERENCES > LANGUAGE

Note: To restore English as the default language press the ESC button for at least 4 seconds on the main page (mimic panel page)

STATISTICS MENU

This menu displays the COUNTERS and the PRODUCTION GRAPH:

- Counters store the Running Time [Hrs] and the Tot. Num. Of Cycles
- Production graph illustrates the:
 - Daily Trend, (last 7 days of SOC and Active Power)
 - Depth of Discharge Distribution, (numbers of cycles with a specific DOD)
 - Discharge Duration, (number of cycles with a specific discharge period)
 - Battery Temperature (numbers of working hours at specific temperature)

COMMANDS

The menu contains a list of commands that the user can activate through the display:

- Local Procedure:
 - charge/discharge battery,
 - stop procedure
 - PCS² calibration procedure

SETTINGS

This menu contains the System Configuration Parameters, all of them are password protected and it is possible to set:

- Local/remote Control
- No. of modules
- Transformer type
- Ac Interface Protection
- Optimisation Mode

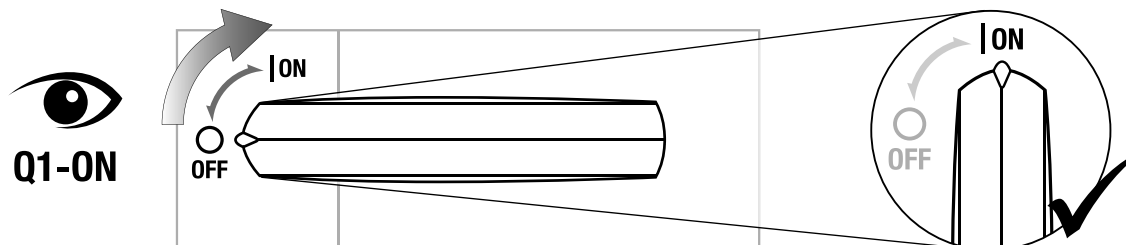
9. OPERATING PROCEDURES



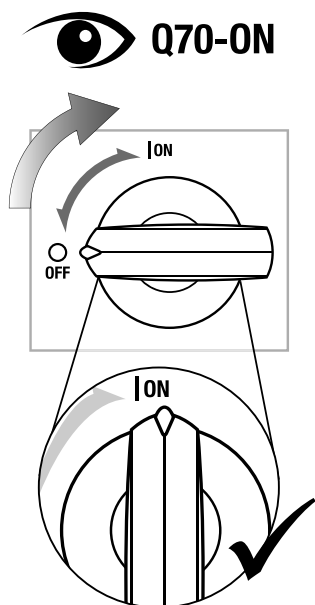
Before carrying out any operations on the unit read the safety standards chapter carefully.

9.1. SWITCHING ON

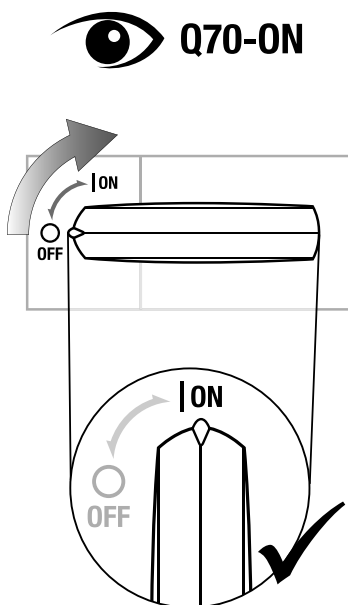
9.1-1



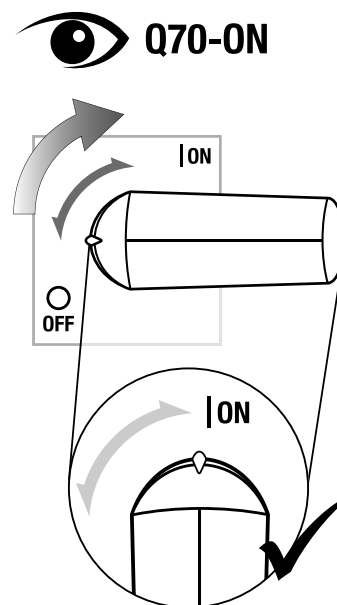
9.1-2 Only for transformer based model



PCS² 33TR

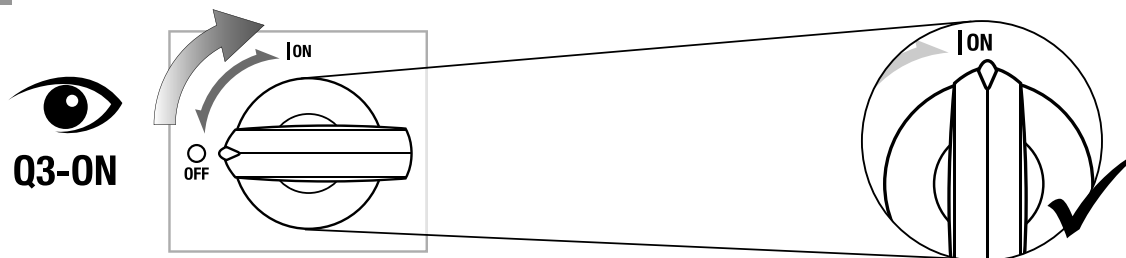


PCS² 66TR



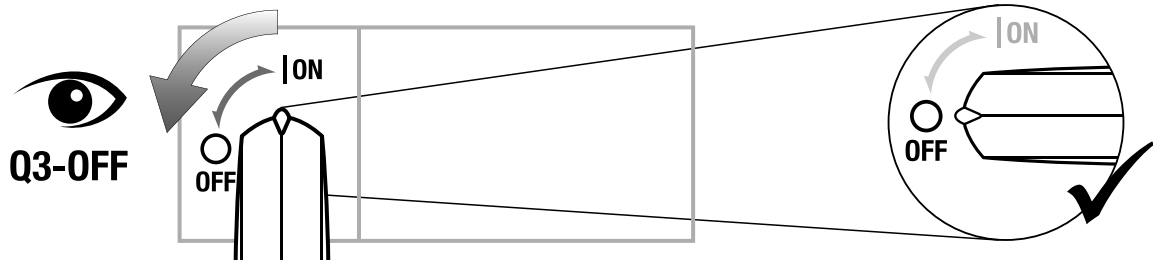
PCS² 100TR

9.1-3



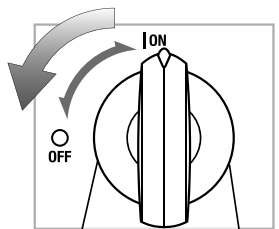
9.2. SWITCHING OFF

9.2-1



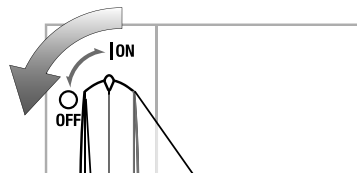
9.2-2 Only for transformer based model

Q70-OFF



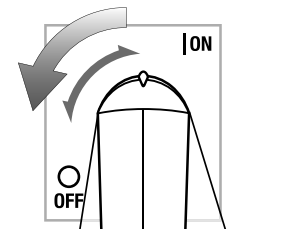
PCS² 33TR

Q70-OFF



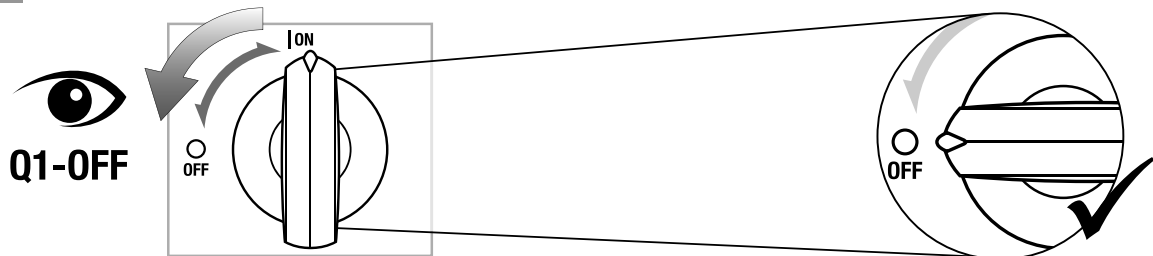
PCS² 66TR

Q70-OFF



PCS² 100TR

9.2-3



If the auxiliary power supply also needs to be cut off disconnect the cable from the auxiliary power supply input socket or break the fuse connection.

This procedure will switch off all the auxiliary PCS² equipment, including the system controller and the control panel.

The general AC power contactor for the machine will also be opened.

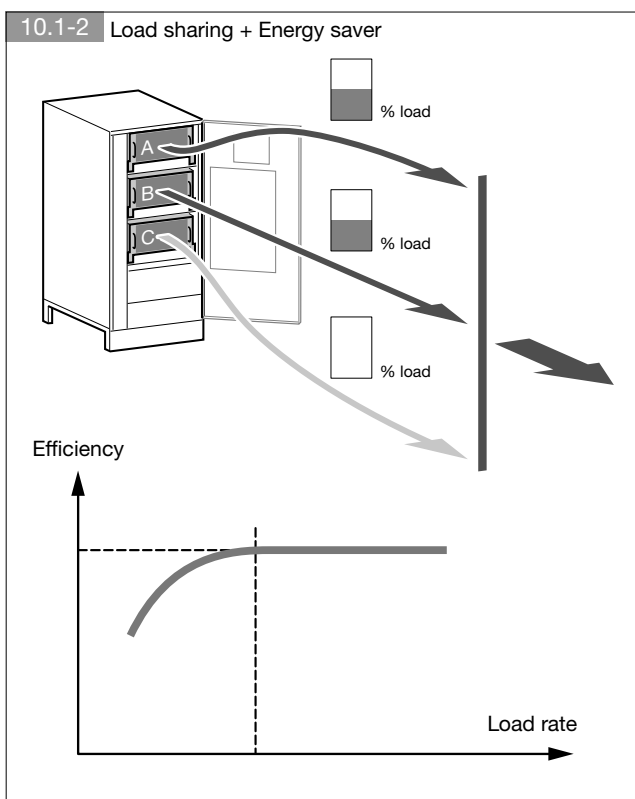
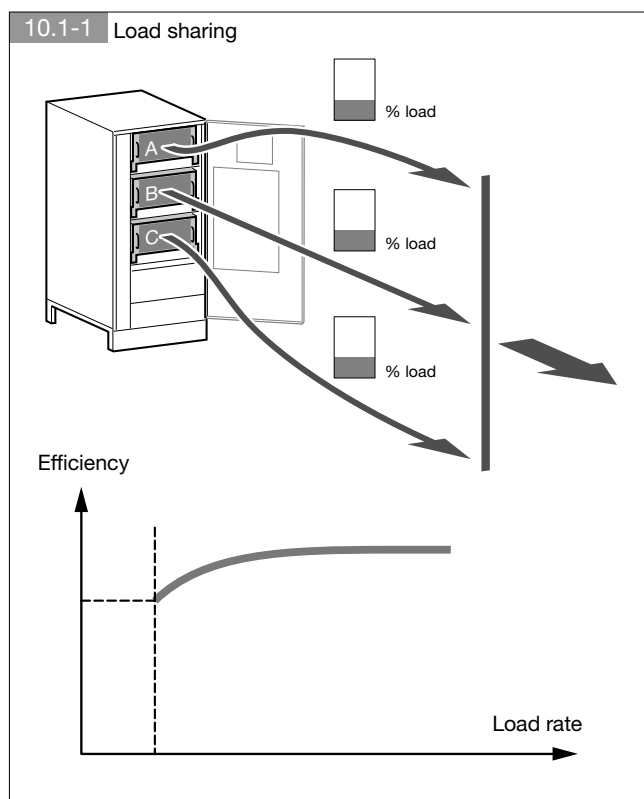
10. OPERATING MODES

10.1. ENERGY SAVER MODE

Energy Saver ensures system availability and simultaneously reduces energy consumption.

This kind of operation has two advantages:

- Longer equipment lifetime (the modules are switched on and off at random, so they run for less time on average);
- Increased efficiency (only the equipment actually required is activated and operates under optimal efficiency conditions - 30 to 60% of rated power).



11. STANDARD FEATURES AND OPTIONS

Features	Type	Description	Availability ⁽¹⁾
Permanent isolation controller (IMD)	Electrical	This feature verifies the insulation status of the IT system	Available as option
AC over-voltage dischargers (SPDO)	Electrical	This feature provides protection against output overvoltage	Available as option
DC over-voltage dischargers (SPDI)	Electrical	This feature provides protection against input overvoltage	Available as option
Cable fastening brackets	Mechanical	This item secures cables correctly	Available as option
Multilevel communication	Communication		Available as standard
Modbus TCP interface	Communication		Available as standard
ADC card	Communication		Available as standard

(1) For features available as standard, see the following paragraphs.

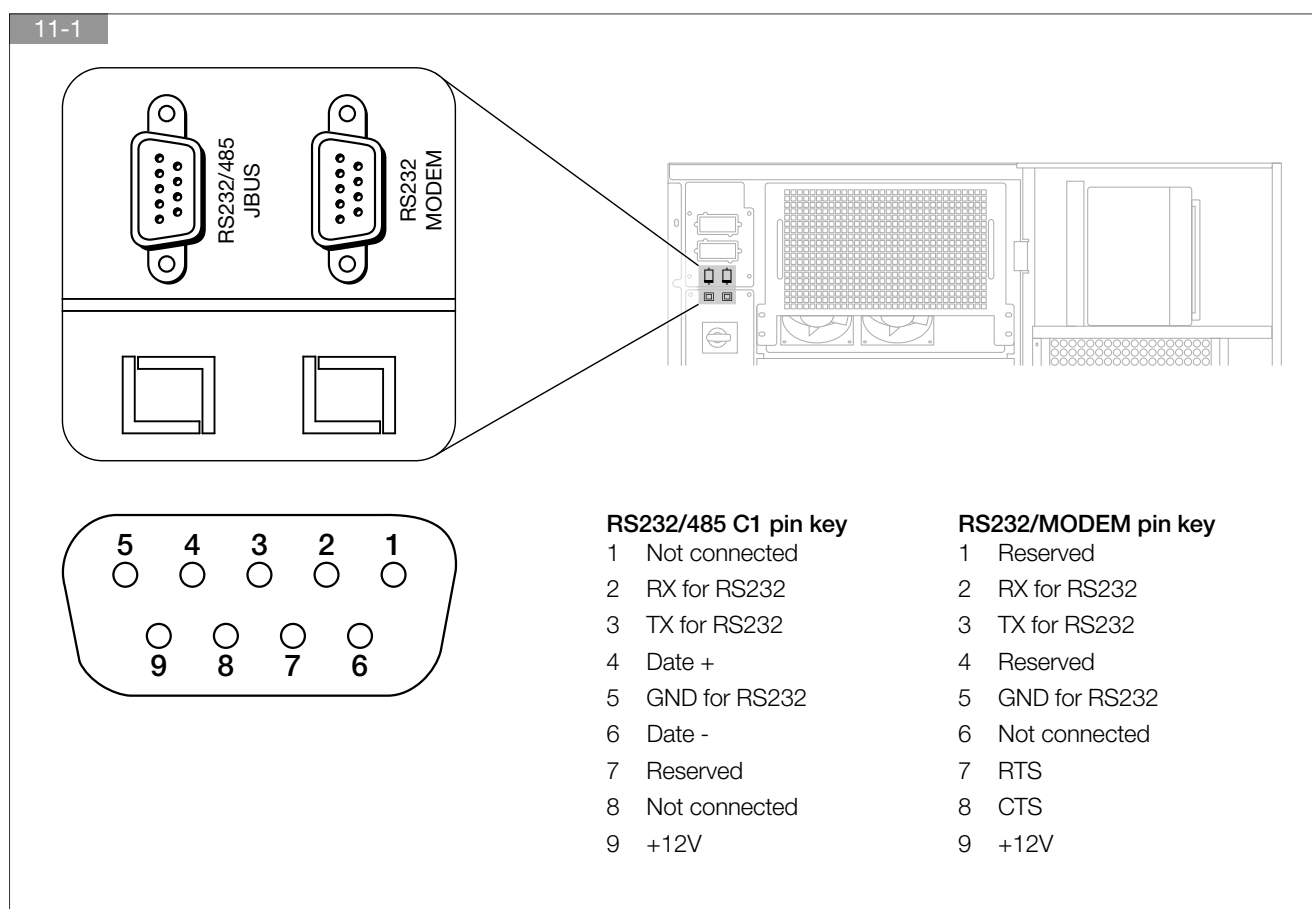
MULTILEVEL COMMUNICATION

RS232/485 is a serial communication channel which can be used to connect to a BMS (Building Management System) or an external supervisor, depending on battery type.



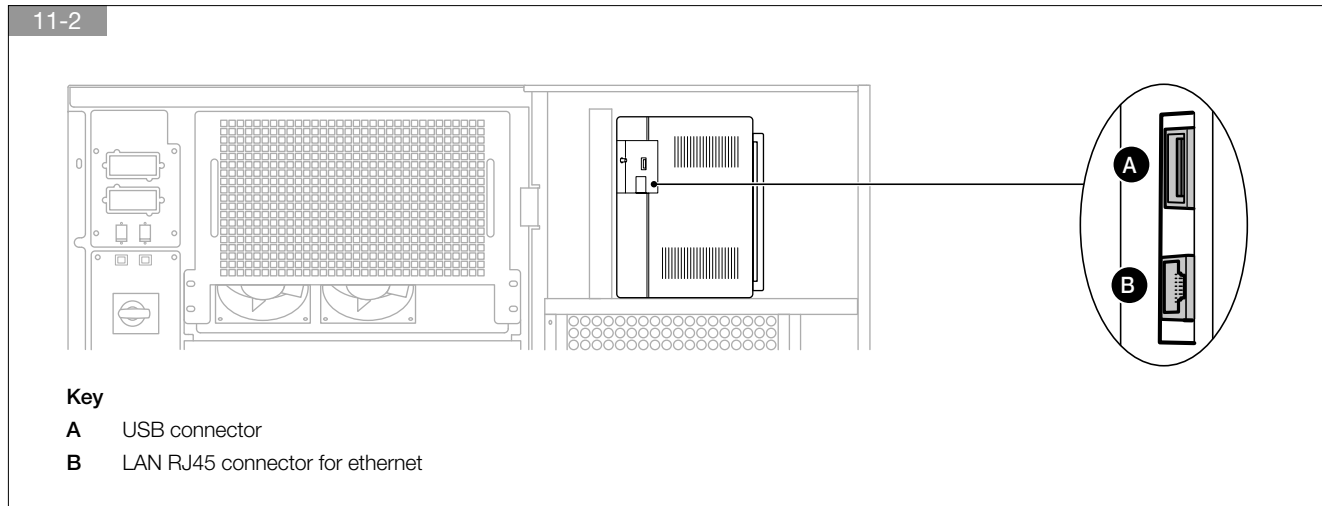
NOTE!

RS485 cable has to be shielded.



MODBUS TCP INTERFACE

The PCS² can be managed from remote stations using MODBUS TCP network protocol. See menu **SETTINGS > CONNECTIVITY > PERIPHERALS > NETWORK PARAMETERS** to **Enabled/Disabled DHCP** setting. Restart the HMI after modifying the parameters. IP Addresses can be changed only if DHCP is disabled.



ADC CARD

This card manages four normally closed or normally open outputs and three digital inputs in configurable mode.

• Electrical data

- Permitted rated current and voltage of normally open or normally closed contacts: 2 A 250 Vac depending on the terminal used.
- Inputs are activated on loop closing.

• External ESD connection

A remote emergency shutdown system (ESD) can be installed by means of the ADC card. Connect a normally closed zero-potential contact to terminals IN1+ and IN1- of the ADC card.

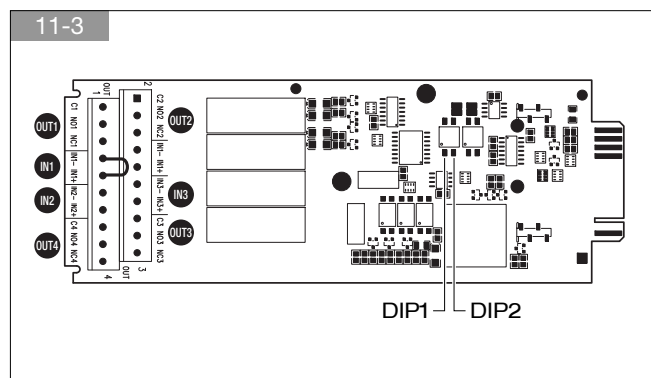


Intervention of the ESD input switches off the PCS² output.

To restore the PCS² to operation:

- Close the ESD contact on 'IN 1' on the ADC board.
- Send the Alarms Reset command.

Filter level configuration DIP1: OFF - DIP2: ON		
IN/OUT	Description	Filter level ⁽¹⁾
OUT 1	General Alarm	2
OUT 2	DC contactor command	1
OUT 3	Battery low or imminent stop	2
OUT 4	Fans command	2
IN 1 ⁽²⁾	ESD	1
IN 2	Thermal protection	2
IN 3 ⁽³⁾	Temperature sensor	/



(1) The filter level indicates the activation delay: 1 (1 s delay), 2 (10 s delay), 3 (30 s delay).

(2) If the external ESD button is not used always insert a jumper to short circuit input IN 1.

12. WARNINGS AND TROUBLESHOOTING

The alarm messages offer immediate diagnosis of any faults, malfunctions or breakdowns in the batteries.

The following events are indicated:

- **Warning:** non-serious alarm conditions that causes the unit stop. This can be reset automatically.
- **Alarm:** serious alarm conditions that causes the unit stop. These alarm conditions require a manual reset.

Alarm and warnings are divided into two categories:

- **System Alarms/Warnings:** these alarms/warnings relate to external parts of the unit (mains power network, output line, ambient temperature). Corrective actions are activated by the user (system installer or operator) or by the Support Service.
- **Unit Alarms/Warnings:** these alarms/warnings relate to parts of the unit. Corrective actions are activated by the Support Service.

System warnings			
Warning		Cause	Remedy
W01	Ambient over-temperature	The ambient temperature recorded by the unit is over 45° (see values on mimic panel).	Check the ventilation or air-conditioning system in the unit room.
W02	Ambient temperature under the minimum threshold	The ambient temperature recorded by the unit is under 15° (see value on mimic panel)	Check the ventilation or air-conditioning system in the unit room.
W04 W66	Internal over-temperature	The temperature of the unit power structure is over 110° (see value on mimic panel).	Check the ventilation or air-conditioning system in the unit room.
W20	High impedance to earth	The isolation controller and resistance to earth values recorded are too high.	Check the protective fuses. If the problem persists contact the support service.
W21	Active Power reference too low for charging batteries	The active power set point is too low to charge battery	Increase the value of active power set point to allow correct battery charging current
W22	Battery Current Derating in progress	Charge/discharge power is de-rated, due to battery request	
W23	Battery fully discharged	Battery is fully discharged	
W24	Battery Low Voltage	Battery cell voltage is critically low	Recharge the battery
W25	Battery Low Capacity	Battery charge is critically low	Recharge the battery
W26	Battery Rest Time request	Battery requires to wait Rest Time before charging/discharging	Wait the rest time
W27	Battery Full Charge request	Battery requires a Full Charge before discharging	
W28	Battery Over-temperature	Battery temperature too high	
W29	Calibration Procedure request	Execution of Calibration procedure is requested	
W30	Equalisation Procedure request	Execution of Equalisation procedure is requested	
W31	Local Mode Enabled	ESS is locally controlled through HMI	
W33 W34	AC input network outside frequency range	Input network is missing or insufficient (voltage and/or frequency values incorrect in reference to the information provided in the technical data table)	Check for any disconnection of protective devices upstream of the unit. Check the applied voltage and frequency comply with the values set on the HMI.

Unit warnings			
Warning		Cause	Remedy
W69 W70	AC input network outside frequency range	Input network is missing or insufficient (voltage and/or frequency values incorrect in reference to the information provided in the technical data table)	Check for any disconnection of protective devices upstream of the unit. Check the applied voltage and frequency comply with the values set on the HMI.
W65	Unit in Derating	The unit is reducing the power supplied/drawn by the network.	Check the other alarms and/or visual warnings

System alarms			
Alarms		Cause	Remedy
A01	Switch-off due to external command	The PCS is switched off due to an external instant switch-off command.	Check the external contact
A04	Low impedance to earth		Check the isolation to earth
A05	AC dischargers triggered		Check and replace if necessary
A06	DC Dischargers triggered		Check and replace if necessary
A07	Output contactor alarm	The output contactor status is not consistent	Contact the support service
A08	Transformer over-temperature		Check the ventilation or air-conditioning system in the unit room
A09	AC input network RMS value outside tolerated range	The input network is missing or insufficient (incorrect voltage and/or frequency values)	check for any disconnection of protective devices upstream of the unit. Check the applied voltage and frequency comply with the values set on the mimic panel.
A10			
A15	Incorrect system configuration		Check the configuration setting
A22	Battery Overvoltage	Battery voltage too high	
A23	Battery Communication fault		Check the cable between PCS and battery
A24	General Battery Alarm		
A25	Battery Cabinet Thermal protection fault	Over temperature inside the cabinet	

Unit alarms			
Alarms		Cause	Remedy
A47	Modules with different configuration		Check if the modules are identified by the same model code for hardware compatibility
A68	Unit off due to over-temperature		
A69	Fan fault	Ventilation system breakdown	Make sure the air inlets and outlets on the front and rear of the unit are free from obstruction.
A72	Unit locked		
A73	Input over-voltage	The DC input voltage has exceeded 900 V.	Check the connections.

13. MAINTENANCE



Before carrying out any operations on the unit read the safety standards chapter carefully.

Carry out a monthly check, to guarantee reliable operation.

- To ensure the appliance is properly ventilated, check that fans are operating correctly and the protective air vent grilles are clean.
- Check the connections, components and fuses for any discolouration or damage.



BEWARE!

Discoloured components indicate damage caused by heat or corrosion.
These parts must be replaced.

- Make sure that cables and screws are well secured.
- Make sure that equipment is clean. Contact SOCOMEC service centre to request machine cleaning.

13.1. PREVENTIVE MAINTENANCE

The equipment should be inspected at annual intervals to ensure continued trouble-free operation.

The equipment could require preventive maintenance, displayed automatically in the control panel.

Maintenance could involve the replacement of fans or capacitors.

14. TECHNICAL SPECIFICATIONS

Models	SUNSYS-PCS2-33TR	SUNSYS-PCS2-66TR	SUNSYS-PCS2-100TR	SUNSYS-PCS2-66TL	SUNSYS-PCS2-100TL
Input (DC)					
DC battery voltage	450 to 850 Vdc			450 to 850 Vdc	
Number of independent converters	1	2	3	2	3
Maximum discharging current	80 A	160 A	240 A	160 A	240 A
Maximum recharging current	80 A	160 A	240 A	160 A	240 A
Output (AC)					
Rated power	33 300 W	66 600 W	100 000 W	66 600 W	100 000 W
Maximum power	36 600 W	73 400 W	110 000 VA	73 400 W	110 000 VA
Rated apparent power	33 300 VA	66 600 VA	100 000 W	66 600 VA	100 000 W
Maximum apparent power	36 600 VA	73 400 VA	110 000 VA	73 400 VA	110 000 VA
Rated voltage ⁽¹⁾	400 Vrms 3 ph			280 Vrms 3 ph	
Voltage tolerance ⁽¹⁾	320 to 480 Vrms 3 ph			224 to 336 Vrms 3 ph	
Rated frequency ⁽¹⁾	50 Hz			50 Hz	
Frequency range ⁽¹⁾	47.5 to 51.5 Hz			47.5 to 51.5 Hz	
Rated current	48 Arms	96 Arms	144 Arms	136 Arms	206 Arms
Maximum current	53 Arms	106 Arms	159 Arms	157 Arms	235 Arms
Total harmonic distortion of current	63 A curva D	125 A curva D	200 A curva D	200 A curva C	250 A curva C
THDI (%)	< 3%			< 3%	
Topology	Single conversion Output transformer			Single conversion Transformerless	
Efficiency					
Dissipated power (max)	1750 W	3500 W	5250 W	2400 W	3650 W
Dissipated power (max)	5980 BTU/h	11950 BTU/h	17900 BTU/h	8184 BTU/h	12450 BTU/h
Maximum efficiency	96.1 %	96.3 %	96.4 %	97.6 %	97.6 %
European efficiency	95.2 %	95.6 %	95.8 %	96 %	97.3 %
Auxiliary power supply					
In operational	>30 W			>30 W	
On standby	>10 W			>10 W	
General data					
Pollution class in accordance with EN60664-1	3			3	
Pulse resistance voltage in accordance with EN 60060-1 AC terminals	2,5 kV			2,5 kV	
Pulse resistance voltage in accordance with EN 60060-1 DC terminals	4 kV			4 kV	
Degree of protection	IP20			IP20	
Environmental category	Non-air-conditioned indoor space			Non-air-conditioned indoor space	
Operating ambient temperature	-5 °C to +50 °C (40 °C to 50 °C with derating)			-5 °C to +50 °C (40 °C to 50 °C with derating)	
Rated temperature	-5 °C to +40 °C			-5 °C to +40 °C	
Storage temperature	-5 °C to +60 °C			-5 °C to +60 °C	
Relative humidity	5 % to 95 % condensation-free			5 % to 95 % condensation-free	
Cooling system	smart cooling			smart cooling	
Required cooling capacity	480 m³/h	1280 m³/h	1760 m³/h	960 m³/h	1440 m³/h
Acoustic noise at 1 m	< 60 dB	< 64 dB	< 64 dB	< 64 dB	
Altitude (max)	1000 m			1000 m	
Dimensions and Weight					
Dimensions (L x D x H)	600 x 795 x 1400 mm		1200 x 795 x 1400 mm	600 x 795 x 1400 mm	
Weight	330 kg	525 kg	190 + 580 kg	160 kg	190 kg

(1) Depending on the specific country setting and regulations.

HEAD OFFICE

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