SOLARC NEW ENERGY

NO:2023.12

SCCM-16/1
PV Combiner Box

User Instruction

Thank you for purchasing this product. Before installing, using, or maintaining the product, please read the instruction manual carefully.

Standard:IEC/EN 62109-1
IEC/EN 61439-1
IEC/EN 61439-2

CONTENTS

1 About This Manual

1.1 Manual Usage

To ensure proper use of this manual, please read it carefully.

⚠ Danger

"Danger" indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ Warning

"Warning" indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ Caution

″Caution" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Note

"Note" indicates important information that helps you make better use of the product.

Symbol	Definition
	This symbol indicates that there is high voltage inside the chassis. Touching may result in the risk of electric shock.
	This symbol indicates that the temperature at this location exceeds the acceptable range for human contact. Please avoid touching to prevent injury.
	This symbol indicates that this is a protective grounding terminal. It must be securely grounded to ensure the safety of operating personnel.

1.2 Other Models

This manual takes USCMM-16/1 as an example. Other models may differ in installation and usage. Please refer to the manual corresponding to the model number for installation and usage. The installation method in this manual is for USCMM-16/1 only and is for reference only. For any questions, please contact the manufacturer.

2 Safety Notice

Please read this manual carefully before installing, using, or maintaining the product to ensure safety and proper operation.

⚠ Danger

High voltage is present inside the chassis, which may cause electric shock if touched. Observe the following safety precautions:

- Before installation, ensure the power supply is turned off.
- During maintenance, use a voltage tester to check for residual voltage. It is recommended to use a tester with a voltage range not exceeding 1,500V to ensure safety.

⚠ Danger

Contact with live parts inside the chassis may cause electric shock or fire!

- Please disconnect the power supply before performing any maintenance.
- Refer to the relevant safety instructions for electrical equipment.

⚠ Danger

The chassis must be grounded properly:

- Improper grounding may pose a risk of electric shock to personnel!
- Ensure the grounding is correctly installed.

⚠ Warning

Only qualified personnel or those with professional training should operate and maintain this product.

- All operations must comply with relevant safety standards.
- Replace damaged components promptly to avoid accidents.

⚠ Warning

When installing or removing the product, ensure that the power supply is disconnected to prevent electric shock or fire.

- Do not touch live parts with wet hands, as this may lead to electric shock.
- Keep children and unauthorized personnel away from the installation area.

Note

After installation, ensure the product is securely fastened to prevent falling and causing injury.

3 Product Introduction

3.1 System Overview

3.1.1 Description

Our company's photovoltaic (PV) system is designed to be compatible with PV inverter products, forming a complete photovoltaic power generation system solution. The PV array is connected to the inverter through a DC coupling, reducing the connection lines between the PV array and the inverter, thereby lowering system costs and enhancing system reliability.

3.1.2 Features

- The PV system includes 1500V DC side fuse protection.
- The PV system includes 1500V DC side circuit breaker protection.
- The PV system includes 1500V DC side surge protection.
- The PV system is equipped with an intelligent control module capable of real-time monitoring of each string's current, voltage, and power, with a communication interface supporting Modbus and other protocols.
- The protection level reaches IP65, meeting outdoor installation requirements.

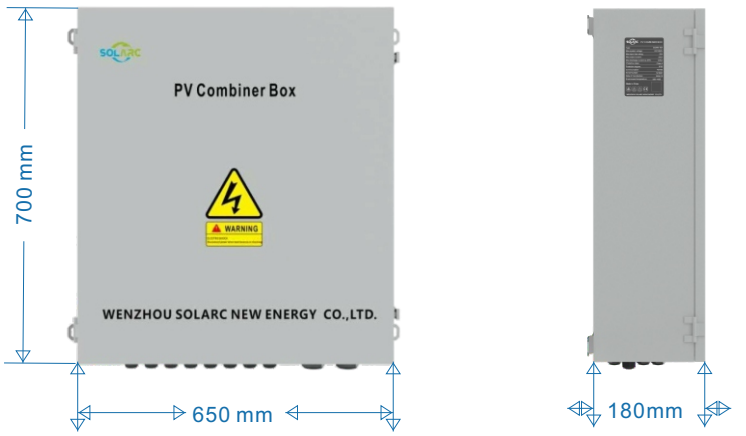
3.1.3 Application Scenarios

Our company's photovoltaic (PV) system is designed to be compatible with PV inverter products, forming a complete photovoltaic power generation system solution. The PV array is connected to the inverter through a DC coupling, reducing the connection lines between the PV array and the inverter, thereby lowering system costs and enhancing system reliability.

3.2 Product Composition

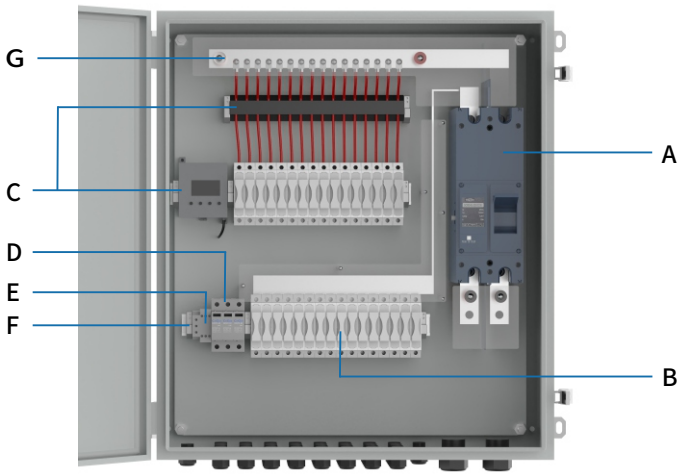
3.2.1 Appearance and Installation Dimensions

The external dimensions of the product are as follows, with dimensions in mm:



3.2.2 Product Internal Layout

Taking the SCMM-16/1 as an example, the internal layout of the product is shown in the following figure.



For reference only, subject to the actual product.

No.	Description
A	Circuit Breaker/Switch
B	Fuse
C	Monitoring Module
D	SPD
E	Rs485 Communication Port
F	Grounding Point,for System Grounding
G	Copper busbar

Safety Precautions

⚠ Warning

The main circuit and control circuit are exposed to rainwater during outdoor transportation, which may cause the waterproof performance to decline, potentially leading to safety accidents.

Note

It is recommended to place the product indoors. If it must be placed outdoors, ensure it is under a shelter to extend its service life.

4 Electrical Connections

4.1 Wiring Precautions

Warning

Incorrect wiring can lead to damage of the photovoltaic panels, combiner boxes, and inverters. When wiring, observe the following precautions:

- Wire according to the wiring diagram.
- Before wiring, ensure to use a multimeter with a voltage rating of not less than 1500V to measure the polarity of each string to ensure there is no reverse polarity!
- Before wiring, identify the positive and negative polarity of the strings to ensure there are no grounding faults.dren and unauthorized personnel away from the installation area.

4.2 Grounding Connections Precautions

Warning

The grounding cable must be properly grounded; otherwise:

- There is a risk of fatal electric shock to personnel in case of a fault!
- There is a risk of equipment damage in case of a lightning strike!

Note

- Grounding connections must comply with relevant grounding standards and specifications.
- The connection between the grounding cable and the equipment, as well as the grounding terminal, must be secure and reliable.
- After the connections are completed, the grounding resistance must be measured, and the resistance value must not exceed 1Ω.

4.3 Waterproof Connectors and Cable Specifications

Identifier	Description	Model	Cable Outer Diameter (mm)
PV+	Positive Input Connector	PG09	4~8
PV-	Negative Input Connector	PG09	4~8
MONITOR INPUT	Communication Input Waterproof Connector	PG-11	5~10
MONITOR OUTPUT	Communication Output Waterproof Connector		
⏚	Grounding Waterproof Connector	PG-16	10~14
OUTPUT DC+	Positive Output Waterproof Connectorr	PG-42	32-42
OUTPUT DC-	Negative Output Waterproof Connector		

5 Routine Maintenance

5.1 Overview

Due to the influence of environmental temperature, humidity, dust, and vibration, components inside the combiner box may experience aging and wear, leading to potential failures. Therefore, it is necessary to perform regular and periodic maintenance on the combiner box to ensure its normal operation and service life.

⚠ Warning

Only qualified electrical engineers should perform the tasks described in this section.

Note

When performing maintenance, do not leave metal items such as screws or washers inside the combiner box, as this may damage the equipment!

Before performing hardware maintenance operations on the combiner box, please turn off the combiner box switch to ensure that the parts to be contacted are not electrified.

5.2 Maintenance Tasks

Inspection Item	Inspection Method	Maintenance Period
Electrical Connections	Check for loose or disconnected wires at the fuse connection points, PG waterproof connectors, etc. Check for wire damage.	Every 3 months
Sealing Strip Inspection	Regularly check if the sealing strip shows signs of bubbles, cracks, peeling, or indentations.	Every 1-2 months for the initial period, once a year thereafter

Note

The maintenance periods recommended in the table are for reference only. The actual maintenance periods should be determined based on the specific installation environment of the product.
The scale of the power station, its location, and environmental factors can all affect the maintenance period of the product. If the operating environment has high wind and sand or thick dust, it is necessary to shorten the maintenance period and increase the frequency of maintenance.

5.3 Replacement of Fuses

⚠ Warning

Fuses cannot be restored after melting. Qualified personnel with certificates must replace the fuses.
Fuses must be replaced with those of the same model and rating as the original!

6 Troubleshooting

6.1 Pre-troubleshooting Operations

Before troubleshooting, please note the following:

- Before starting the operation, ensure that the load switch is turned off.
- Do not touch the exposed metal parts such as copper bars under the protective cover.
- For inspection and repair of the combiner busbar, it is necessary to remove the fuse box cover to disconnect the input wiring.

⚠ Warning

After the load switch is turned off, there will still be high voltage at the output terminals of the load switch!
After removing the fuse box cover, the input terminal screws of the fuse box will still be live! Do not touch!

6.2 Common Faults and Troubleshooting Methods

Fault Phenomenon	Possible Cause	Troubleshooting Method
Significant deviation in current of a certain branch compared to other branches	Abnormal current	Check if the string configuration of the branch is consistent.Inspect if the branch is obstructed.
Display indicates an open circuit fault in a certain branch	Wire disconnection or fuse blown	Check if the PV cable is disconnected or if the fuse needs to be replaced.
Occasional communication failure	Communication line interference	Use double-shielded cables, ground the shield layer, and install a 120Ω resistor between communication terminals A2 and B2 on the last combiner box.

7 Appendix

7.1 Technical Data

Technical Parameter	SCMM-16/1
Maximum PV Array Voltage	1500V
Maximum Input Channels	16
Fuse Rating Current	30A
Maximum Output Channels	1
Output Switch Rating Current	500A
General Parameters	
Enclosure Material	Metal
Input Cable	4~6mm^2
Output Cable	185mm^2
Dimensions (W×H×D)	650×700×180mm
Weight	52kg
Protection Level	IP65
Operating Temperature Range	-20~+60°C
Operating Humidity Range	0-95%, No Condensation
Maximum Operating Altitude	≤2000m (Customization required for altitudes above 2000m)
Accessories	
PV-specific Lightning Protection Module	YSE
Lightning Arrester Status Monitoring	YSE
PV Power Supply	YSE
Rs485 Communication Interface	YSE
Positive Pole Fuse	YSE
Negative Pole Fuse	YSE
Switch Status Detection	YSE
Enclosure Ambient Temperature Monitoring	YSE

7.2 Quality Assurance

The warranty period of this product is based on the contract. If a product malfunctions during the warranty period, Suzhou Speed Energy Co., Ltd. (hereinafter referred to as "our company") will repair or replace the new product free of charge.

Documentation

During the warranty period, our company requires customers to provide the purchase invoice and date of the product. Additionally, the product's trademark should be clearly visible; otherwise, we reserve the right to refuse the quality assurance.

Conditions

- Our company will handle any non-conforming products replaced after the warranty.
- Customers should provide our company with a reasonable amount of time to repair the malfunctioning equipment.

Exclusions

Our company is not liable for quality assurance under the following circumstances:

- The entire machine or parts have exceeded the free repair period.
- Damage caused by transportation.
- Incorrect installation, modification, or use.
- Operation under extremely adverse environmental conditions not specified in this manual.
- Equipment failure or damage caused by repair, modification, or disassembly by non-authorized personnel.
- Equipment failure or damage caused by the use of non-standard or non-solar components or software.
- Any damage beyond the scope specified by relevant international standards for installation and use.
- Damage caused by abnormal natural environmental conditions.

In case of product malfunction due to the above situations, customers may request repair services. After our company's service department determines the cause, we may provide compensated repair services.

7.3 Contact Information

If you have any questions regarding this product, please contact us. To provide you with more efficient service, we kindly request that you provide the following information:

- Equipment Model
- Equipment Serial Number
- Fault Code/Name
- Brief Description of the Fault Phenomenon

Customer Service Phone:

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SOLARC Component Manual
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