SOLARC NEW ENERGY

NO:2023.12

SCDT-16/1
AC Combiner Cabinet

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

The combiner box contains high voltage, and accidental contact can result in fatal electric shock or severe burns. When connecting the combiner box, the following safety precautions must be observed:

- Before connecting, please disconnect the branch circuit breakers first, and then disconnect the main circuit breaker.
- Before connecting, please use a standard multimeter to measure the AC side voltage. Do not proceed with the operation until the multimeter indicates no voltage. If you measure voltage, it could lead to serious consequences.

⚠ 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

The SCDT-3/1 PV AC Combiner Cabinet is an essential component of the PV string inverter system, designed to connect the output current of multiple inverters to the transformer for power protection. This device simplifies the connection between the string inverter and the transformer, enhancing the reliability and maintainability of the system.

3.1.2 Features

- High Protection Level: The protection level reaches IP65, equipped with waterproof, dustproof, UV protection, and anti-corrosion capabilities to meet outdoor installation requirements. It supports multiple inputs and can connect multiple string inverters, with each input line protected by a thermal magnetic circuit breaker, rated at AC 1140V.
- Intelligent Monitoring: Equipped with an internal data collection module, it supports local or remote data monitoring via RS485/ModBus-RTU communication protocols.
- Flexible Customization: Customizable according to user needs for box material, size, and other functions, offering tailored solutions.

3.1.3 Application Scenarios

The photovoltaic (PV) grid-tied combiner boxes manufactured by SOLARC Corporation are widely applied across various scenarios including residential homes, commercial buildings, industrial facilities, agriculture, public institutions, and remote areas. These devices convert the direct current (DC) generated by solar panels into alternating current (AC) and synchronize it with the power grid, enabling self-consumption of electricity and feeding surplus power back into the grid.

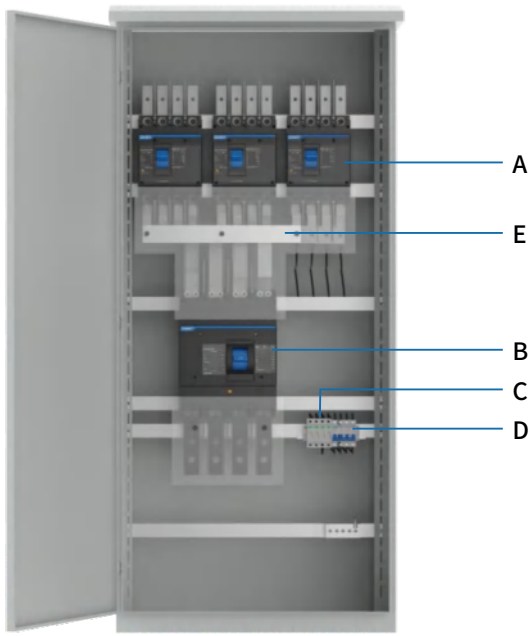
3.2 Product Composition

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 SCDT-3/1 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	Input Circuit Breaker/Switch
B	Output Circuit Breaker/Switch
C	SPD
D	Circuit Breaker
E	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 equipment damage. 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 1000V to measure and confirm there is no voltage present.
- Confirm there are no short circuits and check for grounding faults before wiring.
- Ensure the wiring is properly connected, and the insulating supports, mounting accessories, and attachments are securely installed.

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.

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/circuit breaker is turned off.
- Do not touch the exposed metal parts such as copper bars under the protective cover.
- Operators should wear appropriate personal protective equipment, including insulating gloves, safety goggles, and protective clothing to prevent electric shock and other injuries.
- Ensure that the tools and testing equipment (such as multimeters, insulation resistance testers, etc.) are in good condition and have been calibrated.

⚠ Warning

Only personnel who have received proper training and authorization should perform troubleshooting on the power cabinet!

6.2 Common Faults and Troubleshooting Methods

Fault Phenomenon	Possible Cause	Troubleshooting Method
Indicator Light Not Displaying	1.Fuse blown 2.Indicator light burnt out 3.Control circuit broken	1.Replace the fuse and check for the cause 2.Replace the indicator light of the same model 3.Trace the circuit according to the schematic diagram to identify the break
Three-phase Current Meter Reading Inaccurate	1.Poor contact at current terminals 2.Loose connection at the current transformer terminal 3.Current meter damaged	1.Tighten all current terminals 2.Secure the connection at the current transformer terminal 3.Replace the current meter of the same model
Three-phase Voltage Meter Reading Inaccurate	1.Voltage meter damaged 2.One or two phases of the secondary fuse blown	1.Replace the voltage meter of the same model 2.Replace the fuse of the same model
Circuit Breaker Won't Close	1.Circuit breaker did not reset after tripping 2.Circuit breaker failure	1.Manually press the reset button 2.Replace the circuit breaker of the same model

7 Appendix

7.1 Technical Data

Technical Parameter	SCDB-3/1
Rated Operating Voltage	AC690V
Rated Frequency	50/60Hz
Insulation Voltage	AC1140V
Maximum Input Channels	3
Rated Input Current	80A
Maximum Output Channels	1
Output Switch Rating Current	250A
Surge Protection Device	T2/T1+2,In=20KA,Imax=40KA
General Parameters	
Enclosure Material	Metal
Input Cable	25mm ^{2}
Output Cable	125mm ^{2}
Dimensions (W×H×D)	800×500×1800mm
Weight	50kg
Protection Level	IP65
Operating Temperature Range	-20~+60℃
Operating Humidity Range	0-95%, No Condensation
Maximum Operating Altitude	≤2000m (Customization required for altitudes above 2000m)

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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