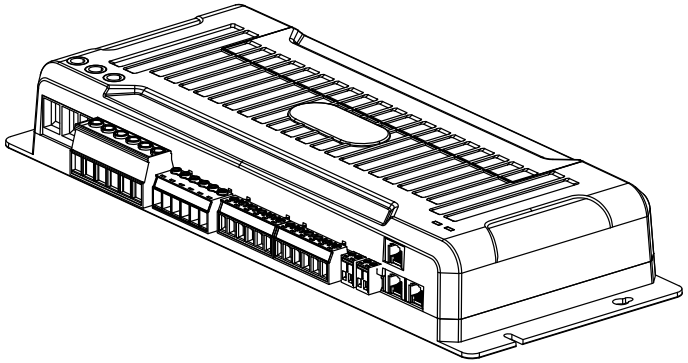
12-Way RV DC Distribution Box User Manual



Code: 114122

Manual version: V1.02 Subject to change without notice

Dear user:

Thank you very much for choosing our product

Safety instructions

This product is designed for DC loads, the DC input sources and 12 DC outputs do not have reverse connection protection, and the use of common negative design, reverse connection may cause damage to the device and other external equipment. 12 DC outputs do not support the use as a DC or AC power switch, and can not be used in parallel with two or more, and can not be connected to the power supply with the battery DC loads. The 12 DC outputs cannot be used as DC or AC power switches, nor can they be used in parallel, nor can they be connected to DC loads with power supply or battery. We are not responsible for any danger or damage to the equipment caused by reverse connection or non-requested use. Before powering up, please check the wiring according to the instruction manual or the polarity of the silkscreen on the case, and whether the connected DC load has a battery or a power supply.

1、Please install the distribution box indoors and prevent water from entering the inside of the box.

2、There is a fuse inside the distribution box, if it is damaged, you need to choose the appropriate fuse for replacement.

3、Always disconnect the main power switch before installing or adjusting the wiring of the distribution box.

4 Check all wiring connections for tightness after installation to avoid danger of heat buildup due to poor contact.

5、When the distribution box is fully loaded with output, the temperature rise is high Please do not touch the shell directly with your hands to avoid burns.

6、All 12 output channels do not have single-channel overcurrent protection, please connect the DC load according to the current size.

7、When normal power output is selected for the output channel, remove the fuse of the corresponding channel and insert it into the fuse holder of the normal power circuit of the corresponding channel;

Warning: Electric shock that may damage devices or electrocution/injury if it is not avoided.

Caution: Potential dangers that may damage devices if they are not avoided.

Note: Important notices in operation that may trigger the device fault alarm if they are not performed.

Contents

1.Product Description

1.1Overview

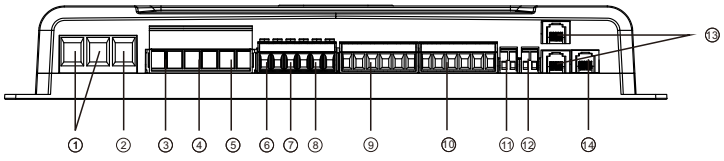
DB12 is a multi-directional DC load switch control box designed for RVs, which works with the touch control panel RM12 ,RMA4/RMA7 (touch screen), quick and easy to control and view the status and parameters of DC loads. Realizes 12 DC loads switching and 1 inverter remote switching in caravan.

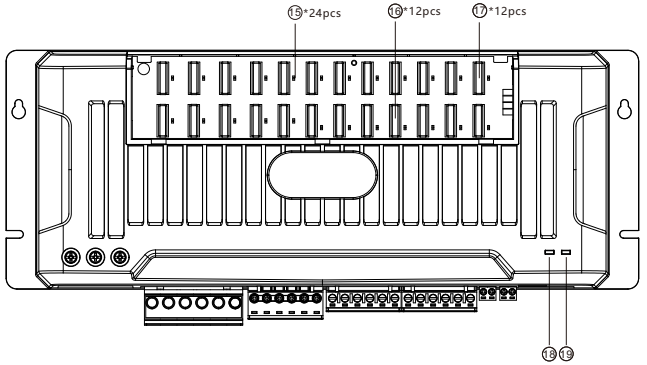
DB12 DC Distribution Box has 3-way 30A, 3-way 20A, 6-way 10A load output interface, which is used for RV DC load power supply control, such as refrigerator, water pump, TV, lights, etc.

1.2 Features

- Supports 12V battery systems
- With battery over-voltage, over-discharge, load over-current protection function
- Supports a wide range of battery types including sealed, gel, open, lithium, and customized
- Touch panel and on-screen display interface for faster switching of loads, viewing and setting of parameters
- With fuse blown indication function
- Built-in Bluetooth communication, real-time monitoring, parameter setting and switching loads through screen/cell phone APP to realize the operation.
- Built-in normally powered output channel, load switching only possible by inserting and removing fuses
- With high-temperature protection function
- Supports RS485 and CAN (RV-C protocol) communication

1.3Appearance and interface description





number	name	Application description
①	INPUT+	Positive input terminal
②	INPUT-	Negative input terminal
③～⑤	CH1～CH3 terminal	Less than 30A terminal, positive terminal on the left and negative terminal on the right terminal
⑥～⑧	CH4～CH6 terminal	Less than 20A terminal, positive terminal on the left and negative terminal on the right terminal
⑨	CH7～12 positive terminal	The terminal with less than 10A is the positive terminal from left to right,which is7～12 terminals from left to right
⑩	CH7～12 negative terminal	The terminal with less than 10A is the negative terminal from left to right,which is7～12 terminals from left to right
⑪	Remote ON/OFF	Control switch of distribution box remotely (default shorted)
⑫	Inverter ON/OFF	Inverter remote control switch
⑬	Parallel RS485	RS485 communication port,used to access RM12/RMA7/RMA4, dual non-isolated communication interfaces
⑭	RS485/CAN	RS485/CAN communication port,used for access to the main controller or other devices,non-isolated communication
⑮	Fuse Blown Indicator	The red indicator illuminates when fuses are blown or not inserted in either group of the corresponding channel, and extinguishes when the channel has power output or fuses are intact.
⑯	Output fuse	CH1～12 output fuse, when replacing the fuse, it is necessary according to the actual load current and the maximum output of the channel to choose the right medium auto fuse
⑰	Constant power load fuse	CH1～12 constant current load fuse, the channel where the fuse is inserted is not controlled by the switch and directly outputs voltage, and when the fuse is inserted, another fuse in the corresponding channel should be pulled out. When replacing the fuse when the fuse is damaged, an appropriate medium-sized automotive fuse should be selected
⑱	Operation Status Indicator	Displays operation status. (details in 3.1)
⑲	Bluetooth Indicator	Displays Bluetooth connection status. (details in 3.1)

This product design adopts the common negative design.

2.Product Applications

2.1Specification

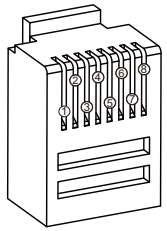
Product model number	DB12
Battery type	Sealed, colloidal, open, lithium iron phosphate battery, customizable (customizable via APP).
System voltage	12V
Input voltage range	9~16V
Maximum Total Output Current	120A
CH1~12 Output	30A-3 ways 20A-3 ways 10A-6 ways
Inverter ON/OFF	≤1A
Protection function	Battery over-discharge, battery overvoltage,temp,Overcurrent protection
Communication function	Bluetooth、 RS485 、CAN(RV-C)
communication interface	With touch panel and on-screen communication interface
Static power consumption	≤ 60mA
Remote Switch Function	√
Protection level	IP21
Environmental temperature	-35 ℃ ~65 ℃
Cooling method	Natural cooling
Size	386*146*54mm
Weight	1.8Kg

2.2 Touch panel or screen dedicated communication interface (Parallel RS485 communication)

The communication ports are connected in parallel and can be used individually or simultaneously.

The communication port is mainly used to connect the touch panel or screen, with power supply and data interaction functions, using RS485 communication, there are special communication protocols;

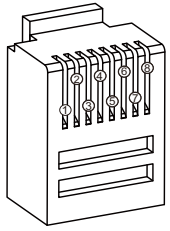
Interface type: Rj45, Total output specification for both interfaces: 13.7V/1.2A
Default baud rate: 115200bps; Parity: none; Data bits: 8 bits; Stop bits: 1bit;
Definition of interface communication line sequence:



serial number	Definition
①	NC
②	NC
③	Positive power (13.75V)
④	Ground
⑤	Ground
⑥	B/D-
⑦	A/D+
⑧	Positive power (13.75V)

2.3 RS485/CANCommunication

1) RS485 Communication:
Interface type: RJ45, matching resistance is 120 ohms.
Default baud rate is 9600 bps; parity bit: none; data bits: 8 bits; stop bits: 1 bit.
2) CAN Communication: CAN 2.0B mode, extended frame, baud rate 250 Kbps, supports RV-C protocol, does not include terminal resistors internally.
3) RJ45 interface communication wire sequence definition:



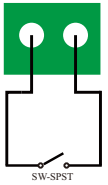
serial number	Definition
①	CAN_L
②	CAN_H
③	NC
④	NC
⑤	Ground
⑥	B/D-
⑦	A/D+
⑧	NC

2.4 Bluetooth communication

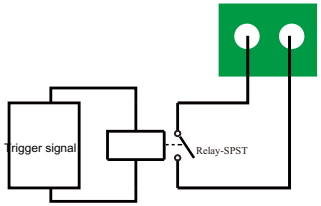
The distribution box integrates a Bluetooth 4.0 BLE module inside, allowing users to monitor data and set parameters of the distribution box through a mobile APP. Scan the QR code below to download the APP:

2.5 Remote Switch for Distribution Box

When the remote switch interface of the distribution box is short-circuited, the distribution box operates; when the interface is open-circuited, the distribution box does not work. In practical applications, a mechanical switch or relay can be connected to this interface to control the operation of the distribution box.



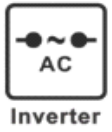
Application Diagram 1: External mechanical switch



Application Diagram 2: External Relay Switch

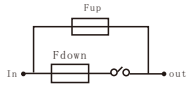
2.6 Inverter remote switch

The remote switch on the inverter is connected to the 【Inverter ON/OFF】 interface on DB12. By using the touch control panel or the mobile APP's 【Inverter Switch】 function, remote operation of the inverter's power on/off can be achieved. The icon for the 【Inverter Switch】 is as follows:



2.7 Introduction to distribution box channel

The DB12 has 12 DC load distribution outputs, each with two output channels independent fuse + switch circuit + output ports or independent fuses + two output channels of the output port.



Fup	Always ON loads
Fdown	Switch ON/OFF loads

2.8 Protection function

Overcurrent Protection (Input Total Current):
When the current of any channel (Ch1~12) exceeds 125A, all DC load switches (except permanent-power loads) will be turned off.

Temperature Protection:

When Device Temperature (Temperature 1) exceeds 100°C or (Temperature 2) exceeds 85°C, the device will shut down all channel switches.

Normal operation resumes when device Temperature (Temperature 1) falls below 95°C and (Temperature 2) below 80°C.

Permanent-power loads are not controlled by switches or temperature protection and are powered directly through fuses. In practice, connect only loads requiring continuous power to the output terminals of the permanent-power fuse.

3.Operation Status and Fault Alarms

3.1 Definition and Functions of Indicator Lights

Indicator Light	Indication Mode	Status Description
Operation Indicator	Red light (steady)	Warning message present
	Green light (steady)	Normal operation
Bluetooth Indicator	Steady light	Connected to APP, no data transmission
	Flashing light	Data transmission in progress
	Off	Not connected to APP

3.2 External Device Monitoring

When the indicator lights cannot be observed due to installation location or other factors, the fault status of the distribution box (including battery over-discharge, battery over-voltage, load overcurrent, excessive temperature, and switch status) can be checked via an external touch panel, external screen, or mobile APP. For details, refer to the user manuals for RM12, RMA4 、 RMA7.

4.Common problems and solutions

Phenomenon	Method of processing
The indicator light is not on.	Check if the battery connection is correct; check if the remote switch is short-circuited.
Output end has no output.	Check if the battery voltage is too low or too high; check if the total load current is overcurrent; check if the output fuse is fused; Check the total load current for over-temperature protection

5.Product installation

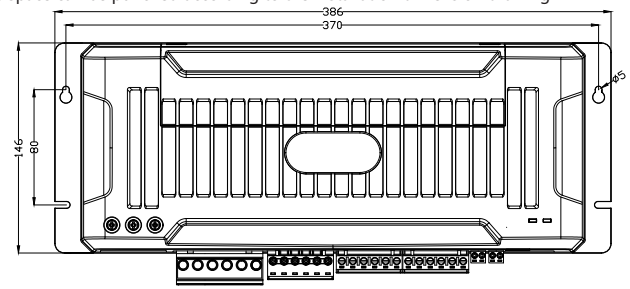
5.1 Installation precautions

- Be very careful when installing the battery. For open lead-acid batteries, wear protective glasses. If you come into contact with the battery acid, rinse immediately with clean water.
- Metal objects should be kept away from the battery to prevent short circuits.
- The battery may produce flammable gases, please keep away from sparks.
- Outdoor installations should avoid direct sunlight exposure and rainwater infiltration.
- Loose connection points and corroded wires can cause significant heat buildup, melting the wire insulation, burning surrounding materials, and even causing fires. Therefore, it is essential to ensure that all connectors are tightly secured and that wires are preferably fastened with cable ties to prevent movement during application, which could lead to loose connections.
- When operating, make sure to use insulated tools and ensure that your hands are dry.
- The battery terminals on the distribution box can be connected to either the same battery or a set of batteries. The subsequent explanations in the manual are all for the use of a single battery, but they also apply to a system of batteries.
- Please follow the safety recommendations of the battery manufacturer.
- The system connection wires are selected according to a current density not greater than 5A/mm².
- During installation, do not reverse the input and output ends, otherwise it may cause irreversible damage!

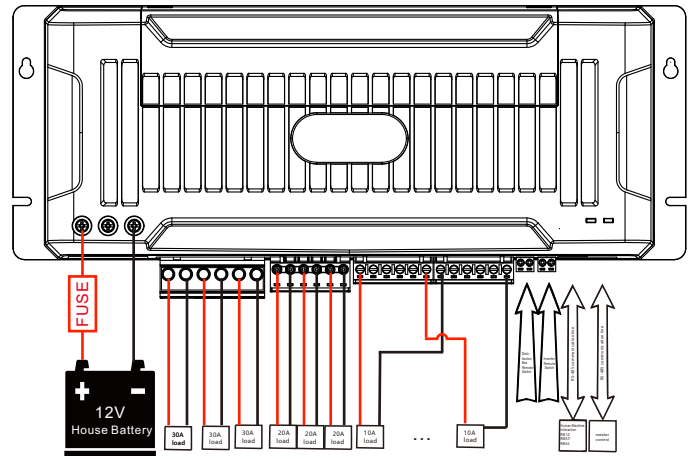
5.2 Installation precautions

Step 1: Choose the installation location
Avoid installing the distribution box in places exposed to direct sunlight, high temperatures, and prone to water ingress, and ensure good ventilation around the distribution box.
Step 2: Secure the hanging screws
Mark the installation dimensions of the distribution box at the installation location, drill two appropriately sized installation holes at the two marked points, and secure the screws in the two installation holes.
Step 3: Secure the distribution box
Align the fixing holes of the distribution box with the two screws that have been fixed in advance and hang it up, then secure the two screws at the bottom.

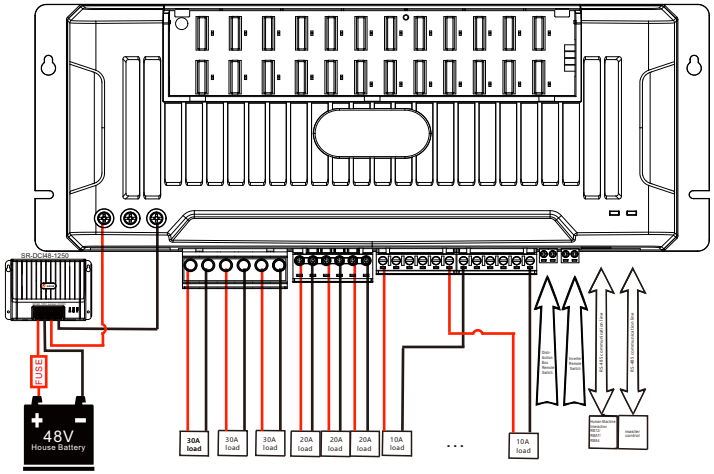
Empty space can be punched according to the installation dimension drawing



Refer to the wiring diagram for specific wiring operations.



A set of battery input typical application wiring diagram



Two sets of input source typical application wiring diagram

Note:Input-output isolation provides enhanced protection for downstream DC loads.

6.System maintenance

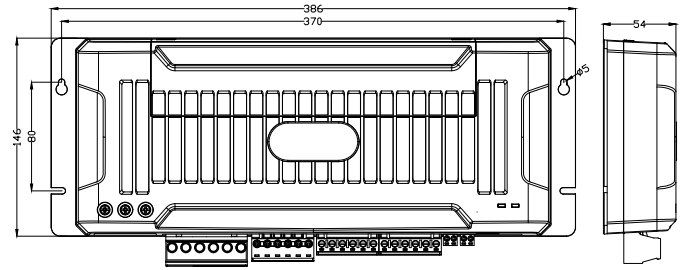
To ensure the distribution box maintains optimal performance over time, it is recommended to regularly check the following items.

- When abnormal faults or error messages are discovered, corrective measures should be taken promptly.
- Inspect the terminal connections for signs of corrosion, insulation damage, high temperatures or burning/discoloration, and deformation of the housing. If any of these issues are found, please please repair or replace them promptly.
- Inspect and find that exposed, damaged, or poorly insulated wires should be repaired or replaced in a timely manner.
- Inspect and clean promptly if there is dirt, nesting insects, or signs of corrosion.

Warning: Electric shock danger! Ensure that all power to the distribution box is disconnected before performing the above operations, then proceed with the appropriate inspection or operation!

Do not attempt to operate if you are not a professional.

7.Product Size



Product model: DB12
Product dimensions: 386*146*54mm
Installation hole spacing: 370.6*80mm
Fixed hole position: 4.5mm