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ASCB1 series intelligent miniature circuit breaker

Installation Manual V1.0

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declare

The company reserves the right to modify the product specifications described in this manual without prior notice. Before ordering, please consult your local agent for new specifications of this product.

target record

1. Overview

ASCB1 series intelligent miniature circuit breakers (hereinafter referred to as intelligent miniature circuit breakers) are used in low-voltage terminal power distribution networks in industrial, commercial, civil buildings and infrastructures in indoor buildings and similar places. The intelligent miniature circuit breaker is used in conjunction with the intelligent gateway to conduct real-time monitoring of the key electrical parameters of the power line, such as voltage, current, power, temperature, leakage, energy consumption, etc. , fault location and other functions.

This series of products can choose single pole, 2 pole, 3 pole and 4 pole .

2. Product number

- Smart Miniature Circuit Breaker

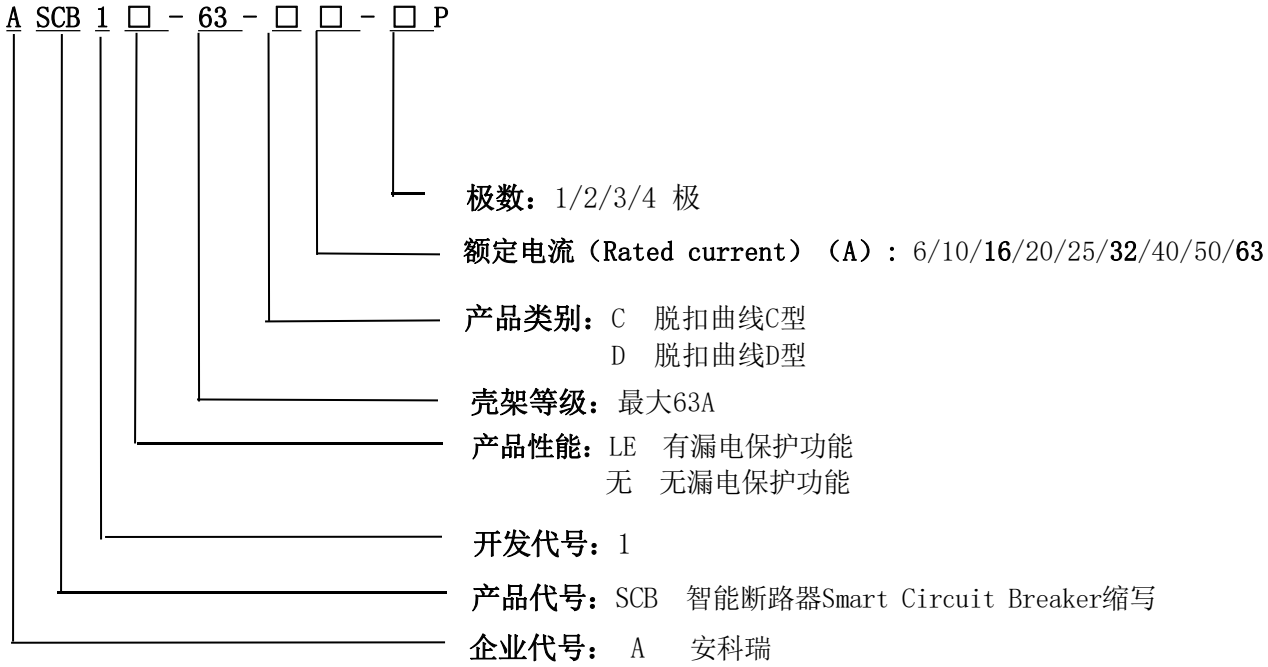


Table 1 Function description table of intelligent miniature circuit breaker

Product number	Function description
ASCB1-63	It can monitor parameters such as voltage, current, power, energy and temperature in real time; it has various protection functions such as overvoltage, undervoltage, overload, short circuit, overcurrent, and overtemperature; it has local manual push rod, local electric control, and local locking , remote control, timing control and other control functions; rail type installation, optional pole number 1P/2P/3P/4P; standard RS-485 (MODBUS) communication; optional trip curve C type/D type.
ASCB1LE-63	It can monitor parameters such as voltage, current, power, electric energy, temperature and leakage in real time; it has various protection functions such as overvoltage, undervoltage, overload, short circuit, overcurrent, overtemperature and leakage; it has local manual push rod, local electric control, Local locking, remote remote control, timing control and other control functions; rail-mounted installation, optional pole number 2P/4P; standard RS-485 (MODBUS) communication; optional trip curve C type/D type.

- Smart Gateway

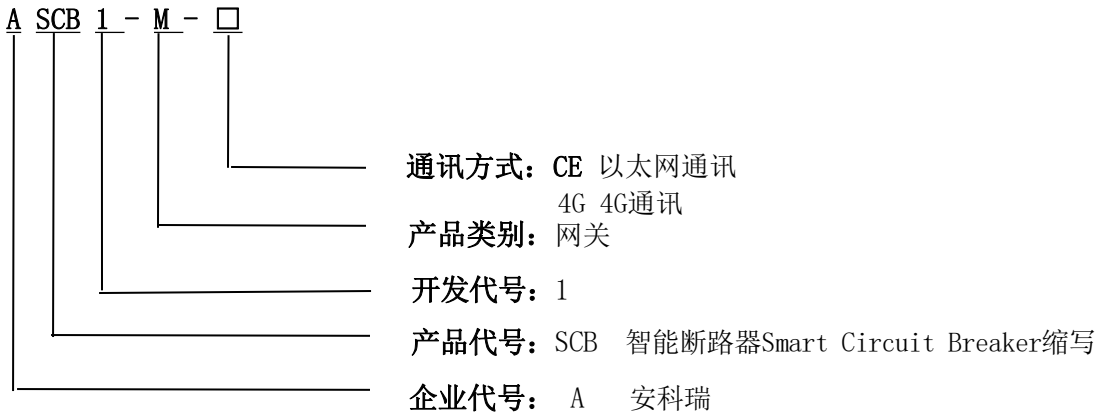


Table 2 Intelligent gateway function description table

ASCB1-M-CE	Can connect up to 16 intelligent miniature circuit breakers; can view real-time data such as voltage, current, power, electric energy, temperature and leakage of each intelligent miniature circuit breaker; can check the fault, alarm and switching status of each intelligent miniature circuit breaker ; Can carry out parameter setting and control for each intelligent miniature circuit breaker; rail type installation, LCD liquid crystal display; support event recording; support RS485 communication; support Ethernet communication.
ASCB1-M-4G	Can connect up to 16 intelligent miniature circuit breakers; can view real-time data such as voltage, current, power, electric energy, temperature and leakage of each intelligent miniature circuit breaker; can check the fault, alarm and switching status of each intelligent miniature circuit breaker ;Can carry out parameter setting and control of each intelligent miniature circuit breaker; rail type installation, LCD liquid crystal display; support event recording; support RS485 communication; support 4G network communication

3. technical parameter

Table 3 Technical parameter table of intelligent miniature circuit breaker

Product number	ASCB1-63	ASCB1LE-63
number of poles	1P/2P/3P/4P	2P/4P
Frame class	63A	
Rated voltage	230V (1P/2P), 400V (3P/4P)	
Rated current	6A, 10A, **16A** , 20A, 25A, **32A** , 40A, 50A, **63A**	
Instantaneous trip type	C/D	
Rated short-circuit	6000A	

breaking capacity			
Protective function	Overcurrent Protection	Default 100% rated current warning, 110% rated current trip, adjustable threshold	
	Short circuit protection	5-10 rated current 0.04 seconds open circuit protection	
	Overload protection	Default 100% rated power warning, 110% rated power trip, adjustable threshold	
	Overvoltage protection	Default 110% rated voltage warning, 120% rated voltage trip, adjustable threshold	
	Undervoltage protection	Default 90% rated voltage warning, 80% rated voltage trip, adjustable threshold	
	Over temperature protection	Default 80℃ early warning, 100℃ trip, adjustable threshold	
	Leakage Protection	none	Default 20mA warning, 30mA trip, adjustable threshold
Leakage self-test		none	Manual key self-test
Mechanical life		20000 times	
Electrical life		6000 times	
Protection class		IP20	
Wiring capability		1-35mm m^2 _	
Altitude requirements		2000m	
ambient temperature		-10℃～ 55 ℃, 24h average temperature not higher than 40 ℃	
Environmental requirements		No explosion hazard, no conductive dust, no enough to corrode metal and destroy insulation, no significant vibration	
Relative humidity		At +40° C, the relative humidity of the air is 50%, and it can have a higher relative humidity at lower temperatures	
Storage temperature		-20℃-70℃	
pollution level		II	
installation type		III	
Installation method		Standard 35mm rail installation	

Table 4 Technical parameter table of ASCB1 series intelligent gateway

Product number	ASCB1-M-4G	ASCB1-M-CE
Working power	AC 220V	
Power consumption	≤30W _ _	
communication method	4G	Ethernet

Display method	LCD dot matrix liquid crystal display
record	Alarm, fault and action records up to 20 records each
protocol	Modbus, MQTT, etc.
Altitude requirements	2000m
ambient temperature	-10℃- 55 ℃, 24h average temperature not higher than 40 ℃
Environmental requirements	No explosion hazard, no conductive dust, no enough to corrode metal and destroy insulation, no significant vibration
Relative humidity	At +40° C, the relative humidity of the air is 50%, and it can have a higher relative humidity at lower temperatures
Storage temperature	-20℃-70℃
Protection class	IP20
Installation method	Standard 35mm rail installation

4. Installation and Wiring

4.1. Outline and installation dimensions (unit: mm)

- Smart Miniature Circuit Breaker

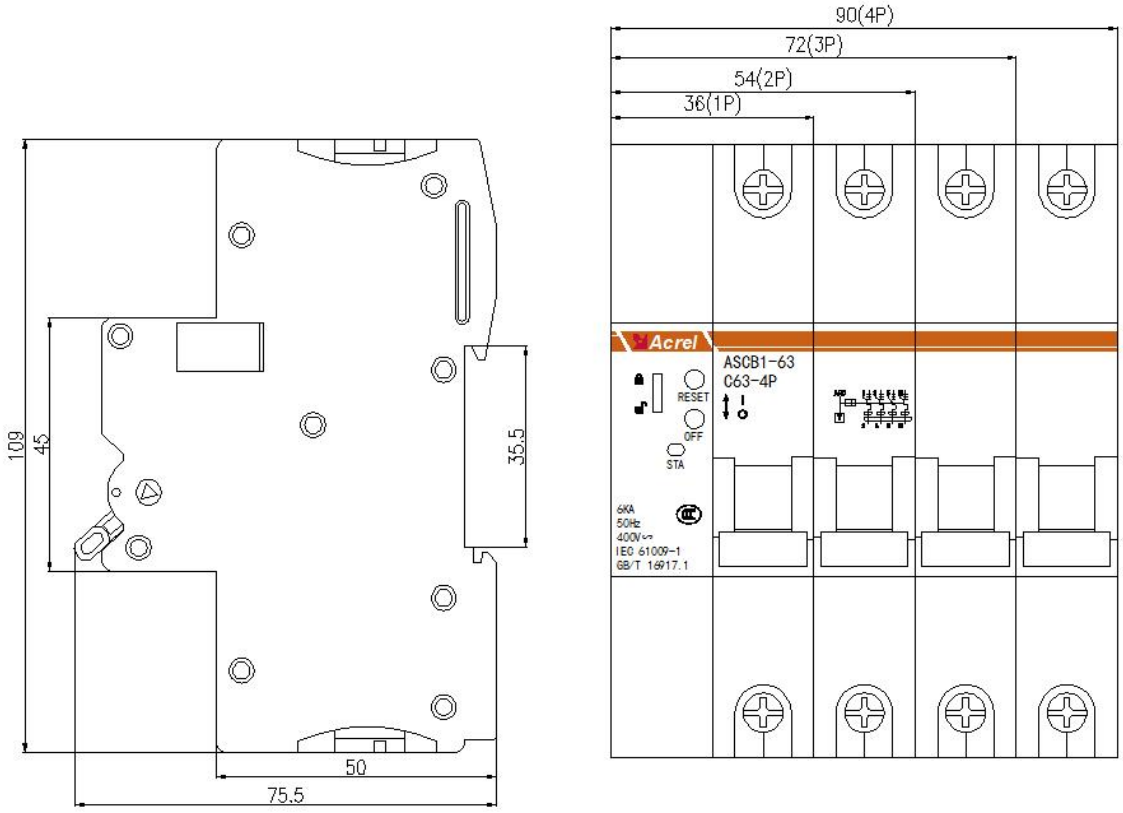


Figure 1 Outline dimension drawing of intelligent miniature circuit breaker

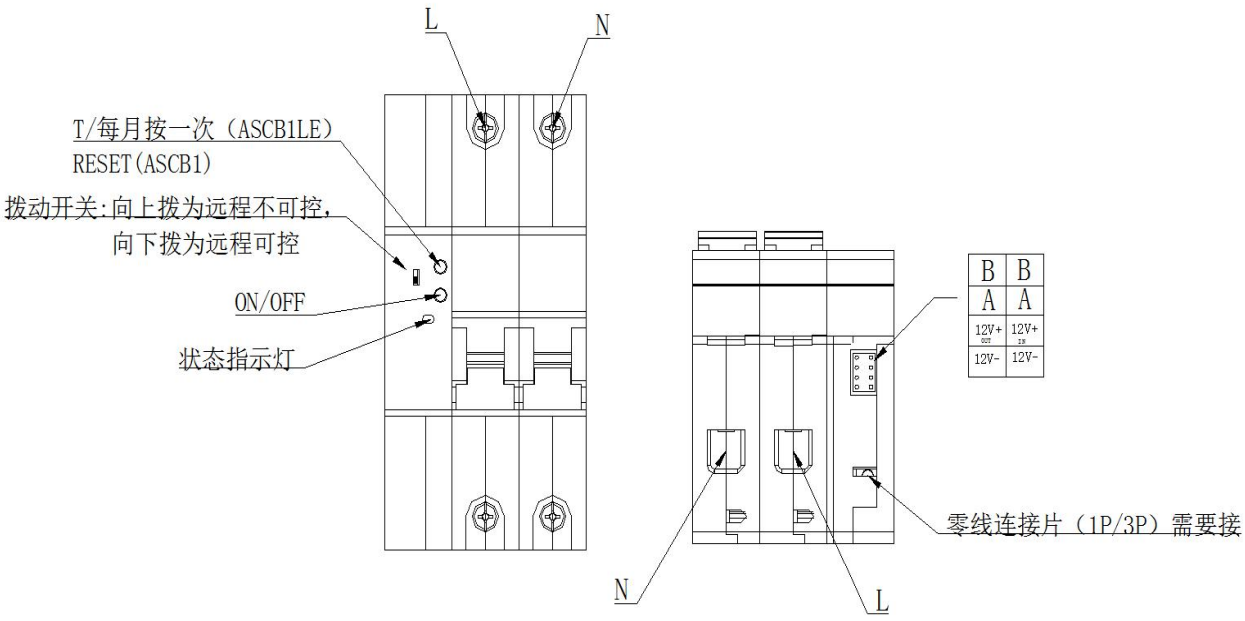


Figure 2 Schematic diagram of intelligent miniature circuit breaker wiring terminal

● Smart Gateway

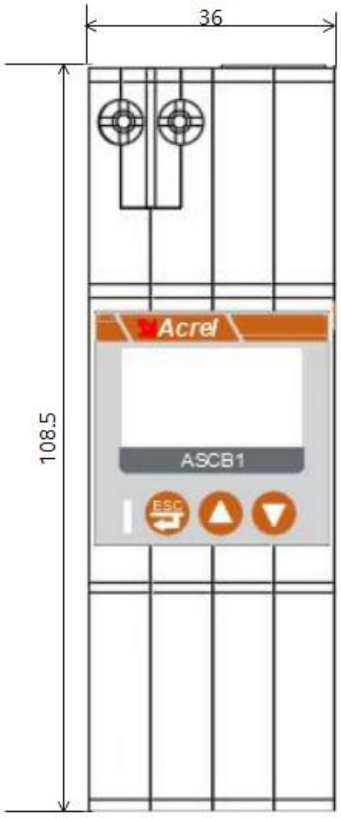


Figure 3 Outline Dimension of Smart Gateway

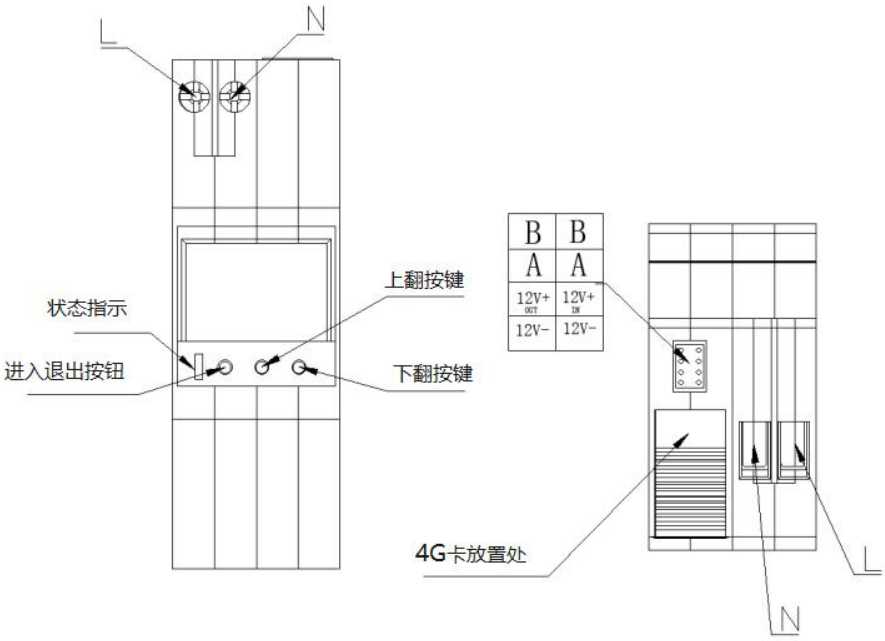


Figure 4 Schematic diagram of smart gateway wiring terminals

4.2. Installation method

1) The device is suitable for standard 35mm rail type installation. When installing, just clip the device into the rail and fix it with a buckle .

2) According to the actual power distribution management and line laying design requirements, select and use IoT modules and electrical boxes that meet the needs

The specifications of the box are assembled and installed in the order of the modules shown in the figure, and each module is connected by a special 8PIN data cable made by the manufacturer.

3) The circuit breaker should be installed vertically. When the handle is in "/OFF", the contacts are disconnected. When the handle moves upward, the contacts move in the closing direction;

4) See Table 5 for the nominal cross-sectional area of the connecting copper wire that matches the rated current of the circuit breaker.

Table 5 Matching table of rated current and conductor cross-sectional area

Rated current (A)	10	16～20	25	32	40～50	63
Conductor cross-sectional area (mm^2)	1.5	2.5	4	6	10	16
Torque (Nm)	3.5	3.5	3.5	3.5	3.5	3.5

5) During installation, please tighten the copper wire with the torque specified in Table 5. After installation, check whether the copper wire is firmly connected by shaking the wire, and then tighten the copper wire with the specified torque again.

Figure 5 is an example of the installation and wiring of the smart miniature circuit breaker, for reference only.

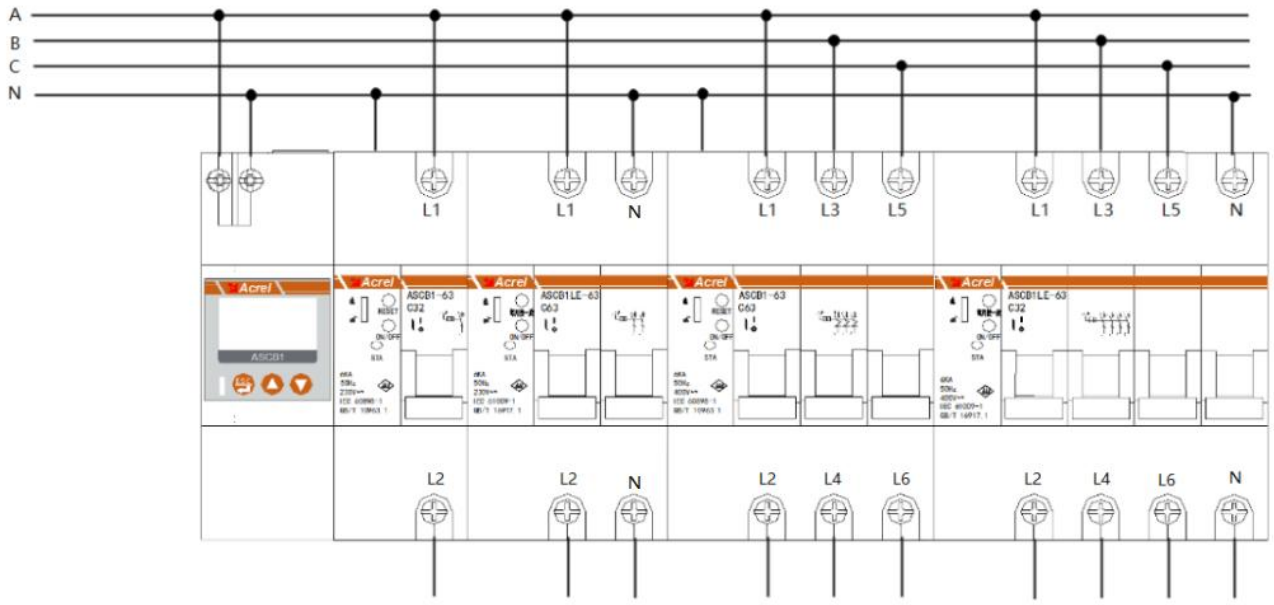
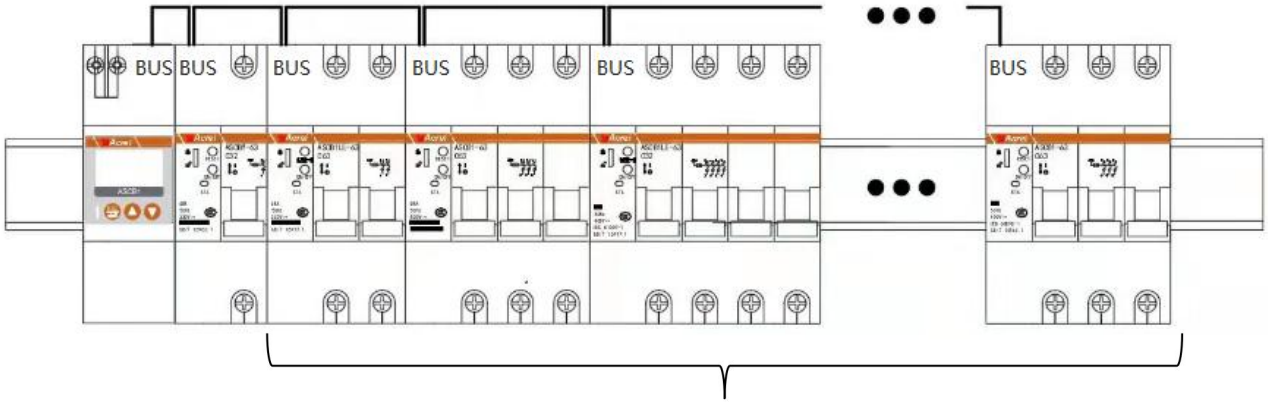


Figure 5 Installation and wiring example diagram

4.3. Wiring example diagram



example diagram of intelligent miniature circuit breaker

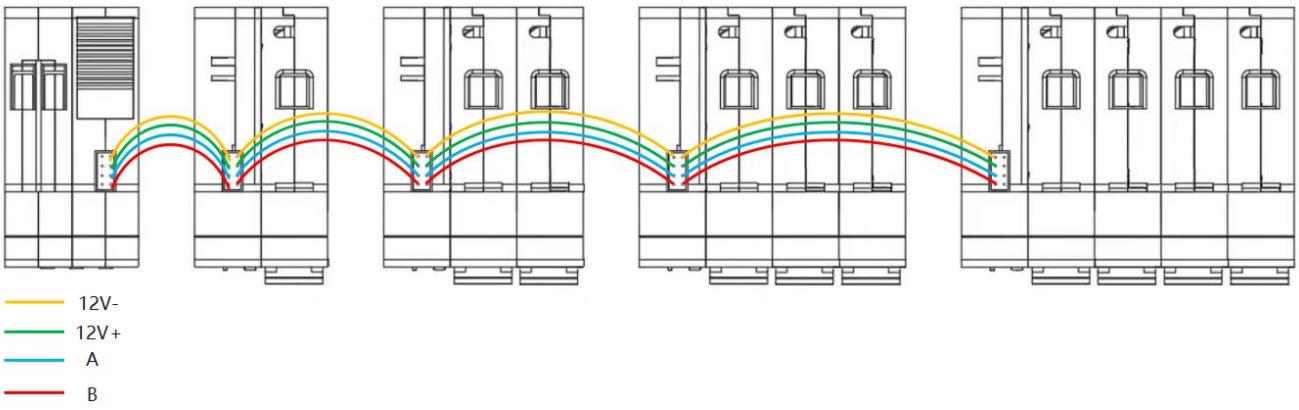


Figure 7 Schematic diagram of 4pin terminal wiring (top view)

Note: Various types of intelligent miniature circuit breakers can be installed in any combination, and one gateway can connect up to 16 intelligent miniature circuit breakers .

5. Use the operation guide

5.1. Description of the key panel and indicator lights of the intelligent miniature circuit breaker

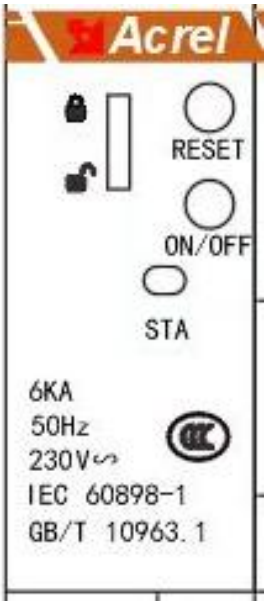


Figure 8 Description of the smart miniature circuit breaker button panel

Key Description:

- ON/OFF: Short press: open and close button, long press for 3S: maintenance state enters and exits;
- T/ Press once a month or RESET: short press the leakage test button, long press 3S: alarm reset and reclosing times return to zero;
- Lock: local lock on and off;

Indicator light description :

- Green: If it is off for 2s, and flashes for 0.1s, it is in normal operation;
- Green: If the 0.5s interval flashes, it means the circuit breaker is in the maintenance state (local closing and remote closing cannot be performed);
- Red: If it is always on, it means that the circuit breaker is in the closed state;
- Red: If it goes out for 2s and flashes for 0.1s, the circuit breaker is faulty;
- Red: If flashes every 0.5s, the circuit breaker alarms;
- Enter the automatic address allocation, the traffic lights flash for 0.5s, after the address is allocated, it will be displayed according to the actual status;

5.2. Description of smart gateway button panel and indicator light

Figure 9 Description of smart gateway button panel

Key Description:

- ESC/ ↵: Confirm or return key;
- ▲: page up;
- ▼: page down;

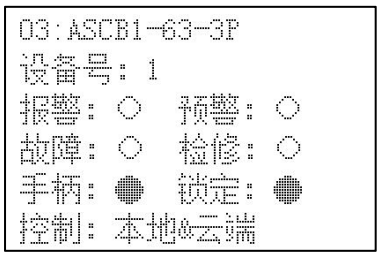
Indicator light description:

- Green light: 2s off, 0.1s flashing, running state;
- Red: If it goes out for 2s and flashes for 0.1s, there is a circuit breaker fault;
- Red: If flashing every 0.5s, there is a circuit breaker alarm;

5.3. Interface operation

5.3.1. Device Status Display

smart miniature circuit breaker is powered on, use the ▲ and ▼ keys to turn the page to query the device status of each device number. The device status interface is displayed as follows.

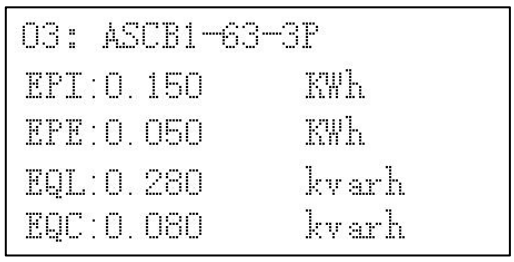


Note: The state definition table is as follows.

symbol	○	●
Call the police	no alarm	There is an alarm
early warning	no warning	There is an early warning
Fault	No trouble	failure
overhaul	Not overhauled	under maintenance
handle	open _	closed
locking	Local unlock, remote control	Locked locally, cannot be controlled remotely

5.3.2. Display of current equipment electrical parameter data

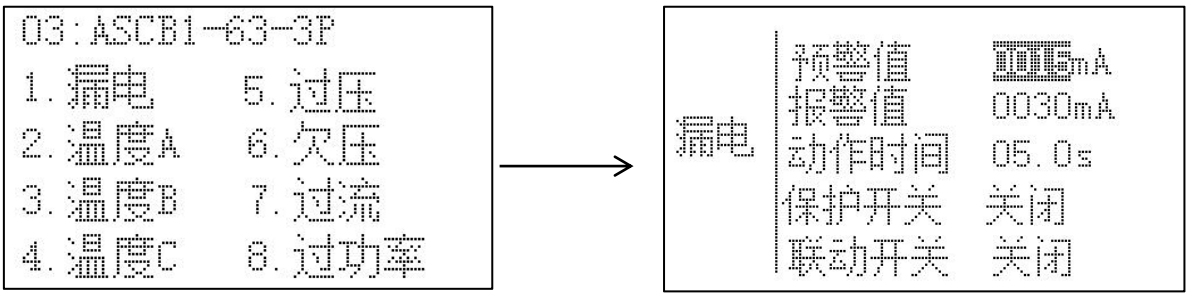
Press the Enter key on the main interface, select "Device List", then select the circuit breaker whose data needs to be viewed, press the Enter key, and you can use the ▲ and ▼ keys to turn the page to query the device electrical parameter data display interface, as shown in the figure below. Display interface for electric energy parameter data.



EPI represents the value of absorbed active energy, EPE represents the value of released active energy, EQL represents the value of inductive reactive energy, and EQC represents the value of capacitive reactive energy.

5.3.3. Display and setting of equipment protection parameters

On the main interface, press the Enter key, select "Device List", press the Enter key, select the circuit breaker whose protection parameters need to be set, for example: "03: ASCB1-63-3P", press the Enter key twice, select " "Parameter Setting" Press the Enter key, enter the password "0001", select "Protection Settings", and press the Enter key to select each protection parameter for viewing.



Note:

1. The leakage, temperature, overvoltage, undervoltage, overcurrent and overpower can be modified or set through the ▲ and ▼ keys .

2. Temperature: Detect the temperature in a short time, and alarm when it exceeds the alarm value. The time and threshold can be adjusted according to the actual situation.

3. Leakage: detect the residual current in a short time, and alarm when it exceeds the alarm value. The time and threshold can be adjusted according to the actual situation.

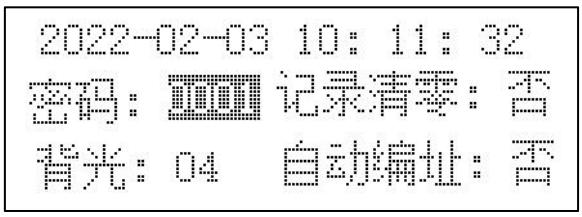
4. Overvoltage and undervoltage: detect the voltage in a short period of time, and alarm when it exceeds the alarm value. The time and threshold can be adjusted according to the actual situation.

5. Overcurrent: detect the current in a short period of time, and alarm when it exceeds the alarm value. The time and threshold can be adjusted according to the actual situation.

6. Over power: detect power, alarm when it exceeds the alarm value, and the time and threshold can be adjusted according to the actual situation.

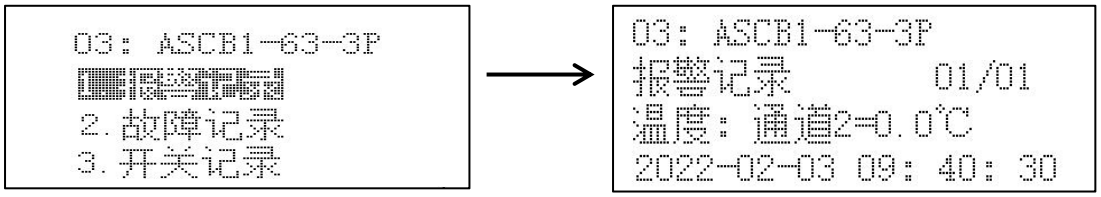
5.3.4. Setting method of device automatic addressing

Return to the home page of the smart gateway, select "5. Local Settings", press Enter, enter the password "0001", select "4. Other Settings", select "Auto Addressing:", press the Enter key, and change "No" to If it is "Yes", long press the Enter key to return to the previous interface, and then press and hold the Enter key again to pop up "Save data or not", press the ▲ and ▼ keys to select Yes.



5.3.5. Query of device event records

Return to the home page of the smart gateway, select "Device List", select the circuit breaker whose event record needs to be viewed, for example: "03: ASCB1-63-3P", press the Enter key twice, select "Event Record" and press the Enter key to view Alarm, fault and switch records.



Note:

1) The data "01" in the upper right corner of the alarm record represents the first data, and the subsequent alarm records can be "02, 03 ... 20 " (up to 20).

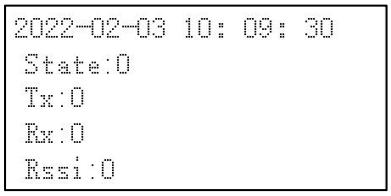
2) The data "01" in the upper right corner of the fault record indicates the first data, and the subsequent alarm records can be "02, 03 ... 20 " (up to 20).

3) The data "01" in the upper right corner of the switch record represents the first data, and the subsequent alarm records can be "02, 03 ... 20 " (up to 20).

4) For data recording , press the ▲left key and the ▼right key to switch the interface.

5.3.6. Display of device network information

Return to the home page of the smart gateway and select "3. Network Information" to display as shown in the figure.



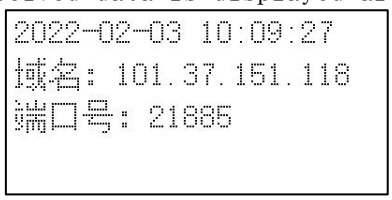
(1)

In the information interface (1) interface, there are four displayed values, the meanings are as follows:

- **Rssi** : The current signal value is displayed after Rssi
- **State:** After the State, the display is the current module state. There are ten states from 0 to 9. The numbers corresponding to 0 to 9 mean the meaning of the current module. as follows
  - **0** initialization
  - **1** Get the IMEI serial number
  - **2** Check the SIM card to get the card number
  - **3** Set the network mode
  - **4** Wait for GPRS to attach
  - **5** Check the signal value
  - **6Set** the network mode
  - **7** Connect to the server
  - **8** server is connected

◆ 9 Close the server connection

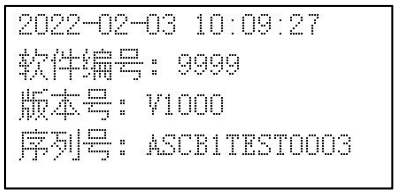
- TX: The number of sent data is displayed after TX
- Rx: The number of received data is displayed after Rx



(2)

Under the information interface (2) interface, the first line displays the domain name (if no domain name is set, it will not be displayed),

The second line shows the port number to connect to the server .



(3)

Under the information interface (3) interface, the software number, version number and serial number are displayed.

6. Precautions

- Before using the product, please check whether the appearance is in good condition. If there is any damage, please contact the seller to replace it in time .
- Correct wiring according to the instruction manual, and check carefully after wiring is completed to ensure correct wirin