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PRODUCT CATALOGUE

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ABOUT US

Jiangsu Sfere Electric Co., Ltd. is a science and technology innovation enterprises dedicated to providing the energy efficiency management, power monitoring, power quality, electrical safety, intelligent low-voltage appliances (universal circuit breaker, intelligent circuit breaker, dual-power automatic transfer switch, terminal appliances, distribution appliances, control appliances etc.), intelligent equipment and other systematic solutions for smart grid clients. The business of the Company focuses on construction and public facilities, industrial enterprises, transportation infrastructure, information communication, new energy, education and medical care and other industries.

Sfere Electric integrates R&D, manufacturing, sales and services, and has complete ecological system from intelligent terminal components, intelligent equipment to IoT cloud platforms and products. The electrical application solutions of the Company empower users with intelligent and digital energy management, and provide users with reliable data services for energy conservation and consumption reduction, energy security and refined energy management.

As a new high-tech enterprise and software enterprise, Sfere Electric always sticks to the concept of independence and innovation with rich achievements in patents and software copyrights. We have participated in the compilation of national and industrial standards for many times, actively undertaken the key scientific research plans of Jiangsu Province, and successively set up Jiangsu Provincial Engineering Technology Center and Postdoctoral Workstation. We are one of the first batch of national intellectual property demonstration enterprises.

CORPORATE CULTURE

Corporate Vision

Build Sfere as a top solution expert of electrical application

Enterprise Spirit

Unity in a concerted effort
Honesty
Intelligence, innovation
Scientific development

Core value

Create value for customers
Share value with employees
Contribute value to society

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Low-voltage distribution equipment 0.4kV

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School prepaid system

SFERE cloud

Power monitoring system

Energy management system

Security platform of intelligent power utilization

Low-voltage distribution box/distribution cabinet

ACB

Air Circuit Breaker

SFW

Model Selection Table

SF W 1 – 4000 H / 3 J1 C 2H1 M 3200A D1 F1 B1 Q10 R4 Optional Accessories

See Note b

Contact Combination
See Note a

Under-voltage Trip
Q10(Instantaneous,AC400V)
Q11(Delay 1s,AC400V)
Q13(Delay 3s,AC400V)
Q15(Delay 5s,AC400V)
Q20(Instantaneous,AC230V)
Q21(Delay 1s,AC230V)
Q23(Delay 3s,AC230V)
Q25(Delay 5s,AC230V)

Closed Electromagnet
B1:AC380V
B2:AC220V
B3:DC220V
B4:DC110V

Shunt Trip
F1:AC380V
F2:AC220V
F3:DC220V
F4:DC110V

Motor Operating Mechanism
D1:AC380V
D2:AC220V
D3:DC220V
D4:DC110V

Rated Current
200A~6300A

Communication Type
M (Modbus-RTU)

Controller Type
2H1/3H1/2H/3H
(See details in Page 9)

Installation Mode
C: Drawer-type/G: Fixed-type

Wiring Mode
J1 horizontal wiring
(default standard)
J2 vertical wiring

Number of Poles 3:3P 4:4P 5:3P+N

Breaking Capacity H: High breaking

Housing Rating 1000/2000/3200/4000/6300

Design No. 1

Product Category Universal circuit breaker

Enterprise Code Sfere Electric

Note a

Auxiliary contact combination 1000 Housing: R4 four-group transfer(Standard Configuration)
Auxiliary contact combination 2000, 3200, 4000 and 6300 Housing:R4 – Four-group transfer（Standard Configuration, R5 – Five-group transfer(Optional), R6-Six-group transfer(Optional), K4-Normally four-on and normally four- off(Optional), K5-Normally five-onand normally five-off(Optional), K6-Normally six-on and normally six-off（Optional）

Note b:Model Explanations and Coding Rules for Interlocking Parts

SF11 – Key lock device (one key for one lock), SF21- Key lock device (one key for two locks), SF31 – Key lock device (one key for three locks), SF32 – Key lock device (two keys for three locks), SF53 – Key lock device (three key for five locks)	1. One out of five for key lock 2. One out of five for mechanical interlocking
Sr11 – Mechanical interlocking device (two groups of steel cables, one-on and one-off), SR12 – Mechanical interlocking device (three groups of steel cables, one-on and two-off), SR21 – Mechanical interlocking device (three groups of steel cables, two-on and one-off), SY11 – Mechanical interlocking device (two groups of stiff shafts, one-on and one-off), SY12 – Mechanical interlocking device (three groups of stiff shafts, one-on and two-off)	

Product Overview

SFW1 series air circuit breakers (hereinafter referred to as Circuit Breaker) are applicable to power distribution networks with current of AC 50Hz, rated voltage of 690V and below, and rated current of 200A-6300A, and it is used to distribute electric energy and protect lines and power equipment from overload, under-voltage, short circuit, single-phase grounding and other troubles. The circuit breaker has intelligent protection function and selective protection precision, which can improve the reliability of power supply and avoid unnecessary power failure. Meanwhile it has the open communication interface to make the "four-control" and satisfy the requirements of the control center and automatic system.

The circuit breaker has an isolation function which is symbolized as: "—/ ⊢× ".

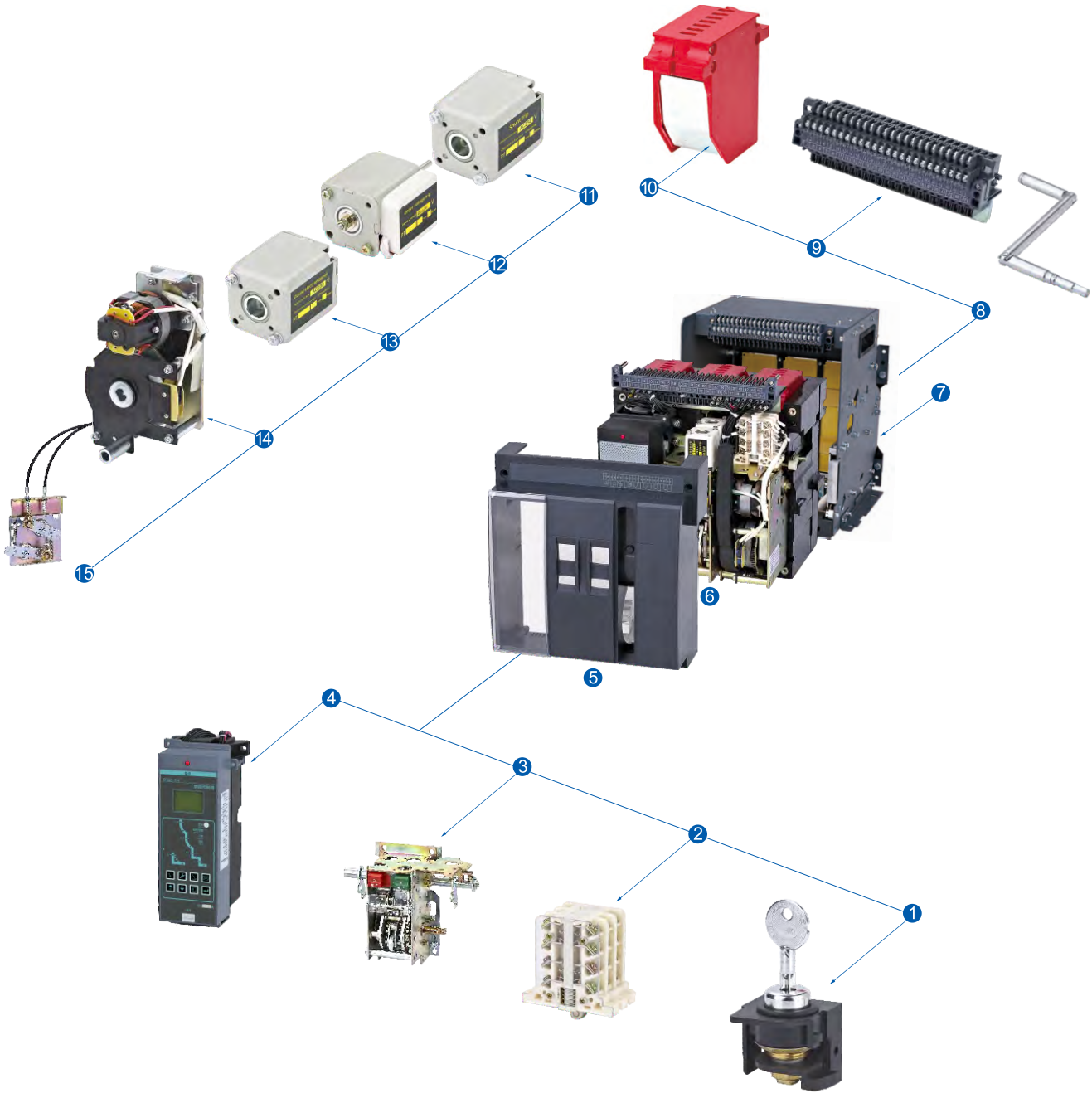
Product features

☐ With the characteristics of intelligent, high breaking, zero flashover, etc.
☐ With 3 poles and 4 poles, drawer type and fixed type; support inverted installation.
☐ With a variety of intelligent controllers, providing three-position / four-position protection function, monitoring function, fault memory function, can be equipped with communication interface, realize four remote functions such as remote measurement, remote signaling, remote control, and remote adjustment.
☐ Conform to IEC60947-2 and other standards.
☐ Complete protection features, convenient setting, high precision, with protection features such as instantaneous, short delay, long delay, single-phase grounding, etc.
☐ Current range 200A-6300A, short-circuit breaking capacity 50kA-135kA

Normal Operation and Installation Conditions

☐ Ambient Air Temperature: The upper limit shall not exceed +40℃, the lower limit shall not be less than -5℃, and the 24h average value shall not be more than +35℃.
Note: Under the working conditions with a lower limit of -10℃ or -25℃, the user shall declare to the Company; under the working conditions with an upper limit more than +40℃ or a lower limit less than -10℃ or -25℃, the user shall negotiate with the Company.
☐ The altitude of the installation site shall not be more than 2,000m.
☐ Atmospheric Conditions: The relative humidity of the atmosphere shall be not more than 50% when the ambient air is +40℃, and there can be a higher phase humidity at a lower temperature. The monthly average maximum relative humidity of the wettest month shall be 90%, while the average minimum temperature of the month shall be +25℃, and the condensation on the product surface due to temperature changes shall be considered. The user shall negotiate with the Company if the specific requirements are exceeded.
☐ Protection Level: IP30
☐ Pollution Class: Class-3
☐ Service Category: Category-B or Category-A
☐ Installation Category: For circuit breaker and under-voltage trip with a rated working voltage of 660V(690V) and below, the primary ring of the power transformer is used for Category-IV installation, and the installation category of the auxiliary circuit and control circuit is Category-III.
☐ Installation Conditions: The circuit breaker shall be installed according to the requirements of this Manual. The vertical inclination of the circuit breaker shall not be more than 5° (the inclination of mine circuit breaker shall not be more than 15°).

Structure and Indicator Introduction



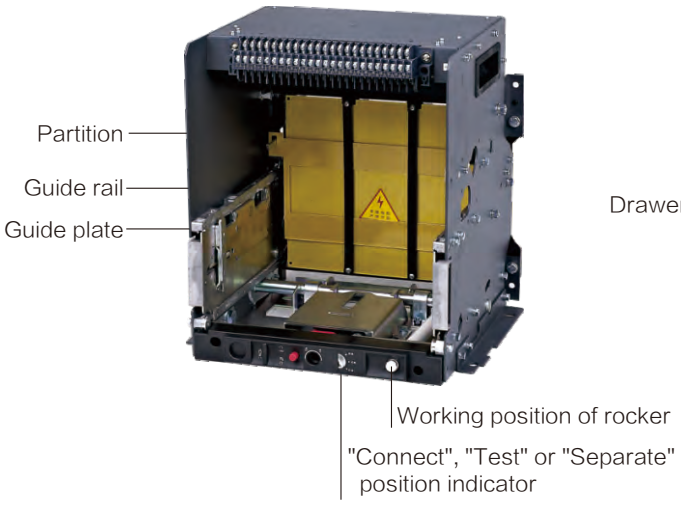
① Key lock
② Auxiliary switch
③ Operating mechanism
④ Controller
⑤ Protection mask
⑥ Body
⑦ Drawer base
⑧ Manual crank
⑨ Secondary wiring terminal
⑩ Arc extinguisher
⑪ Shunt release
⑫ Undervoltage release
⑬ Close electromagnet
⑭ Energy storage motor
⑮ Steel cable chain

Structure and Indicator Introduction

1. Reset button
2. Controller
3. Off button
4. Close button
5. Sfere label
6. Energy release and storage indicators
7. Open and close indicators
8. "Connect"/"Test"/"Separate" position locking and unlocking devices
9. Rocker and its storage position
10. "Connect"/"Test"/"Separate" position indicator

Structure of Drawer-type Circuit Breaker

The drawer-type circuit breaker is composed of circuit breaker body and drawer base. The drawer-type circuit breaker has the guide rail at both sides, the guide rail has an active guide plate, the circuit breaker frame is on the guide plate, and the drawer-type circuit breaker is connected to the circuit through the circuit breaker body bus and drawer base bridge contact.



Three working positions of the drawer-type circuit breaker:

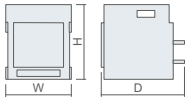
"Connect" position – The main circuit and wiring terminal are connected.

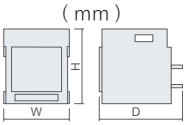
"Test" position–The main circuit is disconnected, the wiring terminal is connected, and the test operation can be conducted.

"Separate" position – The main circuit and the wiring terminal are both disconnected, and the circuit breaker body can be taken out in this position.

The drawer-type circuit breaker has interlocking device, it can only make the circuit breaker closed in Connect or Test position, while it cannot be closed in other positions or during movement of circuit breaker.

Main Technical Parameters

Model of Circuit Breaker			SFW1-1000	SFW1-2000	SFW1-3200
Rated current of housing rating Inm (A)			1000	2000	3200
Rated working current In (A)			200//400/630/ 800/1000	630/800/1000/1250/1600/2000	2000/2500/2900/3200
Rated working current In (A)			AC400V, AC690V	AC400V, AC690V	AC400V, AC690V
Rated frequency (Hz)			50	50	50
Rated insulation voltage Ui (V)			1000	1000	1000
Rated impulse withstand voltage Uimp (kV)			12	12	12
Number of poles (P)			3, 4, 3P+N	3, 4, 3P+N	3, 4, 3P+N
Breaking time (ms)			≤30	≤30	≤30
Making time (ms)			≤70	≤70	≤70
Rated limit short-circuit breaking capacity Icu (kA) (effective value)		AC400V	65	85	110
		AC690V	50	65	75
Rated operating short-circuit breaking capacityIcs (kA) (effective value)		AC400V	65	85	100
		AC690V	50	65	65
Rated short-circuit making capacityIcm (kA) (effective value)		AC400V	145	176	220
		AC690V	105	105	143
Rated short-circuit current tolerancelcw (1s) (kA) (effective value)		AC400V	65	85	85
		AC690V	50	65	65
Operation performance (times)	Electrical life	AC400V	10000	10000	10000
		AC690V	5000	5000	5000
	Mechanical life	Maintenance -free	10000	10000	10000
		With maintenance	20000	20000	20000
Installation form		Fixed-type	√	√	√
		Drawer-type	√	√	√
Wiring method of main circuit		Fixed-type	Horizonal wiring	Horizonal wiring and vertical wiring	Horizonal wiring and vertical wiring
		Drawer-type	Horizonal wiring	Horizonal wiring and vertical wiring	Horizonal wiring and vertical wiring
outline dimension (mm) 		Fixed-type (3/4)	Wide × Deep × High 265/335 × 235 × 310	Wide × Deep × High 370/465 × 370 × 402	Wide × Deep × High 422/537 × 340 × 402
		Drawer-type (3/4)	Wide × Deep × High 275/345 × 340 × 345	Wide × Deep × High 410/505 × 460 × 432	Wide × Deep × High 470/585 × 495 × 432

Model of Circuit Breaker			SFW1-4000	SFW1-6300
Rated current of housing rating Inm (A)			4000	6300
Rated working current In (A)			2000/2500/2900/3200/4000	4000/5000/6300
Rated working voltage Ue (V)			AC400V, AC690V	AC400V, AC690V
Rated frequency (Hz)			50	50
Rated insulation voltage Ui (V)			1000	1000
Rated impulse withstand voltage Uimp (kV)			12	12
Number of poles (P)			3P, 4P, 3P+N	3P, 4P, 3P+N
Breaking time (ms)			≤30	≤30
Making time (ms)			≤70	≤75
Rated limit short-circuit breaking capacity Icu (kA) (effective value)		AC400V	110	135
		AC690V	85	100
Rated operating short-circuit breaking capacityIcs (kA) (effective value)		AC400V	110	120
		AC690V	75	85
Rated short-circuit making capacityIcm (kA) (effective value)		AC400V	220	260
		AC690V	143	187
Rated short-circuit current tolerancelcw (1s) (kA) (effective value)		AC400V	110	120
		AC690V	75	85
Operation performance (times)	Electrical life	AC400V	8000	1000
		AC690V	5000	600
	Mechanical life	Maintenance -free	8000	3000
		With maintenance	15000	5000
Installation form		Fixed-type	-	-
		Drawer-type	√	√
Wiring method of main circuit		Fixed-type	-	-
		Drawer-type	Horizonal wiring	Horizonal wiring
outline dimension (mm) 		Fixed-type (3/4)	-	-
		Drawer-type (3/4)	Wide × Deep × High 580/790 × 495 × 432	Wide × Deep × High 813/928 × 495 × 433

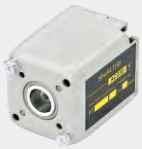
Note: "√" Yes; "-" No.

Accessories

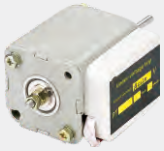
List of Accessories

Lock at off position

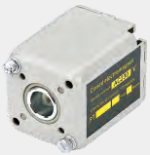
Secondary wiring terminal



Shunt trip



Under-voltage trip

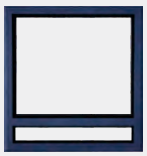


Closed electromagnet

Controller

Auxiliary contact

Phase partition



Door frame

Mechanical interlocking

Electric operating mechanism

Accessory Code	Accessory Name	For Which Circuit Breaker	Supply Mode
K/R	Auxiliary contact	Fixed-type/drawer-type	Standard configuration
B	Closed electromagnet	Fixed-type/drawer-type	Standard configuration
F	Shunt trip	Fixed-type/drawer-type	Standard configuration
D	Motor operating	Fixed-type/drawer-type	Standard configuration
G	Phase partition	Fixed-type/drawer-type	Standard configuration
M	Door frame	Fixed-type/drawer-type	Standard configuration
2H/2H1 3H/3H1	Controller	Fixed-type/drawer-type	Standard configuration（One of four choices）
XT	Secondary wiring terminal	Fixed-type/drawer-type	Standard configuration
Q	Under-voltage trip	Fixed-type/drawer-type	Supply for customer's selections
SF	Lock at off position	Fixed-type/drawer-type	Supply for customer's selections
SR	Mechanical interlocking	Fixed-type/drawer-type	Supply for customer's selections

Note: Standard configurations are as follows:

1. The fixed-type includes circuit breaker body：electronic controller, auxiliary contact (four-group transfer), shunt trip, closed electromagnet, door frame, phase partition, electric operating mechanism and horizontal wiring.
2. The drawer-type includes circuit breaker body：electronic controller, auxiliary contact (four-group transfer), shunt trip, closed electromagnet, door frame, phase partition, electric operating mechanism and horizontal wiring.

Controller of SFW1 Series Air Circuit Breaker

Controller is one of the main components of the circuit breaker, and it can provide overload, short circuit, grounding, current unbalance, over-voltage, under-voltage, voltage unbalance, over frequency, under frequency, inverse power and other trouble protection functions; the reasonable operation of grid can be realized by load monitoring, demand protection, regional interlocking and other functions. Moreover, the controller also has the measurement function of grid parameters such as current, voltage, power, frequency, electric energy, demand and harmonics of the grid nodes; record operation and maintenance parameters such as trouble, alarm, operation, historical maximum current, contact wear and other conditions; when the electric power network is networked for communication, the controller can realize telemetering, remote communication, remote control, remote adjustment etc. in the remote terminal of the power automation network.

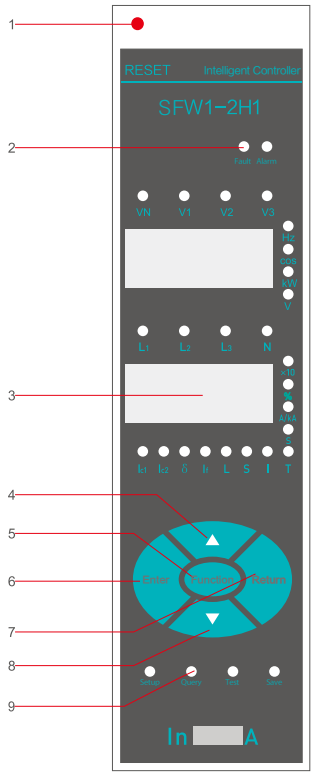
Controller

Function Item			Controller Model			
			SFW1-2H1 (for housing rating 1000A)	SFW1-3H1 (for housing rating 1000A)	SFW1-2H (for housing rating 2000A~6300A)	SFW1-3H (for housing rating 2000A~6300A)
Product Diagram						
HMI	Display	LED	√	-	√	-
		Dot matrix LCD	-	√	-	√
	Operation	Key	√	√	√	√
	Language: Chinese/English		-	√	-	√
Communication	Modbus - RTU		√	√	√	√
Protection	Overload long time delay protection (Ir) (multi curve optional)		√	√	√	√
	Short circuit short time delay protection (I_{sd}) (multiple curves optional)		√	√	√	√
	Short circuit instantaneous protection (Ii)		√	√	√	√
	Current unbalance (phase failure) protection		√	√	√	√
	Earth fault protection (I_g)	Select one	○	○	○	○
	Residual current protection ($I_{\Delta n}$)	Select one	○	○	○	○
	Neutral over-current protection (4P only)		○	○	○	○
	On current protection (MCR)		○	○	○	○
	Out of limit trip protection (HSISC)		○	○	○	○
	Over-voltage protection		-	√	-	√
	Under-voltage protection		-	√	-	√
	Voltage unbalance protection		-	√	-	√
	Over frequency protection		-	○	-	○
	Under frequency protection		-	○	-	○

Protection	Phase sequence protection		–	○	–	○
	Reverse power protection		–	○	–	○
	Power protection required		–	○	–	○
	Load monitoring		√	√	√	√
Measurement function	Current	Three phase current, instantaneous maximum, unbalance rate	√	√	√	√
		Neutral current and grounding current	○	○	○	○
	Voltage: line voltage, phase voltage, average voltage, unbalance rate		–	√	–	√
	Frequency		–	√	–	√
	Power: active power, reactive power, apparent power, power factor		–	√	–	√
	Energy: active energy, reactive energy and apparent energy		–	√	–	√
	Phase sequence		–	√	–	√
	System clock		–	√	–	√
Maintenance function	Test function		√	√	√	√
	Key lock function		–	√	–	√
	Contact wear rate		√	√	√	√
	Historical records	Tripping record (8 times)	√	√	√	√
		Alarm record (8 times)	–	√	–	√
		Displacement record (8 times)	–	–	–	√
Contact output	4-way programmable contact output		○	○	○	○

Note: "√" Yes; "–" No; "○" Optional.

2H1 Type Controller Panel Description



SFW1-2H1Controller
(Suitable for 1000 shell rack)

Indication		
1 Reset	2 LED indicator	3 LED display
4 Up	5 Function	6 Enter
7 Return	8 Down	9 Test/setup/query/save
If Grounding protection current setting value		L Long delay current setting value
S Short delay current setting value		I Instantaneous current setting value
tg Grounding protection time setting value		tr Long delay time setting value
ts Short delay time setting value		

Description

Reset
If you want to close the circuit breaker again after tripping, you need to press the reset button once, otherwise the circuit breaker cannot be closed.

LED indicator
Indicator lights for voltage, current, power, frequency, power factor, etc.; indicator lights for contact wear rate, faults, and alarms.

LED display
Display current, voltage or time.

Up
Adjust the controller parameters upwards.

Function
View and set protection parameters and communication function parameters.

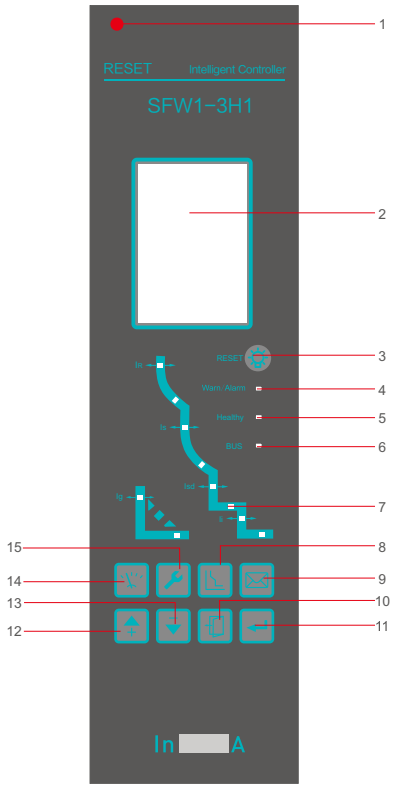
Enter
Confirm after controller parameter selection.

Return
Return to the previous level of operation after controller parameter selection.

Down
Adjust the controller parameters downward.

Test, setup, query, save
Test: simulate the action characteristic test;
Setup: set the technical parameters of the controller;
Query: query the fault record;
Save: save the parameters currently set by the controller.

3H1 Type Controller Panel Description



SFW1-3H1 Controller
(for housing rating 1000A)

Indication		
1 Reset	2 LCD display	3 Reset
4 Fault/Alarm	5 Normal	6 Communication
7 Curve		
Keyboard		
8 Protection setting	9 Information query	10 Exit
11 Enter	12 Up	13 Down
14 Running parameters	15 System setting	

Description

Reset

When a fault trip or a test trip occurs, the reset button pops up. When it is not pressed, the circuit breaker cannot be closed; after the button is pressed, the fault indication is reset at the same time to close the circuit breaker.

Fault/alarm indicator

During normal operation, the indicator light does not light up; when a fault trips, the red indicator light flashes quickly; when an alarm occurs, the red indicator light is always on.

Normal indicator

As long as the 3H1 is powered on and working normally, the green indicator light will always flash.

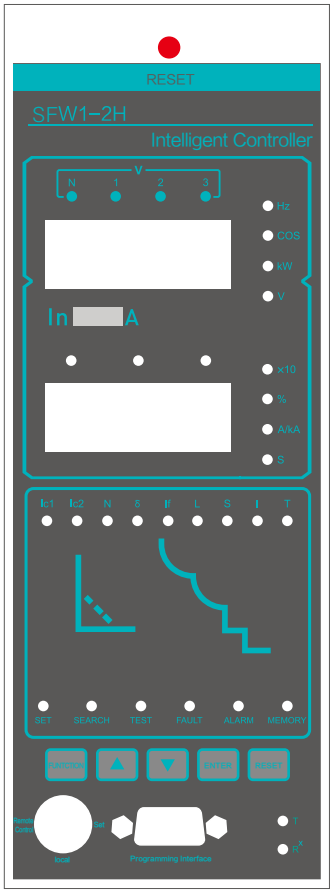
Communication indicator

The communication status indication is as follows:
Modbus：goes off when there is no communication, and flashes when communicating.

Curve indicator

A red indicator light is hidden in the curve. When the fault trips, the corresponding indicator light flashes to indicate the fault type; when the protection parameter is set, the indicator light is always on to indicate the current set item.

2H Type Controller Panel Description



SFW1-2H controller
(suitable for 2000~6300 housing rating)

Comparison table of protection type indicator and setting value in setting state

Green	Red	Set value with ▲ key, ▼ key, OK key, and return key
Ic1	A/kA	Load monitoring IC1 current setting value
	S	Load monitoring IC1 inverse time delay time setting value
Ic2	A/kA	Load monitoring IC2 current setting value
	S	Load monitoring IC2 inverse time delay time setting value
N	N	N phase setting 50% or 100%
δ	%	Current imbalance setting value
	S	Current imbalance delay time setting value
If	A/kA	Grounding leakage current setting value
	S	Grounding leakage time setting value (S green indicator light is always on)
		Grounding inverse time shear coefficient (S green indicator light is flashing)
L	A/kA	Overload long delay current setting value
	S	Overload long delay inverse time delay time setting value
S	A/kA	Short-circuit short delay inverse time current setting value (S red indicator light is always on)
	A/kA	Short-circuit short delay definite current setting value (S red indicator light is flashing)
	S	Short-circuit short delay definite time delay time setting value
I	A/kA	Short-circuit transient current setting value
ID	L1	Controller address number 1-255
BL	L2	Controller baud rate selection, 9.6K or 19.2K

Test function

The controller can perform a test trip. During the test, press the function key until the "test" indicator light flashes, press the OK key once, the controller will issue a command, and the current window will display the tripping time. Press the return key to exit the test status and return to the normal operation status.

Query function

①.Fault query: After the controller is in fault protection mode, the fault indicator light is on, and the fault category indicator light is on at the same time, and the controller displays the fault current and time cyclically. Press ▲ key or ▼ key to view other data of faults in cycle. Press the return key to exit the query status and return to the normal operation status.

Reset function

History query: The controller saves the latest fault record. When inquiring, keep pressing the function key until the "Inquiry" indicator light flashes and press the OK key once, the controller enters the inquiry status, the "Inquiry" indicator and the "Fault" indicator are always on, and the fault category is indicated at the same time, and the controller displays the fault current and time. Press the key and the key to check other data of the faults in cycle. Press the return key to exit the query status and return to the normal operation status.

Note: L1 flashes: The displayed value is the time and year when the fault occurred;

L2 flashes: The displayed value is the time, month and date of the fault;

L3 flashes: The displayed value is the hour and minute when the fault occurred;

L1, L2, L3 flash at the same time: The displayed value is the second when the fault occurred;

Self-diagnosis function

The self-diagnosis function of the controller is used to detect the working status and operating environment of the controller itself. When there is a self-diagnosis fault (such as environmental over-temperature, A/D sampling error, E2PROM error light), the controller will give an indication or display to alarm and remind the user to deal with it. When the "T" indicator on the control panel is on, it means there is a self-diagnostic fault, and the fault code will be displayed by pressing the OK key. If the fault has been withdrawn, press the return key to clear the self-diagnostic fault "T" indicator and return to normal operation status; if there are multiple diagnostic faults, press the ▲ key and the ▼ key to view the fault code in cycle.

Circuit breaker contact wear function

The controller panel displays the contact wear condition. The display shows 100% when leaving factory, indicating that the contact is not worn. When the displayed value drops to 10% during the actual operation, the controller sends an alarm signal to remind the user to replace the contact. It can be reset to 100% after the user replaces the contacts.

MCR making and breaking and HSISC over-limit trip protection

The MCR on-off and off-limit trip protection functions can be selected by users. Both of these two methods are instantaneous action, and the action value is related to the running breaking and limit breaking capacity of the circuit breaker. The operating current is generally: 35kA/45kA, 50kA/65kA, 70kA/90kA. They are all processed by hardware (instead of MCU) to issue tripping action, and the off-limit tripping protection function will always work during the controller operation. The MCR function only works for about 80ms when the controller is powered on, and does not work during normal closing operation.

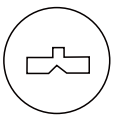
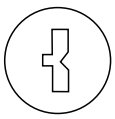
[Note] The operating current values of MCR and HSISC are determined by hardware and cannot be changed after leaving the factory. Please contact us for the specific value before ordering.

Thermal memory function

Repeated overload may cause the conductor to heat up. After the controller delays action due to faults such as overload or short delay, it has the function of simulating the thermal effect of bimetals. The long-time overload energy is released in 30 minutes, and the short-time delay energy is released in 15 minutes. If the circuit breaker closed during this period is overloaded or short-delayed again, the short-delay action time will be shortened, so that the wires and equipment can be better protected. The accumulated thermal effect is automatically cleared when the controller is powered off, and this function can be turned off as required.

Position lock function

The 2H controller panel has position locks in three states: remote control, local, and setting. The functions of the controller in each state are as follows:

Remote control  Setting Local	Remote control  Setting Local	Remote control  Setting Local
Remote control state	Local state	Setting state

Operation	Lock’s position		
	Remote control state	Local state	Setting state
Remote control, remote commissioning	Yes	No	No
Local parameters setting	No	No	Yes
Local test	No	No	Yes

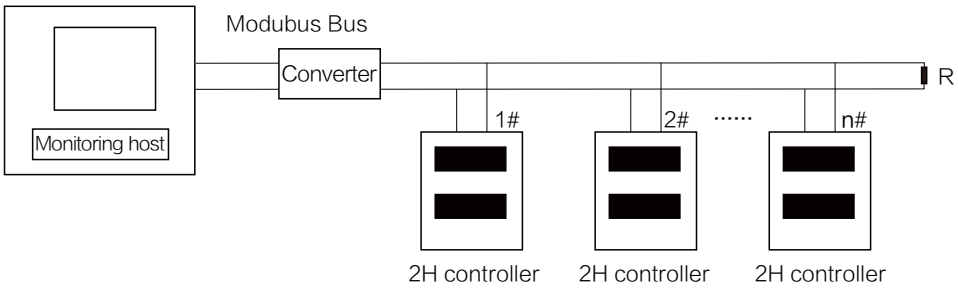
Note: Only the 2H controller has the lock function, but the 3H controller can still perform the above operations (remote control, remote adjustment, local parameter adjustment, local test).

Communication function

2H type controller provides Modbus-RTU communication function, the detailed communication parameters are shown in the following table:

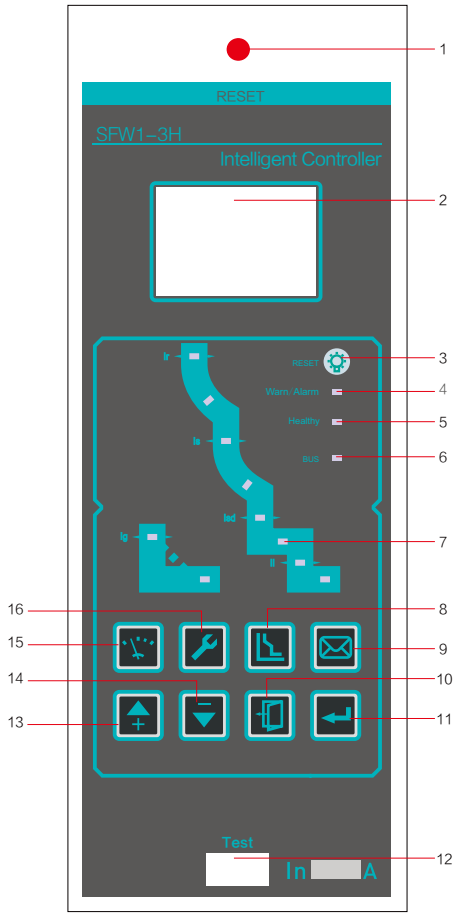
Operation		Lock’s position
Network characteristics	Communication port	RS485(With optical isolation)
	Communication protocol	Modubus-RTU
	Communication medium	Shielded twisted pair
	Transfer speed	9600pbs, 19200pbs optional
	Maximum number of users	255（Theoretical value）
	Communication distance	1200ms
	Communication map	《KT-2H smart cotroller Modubus map V3.0》
Network functions	Remote measurement	Monitor the operating parameters of networked electrical instruments
	Remote debugging	Remote set circuit breaker protection characteristic parameter value
	Remote control	Remote control the breaking of circuit breaker
	Remote communication	Monitor various work statistics of the power grid in real time

The schematic diagram of Modubus system communication network connection is as follows:



The host computer monitoring software is independently developed by the user, and the monitoring software suitable for the control requirements is developed according to their own different functions and requirements. Our company provides communication protocols and corresponding technical support. In order to help users quickly become familiar with and master the network communication function of the controller, our company provides users with a beta monitoring software for free, please contact us for details.

3H Type Controller Panel Description



SFW1-3H controller
(Applicable to 2000~6300 housing rating)

Indication		
1 Reset	2 LCD display	3 Reset
4 Fault/Alarm	5 Normal	6 Communication
7 Curve		
Keyboard		
8 Protection setting	9 Information query	10 Exit
11 Enter	12 Test interface	13 Up
14 Down	15 Running	16 System setting

Description

Reset
When a fault trip or a test trip occurs, the reset button pops up. When it is not pressed, the circuit breaker cannot be closed; after the button is pressed, the fault indication is reset at the same time to close the circuit breaker.

Fault/alarm indicator
During normal operation, the indicator light does not light up; when a fault trips, the red indicator light flashes quickly; when an alarm occurs, the red indicator light is always on.

Normal indicator
As long as the 3H1 is powered on and working normally, the green indicator light will always flash.

Communication indicator
The communication status indication is as follows:
Modbus: goes off when there is no communication, and flashes when communicating.

Curve indicator
A red indicator light is hidden in the curve. When the fault trips, the corresponding indicator light flashes to indicate the fault type; when the protection parameter is set, the indicator light is always on to indicate the current set item.

Test port
There is a 16-pin test port at the bottom of the front panel, which can be inserted into a plug-in portable power box or test unit.

Protection features and functions of the controller

Symbol

Inm: The housing rating current of the circuit breaker matched with the controller

In: Rated current of the controller used with the circuit breaker

Ir/Ir1: Long-time delay current setting value

Is/Ir2: Short delay current setting value

Ii/Ir3: Instantaneous current setting value

Ig/Ir4: Ground current setting value

tr: Long-time delay setting action time

ts: Short-delay setting action time

tg: Grounding setting action time

T: Actual trip action time of controller

I: Actual current value

Operation Definition

Definite time trip

After a certain delay, the tripping action occurs, and the delay time can be adjusted and set. Once set, it will not be affected by the over-current value.

Inverse time tripping

After a certain delay, the tripping action occurs. The delay time is inversely proportional to the square of the current value passed through. The larger the current value, the shorter the action time.

Instantaneous trip

The tripping action occurs without artificial delay.

Controller setting value and error

Long delay	Short delay		Instantaneo us		Grounding fault	
Ir/Ir1	Is/Ir2	Error	Ii/Ir3	Error	Ig/Ir4	Error
(0.4～1)In	(1.5～15)In	±10%	In～50kA(Inm=1000~2500A) In～75kA(Inm=3200～4000A) In～100kA(Inm=6300A)	±10%	Inm=1000～4000A (0.2～1)In Max. 1200A Min. 160A Min. 100A（Inm=100A) Inm=6300A(0.2～1.0)In	±10%

Remarks: Please read the above content carefully during user selection or product use.

Overload long delay protection (two ways)

Power distribution and motor protection	Current setting range（Ir）		Ir=0.4~1In +OFF（No range, minimum 160A）						
	Time setting range（tr）		tr≤15s~500s +OFF（Range 5s）						
	Action characteristics	I	15s	30s	60s	120s	240s	480s	OFF
	$T=(1.5Ir)^2/I^2)tr$	I≤1.05Ir	>2h no action						
		1.15Ir≤1≤1.3Ir	≤1h action						
		1.5Ir	15	30	60	120	240	480	Alarm
		2.0Ir	8.4	16.9	33.8	67.5	135	270	
		7.2Ir	0.65	1.30	2.60	5.20	10	21	
	Accuracy		±10%						
Generator protection	Current setting range		Ir=0.4~1In +OFF（No range, minimum 160A）						
	Time setting range		tr≤15s~500s +OFF（Range 5s）						
	Action characteristics	I	15s	20s	30s	40s	50s	60s	
	$T=(1.2Ir)^2/I^2)tr$	I≤0.95Ir	>2h no action						
		0.95Ir≤1≤1.05Ir	≤1h action						
		1.2Ir	15	20	30	40	50	60	
		6.0Ir	0.6	0.8	1.2	1.6	2.0	2.4	
	Accuracy		±10%						
Thermal memory（30min，Automatically clear after power			Standard+OFF						

The protection characteristics of the controller

Short-circuit short time delay (two ways are optional)

Method One Definite Time	Current setting range (Is)	Is=0.4~15In +OFF (No range, minimum 160A)						
	Time setting range (ts)	ts≤0.1s，0.2s，0.3s，0.4s，0.5s+OFF						
	I>Is	ts	0.1	0.2	0.3	0.4	0.5	
		Delay (s)	0.06	0.16	0.26	0.34	0.44	
		Maximum disconnection time (s)	0.1	0.24	0.3	0.346	0.56	
Method Two -Definite Time + Inverse Time	I>Is and I>8Ir	ts	0.14	0.2	0.35	0.4	0.5	
		Delay (s)	0.06	0.16	0.26	0.34	0.44	
		Maximum disconnection time (s)	0.14	0.24	0.35	0.46	0.56	
	I>Is and I≤8Ir	Inverse time characteristic	$T=\frac{(8Ir)^2}{I^2}ts$					
		Accuracy	± 15%					
	Thermal memory (15min，automatically clear after power)		Standard+OFF					

Short-circuit transient

Current setting range (Ii)	1.0In~50kA/75kA/100kA (No range) +OFF
Action characteristics	I<0.85Ii no action
	I<1.15Ii action

Note: Action refers to tripping, and non-action refers to no tripping.

Grouding fault

Current setting range (Ig)		0.2~1.0In+OFF (No range, maximum 1200A, minimum 160A)					
Time setting range (tg)		0.1s~1.0s OFF					OFF
Action characteristics	tg	0.2	0.4	0.6	0.8	1.0	
	Delay (S)	0.18	0.36	0.54	0.72	0.90	Alarm
	Maximum disconnection time (S)	0.22	0.44	0.66	0.88	1.10	

Load monitoring (Optional two ways)

Method one-monitor two loads	Load 1	Current setting range (I_{Lc1})		0.2~1In+OFF (No range, maximum 1200A, minimum 160A)
		Time setting range (t_{Lc1})		$=\frac{1}{2}t_L$
		Output characteristics	$I < I_{Lc1}$	No unloading
			$I \geqslant I_{Lc1}$	Delay action ,$T=\frac{(1.5Ir)^2}{I^2}t_{Lc1}$
	Load 2	Current setting range (I_{Lc2})		0.2~1In+OFF(Shut off) (No range, minimum 160A)
		Time setting range (t_{Lc2})		$=\frac{1}{4}tr$
		Output characteristics	$I < I_{Lc2}$	No unloading
			$I \geqslant I_{Lc2}$	Delay action,$T=\frac{(1.5Ir)^2}{I^2}t_{Lc2}$
Method two - monitor the unloading/ closing of a load	Unloading characteristics	Current setting range (I_{Lc1})		0.2~1In+OFF(Shut off) (No range, minimum 160A)
		Time setting range (t_{Lc1})		$=\frac{1}{2}tr$
		Output characteristics	$I < I_{Lc1}$	No action
			$I \geqslant I_{Lc1}$	Delay action ,$T=\frac{(1.5Ir)^2}{I^2}t_{Lc1}$
	Reclosing characteristics	Current setting range (I_{Lc2})		0.2~1In+OFF(Shut off) (No range, minimum 160A)
		Time setting range (t_{Lc2})		Fixed 60s
		Output characteristics	$I < I_{Lc2}$	Delay closing
			$I \geqslant I_{Lc2}$	No closing
Accuracy				± 10%
Thermal memory (15min, Automatically clear after power off)				Standard+OFF

Note: Action refers to tripping, and non-action refers to no tripping.

Leakage protection (optional function)

Current setting range ($I_{\triangle n}$)		0.5~30.0A (Setting step 0.1A)											
Action characteristics	Delay time $T_{\triangle n}$(s)	0.06	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83	Instant
	Fault power supply	Maximum disconnection time (s)											
	$<0.8I_{\triangle n}$	No action											
	$\geqslant 1.0I_{\triangle n}$	Action											
	$I_{\triangle n}$	0.36	0.5	1	1.7	2	2.5	3	3.5	4	4.5	5	0.04
	$2I_{\triangle n}$	0.18	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	0.04
	$5I_{\triangle n}$	0.072	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	0.04
	$10I_{\triangle n}$												
Execution way		Trip/OFF											

Pre-alarm (Two ways)

Power distribution and motor protection	Current setting range (I_{rp})		=Ir
	Action characteristics	I≤1.10I_{rp}	No alarm
		I≤1.15I_{rp}	Alarm
Engine protection	Current setting range (I_{rp})		0.2~1.25Ir (No range, minimum 160A)
	Action characteristics	I≤I_{rp}	No alarm
		I≤I_{rp}	Delay alarm,$T=\frac{(1.2Ir)^2}{I^2}t_p$ t_p 5，8，10s
Accuracy			±10%
Thermal memory (30min，Automatically clear after power)			Standard +OFF

Ammeter

Value	L1~L2~L3~G~N (Optional) ~MAX±3%

Test

Tripping	Simulate various currents for opening test
No tripping	Simulate various currents for testing, but does not open the switch

Fault check

Value	Display the current and delay time at the time of opening, the current value of each phase, and the fault time (optional)
Type	The indicator light on the panel indicates the type of tripping

Fault output (Contact rating：AC125V，3V：DC28V，3V)

Fault type	Overload, short circuit, grounding and opening status indication contact output
MRC Tripping alarm	Fault opening alarm contact output
Self-diagnosis	Internal overheating; the controller has no working power supply; the MCU runs abnormally; the circuit breaker refuses to operate, etc

Note: 1. When setting the working parameters of the controller, it should be ensured that Ii>Is>Ir

2、Build $I_{Lc1}>I_{Lc2}$

Order Specifications

User Unit	× × × Company	Order Quantity	100	Order Date	2021.1.1

Example model:

SFW1 — 4000 H/ 3 J1 C 2H1 M 4000A D2 B2 F2 Q20 R4 SF32

Housing Rating
☐1000
☐2000
☐3200
☑4000
☐6300

Number of Poles
☑3(3P)
☐4(4P)
☐5(3P+N)

Installation Mode
☑C:Drawer-type
☐G:Fixed-type

Communication Mode
☑M(Modbus)

Motor Operating Mechanism
☐1:AC380V
☑2:AC220V
☐3:DC220V
☐4:DC110V

Shunt Trip
☐1:AC380V
☑2:AC220V
☐3:DC220V
☐4:DC110V

Contact Combination
(Standard for 1000-6300 housing)
☑R4 four-group transfer
(Optional for 2000-6300 housing)
☐R5 – Five-group transfer
☐R6 – Six-group transfer
☐K4 – Normally four-on and normally four-off
☐K5 – Normally five-on and normally five-off
☐K6 – Normally six-on and normally six-off

SFW1— 4000 **H /** 3 J1 C 2H1 M 4000A **D** 2 **B** 2 **F** 2 Q20 R4 SF32

Wiring Mode
☑J1 horizontal wiring (standard)
☐J2 vertical wiring

Controller Model
See details in Page 9
(for 1000 housing)
☑2H1
☐3H1
(for 1000-6300 housing)
☐2H
☐3H

Rated Current (A)
☐200 ☐2500
☐400 ☐2900
☐630 ☐3200
☐800 ☐3600
☐1000 ☑4000
☐1250 ☐5000
☐1600 ☐6300
☐2000

Closed Electromagnet
☐1:AC380V
☑2:AC220V
☐3:DC220V
☐4:DC110V

Under-voltage Trip
☐Q10(Instantaneous,AC400V)
☐Q11(Delay 1s,AC400V)
☐Q13(Delay 3s,AC400V)
☐Q15(Delay 5s,AC400V)
☑Q20(Instantaneous,AC230V)
☐Q21(Delay 1s,AC230V)
☐Q23(Delay 3s,AC230V)
☐Q25(Delay 5s,AC230V)

One Out of Five for Key Lock
☐SF11:One key for one lock
☐SF21:One key for two locks
☐SF31:One key for three locks
☑SF32:Two keys for three locks
☐SF53:Three key for five locks

One Out of Five for Mechanical Interlocking
Cable type
☐SR11:Two groups, one-on and one-off
☐SR12:Three groups, one-on and two-off
☐SR21:Three groups, two-on and one-off
Stiff shaft type
☐SY11:Two groups, one-on and one-off
☐SY12:Three groups, one-on and two-off

Note: Standard Configuration for Fixed-Type: Circuit breaker body, electronic controller, auxiliary contact (four-group transfer), shunt trip, Door frame, Phase partition,closed electromagnet, electric operating mechanism and horizontal wiring.
Standard Configuration for Drawer-type: Circuit breaker body, electronic controller, auxiliary contact (four-group transfer), shunt trip, Door frame, Phase partition,closed electromagnet, electric operating mechanism, drawer seat and horizontal wiring.

SFW1 Series Intelligent Air Circuit Breaker

Function Descriptions of Accessories

Under-voltage Trip (Q)

☐ It is used to instantly break the circuit breaker when the power voltage is reduced to 35%-70% of the rated vale; the circuit breaker cannot be made when the coil is not excited. It can only be reliably made when the voltage is restored to 85%Ue.

Rated working voltage Ue	Q1	Q2
	AC400V	AC230V
Required power	36VA	24VA
Breaking time	Instantaneous or delayed for 1s, 3s or 5s ± 10%	

Closed Electromagnet (B)

☐ It is used to instantly release the energy storage spring force of the operating mechanism after the circuit breaker finishes energy storage. The circuit breaker can be closed quickly and the reliable action range is 85%-110%Us.

Rated control voltage Us	B1	B2	B3	B4
	AC380V	AC220V	DC 220V	DC 110V
Required power	36VA	24VA	24VA	24VA
Instantaneous current	0.7A	1.3A	1.3A	2.8A
Making time	Not more than 70ms			

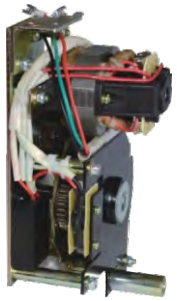
Shunt Trip (F)

☐ It is used for remote breaking of circuit breaker; the reliable action range is 70%-110%Us.

Rated control voltage Us	F1	F2	F3	F4
	AC380V	AC220V	DC220V	DC110V
Required power	36VA	24VA	24VA	24VA
Instantaneous current	0.7A	1.3A	1.3A	2.8A
Breaking time	Not more than 30ms			

Motor Operating Mechanism (D)

☐ It is used for the circuit breaker's electric energy storage and automatic energy storage functions; the circuit breaker also has the manual energy storage function; the reliable action range is 85%-110%Us.



Rated working voltage Ue		D1	D2	D3	D4
		AC380V	AC220V	DC220V	DC110V
Required power	SFW1-1000	85VA	85VA	85VA	85VA
	SFW1-2000				
	SFW1-3200	110VA	110VA	110VA	110VA
	SFW1-4000				
	SFW1-6300	150VA	150VA	150VA	150VA
Energy storage time		Not more than 5ms			

Function Descriptions of Accessories

Auxiliary Switch (K/R)

☐ The agreed heating current of the auxiliary switch is 10A.
Form of Auxiliary Contact: Four-group transfer, five-group transfer, six-group transfer, normally three-on and normally three-off, normally four-on and normally four-off and normally five-on and normally five-off.

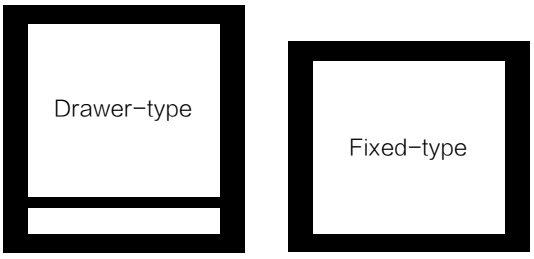
Suitable Housing		1000 Housing	2000/3200/4000/6300 Housing
Form of auxiliary contact		R4-four-group transfer	R4 – Four-group transfer R5 – Five-group transfer R6 – Six-group transfer K4 – Four-normally on and four-normally off K5 – Five-normally on and five-normally off K6 – six-normally on and six-normally off
Agreed heating current Ith		6A	
Breaking capacity	DC-13	0.25A/DC220V	
	AC-15	1.3A/AC220V、0.75A/AC380V	

Phase Partition (G)

☐ It is classified as fixed-type and drawer-type, installed in the slot between each phase of bus, and it is used to increase the insulation strength between the main circuit phase and phase and improve the insulation performance.

Door Frame (M)

☐ It shall be fixed on the cabinet door, beautiful and practical with sealing function. Its protection level reaches IP30; there are two types – drawer-type door frame and fixed door frame.



SFW1 Series Intelligent Air Circuit Breaker

Function Descriptions of Accessories

Key Lock at “Off” Position SF (on Circuit Breaker Body)

☐ The key lock at off position is used to set the circuit breaker in off position. When the key is locked anticlockwise and pulled out, the circuit breaker cannot be closed, so as to prevent illegal operations.

☐ SF11 One key for one lock

☐ SF21 One key for two locks

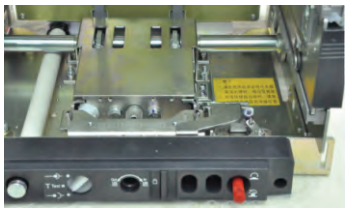
☐ SF31 One key for three locks

☐ SF32 Two keys for three locks

☐ SF53 Three key for five locks

Drawer-type Three-position Lock (Standard Configurations on Drawer Base)

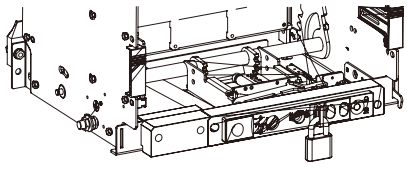
☐ There are "Connect", “Test” and “Separate” position statuses on the drawer base, which are indicated by one indicator. When the crank is shaken, the circuit breaker body will be locked when shaken to the above three positions, and the locking can be released by unlocking (red).



Working-position Lock of Drawer-type Circuit Breaker Rocker (Standard Configurations on Drawer Base)

☐In any position, when the rocker is not placed in its working position, the working position of the rocker can be locked by locking the rocker of the drawer-type circuit breaker with padlock. At this time the rocker cannot be normally inserted into the working position of the rocker, and cannot shake in or shake out. The padlock shall be equipped by the user itself and used for 1000 housing drawer-type products. The diameter specification of the lock beam is 3mm-5mm, it is used for 2000 housing and above drawer-type products, and the diameter specification of the lock beam is 4mm-8mm.

☐Generally, it is used in the following scenarios. When the drawer-type circuit breaker is in a separate position and the rocker is not placed in the working position of the rocker, pull out the black rod under the drawer base, and then use the lock beam of the padlock to pass through the rod. At this time, the circuit breaker body can only be pulled out of the drawer base, but cannot be operated to the "Test" or "Connect" position by remote control.



Function Descriptions of Accessories

Power Transfer System

☐ Introduction to Mechanical Interlocking

The mechanical interlocking mechanism can be used for interlocking between drawer-type circuit breakers as well as fixed circuit breakers.

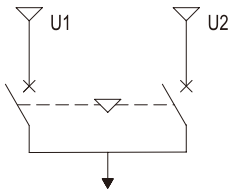
The interlocking mechanism shall be installed by the user. First remove the nut connecting 4 combination screws at the back of the interlocking device, and then fix the interlocking mechanism on the right plate of the circuit breaker with 4 combination screws. The selection of interlocking type is as shown in the table below:

Code	Selection Mode	Specification	Number of Circuit Breakers
SR11	1	Two groups of cables, one-on and one-off	2
SR12	2	Three groups of cables, one-on and two-off	3
SR32	3	Three groups of cables, two-on and one-off	3
SY11	4	Two groups of stiff shafts, one-on and one-off	2
SY21	5	Three groups of stiff shafts, one-on and two-off	3

The Circuit Breaker Can be Used to Interlock the Following Power States

☐ Two circuit breakers (one-on and one-off).

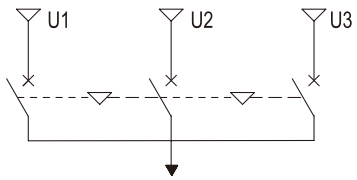
The usage of the user is as shown in the figure below, and the interlocking action state as is shown in the table below.



U1	U2
On	Off
Off	On
Off	Off

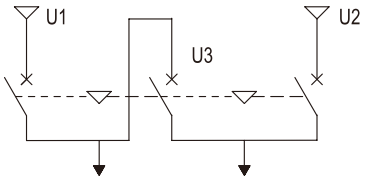
☐ Three circuit breakers (one-on and two-off)

The usage of the user is as shown in the figure below, and the interlocking action state as is shown in the table below.



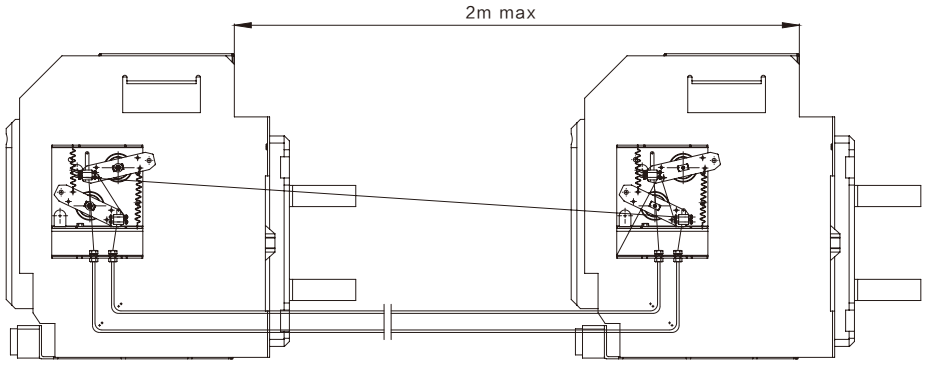
U1	U2	U3
On	Off	Off
Off	On	Off
Off	Off	On
Off	Off	Off

☐ Three circuit breakers (two-on and one-off)
The usage of the user is as shown in the figure below, and the interlocking action state as is shown in the table below.

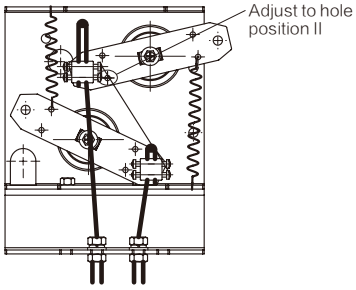


U1	U2	U3
Off	Off	Off
On	On	Off
On	Off	On
Off	On	On

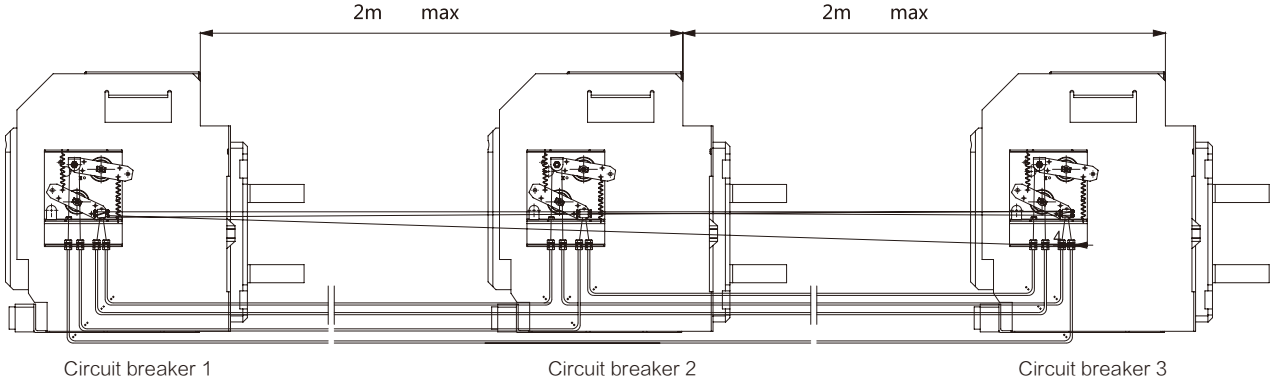
☐ Two-cable Interlocking (one-on and one-off)
Installation Diagram



Adjustment Diagram

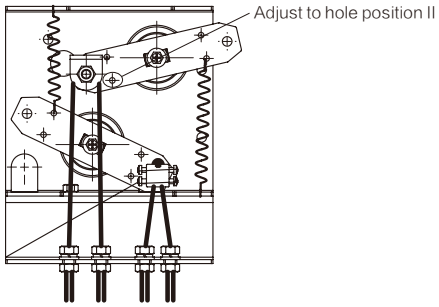


☐ Three-cable Interlocking
Installation Diagram

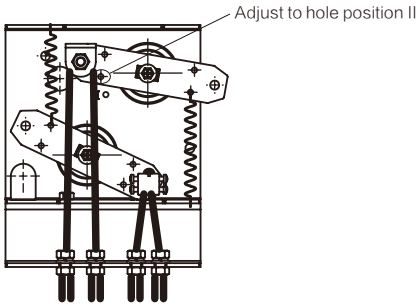


Adjustment Diagram

Unit: mm

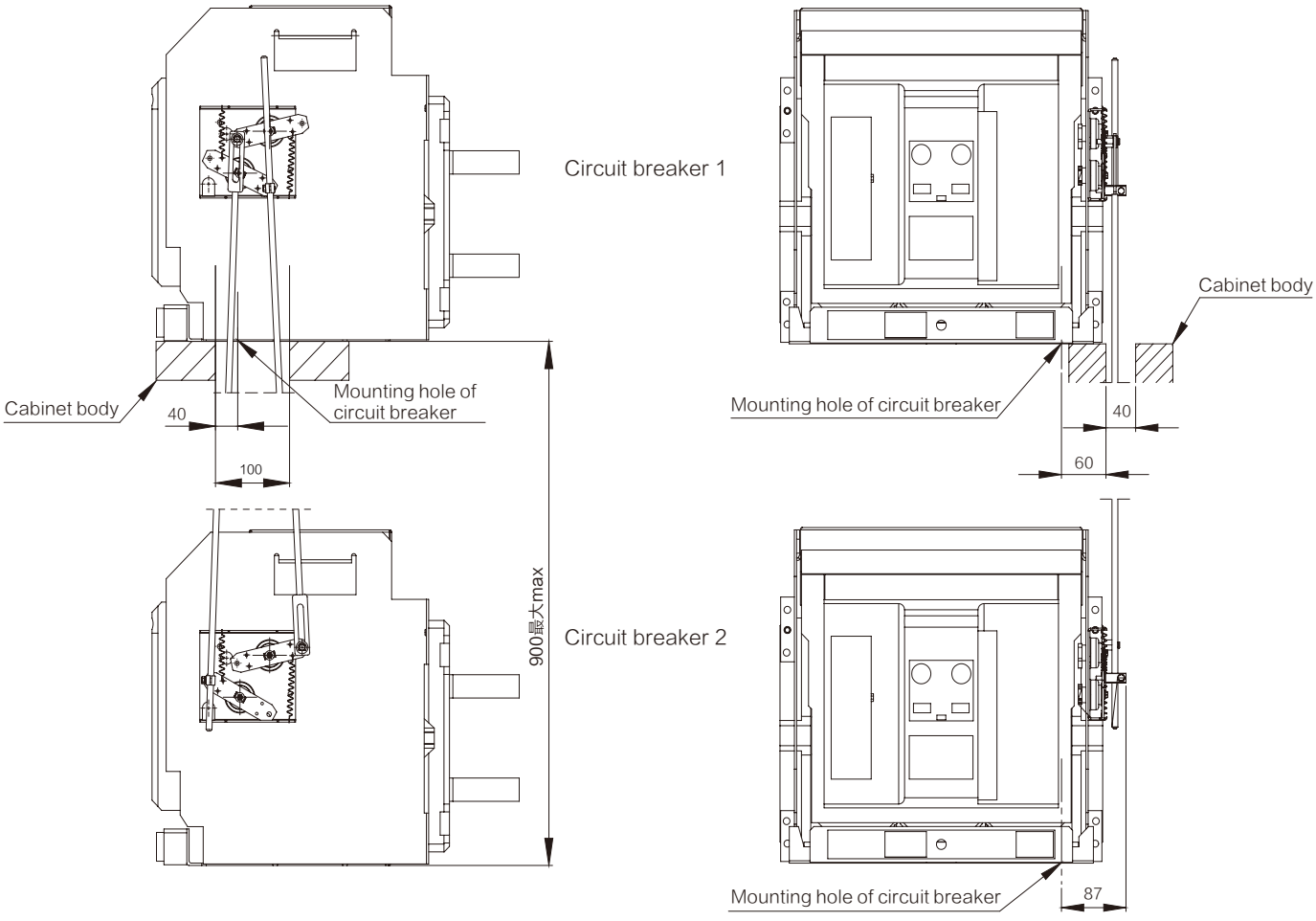


One-on and two-off



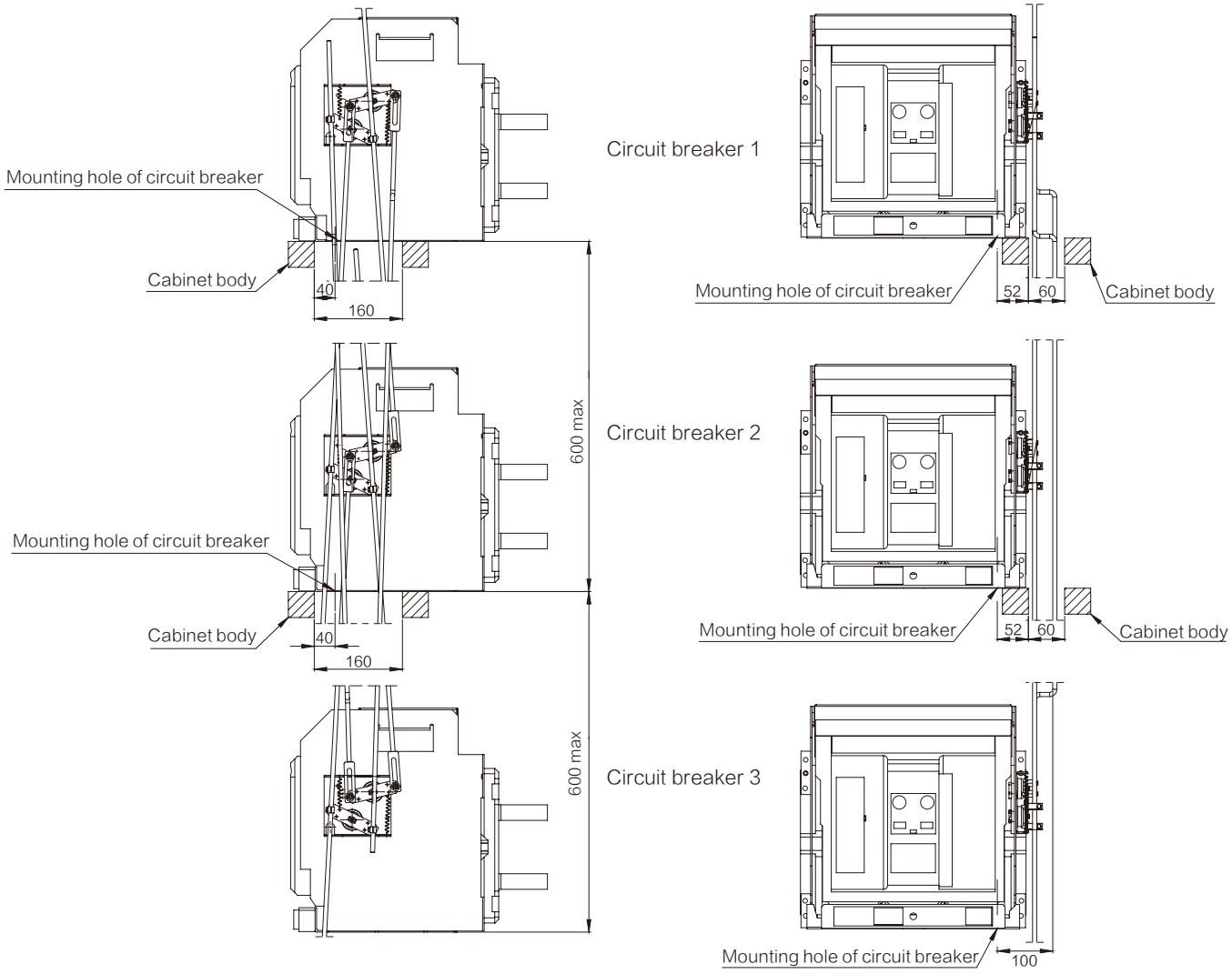
Two-on and one-off

☐ Two-stiff Shaft Interlocking (one-on and one-off) Installation Diagram

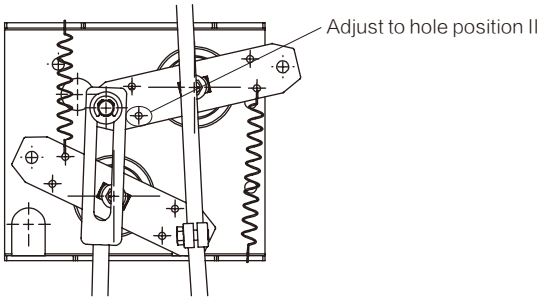


☐ Three-stiff Shaft Interlocking (one-on and two-off)
Installation Diagram (Note: During assembly and adjustment, the connecting rod part can be properly removed)

Unit: mm

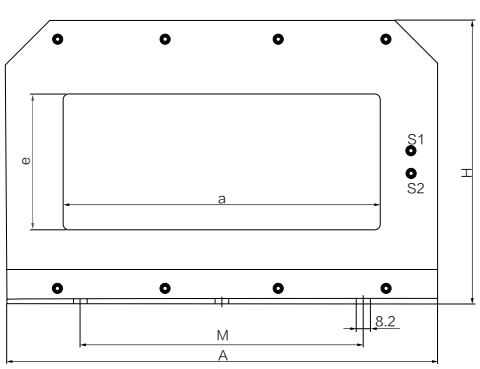


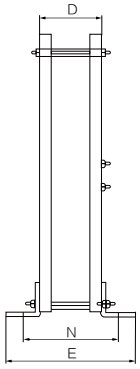
Adjustment Diagram



External transformer

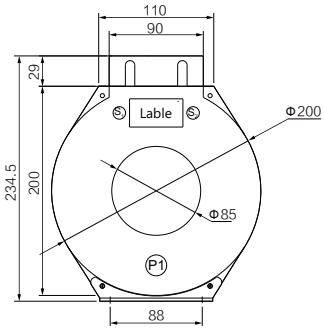
☐ Structure dimensions of external leakage transformer (mode E)

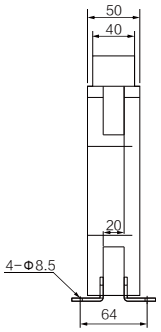




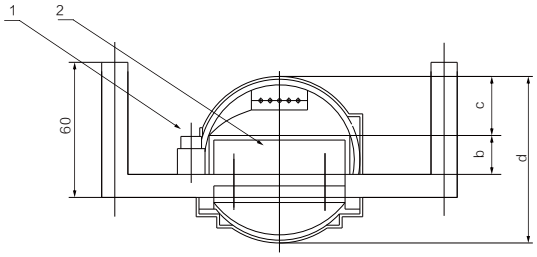
Model	Outline Dimension				Hole Size		Installation Dimension	
	A	H	D	E	a	e	M	N
BH-LMB-280X120	380	250	54	114	280	120	250	72
BH-LMB-370X120	465	250	54	114	370	120	250	72
BH-LMB-500X120	595	250	54	114	500	120	250	72

☐ Structure dimensions of external grounding current transformer (W mode)



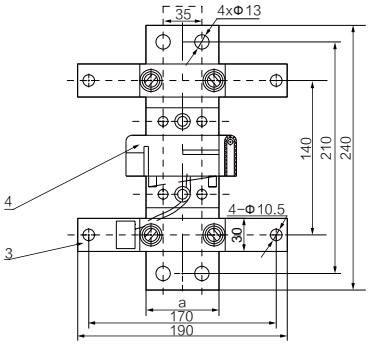


☐ Structure dimensions of external N transformer (3P + N mode)



1—Terminal block 2—Busbar 3—Fixing plate 4—Transformer

Remarks: When the controller is 3P+N, the neutral pole transformer is added to the product.



Inm (A)	a	b	c	d
1000	35	15	26	Φ70
2000	60	12.5	34	Φ89
3200、4000/3P	80	20	35	Φ109.5
6300	80	30	35	Φ109.5

Internal wiring

Ground fault protection circuit

Single-phase grounding protection refers to metallic grounding protection with a fault current of more than a few hundred amperes, and is generally used in neutral-point direct grounding systems.

The controller has two grounding protection methods, the first one is differential type (T), the controller detects the vector sum of three-phase current and neutral pole current for protection. According to the number of poles of the circuit breaker, it is divided into three forms: 3PT, 4PT, (3P+N)T, as shown in Figures 1, 2, and 3 respectively. The second method is ground current type (W), the controller detects the current between the N line and the PE line through an additional current transformer for protection, as shown in Figure 4.

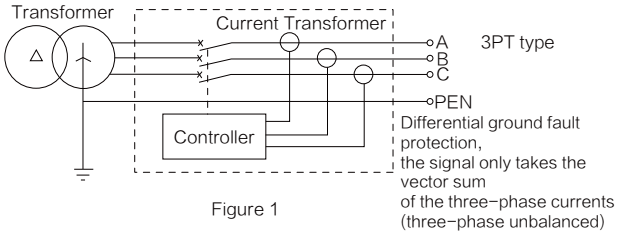


Figure 1

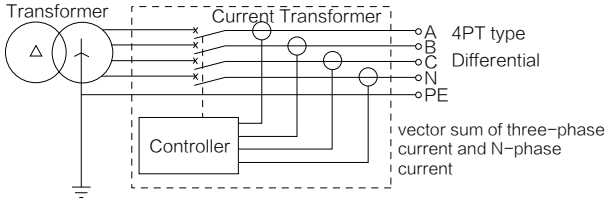


Figure 2

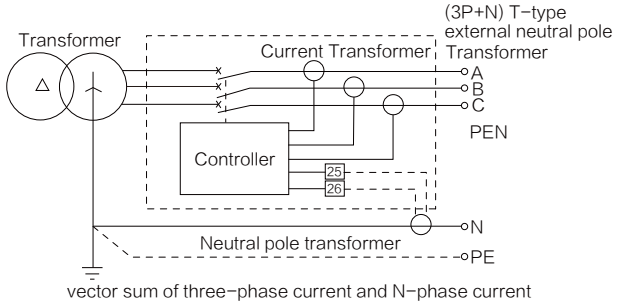


Figure 3

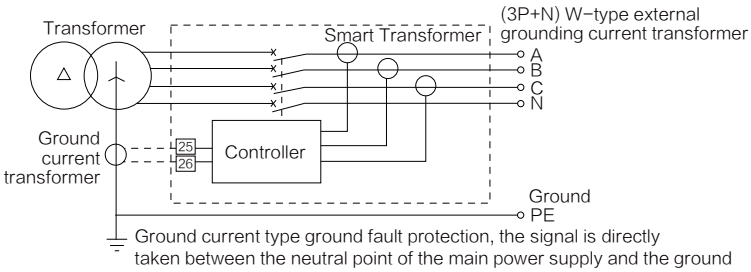
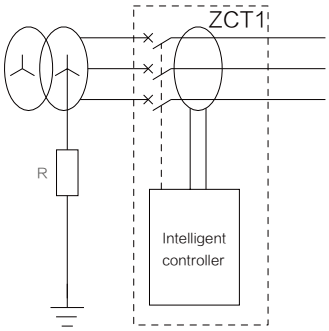
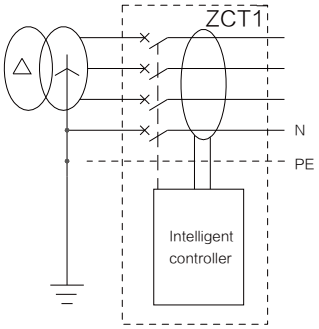


Figure 4

Leakage protection monitoring principle

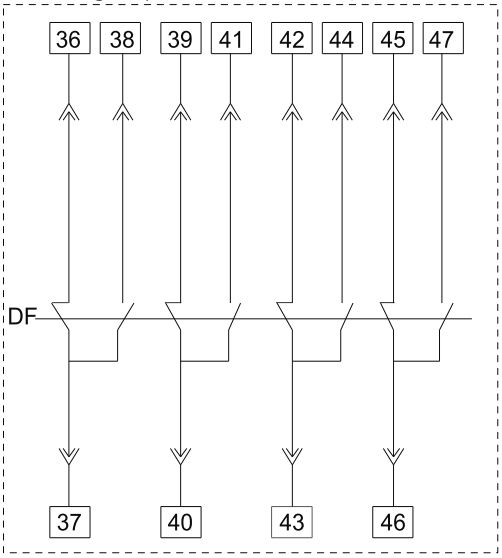




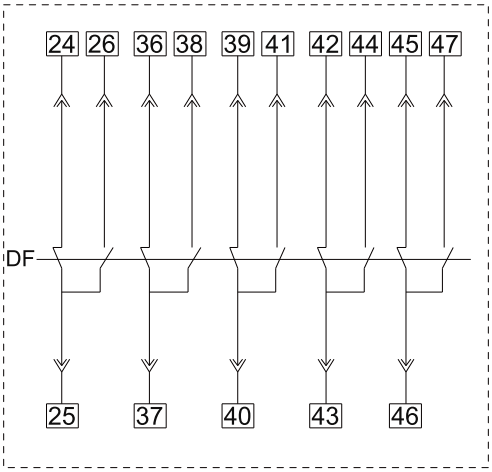
ZCT1:Rectangular leakage current transformer

Leakage Protection		
Setting current	If=	0.5~30.0A+OFF (step difference 0.1A, OFF means closing and exit)
Delay (S)	tf=	Instant，0.06，0.08，0.17，0.25，0.33，0.42，0.5，0.58，0.67，0.75，0.83
Accuracy	± 10% (Intrinsic 40ms)	

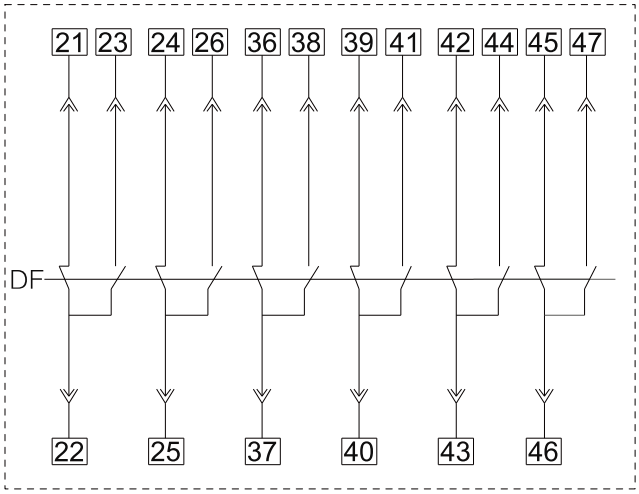
1.Four-group transfer contact (standard configurations)



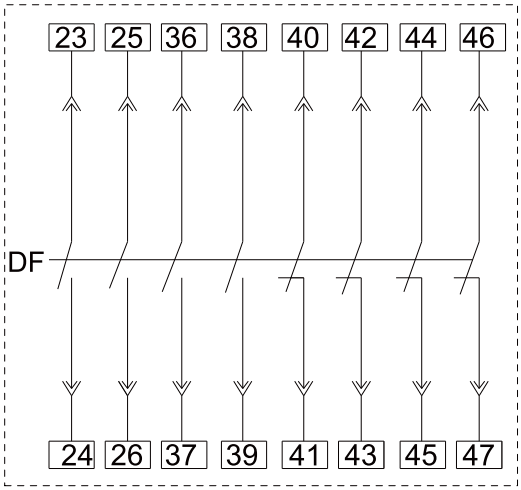
2.Five-group transfer contact (special configuration)



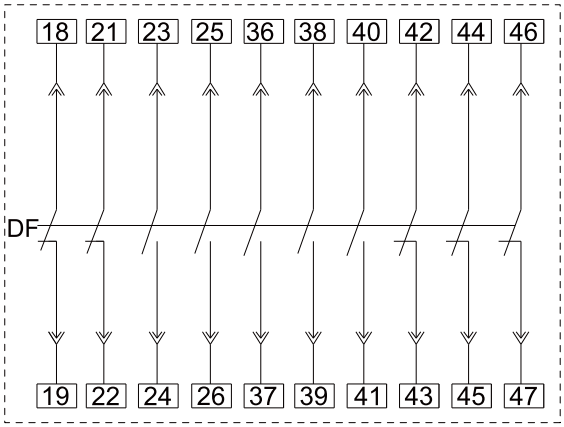
3.Six-group transfer contact (special configuration)



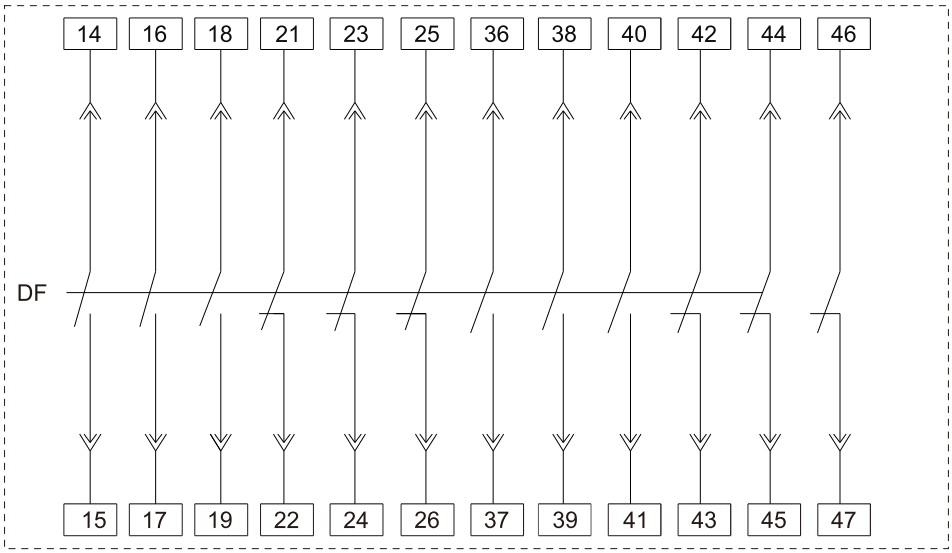
4.Four-normally on and four-normally off contact (special configuration)

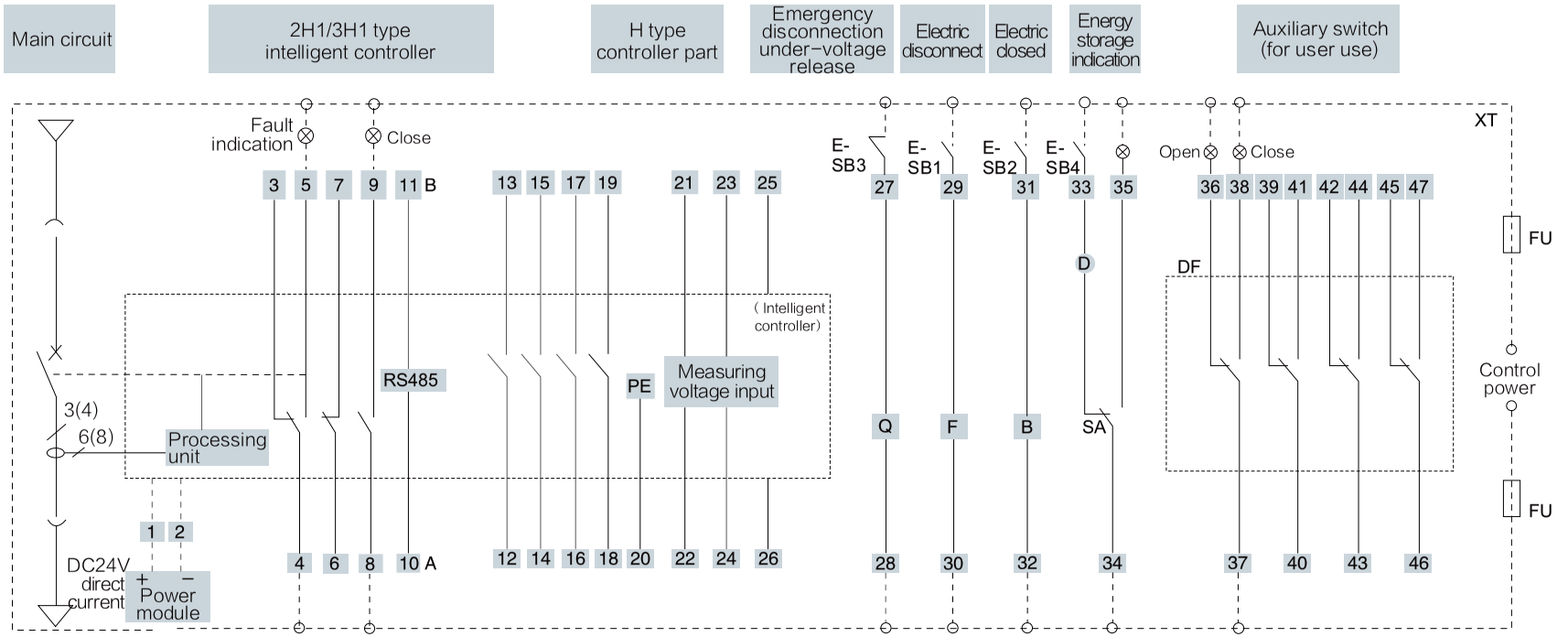


5.Five-normally on and five-normally off contact (special configuration)



6.Six-normally on and six-normally off contact (special configuration)





DF−circuit breaker auxiliary switch

SB1−shunt button (user−supplied)

SB3−under−voltage button (user−supplied)

SB2−close button (user−supplied)

SB4−energy storage button (user−supplied)

1. 2− The input terminal of the working power supply of the controller, and the AC working power supply does not need a DC power supply module.

3, 4, 5 − Fault trip output, 4 is the common point, contact capacity AC250V 3A

6, 7−Auxiliary contact output terminal of circuit breaker status

8, 9−Auxiliary contact output terminal of circuit breaker status

10, 11−RS485 communication interface, corresponding to RS485 communication interface A and B respectively

12, 13 − Relay programmable output contact 1

14, 15 − Relay programmable output contact 2

16, 17 − Relay programmable output contact 3

18, 19 − Relay programmable output contact 4

Q−Under voltage (instantaneous or delayed) release

F−Shunt release

B−Closing electromagnet

D−Energy storage motor

SA−Energy storage motor action (micro) switch

XT− Secondary Terminal

⊗−Signal light (user−supplied)

FU−Fuse

20: PE protection grounding

21, 22, 23, 24−Measurement voltage signal input: corresponding to UN, UA, UB, UC respectively

25, 26−External phase N transformer

Note: 1. Power supply − if the rated voltages of Q, F, B are different, they should be connected to different power supplies (the dotted line part should be connected by the user). The wiring must be sequenced, otherwise the controller will not work properly or may be damaged.

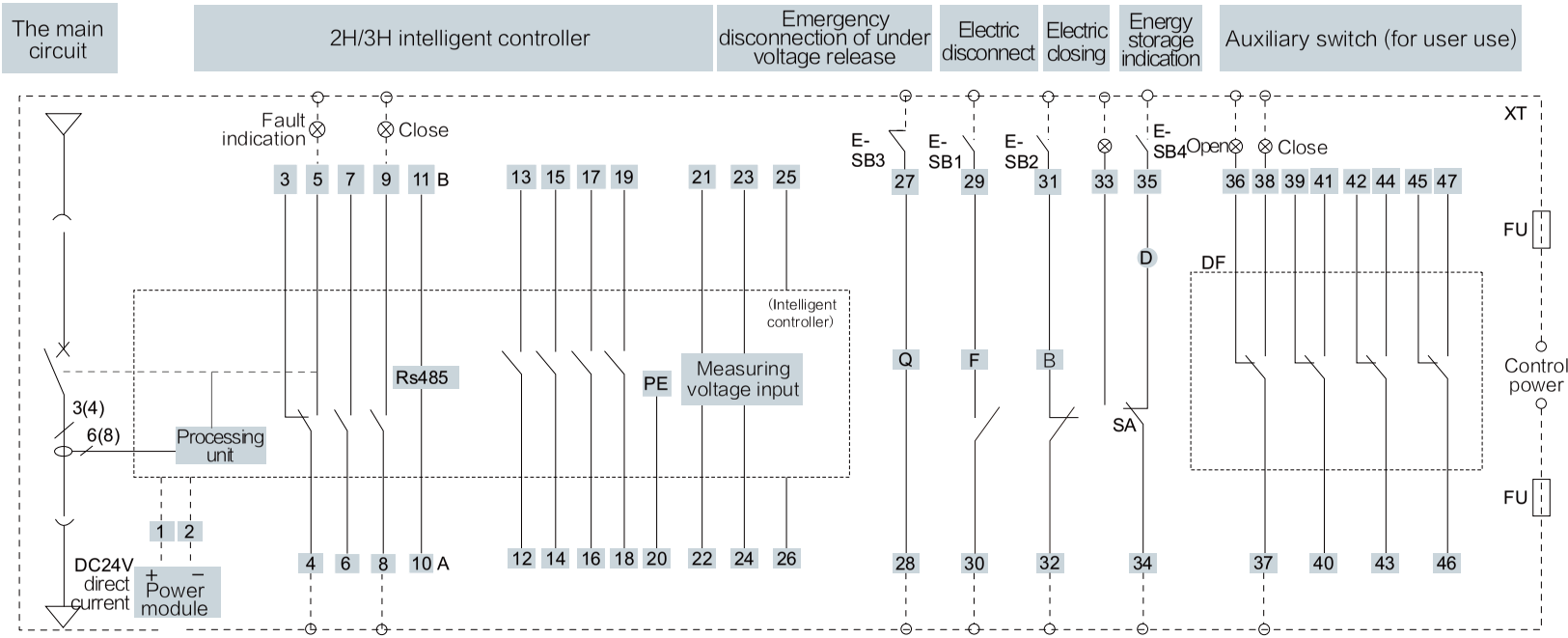
2. Terminals 33 and 34 can be directly connected to the power supply (automatic pre−energy storage), or can be connected to the power supply after the normally open button in series (manually controlled pre−energy storage);The combined output is controlled by the communication function.

The four groups of signal relays are programmable output contacts, and the contact capacity is AC250V 3A. The standard definition is as shown in the figure above.

(Users can specify when purchasing if they need special definitions)

SFW1−1000 type (with 2H1/3H1 type controller) secondary wiring diagram

10.1 SFW1-2000 and above control circuit wiring diagram (user)



Note: When the power supply voltage (working power) of the controller is DC voltage, the controller has its own DC power supply module, which needs to be specially customized;

DF-Auxiliary switch
SB1-Shunt button (user-supplied)
SB3-Undervoltage button (user-supplied)
SB2-Close button (user-supplied)
SB4-Energy storage button (user-supplied)
SA-Energy storage motor action (micro) switch
XT-Secondary circuit terminal
⊗-Signal light (user-supplied)
FU-Fuse
R-Undervoltage (instantaneous or delayed) release
F-Shunt release
B-Closing electromagnet
D-Energy storage motor

Note: Power supply - 1. If the rated voltages of Q, F, X are different, they should be connected to different power supplies (the dotted line part should be connected by the user), and must be wired in sequence, otherwise the controller will not work normally or may cause damage ;

2. Terminals 34 and 35 can be directly connected to the power supply (automatic pre-energy storage), or can be connected in series with the normally open button and then connected to the power supply (manually controlled pre-energy storage);

3. The four groups of signal relays are programmable output contacts, and the contact capacity is AC250V 3A. The standard definition is as shown in the figure above (if the user needs a special definition, it can be specified when purchasing).

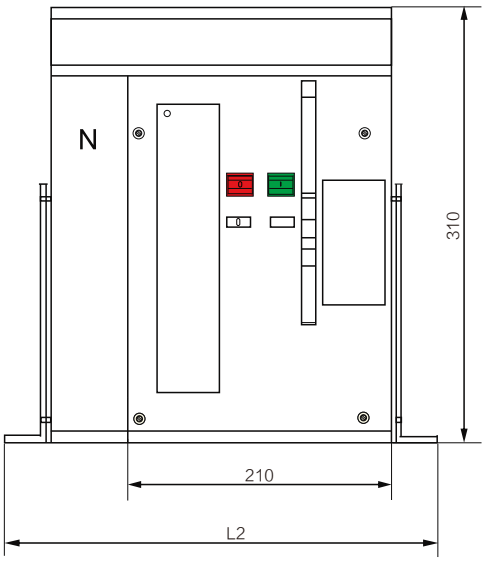
1.2- The input terminal of the working power supply of the controller (common for AC and DC, 1 is "+" and 2 is "-" in DC)
3, 4, 5 - Fault trip contact output terminal, 4 is the common point
6, 7, 8, 9 - Auxiliary contact output terminals for circuit breaker status
10, 11-RS485 communication interface, corresponding to RS485 communication interface A, B respectively
12, 13 - Relay programmable output contact 1
14, 15 - Relay programmable output contact 2
16, 17 - Relay programmable output contact 3
18, 19-Relay programmable output contact 4 20-protective ground wire
20-保护地线
21, 22, 23, 24-Voltage display input terminals: corresponding to UN, UA, UB, UC respectively (with multi-function meter)
25, 26- External phase N transformer (residual current protection is available)

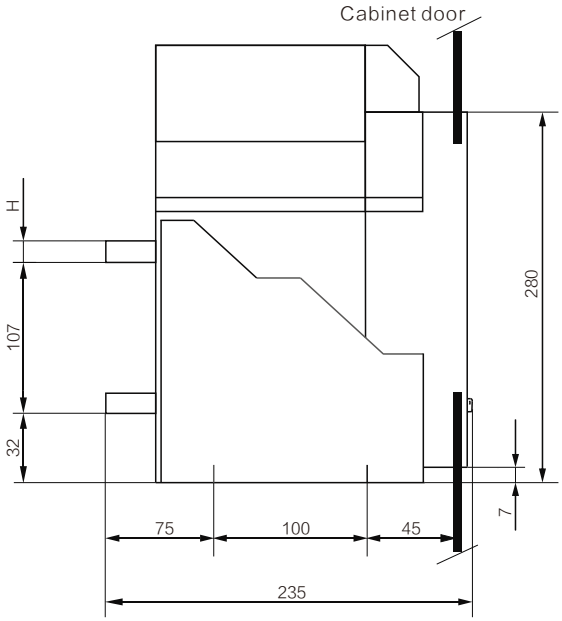
SFW1-2000 and above (with 2H/3H controller) and above frame secondary wiring diagram

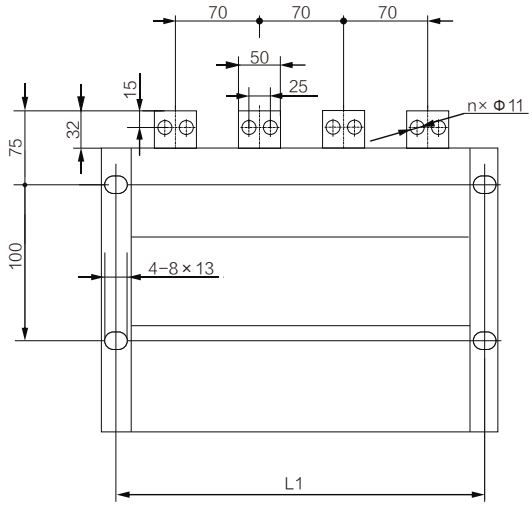
Outline and Installation Dimension

☐ InstallationandoutlinedimensionforSFW1-1000/3andSFW1-1000/4fixed-typecircuitbreakers

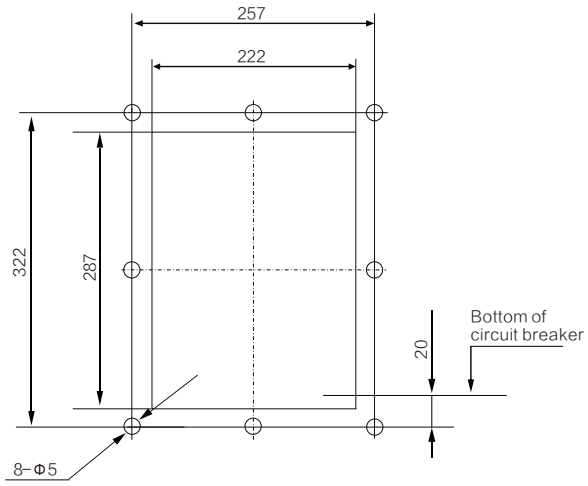
Unit: mm







Bottom mounting dimensions of circuit breaker



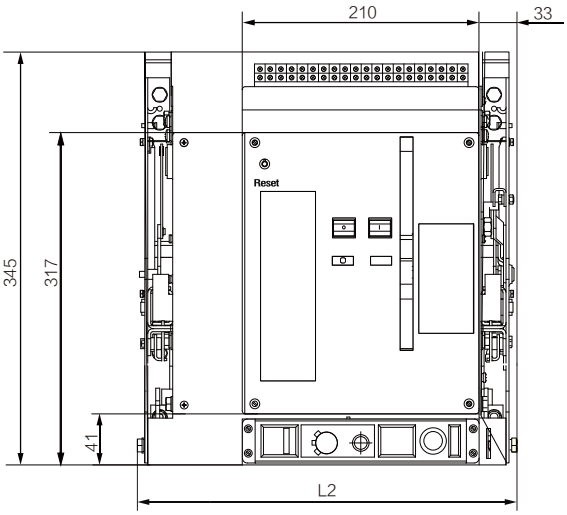
Door frame cut-out size

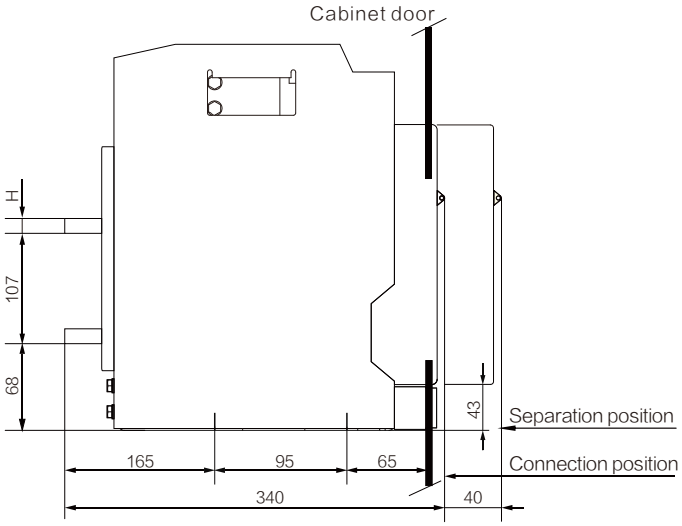
SFW1-1000	L1	L2
Three-pole	242	265
Four-pole	312	335

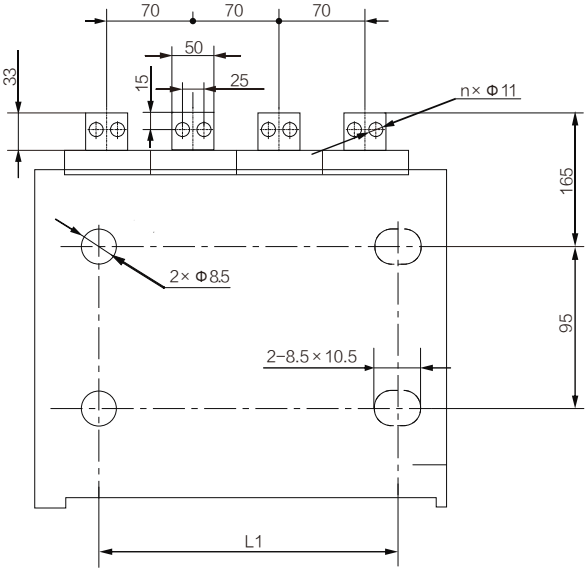
In (A)	n (Three-pole/Four-pole)	H (mm)
200~1000	12/16	10

☐ Installation and external dimensions of SFW1-1000/3,4 drawer circuit breakers

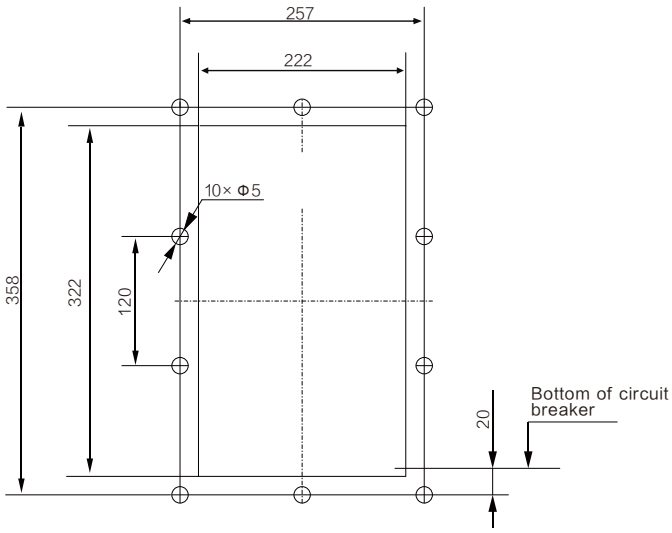
Unit: mm







Bottom mounting dimensions of circuit breaker



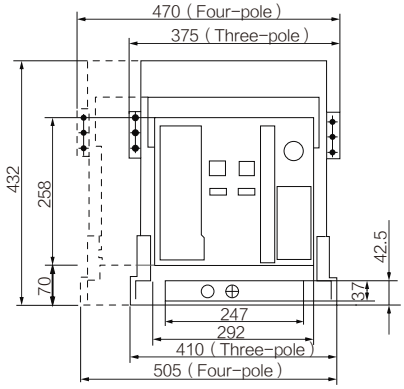
Door frame cut-out size

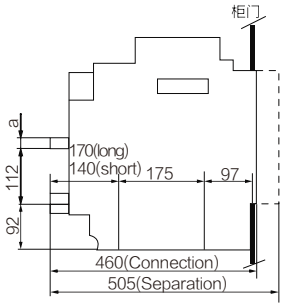
SFW1-1000	L1	L2
Three-pole	145	275
Four-pole	215	345

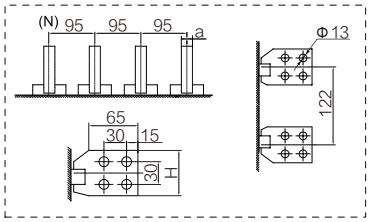
In (A)	n (Three-pole/Four-pole)	H (mm)
200~1000	12/16	10

☐ SFW1-2000/3,4 drawer installation dimensions and door frame cut-out

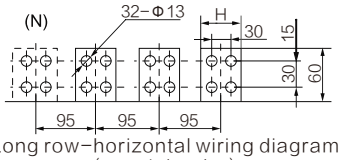
Unit: mm



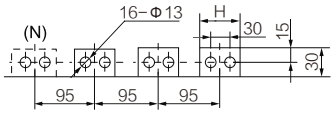




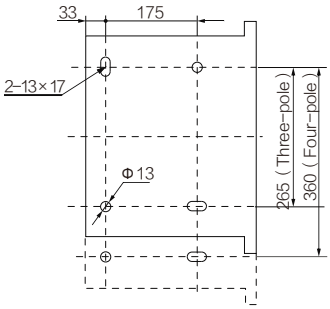
vertical wiring



Long row-horizontal wiring diagram
(special order)

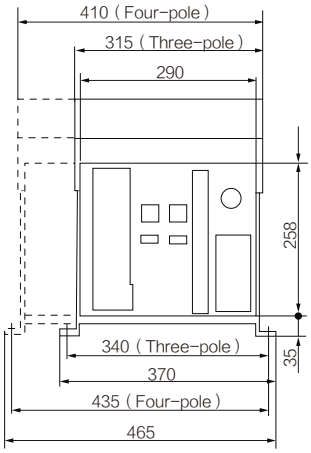


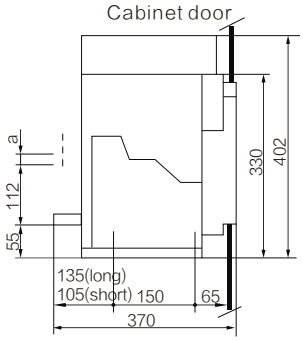
Short row-horizontal wiring diagram
(regular order)

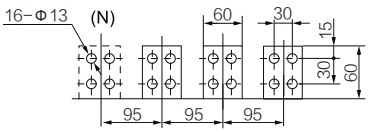


In(A)	a(mm)	H(mm)
630-800	10	60
1000-1600	15	60
2000	20	60

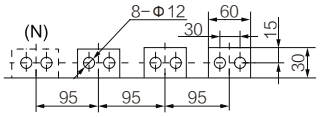
☐ SFW1-2000/3,4 fixed installation dimensions and doorframe cut-out



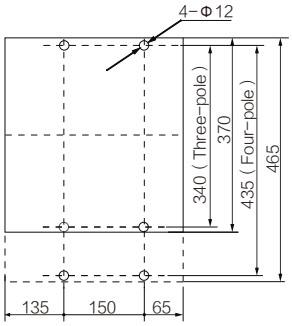




Long row-horizontal wiring diagram
(special order)



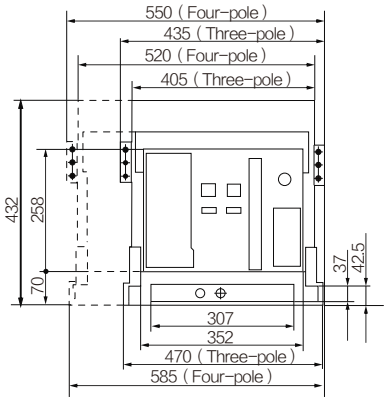
Short row-horizontal wiring diagram
(regular order)

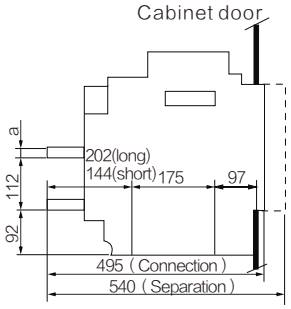


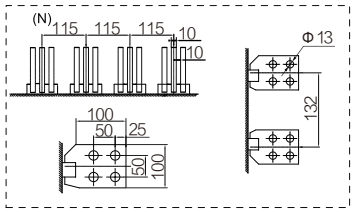
In(A)	a(mm)
630-800	10
1000-1600	15
2000	20

☐ SFW1-3200/3,4 drawer installation dimensions and door frame cut-out

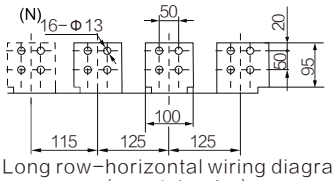
Unit: mm



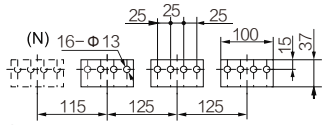




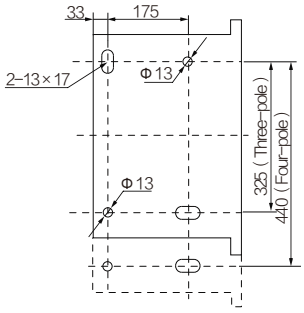
vertical wiring



Long row-horizontal wiring diagram
(special order)

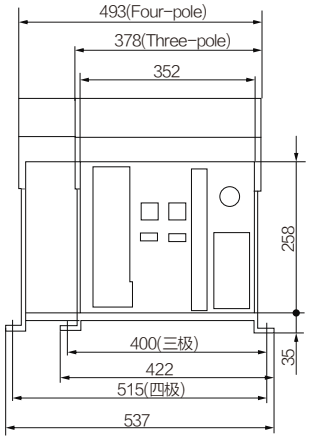


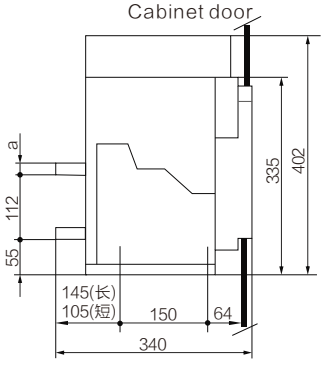
Short row-horizontal wiring diagram
(regular order)

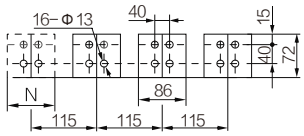


In(A)	a(mm)
2000,2500	20
3200	30

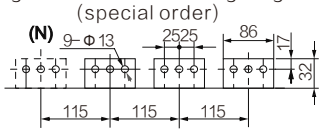
☐ SFW1-3200/3,4 fixed installation dimensions and door frame cut-out



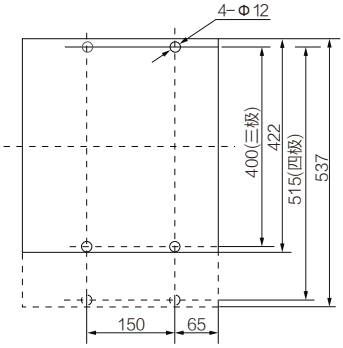




Long row-horizontal wiring diagram
(special order)



Short row-horizontal wiring diagram
(regular order)

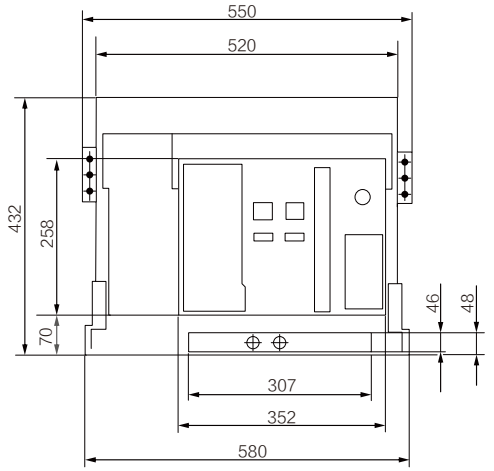


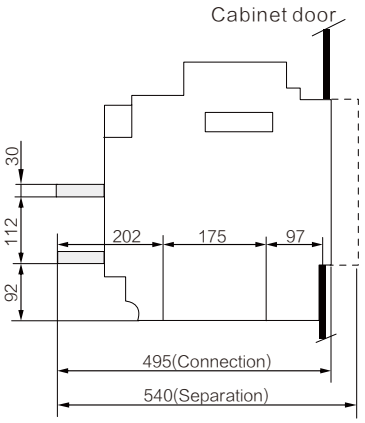
In(A)	a(mm)
2000,2500	20
3200	30

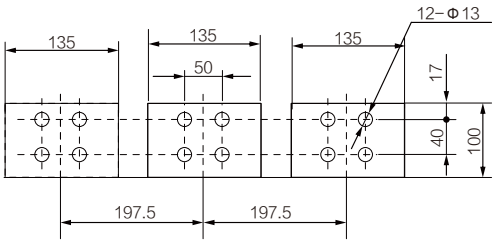
Note: 1. SFW1-3200 housing is default to short row when ordering

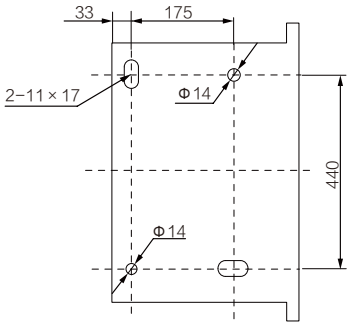
☐ SFW1-4000/3 drawer installation dimensions and door frame cut-out

Unit: mm





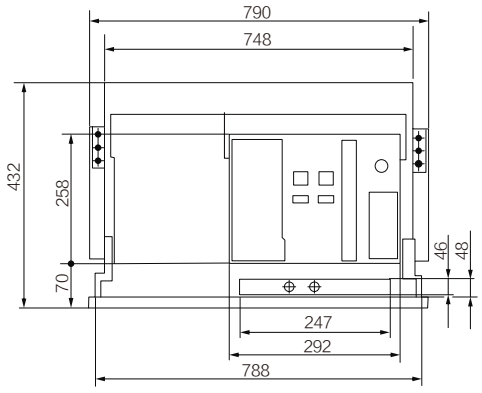


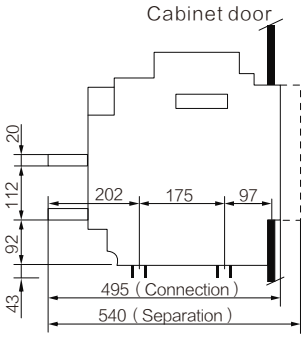


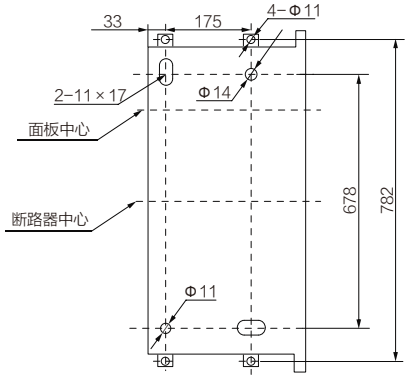
(Horizontal wiring)

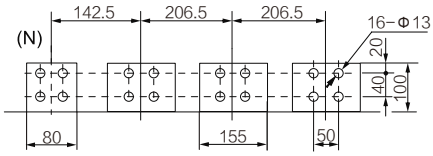
Note: 1. The size of the mounting hole from the center of the panel to the right side of the circuit breaker is 235mm.

☐ SFW1-4000/4 fixed installation dimensions and door frame cut-out







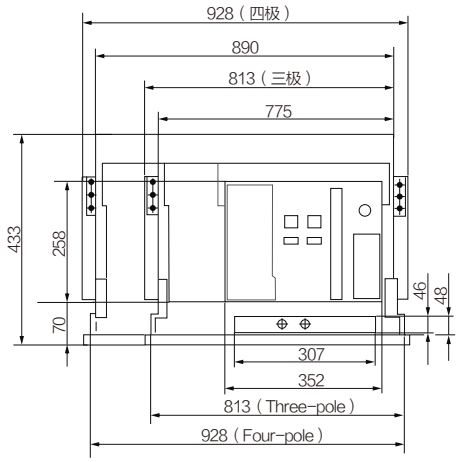


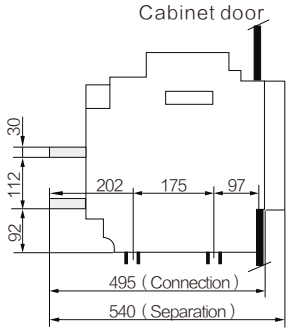
(Horizontal wiring)

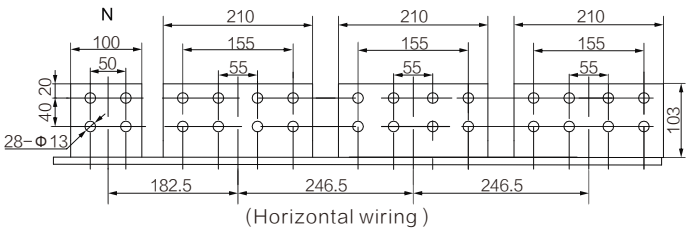
Note: 1. The size of the mounting hole from the center of the panel to the right side of the circuit breaker is 205mm.

☐ SFW1-6300/3,4 drawer installation dimensions and external dimensions (In=4000A,5000A)

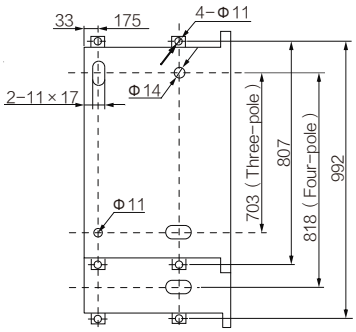
Unit: mm





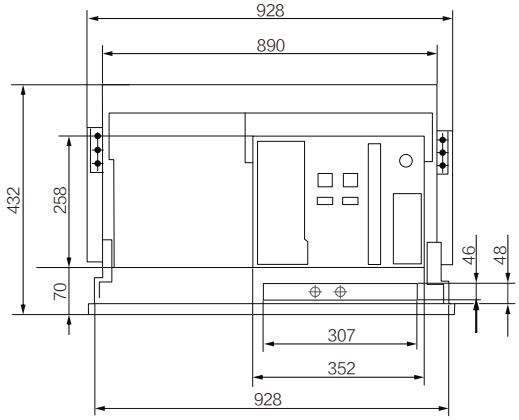


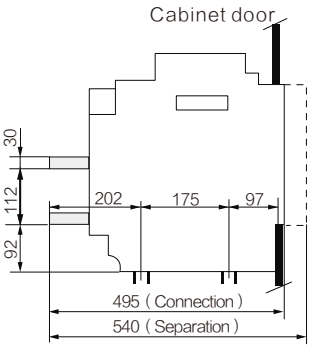
(Horizontal wiring)

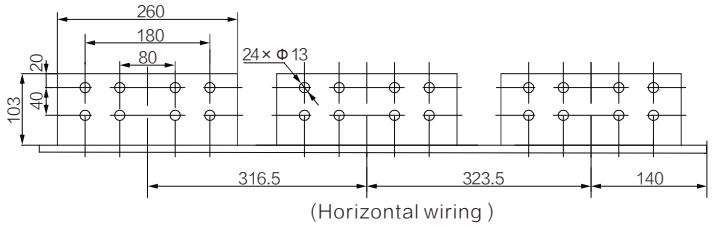


Note: 1. The dimension from the center of the panel to the mounting plate on the right side of the circuit breaker is 235mm, and the dimension from the center of the circuit breaker to the center of the panel is 171.5mm (three poles), 229mm (four poles)

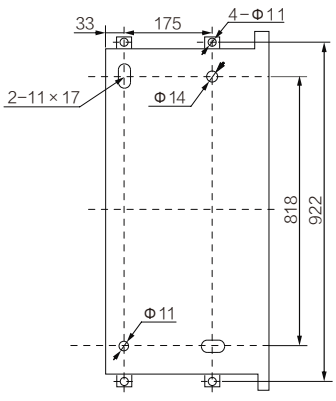
☐ SFW1-6300/3,4 drawer installation dimensions and external dimensions (In=6300A)







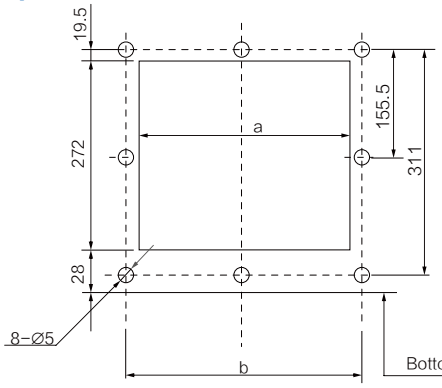
(Horizontal wiring)



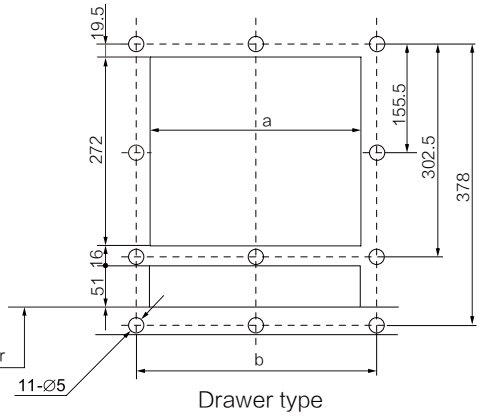
Note: 1. The dimension from the center of the panel to the mounting plate on the right side of the circuit breaker is 235mm, and the dimension from the center of the circuit breaker to the center of the panel is 229mm.

Installation Instructions

2000 type and above door frame size and mounting hole spacing



Fixed type



Drawer type

Inm	a mm	b mm
2000	306	345
3200、4000/3	366	405
4000/4	306	345
6300	366	405

Note: For 1000-style door frame cut-out dimensions, see the corresponding outline and installation dimensions pages.

Derating use (derating at different temperatures)

Executive standard	Ambient temperature	SFW1-1000	SFW1-2000	SFW1-3200、4000	SFW1-6300
GB/T 14048.2 IEC/EN 60947-2	40℃	200，400，630 800，1000	630，800，1000 1250，1600，2000	2000，2500，3600 3200，4000	4000，5000， 6300
	45℃	200，400，630 800，1000	630，800，1000 1250，1550，1900	2000，2400，3500 3000，3800	4000，5000， 6000
	50℃	200，400，630 800，1000	630，800，1000 1250，1500，1850	2000，2300，3400 3000，3600	4000，5000， 5600
	55℃	200，400，630 800，1000	630，800，1000 1200，1400，1800	2000，2200，3300 2800，3400	4000，4800， 5400
	60℃	200，400，630 800，1000	630，800，1000 1150，1300，1700	2000，2200，3200 2800，3200	4000，4800， 5200

When the altitude exceeds 2000 meters, the insulation performance, cooling performance and pressure in the atmosphere will change, and its performance can be corrected by referring to the following table: Derating requirements at different altitudes.

a.Voltage

Altitude (m)	Power frequency withstand voltage (V)	Insulation voltage (V)	Rated working voltage (V)
2000	2200	1000	690
3000	1955	800	580
4000	1760	700	500
5000	1600	600	400

b.Current

Altitude (m)	Rated working current(Ie)
2000	Ie
2500	0.93Ie
3000	0.88Ie
3500	0.83Ie
4000	0.78Ie
4500	0.73Ie
5000	Please contact to manufacturer

Recommended busbar installation

Inm (A)	In (A)	Busbar		
		Thickness（mm）	Width（mm）	The number of
SFW1-1000	200	5	20	1
	400	5	50	1
	630	5	40	2
	800	5	50	2
	1000	5	40	3
SFW1-2000	630	5	60	2
	800	5	60	2
	1000	5	60	2
	1250	10	60	2
	1600	10	60	2
	2000	10	60	3
SFW1-3200	2000	10	60	2
	2500	5	100	4
	3200	10	60	5
SFW1-4000	3200	10	100	5
	3600	10	100	5
	4000	10	100	5
SFW1-6300	4000	10	100	5
	5000	10	100	6
	6300	10	100	6

Note: The specifications in the table are that the circuit breaker is in the surrounding environment of 40° C and installed uncovered, which meets the specifications of the copper bars used under the heat-generating conditions stipulated in GB/T14048.2.

When the copper bar selected by the user cannot match the circuit breaker terminals, it is necessary to design and process the extended busbar for transfer. The extended busbar is designed by the user. The cross-sectional area of the extended busbar cannot be smaller than the requirements in the above table less than the gap between the circuit breaker terminals.

After the busbar is installed as recommended in the table above, the electrical clearance between the same poles of the circuit breaker must be ensured not less than 18mm. When the thyristor is used in the load equipment for three-phase rectification and high-frequency inverter electrical components, such as high-frequency induction heating electric furnace (intermediate frequency furnace steelmaking equipment), solid-state high-frequency welding machine (such as submerged arc welding machine), vacuum heating Melting equipment (such as monocrystalline silicon growth furnace), when selecting circuit breakers, in addition to the influence of ambient temperature and altitude, it is also necessary to consider the influence of high-order harmonics generated by thyristors on circuit breakers. For derating use, a derating factor (0.5~0.8) is recommended.

After the circuit breaker is installed, the safety distance between charged bodies of different potentials and between the charged bodies and the ground shall not be less than 18mm.

Power loss of incoming and outgoing lines of circuit breaker (each pole)

In (A)	Power	Consumption(W)	
		Drawer type	Fixed type
SFW1-1000	200	80	15
	400	95	30
	630	115	45
	800	140	80
	1000	230	110
SFW1-2000	630	70	34.4
	800	110	50
	1000	172	78
	1250	268	122
	1600	440	200
	2000	530	262
SFW1-3200	2000	384	200
	2500	600	312
	3200	737	307
SFW1-4000	4000/3	921	450
	4000/4	900	-
SFW1-6300	4000	575	-
	5000	898	-
	6300	1426	-

MCCB

Molded Case Circuit Breaker SFM

Model Selection Table

SF M 3 – 630 H / 3 3 00 2 A P R D 400A

Rated Current 10–630A

Operating Mechanism

D:Electric operating mechanism
TA (square handle) TB (round handle): Manual operating mechanism

Wiring Mode

No code (front–panel wiring),
R (back–panel wiring), PR (plug–in)

Operation Mode

No: Direct operation with handle
P: Electric operating
Z: Operation by rotating handle

N–pole Form

Form of neutral grade (N–pole) for 4–pole product:
Type–A: N–pole is not installed with over–current trip, and N–pole is always connected, but not made/broken with other three poles
Type–B: N–pole is not installed with over–current trip, and N–pole is made/broken with other three poles

Use Code

No: Circuit breaker for power distribution
2: Protective motor

Accessory Code

See “List of Accessory Codes”

Trip Mode Code

2: Electromagnetic trip only
3: Thermal–Electromagnetic trip

Number of Poles 3 poles/4 poles

Breaking Capacity

L:Basic–type
M:Relatively high breaking–type
H:High breaking–type

Housing Rating

63/125/250/400/630

Design No. 3

Product Category

Molded case circuit breaker

Enterprise Code Sfere Electric

Purpose and scope of application

- ☐ More convenient maintenance: Modular installation of accessories, free selection, easier inventory.
- ☐ More advanced structure: Patented design such as quick-rod structure and double-spacing structure, the product performance is better.
- ☐ More complete accessories: Complete product accessories are available for selection, with stronger expansion functions to meet the diverse requirements of customers.
- ☐ Wider temperature: The working environment temperature is -35℃to -70℃, and the product is widely used.
- ☐ Smaller size: Using a new technology platform.
- ☐ Wider and higher voltage: The rated working voltage is up to 690V, and the rated insulation voltage is up to 1000V, which meets the requirements of railway, new energy, electric power, metallurgy and other industries.
- ☐ Safer Operation: Clamshell design, double insulation, safer maintenance operation.
- ☐ More reliable products: Automatic assembly and testing equipment to provide high-quality products.
- ☐ More Exquisite Appearance: The unified industrial design of the whole series makes the appearance more beautiful.

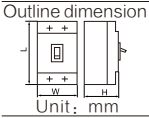
Product and Features

SFM3 series molded case circuit breaker (hereinafter referred to as "circuit breaker") is suitable for infrequent transfer and infrequent starting of motor in circuits with AC 50/60Hz, rated insulation voltage up to 1,000V, rated working voltage up to 415/690V and rated working current up to 800A (Inm≤400A and below). The circuit breaker has the overload and short-circuit protection functions, and can protect the circuit and power equipment from damage. The circuit breaker has the features of small dimension, high breaking capacity, short arc, vibration resistance etc. The circuit breakers can be installed vertically (i.e., vertical installation) or horizontally.

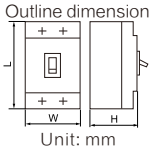
Normal Working Environment

- ☐ The ambient air temperature is -5℃ to +40℃.
- ☐ The altitude of the installation site shall not be more than 2,000m.
- ☐ The relative humidity of the air at the installation site shall not be more than 50% when the highest temperature is +40℃, and may be higher when the temperature is lower. For example, it can reach 90% when the temperature is 20℃. Special measures shall be adopted for occasional condensations due to temperature changes.
- ☐ The pollution class is Class-3.
- ☐ The installation category of the main circuit of the circuit breaker is Category-III, and the installation category of the other auxiliary circuits and control circuits is Category-Ⅱ.
- ☐ The circuit breaker is suitable for electromagnetic environments.
- ☐ The circuit breaker shall be installed in a place without explosion hazard, conductive dust or any substance that can corrode the metal and damage the insulation.
- ☐ The circuit breaker shall be installed in a place free from rain or snow.
- ☐ Storage Condition: The ambient air temperature is -40℃ to +70℃.

Main Technical Parameters

Model		SFM3-63			SFM3-125				SFM3-250			
Housing rating Inm (A)		63			125				250			
Rated current In (A)		10/16/20 25/32/40/50/63			16/20/25/32/40/50 63/80/100/125				100/125/140 160/180/200/225/250			
Rated working voltage Ue (V)		AC415/690										
Rated insulation voltage Ui (V)		AC1000										
Rated impulse withstand voltage Uimp		8kV							12kV			
Number of poles		3	3	4	3	3	3	4	3	3	3	4
Rated limit short-circuit breaking capacity level		L	M	M	L	M	H	M	L	M	H	M
Rated limit short-circuit breaking capacity Icu (kA)	AC690V	8kA	12kA	12kA	12kA	20kA	25kA	20kA	16kA	20kA	30kA	20kA
	AC415V	36kA	55kA	55kA	50kA	70kA	100kA	70kA	50kA	70kA	100kA	70kA
Rated operating short-circuit breaking capacity Ics (kA)	AC690V	5kA	10kA	10kA	80kA	15kA	18kA	15kA	8kA	15kA	20kA	15kA
	AC415V	36kA	40kA	40kA	40kA	50kA	70kA	50kA	40kA	50kA	70kA	50kA
Mechanical life (times)	With machine maintenance	40000			40000				40000			
	Without machine maintenance	20000			20000				20000			
Outline dimension  Unit: mm	L	130			150				165			
	W (3P/4P)	75/100			92/122				107/142			
	H (L/M, H)	60			64.5/82.5				86/103			

Main Technical Parameters

Model		SFM3-400				SFM3-630			
Housing rating Inm (A)		400				630			
Rated current In (A)		200/250/315/ 350/400				400/500/630			
Rated working voltage Ue (V)		AC415/690							
Rated insulation voltage Ui (V)		AC1000							
Rated impulse withstand voltage Uimp		12kV							
Number of poles		3	3	3	4	3	3	3	4
Rated limit short-circuit breaking capacity level		L	M	H	M	L	M	H	M
Rated limit short-circuit breaking capacity Icu (kA)	AC690V	16kA	20kA	35kA	20kA	16kA	20kA	35kA	20kA
	AC415V	50kA	75kA	100kA	75kA	50kA	75kA	100kA	75kA
Rated operating short-circuit breaking capacity Ics (kA)	AC690V	8kA	15kA	22kA	15kA	8kA	15kA	22kA	15kA
	AC415V	50kA	70kA	75kA	70kA	50kA	70kA	75kA	70kA
Mechanical life (times)	With machine maintenance	20000				20000			
	Without machine maintenance	10000				10000			
Outline dimension  Unit: mm	L	257				257			
	W (3P/4P)	150/198				150/198			
	H (L/M, H)	100				100			

Protection features

The thermal release of the circuit breaker has inverse time characteristics; the electromagnetic release is instantaneous.

Rated current of trip unit （A）	Thermal release (ambient temperature +40℃)		Electromagnetic release operating current （A）	Remark
	(h)(cold status) inactive time (h)	(h)(cold status) inactive time (h)		
10≤In≤25	>1	≤1	300	Distribution type
25≤In≤63			10In±20%	
63≤In≤630	>2	≤2		
Rated current of trip unit （A）	(h)(cold status) inactive time (h)	(h)(cold status) inactive time (h)	Electromagnetic release operating current （A）	
10≤In≤25	>1	≤1	300	Motor protection type
25≤In≤63			12In±20%	
63≤In≤630	>2	≤2		

Power loss

Model	Rated current （A）	Three/four-pole total power loss （W）		
		Front panel wiring	Rear panel wiring	Plug-in rear wiring
SFM3-63(L, M)	63	28	31	32
SFM3-125(L, M, H)	125	28	31	32
SFM3-250(L, M, H)	250	63	90	90
SFM3-400(L, M, H)	400	68	72	100
SFM3-630(L, M, H)	630	180	190	200

Ambient temperature change derating factor

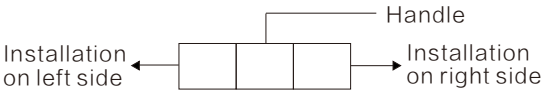
Model	+40℃	+45℃	+50℃	+55℃	+60℃
Factor	Derating factor	Derating factor	Derating factor	Derating factor	Derating factor
SFM3-63(L, M)	1In	0.95In	0.89In	0.84In	0.76In
SFM3-125(L, M, H)	1In	0.95In	0.89In	0.84In	0.76In
SFM3-250(L, M, H)	1In	0.96In	0.91In	0.87In	0.82In
SFM3-400(L, M, H)	1In	0.94In	0.87In	0.81In	0.73In
SFM3-630(L, M, H)	1In	0.93In	0.88In	0.83In	0.76In

Note: The above derating factors are all measured under the rated current of the general frame class.

Altitude derating factor

Altitude	2000	2500	3000	3500	4000	4500	5000
Working current correction factor	In	In	0.98In	0.97In	0.96In	0.95In	0.94In
Working voltage correction factor	Ue	Ue	0.83Ue	0.77Ue	0.71Ue	0.67Ue	0.63Ue
Power frequency withstand voltage correction factor	U	U	0.89U	0.85U	0.80U	0.77U	0.73U

Accessory Code



□ Alarm contact
■ Auxiliary contact
● Shunt trip
○ Under-voltage trip
→ Lead direction

Code	Accessory Name \ Model	Number of Poles	SFM3-63 3	SFM3-63 4	SFM3-125 3	SFM3-125 4	SFM3-250 3	SFM3-250 4	SFM3-400/630 3	SFM3-400/630 4
00	No accessory									
08	Alarm contact		←□		←□		←□		←□	
10	Shunt trip		←●		←●		←●		←●	
20	Single auxiliary contact (1NO1NC)		←■		←■		←■		–	
	Dual auxiliary contacts (2NO2NC)		–		–		–		←■■→	
30	Under-voltage trip		←○		←○		←○		←○	
40	Shunt trip, auxiliary contact (1NO1NC)		←●■→		←●■→		←●■→		–	
	Shunt trip, auxiliary contact (2NO2NC)		–		–		–		←●■■→	
50	Shunt trip, under-voltage trip		←○●		←○●		←○●		←○●	
60	Two sets of single auxiliary contacts (2NO2NC)		←■■→		←■■→		←■■→		–	
	Two sets of dual auxiliary contacts (4NO4NC)		–		–		–		←■■■■→	
70	Under-voltage trip, auxiliary contact (1NO1NC)		←○■→		←○■→		←○■→		–	
	Under-voltage trip, auxiliary contact (2NO2NC)		–		–		–		←○■■→	
18	Shunt trip, alarm contact		←●□→		←●□→		←●□→		←□●	
28	Single auxiliary contact (1NO1NC), alarm contact		←■□→		←■□→		←■□→		–	
	Dual auxiliary contacts (2NO2NC), alarm contact		–		–		–		←■■□→	
38	Under-voltage trip, alarm contact		←○□→		←○□→		←○□→		←○□	
48	Shunt release, single auxiliary contact (1NO1NC), alarm contact		←●■□→		←●■□→		←●■□→		–	
	Shunt release, dual auxiliary contacts (2NO2NC), alarm contact		–		–		–		←●■■□→	
68	Two-group auxiliary contact (2NO2NC), alarm contact		←■■□→		←■■□→		←■■□→		–	
	Two-group auxiliary contact (4NO4NC), alarm contact		–		–		–		←■■■■□→	
78	Single auxiliary contact (1NO1NC), undervoltage release, alarm contact		←○■□→		←○■□→		←○■□→		–	
	Dual auxiliary contacts (2NO2NC), undervoltage release, alarm contact		–		–		–		←○■■□→	

Note: "–" No

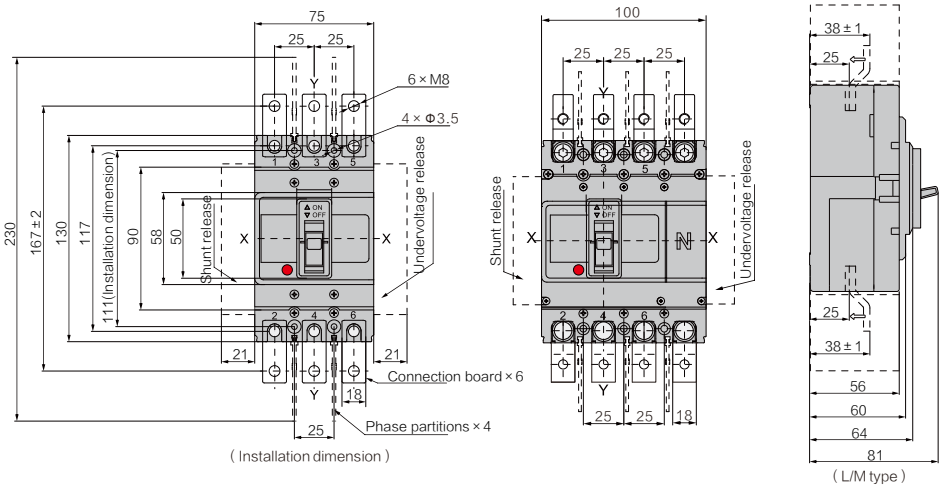
Outline and Installation Dimension

☐ SFM3-63 front-panel wiring

(X-X, Y-Y three-pole circuit breaker center)

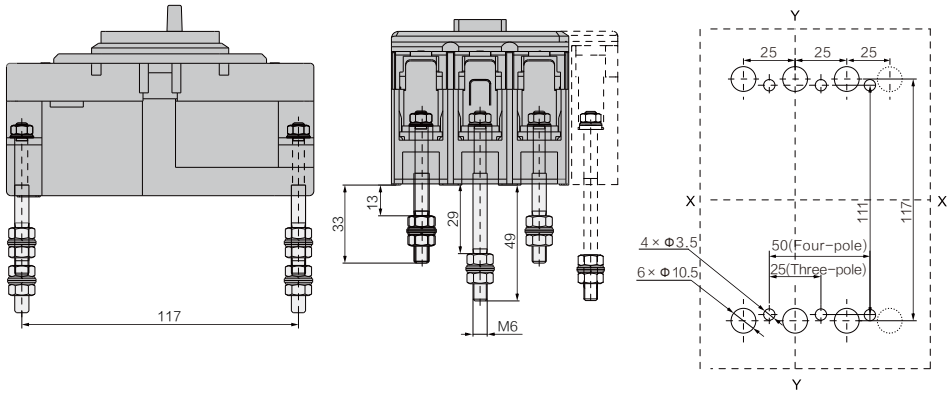
Unit: mm

☐ SFM3-63

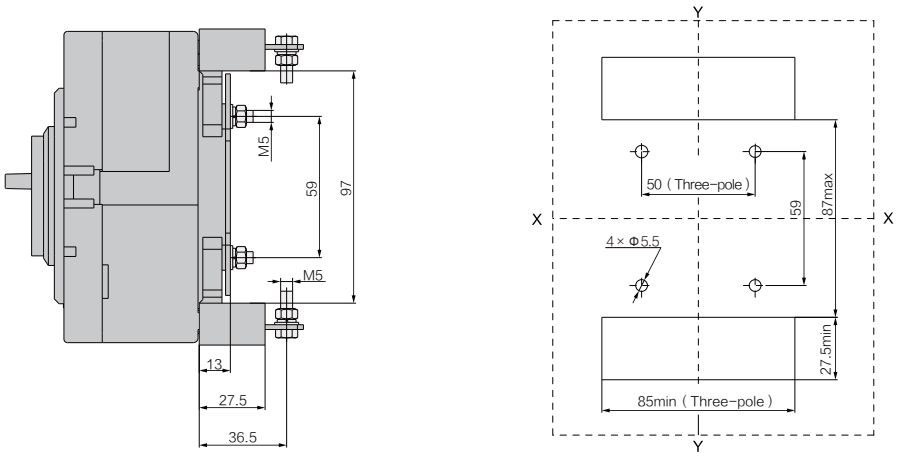


☐ SFM3-63 back-panel wiring

(X-X, Y-Y three-pole circuit breaker center)



☐ SFM3-63 plug-in

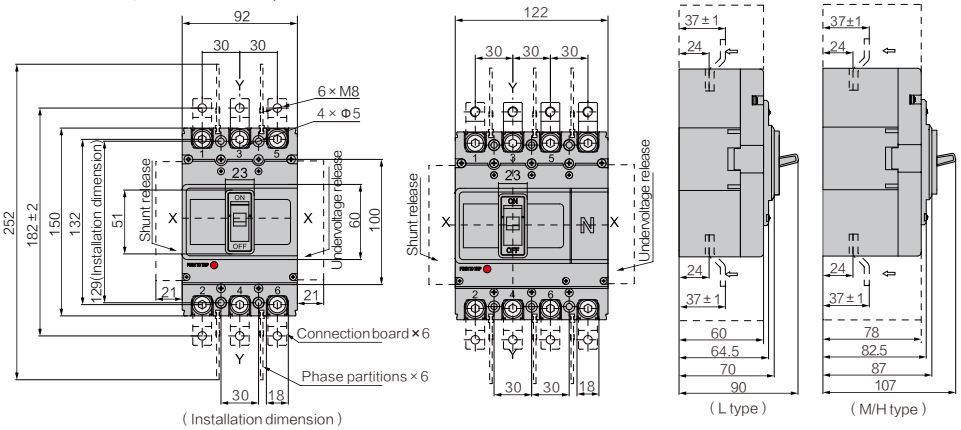


☐ SFM3-125

☐ SFM3-125 front-panel wiring

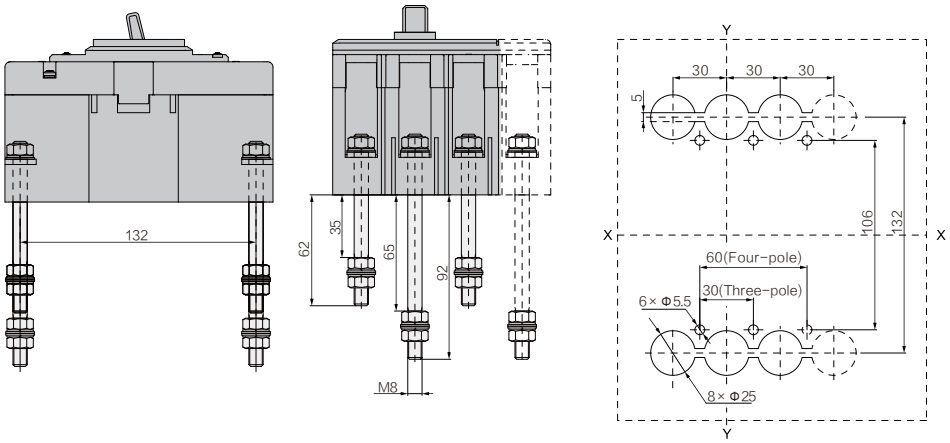
(X-X, Y-Y three-pole circuit breaker center)

Unit: mm

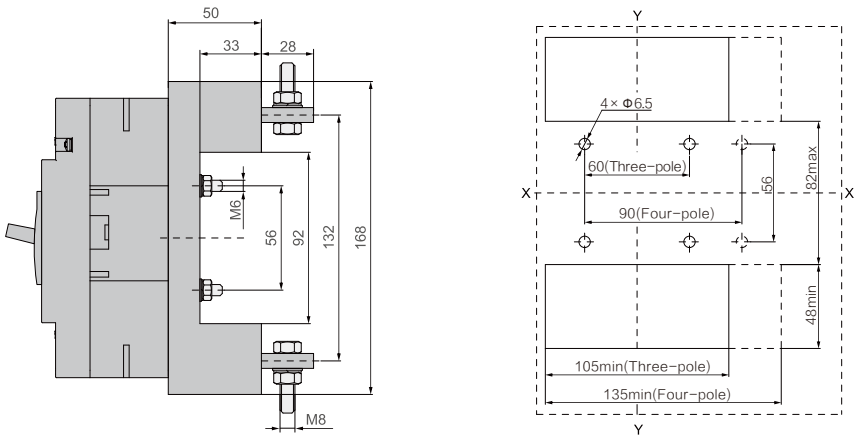


☐ SFM3-125 back-panel wiring

(X-X, Y-Y three-pole circuit breaker center)



☐ SFM3-125 plug-in

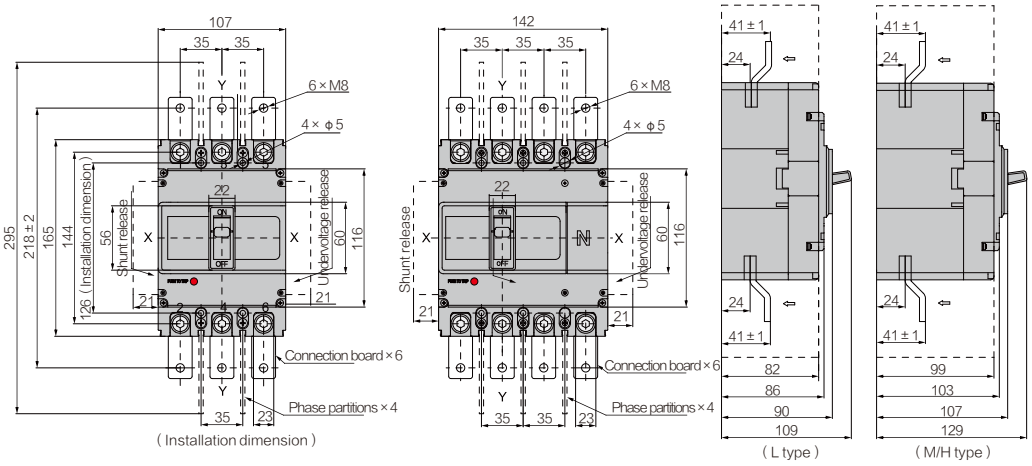


☐ SFM3-250 front-panel wiring

(X-X, Y-Y three-pole circuit breaker center)

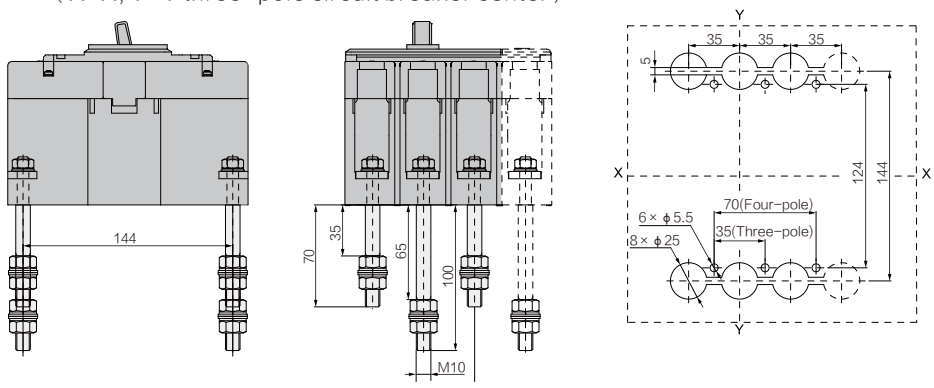
Unit: mm

☐ SFM3-250

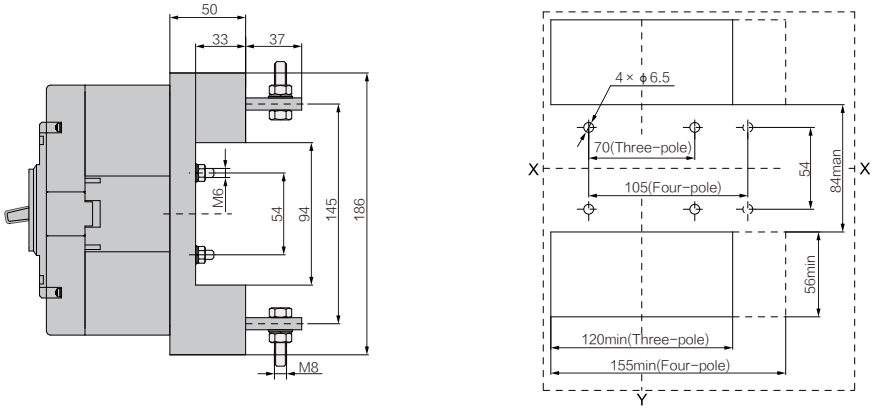


☐ SFM3-250 back-panel wiring

(X-X, Y-Y three-pole circuit breaker center)



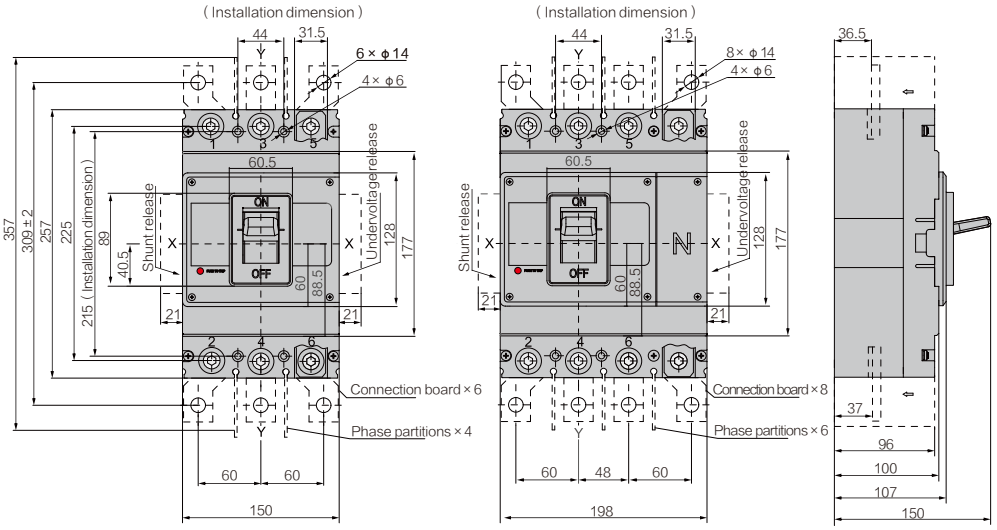
☐ SFM3-250 plug-in



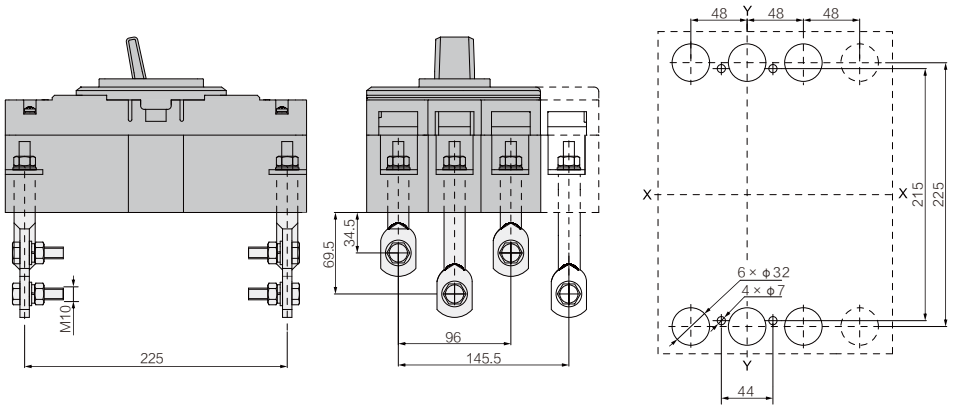
☐ SFM3-400 front-panel wiring

Unit: mm

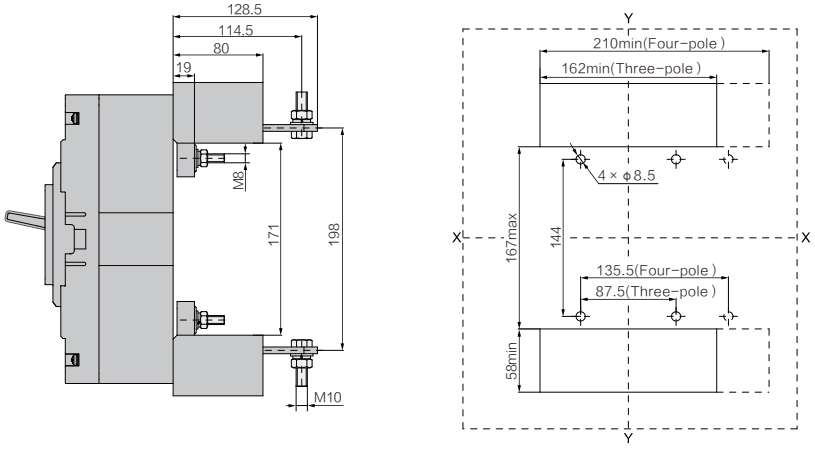
☐ SFM3-400



☐ SFM3-400 back-panel wiring



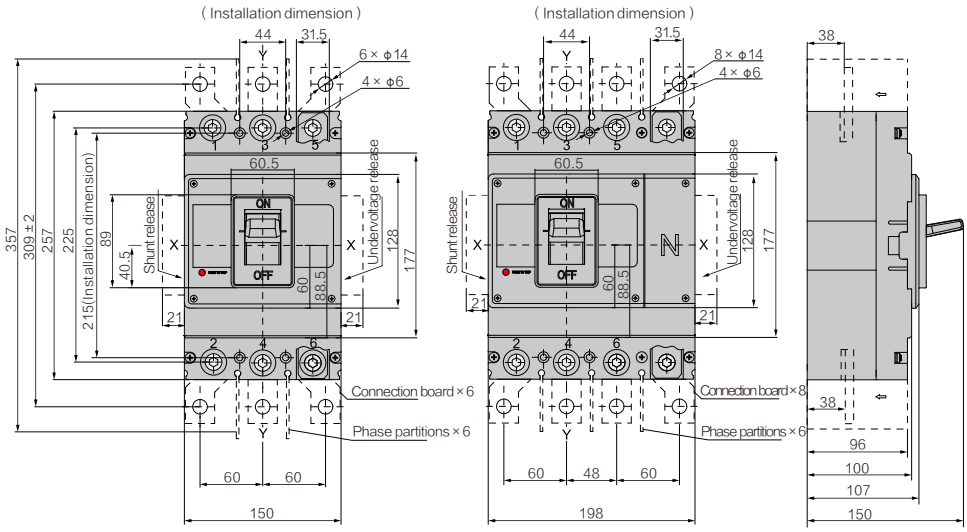
☐ SFM3-400 plug-in



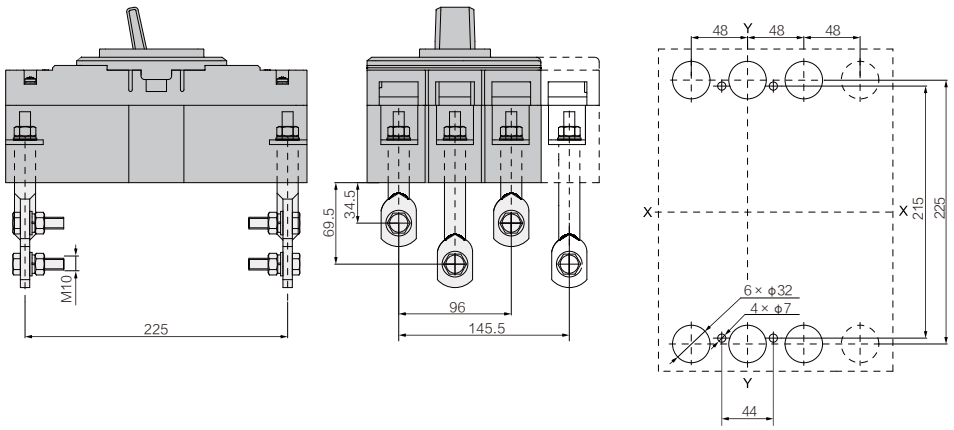
☐ SFM3-630

☐ SFM3-630 front-panel wiring

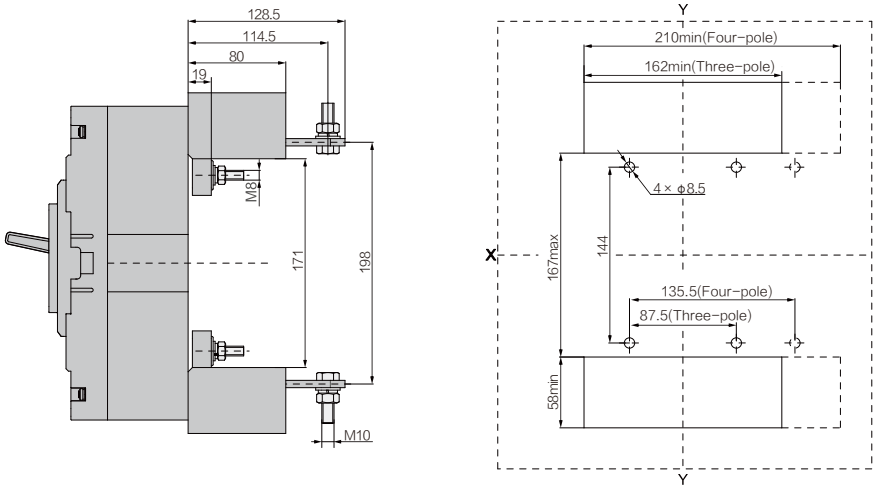
Unit: mm



☐ SFM3-630 back-panel wiring



☐ SFM3-630 plug-in

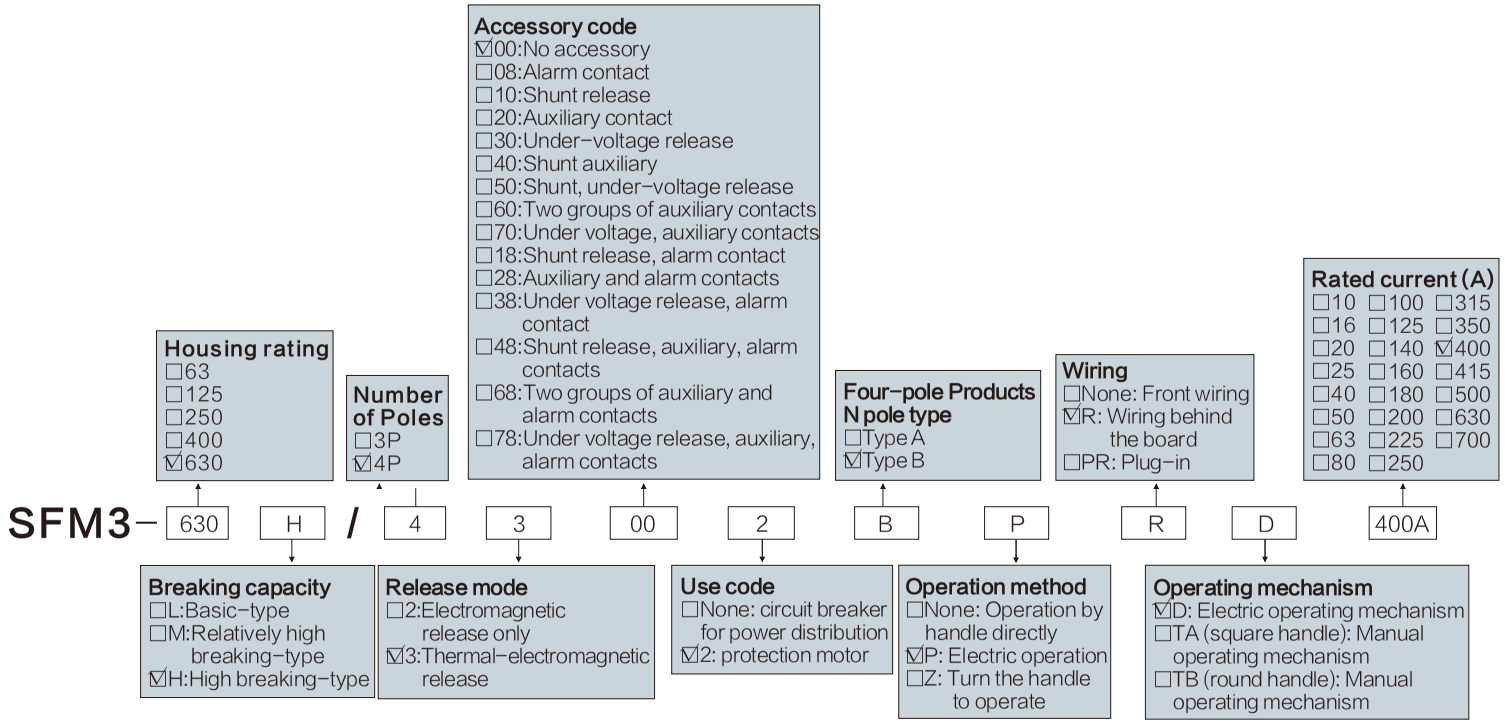


Order specification

User	xxxCo., Ltd.	Quantity	100	Date	2021.1.1

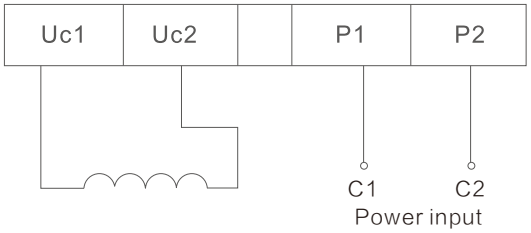
Example model:

SFM3 – 630 H / 4 3 00 2 B P R D 400A



Optional Accessories of SFM3 Series Molded Case Circuit Breaker

Under-voltage Trip



Under-voltage release wiring diagram

SFM3-63 to SFM3-250 under-voltage trip

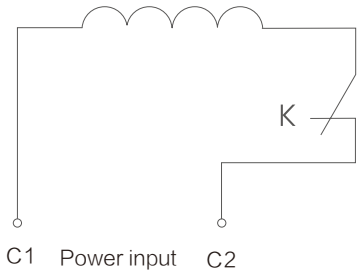
SFM3-400 to SFM3-630 under-voltage trip

☐ When the rated voltage is 35%~70%, the under-voltage release should reliably trip the circuit breaker;
☐ At 85%~110% of the rated voltage, the under-voltage release should ensure that the circuit breaker can be closed;
☐ When the rated voltage is lower than 35%, the under-voltage release shall prevent the circuit breaker from closing.
Warning: The under-voltage release must be energized before the circuit breaker can be tripped and closed. Otherwise, the circuit breaker will be damaged! Note: The lead-out length of the direct wire is 30cm by default at the factory. If it exceeds, please order instructions.

Shunt Trip

The rated control voltage of the shunt release is: AC230V, AC400V, DC24V. When the rated control power supply voltage is between 70% and 110%, the shunt release should reliably trip the circuit breaker.

Wiring Diagram



SFM3-63 to SFM3-250 shunt trip

SFM3-400 to SFM3-630 shunt trip

Note: When the rated control power supply voltage is DC24V or DC24~30V, there are two solutions
Option 1: Use DC24V or DC24~30V shunt release, but the following conditions should be met: The maximum length of copper wires (the length of each of the two wires) must meet the following conditions, and the power supply at the release terminals must be Meet the minimum 50W requirement.

Applied voltage	Maximum copper wire length (each length of two wires)	
	1.5mm²	2.5mm²
100% power supply voltage	150m	250m
85% power supply voltage	100m	160m

Note: The lead-out length of the direct wire is 30cm by default in the factory.

Option 2: Use DC24V intermediate relay AC23V or AC400V shunt release, and the contact capacity of the intermediate relay is not less than 1A.

Auxiliary contact

Auxiliary contacts are used for automatic control of the control circuit of the circuit breaker. (such as the signal indication of the opening and closing status of the circuit breaker)

Circuit breaker status	Auxiliary wiring diagram of circuit breaker below housing rating 250	Auxiliary wiring diagram of circuit breaker with housing rating 400 and above
Closed position	F12 F14 F11	F12 F14 F11 F22 F24 F21
Open position	F12 F14 F11	F12 F14 F11 F22 F24 F21

Auxiliary contact

Note: The lead-out length of the direct wire is 50cm by default in the factory.

Alarm contact

The alarm contact is used for the alarm contact not to alarm when the circuit breaker is normally closed and opened, and to alarm when the circuit breaker is overloaded, short-circuited, and under-voltage of the line and equipment to ensure the opening.

Circuit breaker status	Alarm contact wiring diagram
Closing and opening positions	B12 B14 B11
Free trip position	B12 B14 B11

Alarm contact

Note: The lead-out length of the direct wire is 30cm by default at the factory. If it exceeds, please order instructions.

Auxiliary alarm contact

The auxiliary alarm contact is used for automatic control of the control circuit of the circuit breaker and for alarming when the circuit breaker is overloaded, short-circuited, and under-voltage faults of lines and equipment are opened.

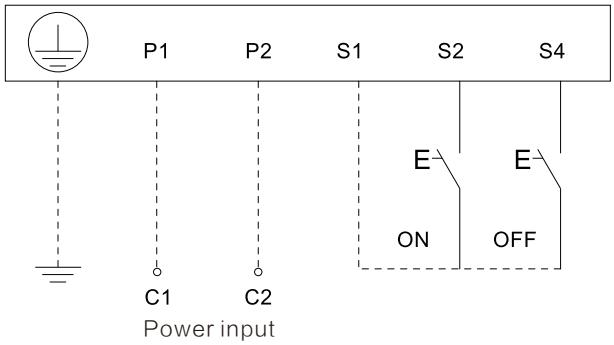
Circuit breaker status	Auxiliary alarm contact wiring diagram
Closing position	F12 F14 F11 B12 B14 B11
Opening position	F12 F14 F11 B12 B14 B11
Free trip position	F12 F14 F11 B12 B14 B11


Auxiliary alarm contact

Note: The lead-out length of the direct wire is 30cm by default at the factory. If it exceeds, please order instructions.

D-type Electric Operating Mechanism (D)

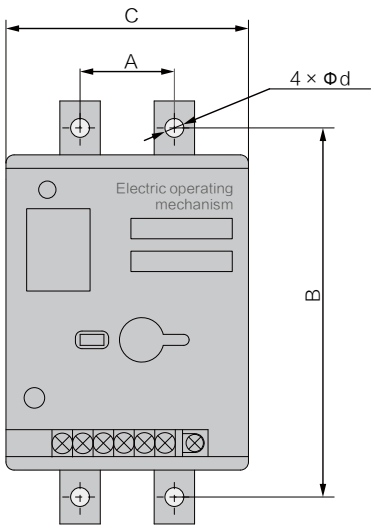
Wiring Diagram

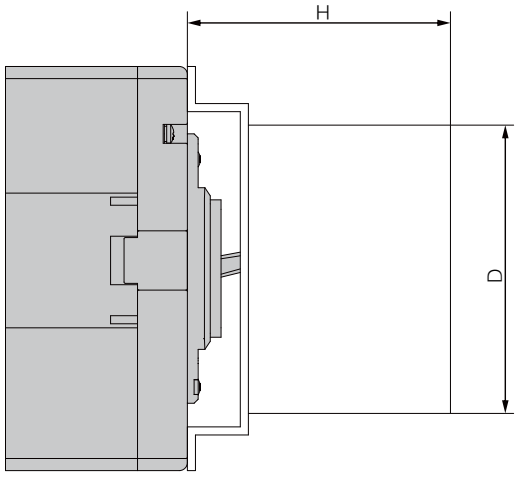


Outline and Installation Dimension of Motor

Model&specification	Adaptivecircuitbreaker					
	A	B	C	D	H	d
D-63L/M	25	117	74	102	90	3.5
D-125L/M/H	30	129	90	116	92	4.5
D-250L/M/H	35	126	90	118	92	4.5
D-400L/M/H	44	215	130	176	145	6.5
D-630L/M/H	44	215	130	176	145	6.5

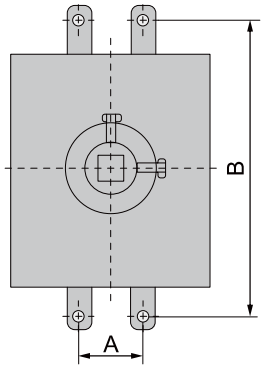
Installation Diagram

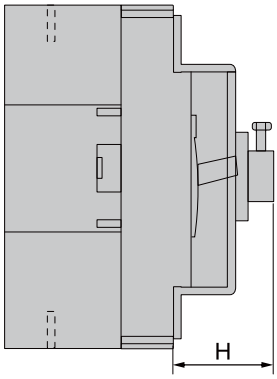




Manual operating mechanism (T)

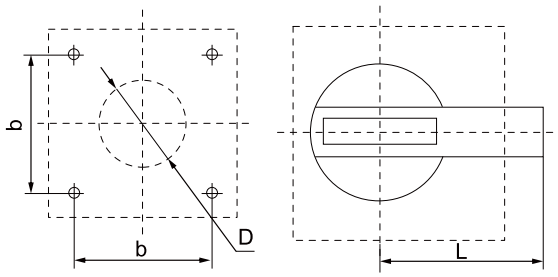
Installation dimension and diagram



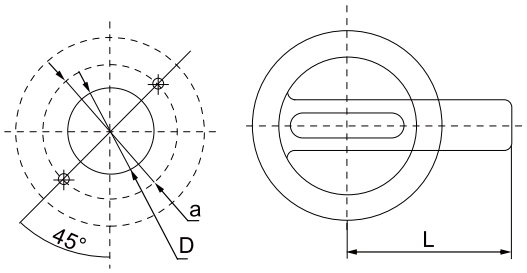


Operating mechanism outline and installation dimension table

Model Specifications	Installation dimension			Type A handle installation dimensions					Type B handle installation dimensions			
	A	B	H	D	d	a	b	L	D	d	a	L
T-63L/M	25	117	51	Φ35	Φ4.5	65	65	65	Φ35	Φ4.5	53	65
T-125L/M/H	30	129	52	Φ35	Φ4.5	65	65	65	Φ35	Φ4.5	53	65
T-250L/M/H	35	126	56	Φ35	Φ4.5	65	65	95	Φ35	Φ4.5	53	95
T-400L/M/H	44	215	97	Φ35	Φ4.5	65	65	125	Φ35	Φ4.5	53	125
T-630L/M/H	44	215	97	Φ35	Φ4.5	65	65	125	Φ35	Φ4.5	53	125



Type A handle installation dimension diagram



Type B handle installation dimension diagram

MTS

Isolation Switch
SFG

Model Selection Table

SF G – 63 / 3P J 16 11 F

Wiring Mode
F (front-panel wiring)

Auxiliary Contact
11 (normally one-on and normally one-off)
22 (normally two-on and normally two-off)

Rated Current
16-1600A

Operation Mode
No (front-cabinet operation)
J (out-cabinet operation)

Number of Poles 3P/4P

Housing Rating
63/100/160/250/630/1600

Product Category Isolation switch

Enterprise Code Sfere Electric

Product Overview

SFG series isolation switches are applicable to circuit with AC 50Hz, rated voltage of 400V and below and rated current of 16A-1600A. It is used for infrequent manual circuit making and breaking, and 690V products are only used for electrical isolation.

Normal Working Conditions

☐ The altitude shall not be more than 2,000m.
☐ The ambient temperature shall not be more than 40℃, but not lower than -5 ℃.
☐ The relative humidity shall not be more than 95%.
☐ No environment with explosive hazard medium.
☐ No environment with rain or snow attack.
Note: If it is expected to be used in an ambient air temperature more than +40℃ or lower than -5℃ to -45℃, the user shall indicate the situations to the manufacturer when ordering.

Structural Features

☐ The switch adopts the acceleration closing mechanism of spring energy storage in place and quick instantaneous release as well as the contact structure simultaneously connecting and disconnecting parallel double breakpoints, which greatly improve the electrical and mechanical performance of the switch.
☐ The conductive parts of the switch are installed in an insulating base of glass fiber reinforced unsaturated polyester mold; the operation mode is manual handle operation, and it has high dielectric performance, protection capability and reliable operation safety.
☐ Some switches are 3 poles and some are 4 poles (3 poles + neutral pole that can be on/off).

☐ The marking window is set in the front of the switch, indicating the on-off state of the contact and ensuring the reliability and safety of the switch operation.

☐ The operating handle can be directly installed on the switch for operation (referred to as in-cabinet operation), or can be operated outside the door of the distribution cabinet (referred to as out-cabinet operation) by an extended shaft, so as to ensure convenient operation.

☐ Provide the normally on and normally off contacts as well as the wiring mode for special mounting plate and front-panel wiring to meet diverse demands of the users.

☐ When it is at the breaking position "0", lock the handle with two or three locks to prevent mis-operation.

Structures and Features

The switch uses the housing made of unsaturated polyester glass fiber reinforced molded plastic (DMC); the spring energy storage fast mechanism can quickly realize making and breaking between contacts; the contact structure is parallel double breakpoint with two separate contact surfaces, and the pressure of the contact is guaranteed by a sheet spring; the switch can automatically determine the limit position of on/off, and has an obvious indications of the position of the moving contact.

Function Code of Auxiliary Contact

Normally one-on and normally one-off	11	1NO+1NC
Normally two-on and normally two-off	22	2NO+2NC

Main Technical Parameters

Rated current of housing rating Inm(A)		63 (100)	160	250	630	1600
Rated insulation voltage Ui		800V		1000V		
Rated impulse withstand voltage Uimp		8kV		12kV		
Rated working voltage Ue		AC400V				
Rated frequency		50Hz				
Service category		AC-22B				AC-21B
Rated working currentle(A)	AC400V	16/20/25/32/ 40/50/63/80/100	63/80/100/ 125/160	180/200/225/250	315/400/500/630	800/1000/1250/1600
Rated short-circuit making capacity Icm(kA)		8kA	17kA		40kA	105kA
Short-time withstand current Icw(kA)		5kA/0.3s	10kA/1s		20kA/1s	35kA/1s
Mechanical life(times)		1700	1400		800	500
Electrical life(times)		300	200			100
Operating force matrix(N · m)		/	6.5	15		27
Weight (excludinghandle),kg	3P	/	0.88	3.8	4.2	16
	4P	/	1.1	4.6	5	20

Notes: 1. The operating torque is for reference only;
2. The product weight is for reference only;

☐ SFG-630

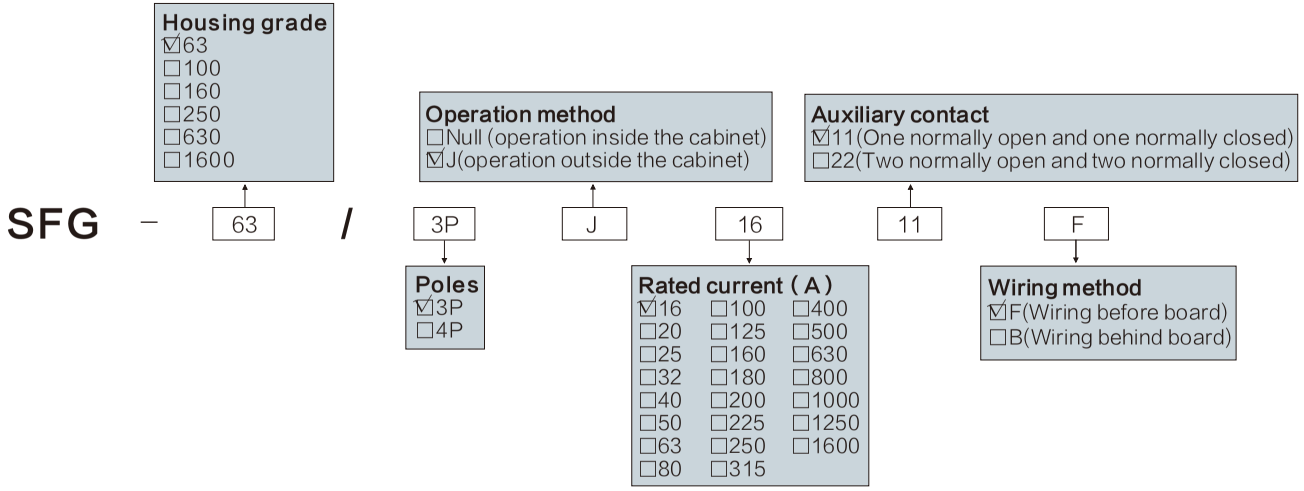
☐ SFG-1600

Order specification

User	× × × Co.,Ltd	Quantity	100	Date	2021.1.1

Example model:

SFG – 63 / 3P J 16 11 F

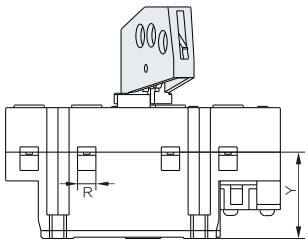


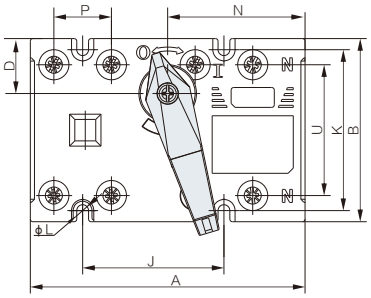
Outline and Installation Dimension

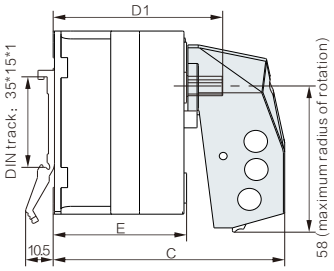
SFG -63 Series Outline and Installation Dimension

☐ Front direct operation

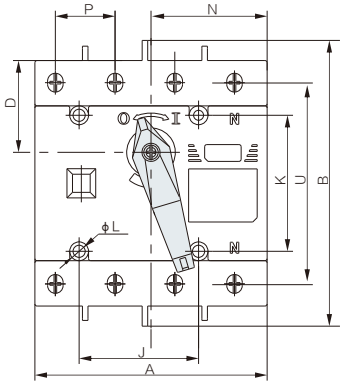
☐ SFG-63

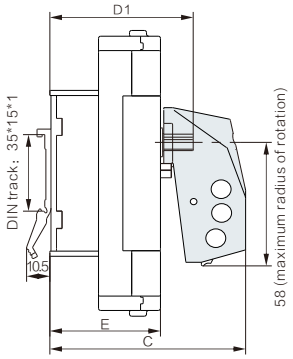


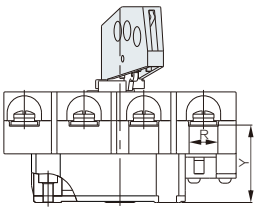




SFG-100 Series Outline and Installation Dimension

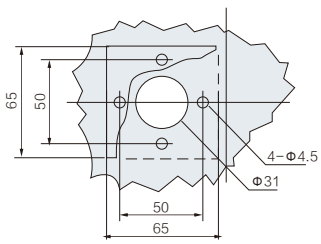


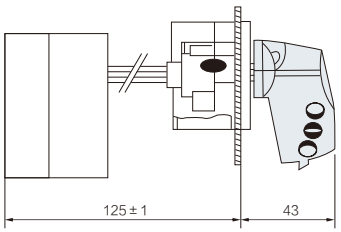




☐ SFG-100

SFG-63/100 Series Front out-cabinet operation



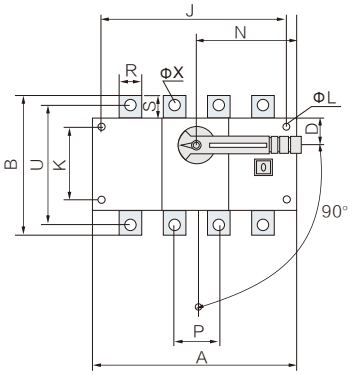


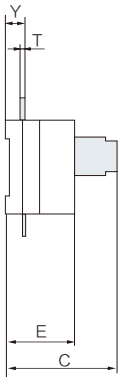
Front out-cabinet operation - Dimension of mounting hole

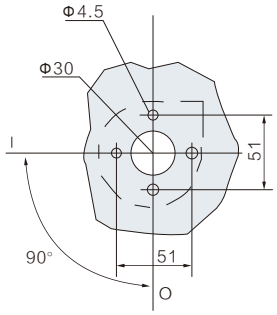
SFG-125~630 Series Outline and Installation Dimension

Unit: mm

☐ Front direct operation

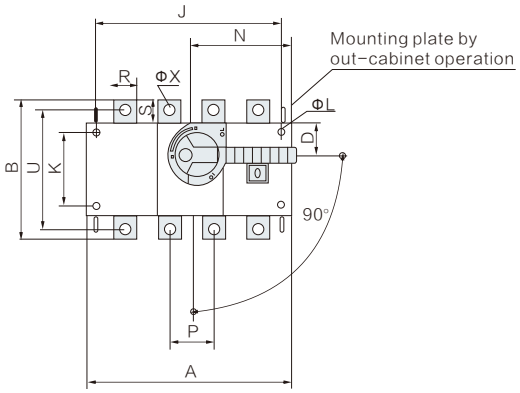


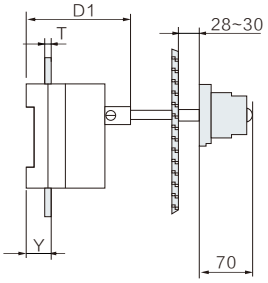




Installation dimension of out-cabinet handle seat

☐ Front out-cabinet operation





☐ SFG-125~630 Series Outline and Installation Dimension

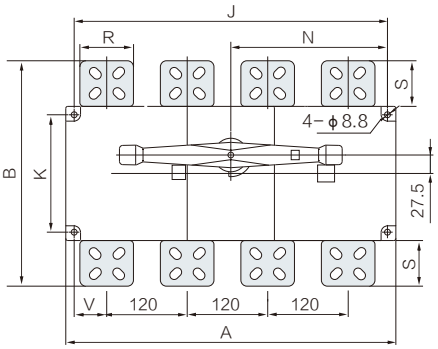
Unit:mm

Specification	Outline and installation dimension																
	A	B	C	D	D1	E	ΦL	J	K	N	P	R	S	T	U	ΦX	Y
SFG-63A/3(4)	105	70	88.5	21	65	51	4.5	54	61.5	56.5	22	7	–	–	50	–	33
SFG-100A/3(4)	105	129.2	88.5	50.6	65	50	4.5	54	61.5	56.5	27	13	–	–	91	–	35
SFG-125A/3	140	135	109	17	94	62.5	5.5	120	65	82	36	20	25	3.5	115	9	19
SFG-125A/4	170	135	109	17	94	62.5	5.5	150	65	82	36	20	25	3.5	115	9	19
SFG-160A/3	140	135	109	17	94	62.5	5.5	120	65	82	36	20	25	3.5	115	9	19
SFG-160A/4	170	135	109	17	94	62.5	5.5	150	65	82	36	20	25	3.5	115	9	19
SFG-200A/3	180	165	140	35	103	86	7	160	90	115	50	25	28	3.5	140	11	25
SFG-200A/4	230	165	145	35	103	86	7	210	90	115	50	25	28	3.5	140	11	27
SFG-250A/3	180	165	140	35	103	86	7	160	90	115	50	25	28	3.5	140	11	25
SFG-250A/4	230	165	145	35	103	86	7	210	90	115	50	25	28	3.5	140	11	27
SFG-315A/3	230	234	170	50	134	116	7	210	140	145	65	32	37	5	205	11	37
SFG-315A/4	290	234	170	50	134	116	7	270	140	145	65	32	37	5	205	11	37
SFG-400A/3	230	234	170	50	134	116	7	210	140	145	65	32	37	5	205	11	37
SFG-400A/4	290	234	170	50	134	116	7	270	140	145	65	32	37	5	205	11	37
SFG-500A/3	230	250	170	50	134	116	7	210	140	145	65	40	45	6	215	12.5	38
SFG-500A/4	290	250	170	50	134	116	7	270	140	145	65	40	45	6	215	12.5	38
SFG-630A/3	230	250	170	50	134	116	7	210	140	145	65	40	45	6	215	12.5	38
SFG-630A/4	290	250	170	50	134	116	7	270	140	145	65	40	45	6	215	12.5	38

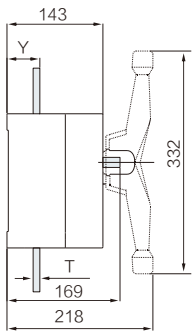
SFG-800~1600 Series Outline and Installation Dimension

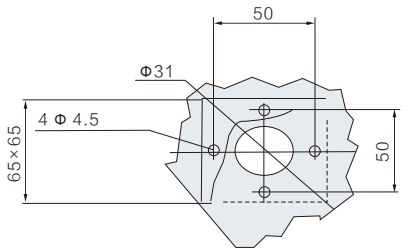
Unit: mm

☐ Front direct operation

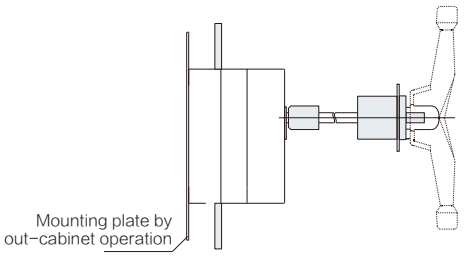


800~1600A Front direct operation



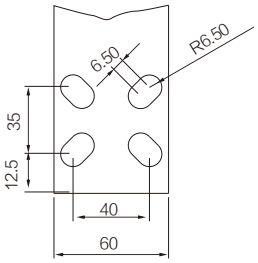


Installation dimension of out-cabinet handle seat

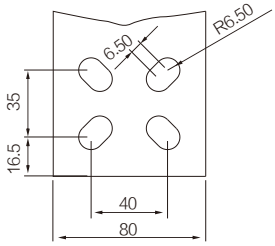


800-1600A/J out-cabinet operation

☐ Terminal Block



800~1000A



1250~1600A

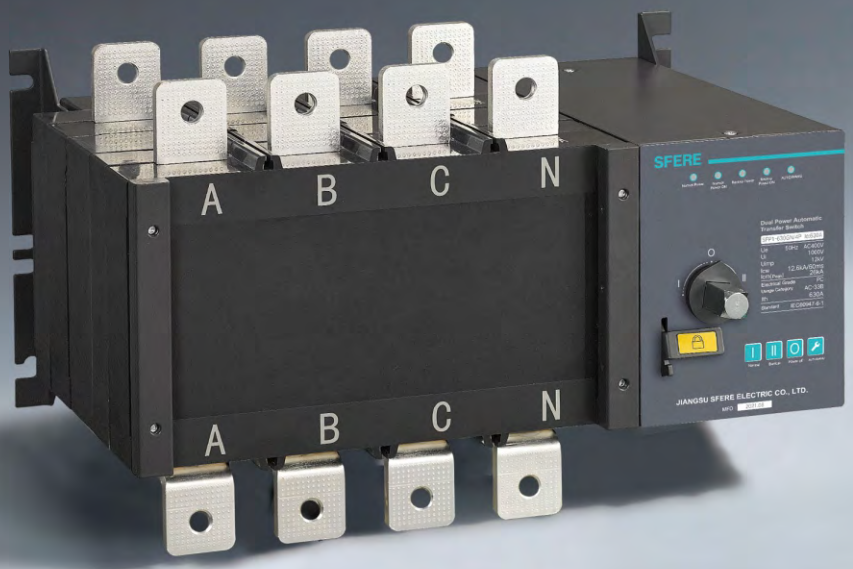
☐ SFG-800~1600 Series Outline and Installation Dimension

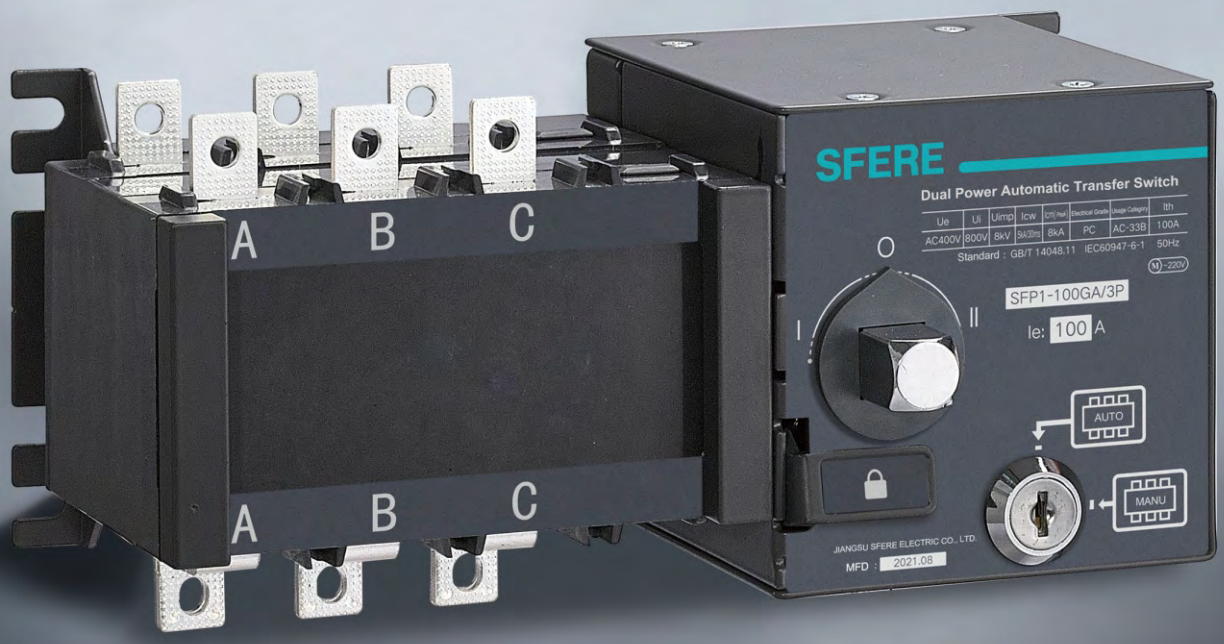
Unit: mm

Specification	Outline and installation dimension									
	A	B	J	K	N	R	S	T	Y	V
SFG-800A/3	378	328	352	175	173.5	60	64	8	48	57
SFG-800A/4	492	328	467	175	233.5	60	64	8	48	48.5
SFG-1000A/3	378	328	352	175	173.5	60	64	8	48	57
SFG-1000A/4	492	328	467	175	233.5	60	64	8	48	48.5
SFG-1250A/3	378	336	352	175	173.5	80	68	8	48	57
SFG-1250A/4	492	336	467	175	233.5	80	68	8	48	48.5
SFG-1600A/3	378	336	352	175	173.5	80	68	10	49	57
SFG-1600A/4	492	336	467	175	233.5	80	68	10	49	48.5

ATS

Grade-PC Automatic Transfer Switch SFP





Model Selection Table

SF P 1 – 1600 GA / 4P 1250 R

Optional Function

R:Auto switching with auto recovery

S:Auto switching without auto recovery

B:Circuit–II priority

F:Grid–generation

Rated Current

GA/GN:16A–3200A

NA/N:16A–630A

Q:630A–3200A

Number of Poles

2P (125A and below product) /3P/4P,
only for NA/N series

Product Code

GA:Integrated three–position (with fire control)

(Optional function, as shown in controller model selection)

GN:Integrated three–position (intelligent)

NA:Integrated two–position (intelligent)

N:Split–type two–position (intelligent) + controller

Q:Split–type two–position (intelligent) + controller

Housing Rating

GA:100/250/630/1600/3200

GN:100/250/630/1600/3200

NA/N:63/125/250/400/630

Q:3200

Design No. 1

Product Category Grade–PC automatic transfer switch

Enterprise Code Sfere Electric

Note: The split–type product can be equipped with SF70–series intelligent automatic transfer switch controller;the optional functions are given in Quick Selection Table for Controller.

Product Features

SFP1–series automatic transfer switching equipment (ATSE) consists of two parts – switch body and transfer controller. The switch is driven with the solenoid coil to ensure high transfer rate; the transfer controller is equipped with normal power supply and the working voltage of standby power supply is AC220V.

Model NA is of a special dedicated ATSE, which is of compact structure with the intelligent controller installed in the switch body. It is convenient for the user to connect the wires since it only needs to turn on the main circuit before switching in.

Model N adopts split–type external control, where the controller is connected to the switch body through a special cable for the convenience of installation and wiring. Both the split–type and integrated products have the ability to detect the faults of two circuits of three–phase power supply such as overvoltage, undervoltage and phase loss etc.; they also may be optionally equipped with start/stop signal output functions of generator unit (the signal will be sent with about 3s delay when the main power supply fails, and will be disabled with about 3s delay when the main power supply is recovered).

☐ SFP1-100GA

GA Series Automatic Transfer Switch

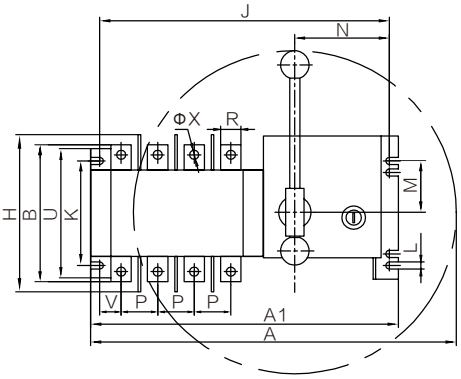
Main Technical Parameters

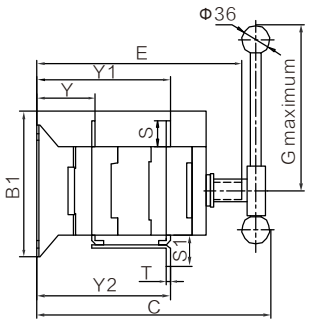
Model		SFP1-GA																												
Housing rating		100								250					630					1600					3200					
Rated working current		16	20	25	32	40	50	63	80	100	125	160	200	225	250	315	350	400	500	630	800	1000	1250	1600	2000	2500	3200			
Rated insulation voltage		800V								1000V																				
Rated impulse withstand voltage		8KV								12KV																				
Rated working voltage		AC400V																												
Service category		AC-33B																									AC-33iB			
Rated short-circuit making capacity		8KA								17KA					26KA					67.5KA										
Rated short-time withstand current		5kA/30ms								10kA/60ms					12.6kA/60ms					32kA/60ms										
Transfer time		2.5s								1s										1.2s				1.8s				2.4s		
Control voltage		AC220V																												
Rated motor power	Start	20W								325W					355W					400W	440W				600W					
	Normal									62W					74W					90W	98W				120W					
Weight (kg) 4P		3.4								6.0		7.6			15.8		16.8			36	36	37	38.6	55		61		67		
Rated short-time limiting current, Iq		Front fuse 50kA													Front fuse 90kA															

Note: The weight in the table is only for reference ;

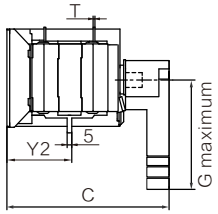
Outline and Installation Dimensions

☐ 16A-1600A Outline and Installation Dimensions (2-in & 1-out)

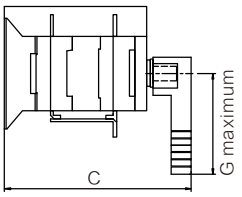




400A~1600A

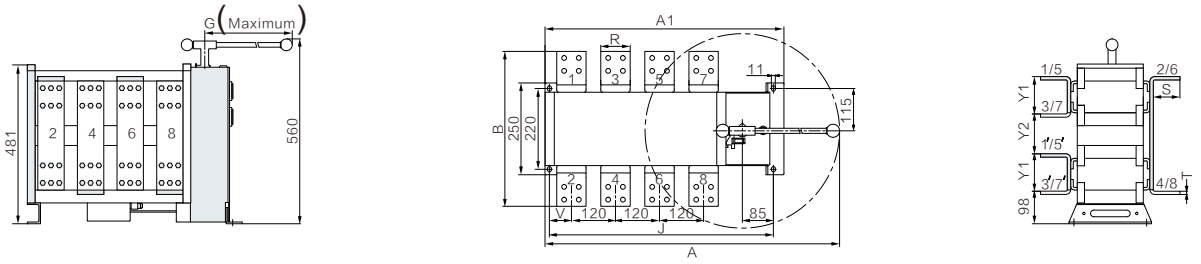


100A

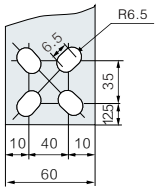


160A~250A

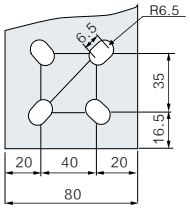
☐ 2000A–3200A Outline and Installation Dimensions (2–in & 1–out)



☐ 1000A–1600A Installation Drawing

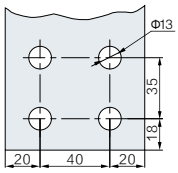


800A~1000A



1250A~1600A

☐ 2000A–3200A Installation Drawing



2000A~3200A

Unit: mm

Specification	Outline Dimensions								Switch Installation											Wiring Terminal				
	A	A1	B	B1	C	E	G	H	J	K	L	M	N	P	R	S	S1	T	U	V	ϕX	Y	Y1	Y2
16~100A/3P/4P	270	245	110	103	170	142	115	146	226	84	7	44	81	30	14	18	23	2.5	103	12	6	40.5	92	67.5
125~160A/3P/4P	348	305	147	142	224	190	144	185	284	102	7	49	91	36	20	25	37	3.5	127.5	19	9	56	127.5	127.5
250A/3P/4P	411	368	170	142	224	190	144	200	352	102	7	49	91	50	25	29	40	3.5	141.5	28	11	56	130	130
400A/3P	525	374	249	222	305	268	250	290	354	179	9	96	91	65	32	37	52	5	222	38	11	83	193	193
400A/4P	585	435	249	222	305	268	250	290	415	179	9	96	91	65	32	37	52	5	222	38	11	83	193	193
630A/3P	525	374	265	222	305	268	250	290	354	179	9	96	91	65	40	45	61	6	222	38	12	83.5	193.5	196
630A/4P	585	435	265	222	305	268	250	290	415	179	9	96	91	65	40	45	61	6	222	38	12	83.5	193.5	196
800~1000A/3P	785	520	352	250	390	326	360	/	496	220	11	115	84	120	60	64	88	8	250	56.5	13	109	254	254
800~1000A/4P	1080	635	352	250	390	326	540	/	610	220	11	115	84	120	60	64	88	8	250	60.5	13	109	254	254
1250A/3P	785	520	368	250	390	326	360	/	496	220	11	115	84	120	80	68	100	8	250	56.5	13	109	254	254
1250A/4P	1080	635	368	250	390	326	540	/	610	220	11	115	84	120	80	68	100	8	250	60.5	13	109	254	254
1600A/3P	785	520	376	250	390	326	360	/	496	220	11	115	84	120	80	68	108	10	250	56.5	13	110	255	255
1600A/4P	1080	635	376	250	390	326	540	/	610	220	11	115	84	120	80	68	108	10	250	60.5	13	110	255	255
2000A/3P	785	537	423	/	/	/	360	/	496	/	/	/	/	/	80	81	/	10	/	56	/	/	113	121
2000A/4P	1080	651	423	/	/	/	540	/	610	/	/	/	/	/	80	81	/	10	/	60	/	/	113	121
2500A/3P	785	537	433	/	/	/	360	/	496	/	/	/	/	/	80	81	/	15	/	56	/	/	118	116
2500A/4P	1080	651	433	/	/	/	540	/	610	/	/	/	/	/	80	81	/	15	/	60	/	/	118	116
3200A/3P	785	537	443	/	/	/	360	/	496	/	/	/	/	/	80	81	/	20	/	56	/	/	123	111
3200A/4P	1080	651	443	/	/	/	540	/	610	/	/	/	/	/	80	81	/	20	/	60	/	/	123	111

☐ SFP1-250GN

GN Series Automatic Transfer Switch

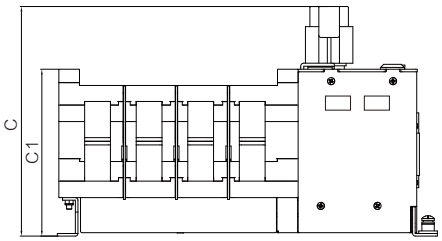
Main Technical Parameters

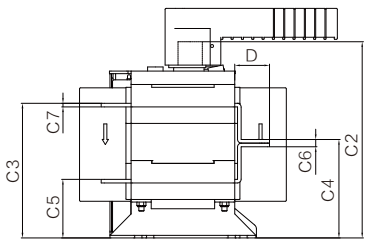
Model		SFP1-GN																														
Housing rating		100								250							630							1600					3200				
Rated working current		16	20	25	32	40	50	63	80	100	125	160	200	225	250	315	350	400	500	630	800	1000	1250	1600	2000	2500	3200					
Rated insulation voltage		800V								1000V																						
Rated impulse withstand voltage		8KV								12KV																						
Rated working voltage		AC400V																														
Service category		AC-33B																										AC-33iB				
Rated short-circuit making capacity		8KA								17KA						26KA					67.5KA											
Rated short-time withstand current		5kA/30ms								10kA/60ms						12.6kA/60ms					32kA/60ms											
Transfer time		2.5s								3s											2.7s							3.7s				
Control voltage		AC220V																														
Rated motor power	Start	20W								325W						355W					400W	440W						600W				
	Normal									62W						74W					90W	98W						120W				
Weight (kg) 4P		3.4								6.0		7.6				15.8		16.8			36	36	37	38.6	55		61	67				
Rated short-time limiting current, Iq		Front fuse 50kA														Front fuse 90kA																

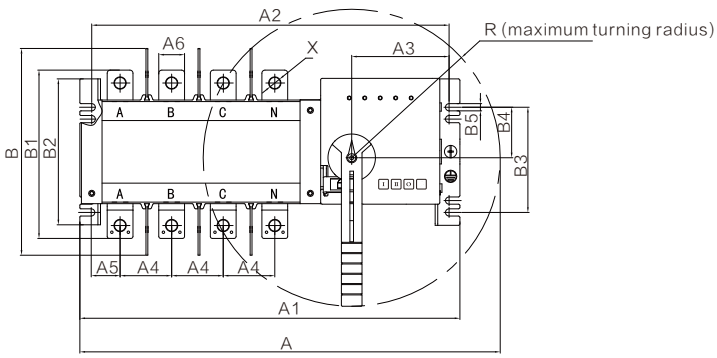
Note: The weight in the table is only for information;

Outline and Installation Dimensions

☐ 16A-250A Installation Dimensions (2-in & 1-out)

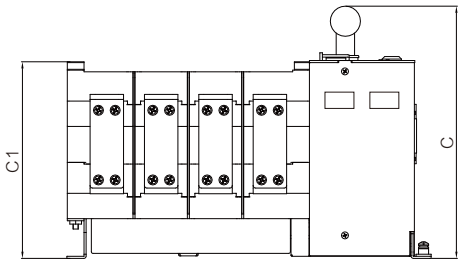


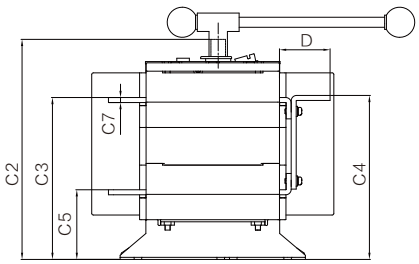


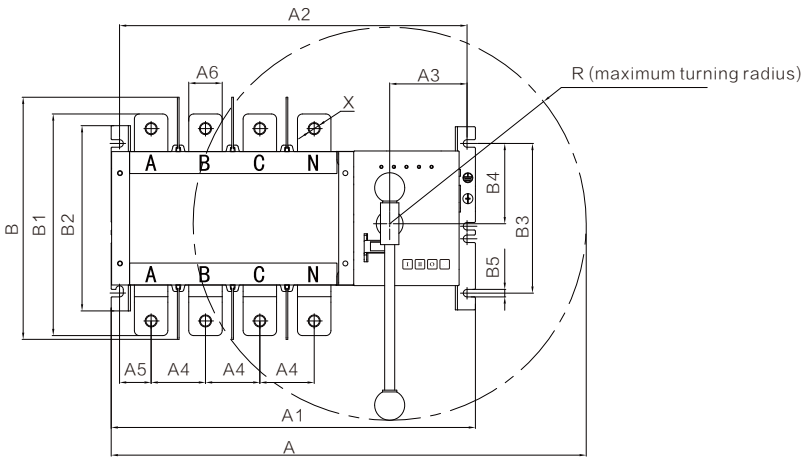


☐ SFP1-630GN

☐ 400A-630A Installation Dimensions (2-in & 1-out)







☐ 16A-630A Installation Dimensions (2-in & 1-out) Unit: mm

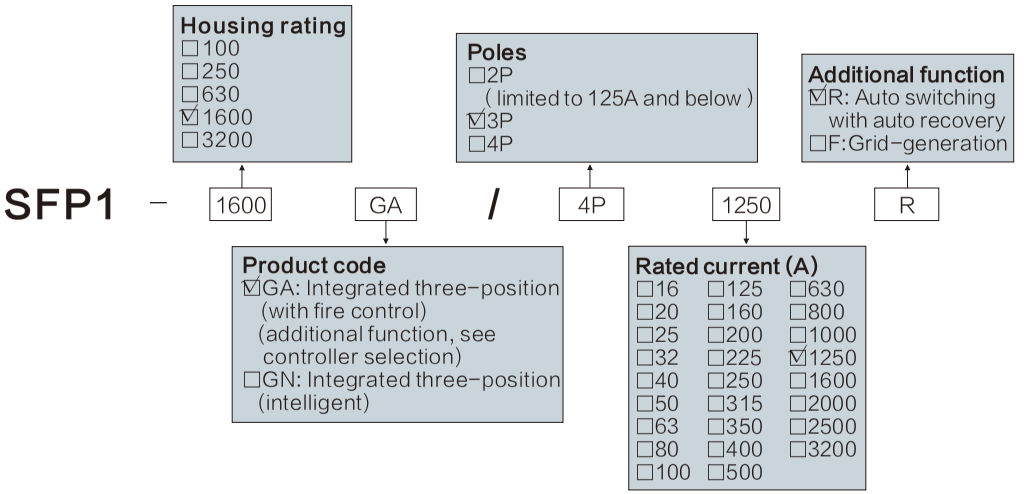
Specification	Outline and Installation Dimensions																						
	A	A1	A2	A3	A4	A5	A6	B	B1	B2	B3	B4	B5	C	C1	C2	C3	C4	C5	C6	C7	D	X	R
16-100A	268	260	241	96	30	12	14	145.5	110.5	103	84	44	7	170	118	143	92	67.5	40.5	5	2.5	22.5	6.7	115
125-160A	344	304	283.5	94.5	36	19.3	20	185.5	140	127.5	102	49	7	223	163	187	129	94	56.5	7	3.5	30	9	144
200-250A	408	368.5	347	94.5	50	28	25	200.5	163	141.5	102	106.5	7	223	162	186	130.5	97	56.5	7	3.5	34	11	144
400/3P	510	375.5	355.5	92.5	65	38	32	289.5	248.5	221.5	179	96	9	303	235	266.5	192.5	193	82.5	-	5	52	11	235
400/4P	570	435.5	415.5	92.5	65	38	32	289.5	248.5	221.5	179	96	9	303	235	266.5	192.5	193	82.5	-	5	52	11	235
630/3P	510	375.5	355.5	92.5	65	38	40	289.5	265	221.5	179	96	9	303	235	266.5	193.5	196	83.3	-	6	60.5	12.5	235
630/4P	570	435.5	415.5	92.5	65	38	40	289.5	265	221.5	179	96	9	303	235	266.5	193.5	196	83.3	-	6	60.5	12.5	235

Order Specification

User	xxx Co., Ltd.	Quantity	100	Date	2021.1.1

Example model:

SFP1 – 1600 GA / 4P 1250 R



NA Series Automatic Transfer Switch Integrated-type Two Positions

☐ SFP1-125NA

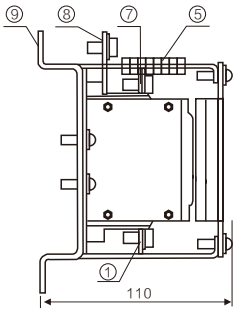
☐ Rated current:80A~125A

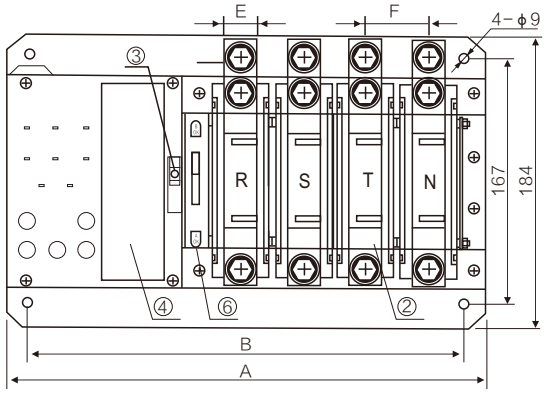
Main Technical Parameters

Parameters \ Model		SFP1-63NA			SFP1-125NA		
Rated working current (A)		16,20,25,32,40,50,63			80,100,125		
Rated control power supply current (A)		5					
Rated short-time withstand current (kA)		10					
Rated impulse withstand voltage (kV)		8					
Service category		AC-33A					
Service life	Mechanical	20000					
	Electrical	6000					
Number of poles		2P	3P	4P	2P	3P	4P
Weight (kg)		4.2	4.7	5.2	5	5.5	6.5
Operating period (s/time)		10					

Outline and Installation Dimensions

1.Load bus
2.Power supply module
3.Debugging handle
4.Nameplate
5.Wiring terminal
6.Mechanical indicator of power supply transfer
7.Common power supply bus
8.Standby power supply bus
9.Base





单位: mm

Code	Number of poles	SFP1-63NA	SFP1-125NA
A	2P	216	237
	3P	243	274
	4P	270	311
B	2P	196	217
	3P	223	254
	4P	250	291
E		12	20
F		27	37

☐ SFP1-250NA
☐ Rated current:160A~250A

NA Series Automatic Transfer Switch Integrated-type Two Positions

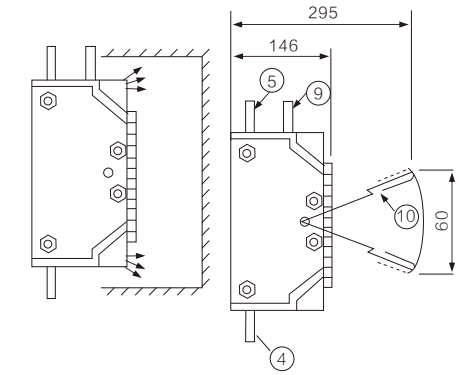
Main Technical Parameters

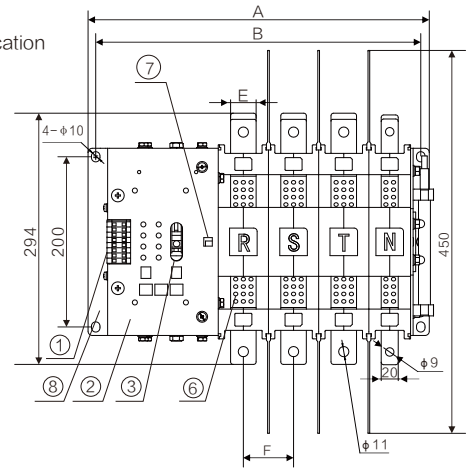
Parameters \ Model		SFP1-250NA		SFP1-630NA	
Rated working current (A)		160,180,200,225,250		250,315,400,500,630	
Rated control power supply current (A)		7			
Rated short-time withstand current (kA)		10			
Rated impulse withstand voltage (kV)		12			
Service category		AC-33A			
Service life	Mechanical	17000			
	Electrical	6000			
Number of poles		3P	4P	3P	4P
Weight (kg)		18	19	20	22
Operating period (s/time)		10			

Outline and Installation Dimensions

*Arcing distance
220V 50mm
380V 80mm

1.Wiring terminal
2.Nameplate
3.Debugging handle socket
4.Load bus
5.Standby power supply bus
6.Arc chute
7.Normal/standby power supply closing indication
8.Base
9.Normal power supply bus
10.Debugging handle (removable)





Unit: mm

Code	Number of poles	SFP1-250NA	SFP1-630NA	
		160/180/200/225/250A	250/315/400A	500/630A
A	3P	326	352	352
	4P	375	402	412
B	3P	302	332	332
	4P	352	382	392
E		20	R/S/T=30 N=20	35
F	4P	49	400/3P=59, 400/4P=54	59

☐ SFP1-125N

☐ Rated current:80A~125A

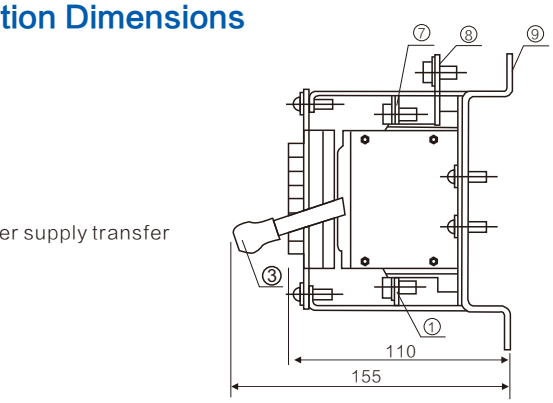
N Series Automatic Transfer Switch Split-type Two Positions

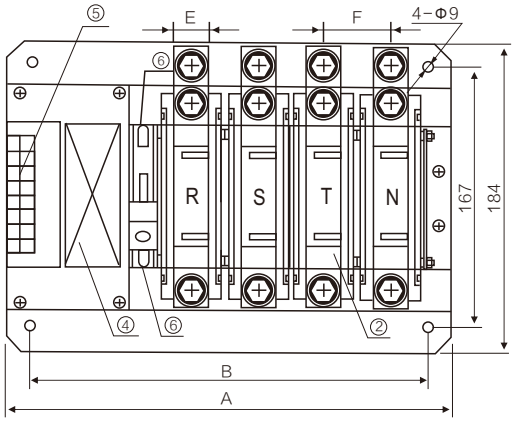
Main Technical Parameters

Parameters \ Model		SFP1-63N			SFP1-125N		
Rated working current (A)		16,20,25,32,40,50,63			80,100,125		
Rated control power supply current (A)		5					
Rated short-time withstand current (kA)		10					
Rated impulse withstand voltage (kV)		8					
Service category		AC-33A					
Service life	Mechanical	20000					
	Electrical	6000					
Number of poles		2P	3P	4P	2P	3P	4P
Weight (kg)		3.2	3.7	4.2	4	4.5	5.5
Operating period (s/time)		10					

Outline and Installation Dimensions

1. Load bus
2. Power supply module
3. Debugging handle
4. Nameplate
5. Wiring terminal
6. Mechanical indicator of power supply transfer
7. Normal power supply bus
8. Standby power supply bus
9. Base





Unit: mm

Code	Number of Poles	SFP1-63N	SFP1-125N
A	2P	170	191
	3P	197	228
	4P	224	265
B	2P	150	171
	3P	177	208
	4P	204	245
E		12	20
F		27	37

☐ SFP1-250N
☐ Rated current:160A~250A

N Series Automatic Transfer Switch Split-type Two Positions

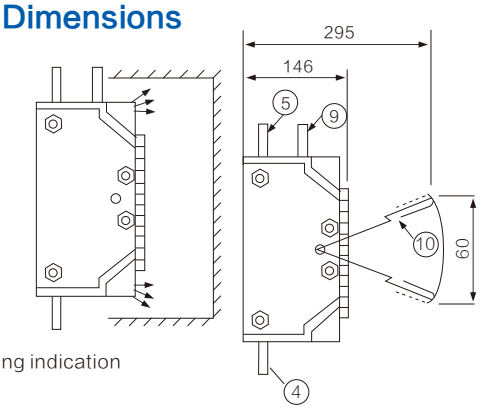
Main Technical Parameters

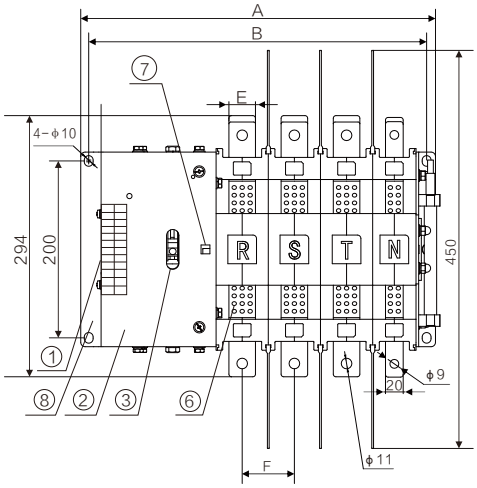
Parameters \ Model		SFP1-250N		SFP1-630N	
Rated working current (A)		160,180,200,225,250		250,315,400,500,630	
Rated control power supply current (A)		7			
Rated short-time withstand current (kA)		10			
Rated impulse withstand voltage (kV)		12			
Service category		AC-33A			
Service life	Mechanical	17000			
	Electrical	6000			
Number of poles		3P	4P	3P	4P
Weight (kg)		18	19	20	22
Operating period (s/time)		10			

Outline and Installation Dimensions

*Arcing distance
220V 50mm
380V 80mm

1.Wiring terminal
2.Nameplate
3.Debugging handle socket
4.Load bus
5.Standby power supply bus
6.Arc chute
7.Normal/standby power supply closing indication
8.Base
9.Normal power supply bus
10.Debugging handle (removable)





Unit: mm

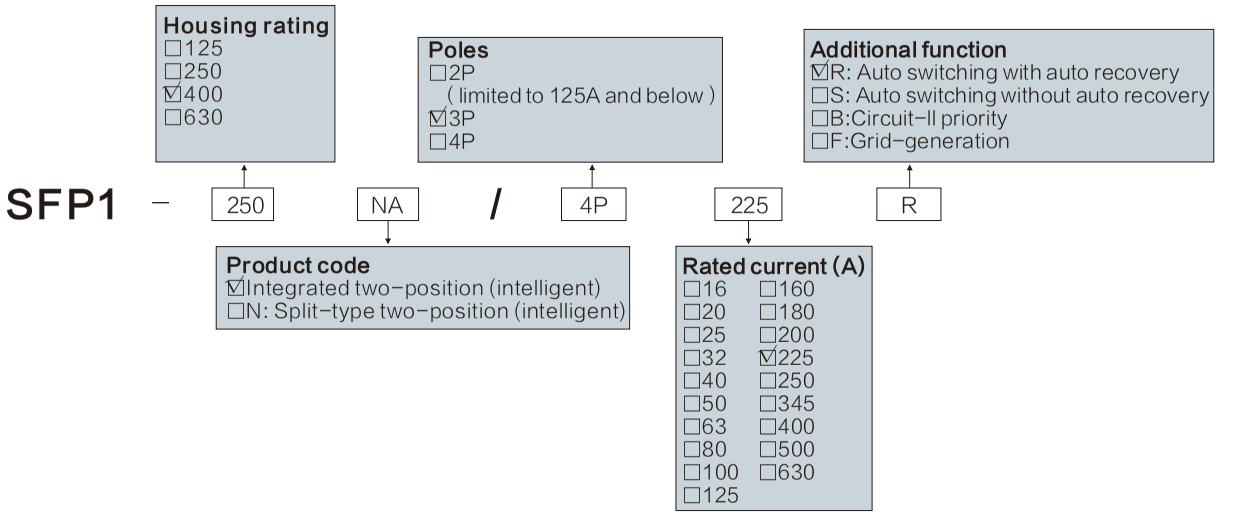
Code	Number of poles	SFP1-250N	SFP1-630N	
		160/180/200/225/250A	250/315/400A	500/630A
A	3P	326	352	352
	4P	375	402	412
B	3P	302	332	332
	4P	352	382	392
E		20	R/S/T=30 N=20	35
F	4P	49	400/3P=59, 400/4P=54	59

Order Specification

User	xxx Co., Ltd.	Quantity	100	Date	2021.1.1

Example model:

SFP1 – 250 NA / 4P 225 R



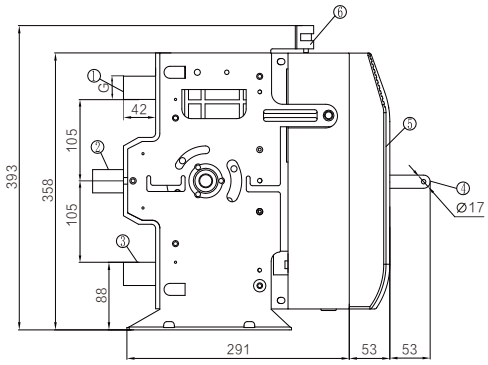
☐ SFP1-3200Q
☐ Rated current:630A~3200A

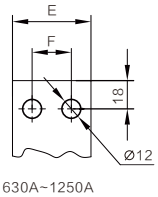
Q Automatic Transfer Switch – Two-section

Main Technical Parameters

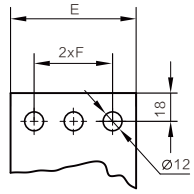
Parameters \ Model		SFP1-3200Q															
Rated working current(A)		630		800		1000		1250		1600		2000		2500		3200	
Rated control power supply current (A)		16															
Rated short-time withstand current (kA)		66															
Rated impulse withstand voltage (kV)		12															
Service category		AC-33B															
Service life	Mechanical	2500															
	Electrical	500															
Number of poles		3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P
Weight(kg)		39	44.5	40	47	41	48.5	42	50	45	54	58	68	59.5	70	61	72
Operating period(s/time)		15		20		25											

Outline and Installation

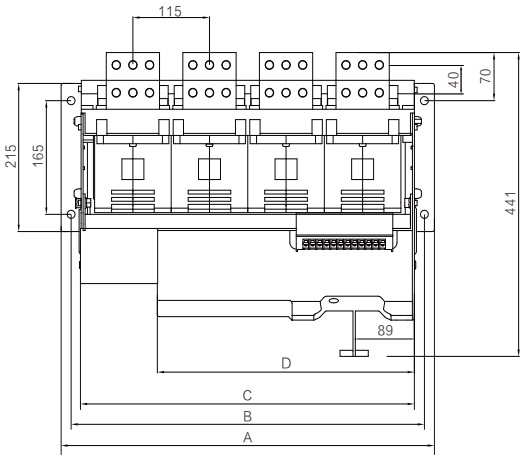




630A~1250A



1600A~3200A



① Normal power supply bus
② Load bus
③ Standby power supply bus
④ Manual operating handle in case of no load
⑤ Mechanical indication of switching status
⑥ Terminal strip of control circuit

Unit: mm

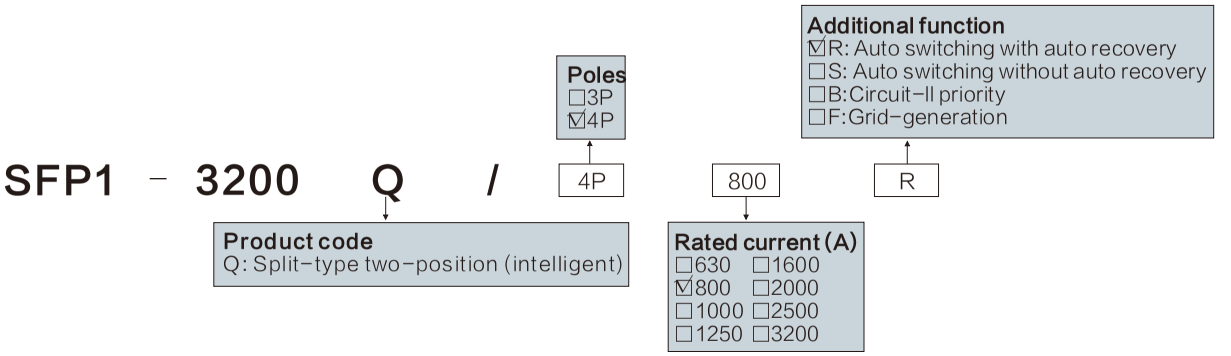
Code	Number of Poles	630A	800A	1000A	1250A	1600A	2000A	2500A	3200A
A	3P/4P	445(3P)/561(4P)							
B	3P/4P	415(3P)/530(4P)							
C	3P/4P	384(3P)/502(4P)							
D		386							
E		45		50	60	80			
F		25							
G		6	10				20	25	30

Order Specification

User	xxx Co., Ltd.	Quantity	100	Date	2021.1.1

Example model:

SFP1 – 3200 Q / 4P 800 R



Model Selection Table

SF – 70 0 / T

Enterprise Code	Product Code	Design No	Function Code

Name	Description
Enterprise Code	Jiangsu Sfere Electric Co.,Ltd.
Product Code	70 Series Controller of Automatic Transfer Switch
Design No	0/1/2
Function Code	B:(default) with B function for AC power supply,without B function for DC power supply (terminal 19– and 20+) i: Current detection function T: 485 communicating function

Notes: If SF–700 needs to be equipped with i and T functions, additional charges shall be paid, and no cables will be equipped.
SF–701 is not equipped with i and T functions, and the length of standard cable is 1.8m.
If SF–702 needs to be equipped with T function, additional charges shall be paid. The length of standard cable is 1.8m.

☐ SF–700

Performance and Characteristics of SF–700 Controller of Automatic Transfer Switch

☐ The system type may be configured as 1# for mains supply and 2# mains supply, 1# mains supply and 2# power generation, 1# power generation and 2# mains supply, as well as 1# power generation and 2# power generation 128x64 LCD, with backlight, displayed in two languages (simplified Chinese & English), and operatable with touch buttons; collecting and displaying three–phase voltage and frequency parameters of two circuits.

Circuit I	Circuit II
Line voltage, Uab, Ubc, Uca	Line voltage, Uab, Ubc, Uca
Phase voltage, Ua, Ub, Uc	Phase voltage, Ua, Ub, Uc
Frequency, F1	Frequency, F2

☐ With the protection functions of overvoltage, undervoltage, phase loss, reverse phase sequence, overfrequency and underfrequency.
☐ Automatic/manual status switching; in manual status, the switch can be turned on or off by force.
☐ All parameters are programmable in the field with the level–2 command for the purpose of avoiding unauthorized operation.
☐ The generator unit can be set to loaded/no–load mode for test run in the field.
☐ Capable of re–making and re–tripping on after power failure.。
☐ Making output can be set to pulse or continuous output.
☐ Applicable to the switch with one breaking position, two breaking positions or no breaking position.
☐ Two–circuit N–wire separation design.
☐ Real–time clock display.
☐ Timer–based start/stop of generator unit; can be set to single running, once every month or once every week; can be set to loaded or no–load running.
☐ Can control two generator units to run in cycle, with settable running time and stop interval for the generator units.
☐ Wide range of DC power supply, capable of undertaking instantaneous maximum DC input of 80V, or powered with the HWS560 (85V–560VAC input, 12VDC output) power supply module.
☐ Wide spacing between AC input wiring terminals, capable of undertaking maximum input voltage of 625V.
☐ With RS–485 isolated communication interface, subject to Modbus communication protocol, with the remote functions – remote control, remote signaling and telemetering; capable of controlling start/stop of generator unit and ATS making/breaking via remote control.
☐ Capable of querying the status of current controller (including the internal switching quantities such as input port, overvoltage and undervoltage etc.)
☐ Suitable for various wiring types (three–phase four–wire, three–phase three–wire, single–phase two–wire and two–phase three–wire).
☐ With modular structure design, flame–retardant ABS housing; plug–in wiring terminal, embedded installation, compact structure and convenient installation.

Main Technical Parameters of SF-700 Controller

Model	SF-700		
Working voltage	1. DC8.0V-35.0V continuous power supply. 2. AC power supplies L1N1 & L2N2; voltage range AC (160V-280V)		
Overall power consumption	<3W (standby mode: ≤2W)		
AC voltage input	AC system	SF-700、SF-700/i	SF-700/B、SF-700/Bi
	Three-phase four-wire (L-L)	80V~625V	80V~480V
	Three-phase three-wire (L-L)	80V~625V	NA
	Single-phase two-wire (L-N)	50V~360V	50V~280V
	Two-phase three-wire (A-B)	80V~625V	80V~480V
Rated frequency	50/60Hz		
Making/breaking relay output capacity	16A 250VAC passive output		
Programmable relay output capacity	16A/7A 250VAC passive output		
Digital input port	Grounding in effect		
Communication mode	RS485 isolated port; Modbus-RTU protocol		
Outline dimension	211mmx155mmx55mm		
Hole dimension	186mmx141mm		
Working condition	Temperature: (-25 to +70)℃ ; humidity: (20-90)%		
Storage condition	Temperature: (-30 to +80)℃		
Protection grade	IP55: When a waterproof rubber ring is fitted between the controller and the control panel IP42: When no waterproof rubber ring is fitted between the controller and the control panel		
Insulation strength	Object: Among input/output/power supply Reference standard: IEC688-1992 Test method: ACI.5KV/1 min; leakage current 5mA		
Weight	0.8kg (SF-700,SF-700/i)		

SF-701/SF-702 Controller Functions

Product model	SF-701	SF-702
Installation mode	Split-type	
Display mode	Indicator lamp display	LCD display
Rated duty	Uninterrupted duty	
Auto switching with auto recovery	■	■
Auto switching without auto recovery	■	■
Mutual standby	■	■
Auto start of generator	■	■
Detection of service power supply	Detection of four-phase loss and overvoltage/ undervoltage detection of three-phase voltage	
Detection of normal power supply	Detection of four-phase loss and overvoltage/ undervoltage detection of three-phase voltage	
Passive fire protection input	■	■
Active fire protection input (DC9-36V)	■	■
Adjustable transfer delay	■	■
Real-time voltage display	□	■
Indication of normal & standby power supplies	■	■
Adjustable service & standby overvoltage and undervoltage	■	■
Adjustable start & stop time of generator	■	■(F/F1)
Programmable output port	□	■
RS485 communicating function	□	■

Note: ■ YES
□ NO

□ SF-701

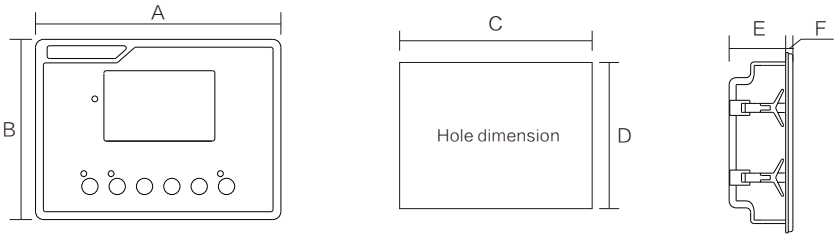
□ SF-702

SF-702 Controller Parameter Code, Range and Default

S/N	Parameter Code	Parameter Name	Range	Factory Default
1	u280	Normal overvoltage threshold	200-300	280
2	u165	Normal undervoltage threshold	100-200	175
3	n280	Standby overvoltage threshold	200-300	280
4	n165	Standby undervoltage threshold	100-200	175
5	⌜	Delay time for switching to normal power supply	0-240	1
6	⌝	Delay time for switching to standby power supply	0-240	1
7	q	Time for starting generator	0-240	5
8	d	Time for stopping generator	0-240	5
9	P	Brightness control of backlight	0-10	8
10	E	ATS working mode	0=Auto switching with auto recovery 1=Without auto recovery or mutual standby 2=Circuit-II priority	0
11	J	Programmable output port (F/F1)	0-8	0
12	□	Machine address	1-32	1
13	b	Baud rate	1=2400 2=4800 3=9600 4=19200	3
14	H	Restore factory setting	(0- 3) 3=Restore factory setting	0

Note: When pressing ‘Enter’ to restore factory setting in case of H=003, it should be noted that this will restore all factory data, including the sampling coefficient of normal and standby power supply voltages. After restoring, the voltage data collected by the controller may differ from the actual normal/standby input voltage by about ± 10V.

Outline and Installation Dimensions



单位: mm

Model	Outline and Installation Dimensions					
	A	B	C	D	E	F
SF-700	210	155	186	141	48	7
SF-701	150	122	130	111	62	/
SF-702	150	122	130	111	62	/

ATS

Grade-CB Automatic Transfer Switch SFC

Model Selection Table

SF C 3 – 630 W2 / 4P 125 R

Optional Functions

R (Auto switching with auto recovery)
S (Auto switching without auto recovery)
F (Grid- Power generation)
B (Circuit-II priority)
T (Communication)

Rated Current 6A-630A

Number of Poles 4P

Product Code

W1 intelligent LED, integrated
W2 intelligent LED, split-type
W3 intelligent LCD, split-type
Note: No W2/W3 for 63A housing rating

Housing Rating 63/125/250/630

Design No 3

Product Category

Grade-CB automatic transfer switch

Enterprise Code Sfere Electric

Product Features

☐ Grade-CB automatic transfer switch realizes 2-in and 1-out.
☐ With settable parameters; with telecommunication operation as an option.
☐ All-bakelite housing with high safety factor and no outward flashover.
☐ With compact design and high anti-interference performance.
☐ With small volume and isolation function.
☐ With multi-functional operating handle, which can be used as the selection switch for operating handle, and can be used to tighten the screws on the switch for the convenience of installation.

Normal Working Environment

☐ The ambient air temperature shall be -5℃ to +40℃, and the average temperature shall not be more than +35℃ in 24h.
☐ The altitude at which it is installed shall not exceed 2,000m.
☐ When the maximum temperature is +40℃, the relative humidity of the air shall not exceed 50%; a higher relative humidity is acceptable at a lower temperature such as 90% at 20℃. Special measures shall be taken for the condensation which occurs infrequently as the temperature changes.
☐ The pollution class shall be class 3.
☐ The installation category shall be III.
☐ The power cords of two circuits shall be connected to the upper end of the transfer device, and the load wire shall be connected to the lower end.
☐ The installation location shall be free from obvious vibration and impact.

☐ SFC3-63W1

Main Technical Parameters

Model	SFC3-63	SFC3-125	SFC3-250	SFC3-630
Rated working current, In(A)	6/10/16/20/25 32/40/50/63	63/80/100/125	160/180/200/ 225/250	315/350/400/ 500/630
Mechanical life	10000	7000	5000	3000
Electrical life	4500	3000	2000	1000
Rated working voltage	AC230V/AC400V	AC400V/AC690V		
Rated control voltage	AC220V			
Rated insulation voltage	AC500V	AC800V	AC1000V	
Use category	AC-33iB			
Transfer action time	≤2s	≤3s + delay time		
Return transfer time	≤2s	≤3s+0.5s,5s,10s,15s,20s,25s,30s		
Rated short-circuit making capacity (Icm)	10KA	105KA	105KA	145KA
Rated short-circuit breaking capacity (Icn)	6KA	50KA	50KA	65KA
Operating period (s/time)	10	10+ delay time		
Weight (Kg)	/	6.2	9.1	32.1

Controller Functions

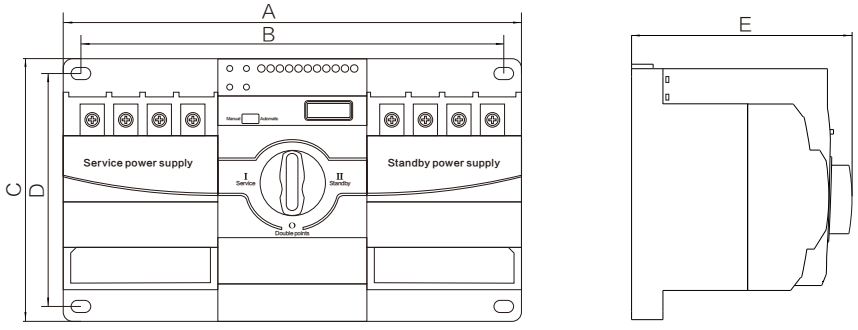
Product Model	SFC3-63W1
Installation mode	Integrated
Display mode	Indicator lamp display
Rated duty	Uninterrupted duty
Auto switching with auto recovery	■
Auto switching without auto recovery	☐
Mutual standby	☐
Ability to start generator	■
Detection of normal power supply	Undervoltage, overvoltage & phase loss detection
DC24V active fire protection input	■
Fire protection feedback	☐
Active making indication	NO
Passive making indication	■
RS485 communicating function	■

Note: ■indicates that this function is available;
☐indicates that this function is customized.

Outline and Installation Dimensions

☐ SFC3-63 Outline and Installation Dimensions

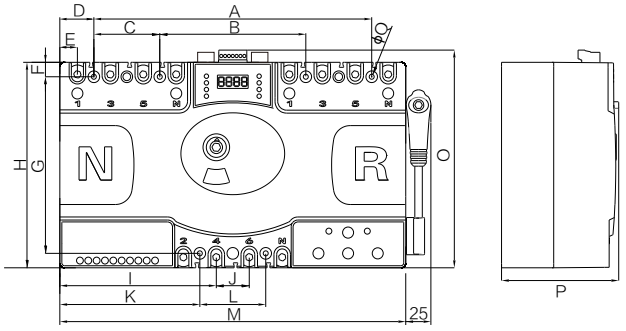
Unit: mm



Model	Outline and Installation Dimensions				
	A	B	C	D	E
SFC3-63W1	246	227	141	125	113

☐ SFC3-125~630W1

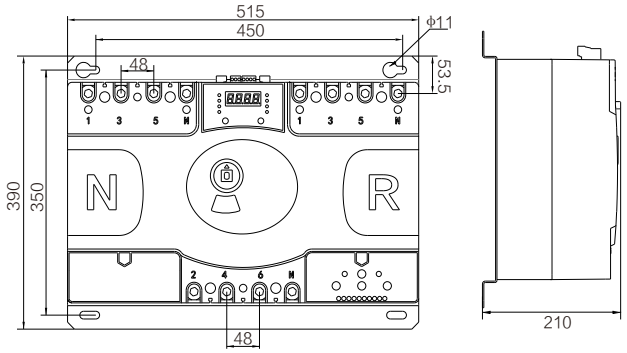
☐SFC3-125 & SFC3-250 Outline and Installation Dimensions



Unit: mm

Model	Outline and Installation Dimensions															
	A	B	C	D	E	F	G	H	I	J	K	L	M	O	P	Q
SFC3-125	253	133	60	31	16	13	159	185	112.5	30	127.5	60	315	196	107	4.5
SFC3-250	288	148	70	17.5	21	13	189	215	130	35	147.5	70	365	230	125	4.5

☐ SFC3-630 Outline and Installation Dimensions



Product Model	SFC3-125W1~630W1	SFC3-125W2~630W2	SFC3-125W3~630W3
Installation mode	Integrated	Split-type	Split-type
Display mode	LED + indicator lamp display		LCD + indicator lamp display
Rated duty	Uninterrupted duty		
Auto switching with auto recovery	■	■	■
Auto switching without auto recovery	■	■	■
Mutual standby	■	■	■
Ability to start generator	■	■	■
Detection of normal power supply	Four-phase undervoltage, overvoltage and phase loss detection		
Detection of standby power supply	Four-phase undervoltage, overvoltage and phase loss detection		
Passive fire protection input	■	■	■
DC24V active fire protection input	■	■	■
Fire protection feedback	■	■	■
Unloading	■	■	■
Active making indication	■	■	■
Passive making assistance	■	■	■
Passive tripping alarm assistance	■	■	■
Indication of normal & standby power supplies	■	■	■
RS485 communicating function	■	■	■
Transfer delay	■	■	■
Intelligent controller	■	■	■
Real-time voltage display	■	■	■
Frequency detection	■	■	■
Button operation switching	■	■	■

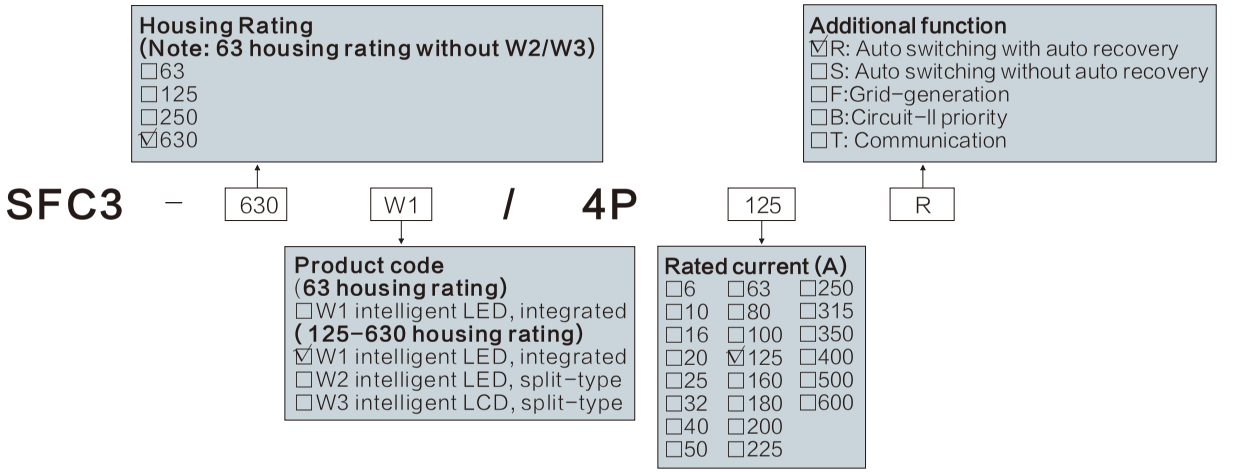
Note: ■ YES

Order Specification

User	xxx Co., Ltd.	Quantity	100	Date	2021.1.1

Example model:

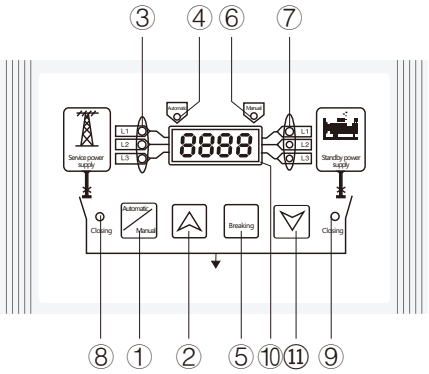
SFC3 – 630 W1 / 4P 125 R



■ W2/W3 Controller (Split-type)

☐ W2 plug-in LED split-type controller

☐ W2



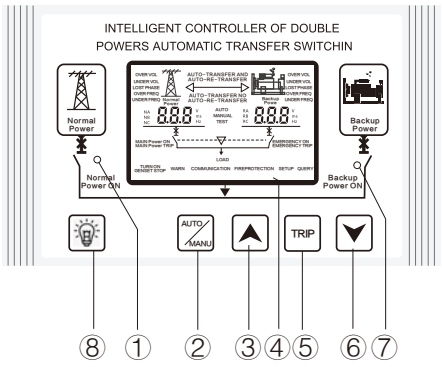
Display and Button Functions

①Automatic/manual button
②Normal switching button
③Normal AN/BN/CN three-phase voltage display
④Auto lamp display
⑤Breaking button
⑥Manual lamp display
⑦Standby AN/BN/CN three-phase voltage display
⑧Service making indication
⑨Standby making indication
⑩Real-time LED display of normal and standby voltage and frequency
⑪Standby switching button

Functions

The synchronous main controller displays the parameters, controls the switch switching and modifies the switch parameters etc.

☐ W3 plug-in LCD split-type controller



Display and Button Functions

①Normal making indication
②Automatic/manual button
③Normal making button
④LCD display area
⑤Breaking button
⑥Standby making button
⑦Standby making indication
⑧Lighting button

Functions

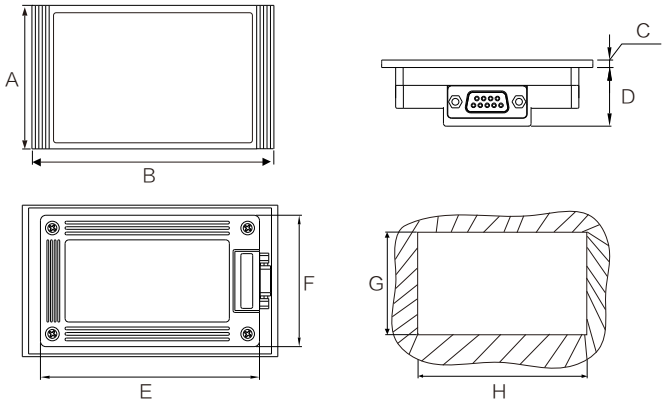
The synchronous main controller displays the parameters, controls the switch switching and modifies the switch parameters etc.

☐ W3

■ Function Description of W2/W3 Controller Buttons

Buttons	Functions
Automatic/Manual	Press the button Automatic/Manual to switch between manual and automatic functions, and press the button Automatic/Manual successively for 10 times to enter the parameter setting menu.
▲	In the manual status, press the button ▲ to turn on the load of circuit 1. In the setting menu, this button is used to page up or increase/decrease the value.
▼	In the manual status, press the button ▼ to turn on the load of circuit 2. In the setting menu, this button is used to page up or increase/decrease the value.
Breaking	In the manual status, press the button Breaking to turn off the load of circuits 1 & 2. In the setting menu, this button is used to save or confirm the value.
Lighting	Press the button Lighting to turn on or off the backlight of LCD (W3 liquid crystal controller).

■ Outline and Installation Dimensions of W2/W3 Controller



Unit: mm

Model	Outline and Installation Dimensions							
	A	B	C	D	E	F	G	H
W2	83	140	3	23	120	72	74	122
W3	83	140	3	23	120	72	74	122

Operation Instructions for W2/W3 Controller

☐ Introduction to LED display.

☐ Display in the normal working status: a, b, c & f refer to the voltages of phases A, B & C and the frequency of service

power supply.a., b., c. & f. refer to the voltages of phases A, B & C and the frequency of service power supply. When

the switch-on indicator lamp is flashing, it indicates that the switch is ready for transfer with a delay.

☐ Display in the trouble switching status:

If 'nEtt' is displayed: It indicates the timeout trouble of motor when switching to the service power supply.

If 'tEtt' is displayed: It indicates the timeout trouble of motor when switching to the standby power supply.

If '-Ett' ' is displayed: It indicates the timeout trouble of motor when both supplies are switched on.

☐ Parameter code, range and default

Parameter Code	Parameter Name	S/N	Range	Factory Default
U 260	Service overvoltage threshold	1	AC230-AC300	280
u 175	Service undervoltage threshold	2	AC150-AC210	175
□010	Returned value of service voltage	3	0-50V	10
⌐ 005	Service transfer delay	4	0-240s	2
U.260	Standby overvoltage threshold	5	AC230-AC300	280
u.175	Standby undervoltage threshold	6	AC150-AC210	175
□.010	Returned value of standby voltage	7	0-50V	10
⌐.005	Standby transfer delay	8	0S-240S	2
q.005	Generator start delay	9	0S-120S	5
d.005	Generator stop delay	10	0S-120S	5
J.001	Machine address	11	1 - 32	1
b.001	Selection of baud rate	12	1=2400 2=4800 3=9600 4=19200	3
E.000	Auto switching with auto recovery – Auto switching without auto recovery – Circuit-II priority	13	0=Auto switching with auto recovery, 1=Auto switching without auto recovery or mutual standby, 2= Circuit-II priority	0
F.001	Working frequency	14	1=50Hz(40-60) 0=60Hz(50-70)	1
H.001	Restore factory setting	15	1=Restore factory setting	0

☐ Setting operation process

■Operation process for parameter modification

How to enter: Press the button ‘Manual/Automatic’ successively for 10 times to enter the parameter modification menu, and the 4th display code will flash.

How to modify parameter: Press the button “Service” to page down or press the button “Standby” to page up the code. Press the button “Double switching” to enter the parameter to be modified, and the last three display codes will flash; then, press the button “Service” or ‘Standby’ to increase or decrease the value, and then press the button ‘Double switching’ to save the parameters and enter the next option.

How to exit: It will exit automatically if no button is operated in10s, or when the button “Double switching” is pressed; if the button ‘Save’ is not pressed during the parameter modification process, it will exit directly with the parameters modified not saved.

■Operation process for voltage calibration

How to enter: In the automatic status, press the button ‘Standby’ for 10 times to enter, and the 4th digit will display ‘III’ and flash.

ow to calibrate voltage: Before calibrating the voltage, it is necessary to set the service three-circuit power supply and standby three-circuit power supply as AC220V; in this case, press the button ‘Double switching’ to save the modified value.

How to exit: It will exit automatically if no button is pressed in 10s or by pressing the button ‘Standby’ for 10 times.

■Switching record query

How to enter: In the automatic status, press on the buttons ‘Service’ and ‘Standby’

E-01: Last switching record.

E-02: Last but one switching record.

E-03: Last but two switching record.

Press the button ‘Double switching’ to enter and query the switching reason.

u-00: Indicates that there is no switching record.

u-01: Indicates the switching record of service phase A trouble.

u-02: Indicates the switching record of service phase B trouble.

u-03: Indicates the switching record of service phase C trouble.

(Note: The switching that is not triggered by a trouble will not be recorded. The trouble records include phase loss, undervoltage, overvoltage and no-voltage troubles. The case that the service phases A, B, C & N are powered off simultaneously will not be recorded neither).

How to exit: It will exit automatically if no button is pressed in 10s.

MCB

Miniature Circuit Breaker SFB

Miniature Leakage Circuit Breaker SFBL

Model Selection Table

SF B 1 – 63 H C 32 / 2P

- **Number of Poles** 1P/2P/3P/4P
- **Rated Current** 6A/10A/16A/20A/25A/32A/40A/50A/63A
- **Tripping Characteristic**
  Type C:5In–10In
  Type D:10In–20In
- **Breaking Class**
  None: Breaking capacity 4.5kA
  H: Breaking capacity 6kA
- **Housing Rating** 63
- **Design No.** 1
- **Product Category** Miniature circuit breaker
- **Enterprise Code** Sfere Electric

Applicable Range

SFB1–63–series circuit breakers are applicable for places with AC 50Hz or 60Hz, rated voltage of 400V and below, and rated current of 6A–63A. It is mainly used for overload and short–circuit protection of lighting, power distribution lines and equipment in office buildings, residences and similar buildings. It can also be used for infrequent line transfer under normal conditions.

△ Functions: Overload, short–circuit protection

△ Uses: Lighting for power distribution, and motor protection

△ Number of Poles: 1P/2P/3P/4P

△ Breaking Capacity: 4500/6000A

△ Current: 6A/10/16/20/25/32/40/50/63A

SFB1–63 series Circuit Breaker

Main Technical Parameters

Product Name	SFB1–63	SFB1–63H
Applicable standard	IEC60898–1	
Product certification	CCC	

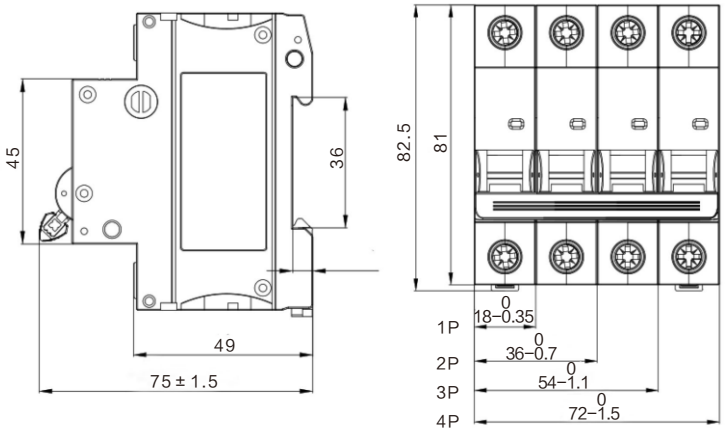
☐ SFB1-63

Electrical characteristics	SFB1-63	SFB1-63H
Number of poles	1P, 2P, 3P, 4P	1P, 2P, 3P, 4P
Rated frequency (Hz)	50/60	50/60
Housing current , I nm (A)	63	63
Rated current , I n (A)	6A/10A/16A/20A/25A/ 32A/40A/50A/63A	6A/10A/16A/20A/25A/ 32A/40A/50A/63A
Rated voltage , Ue (V)	Ac230, AC400(1P)/ AC400(2P/3P/4P)	Ac230, AC400(1P)/ AC400(2P/3P/4P)
Rated insulation voltage , Ui (V)	500V	500V
Rated impulse withstand voltage , Uimp (kV)	4kV	4kV
Rated operating short-circuit breaking capacity, Ics (kA)	4.5kA	6kA
Instantaneous tripping characteristics	C (5In-10In) D (10In-20In)	C (5In-10In) D (10In-20In)
Tripping form	Thermal magnetic trip	Thermal magnetic trip
Pollution class	Class 2	Class 2

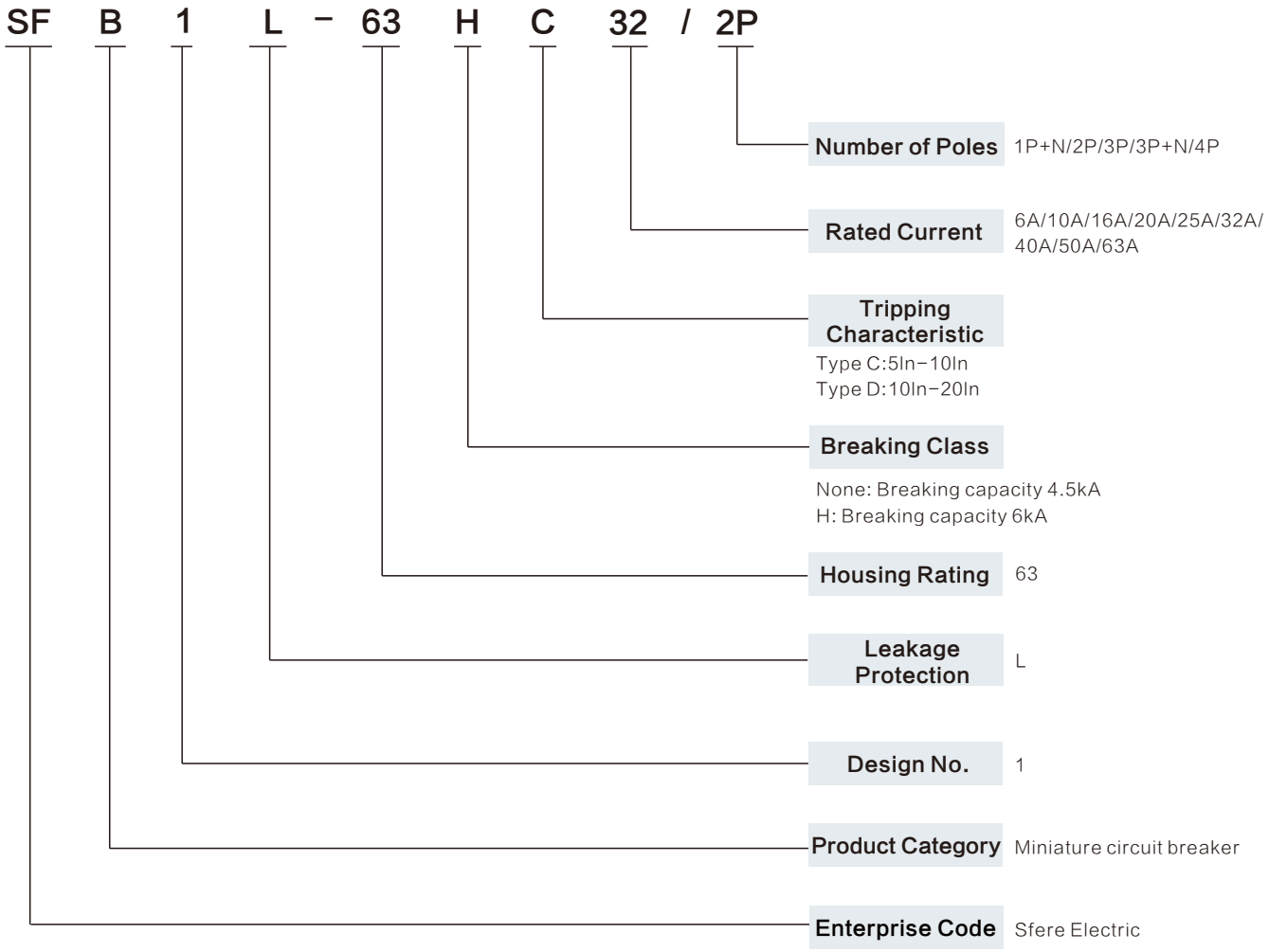
Mechanical Characteristics	SFB1-63	SFB1-63H
Electrical life	10000	10000
Mechanical life	20000	20000
Protection level	IP20	IP20

Normal Operating Conditions and Installation Characteristics	SFB1-63	SFB1-63H
Operating ambient temperature	-35℃~+70℃	-35℃~+70℃
Installation altitude	Up to 2000m	Up to 2000m
Wiring terminal	Screw crimping	Screw crimping
Maximum wiring capacity	25mm²	25mm²
Maximum limit torque	2.5N · m	2.5N · m
Installation category	Category Ⅱ and Category Ⅲ	Category Ⅱ and Category Ⅲ
Installation mode	TH35-7 .5(1 .0) standard rail	TH35-7 .5(1 .0) standard rail
Incoming mode	Incoming either from up or down	Incoming either from up or down

Outline and Installation Dimensions (Unit:mm)



Model Selection Table



Applicable Range

SFB1L–63–series leakage circuit breaker is applicable for the lines with rated working voltage of 400V and below, rated current of 6A–63A and frequency of AC 50Hz or 60Hz, and has leakage, electric shock, overload, short circuit and other protection functions. It is mainly used for protection of building lighting and power distribution system.

△ Functions: Overload, short–circuit and leakage protection

△ Uses: Lighting for power distribution, motor protection and other civil uses

△ Number of Poles: 1P+N, 2P, 3P, 3P+N &4P

△ Breaking Capacity: 4500/6000A

△ Current: 6A/10A/16A/20A/25A/32A/40A/50A/63A

□ SFB1L-63

SFB1L-63-series Leakage Circuit Breaker

Main Technical Parameters

Product Name	SFB1L-63	SFB1L-63H
Applicable standard	IEC61009-1	
Product certification	CCC	

Electrical characteristics	SFB1L-63	SFB1L-63H
Number of poles	1P+N, 2P, 3P, 3P+N, 4P	1P+N, 2P, 3P, 3P+N, 4P
Rated frequency (Hz)	50/60	50/60
Housing current , I nm (A)	63	63
Rated current , I n (A)	6A/10A/16A/20A/25A/ 32A/40A/50A/63A	6A/10A/16A/20A/25A/ 32A/40A/50A/63A
Rated voltage , Ue (V)	AC230(IP+N/2P) AC400(3P/3P+N/4P)	AC230(IP+N/2P) AC400(3P/3P+N/4P)
Rated insulation voltage , Ui (V)	500V	500V
Rated impulse withstand voltage , Uimp (kV)	4kV	4kV
Residual current feature	AC Type	AC Type
Residual leakage action current value	30mA	30mA
Rated operating short-circuit breaking capacity, Ics (kA)	4.5kA	6kA
Instantaneous tripping characteristics	C (5In-10In) D (10In-20In)	C (5In-10In) D (10In-20In)
Tripping form	Thermal magnetic trip	Thermal magnetic trip
Pollution class	Class 2	Class 2

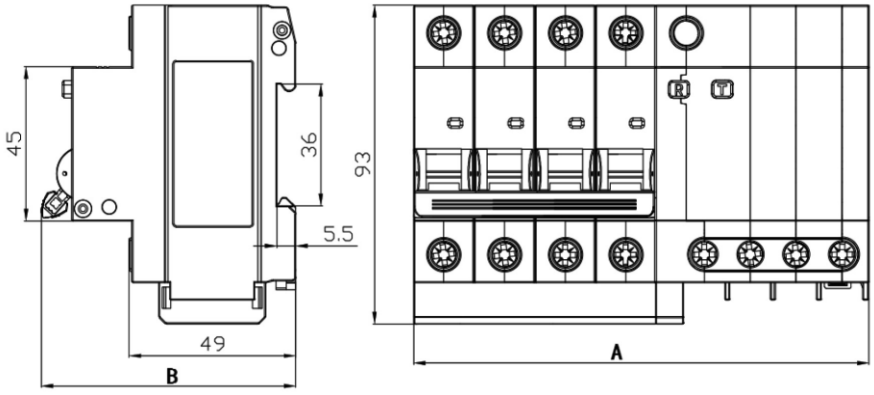
Mechanical Characteristics	SFB1L-63	SFB1L-63H
Electrical life	10000	10000
Mechanical life	20000	20000
Protection level	IP20	IP20

Normal Operating Conditions and Installation Characteristics	SFB1L-63	SFB1L-63H
Operating ambient temperature	-35℃~+70℃	-35℃~+70℃
Installation altitude	Up to 2000m	Up to 2000m
Wiring terminal	Screw crimping	Screw crimping
Maximum wiring capacity	25mm²	25mm²
Maximum limit torque	2.5N · m	2.5N · m
Installation category	Category Ⅱ and Category Ⅲ	Category Ⅱ and Category Ⅲ
Installation mode	TH35-7 .5(1 .0) standard rail	TH35-7 .5(1 .0) standard rail
Incoming mode	Incoming either from up or down	Incoming either from up or down

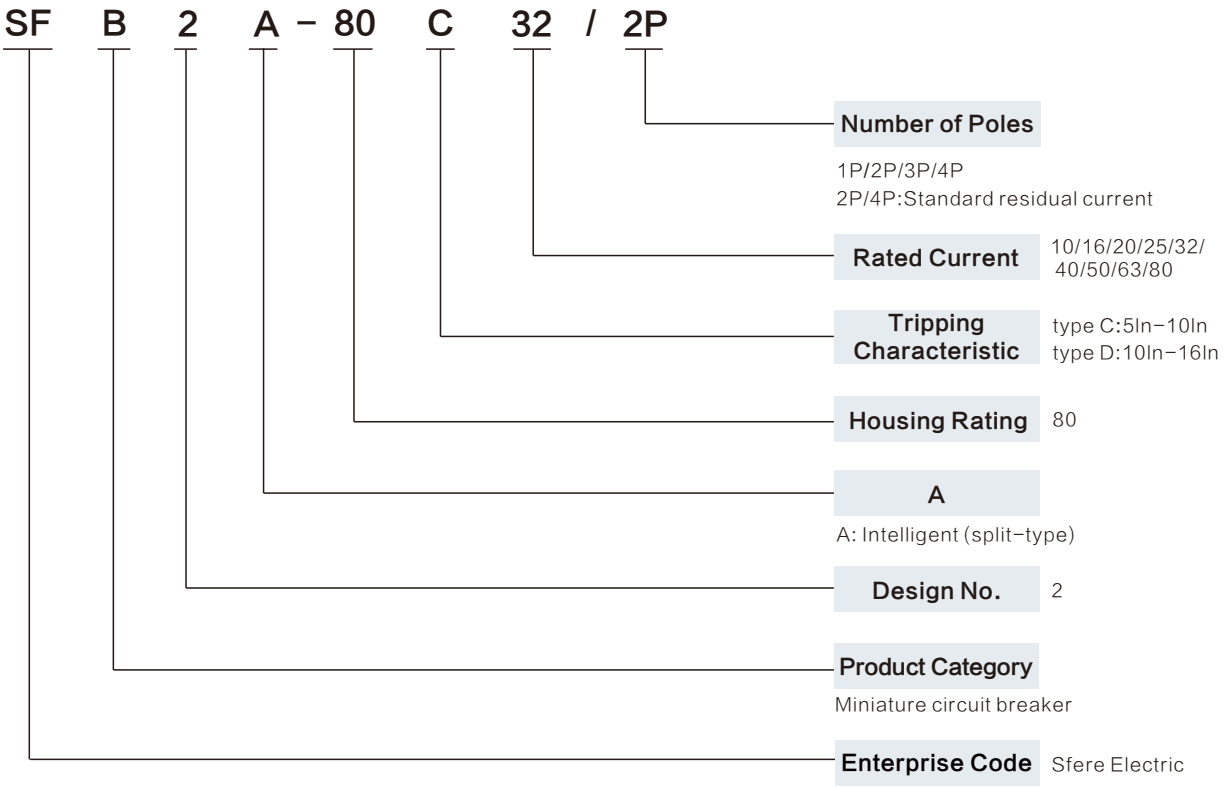
Outline and Installation Dimensions

Unit: mm

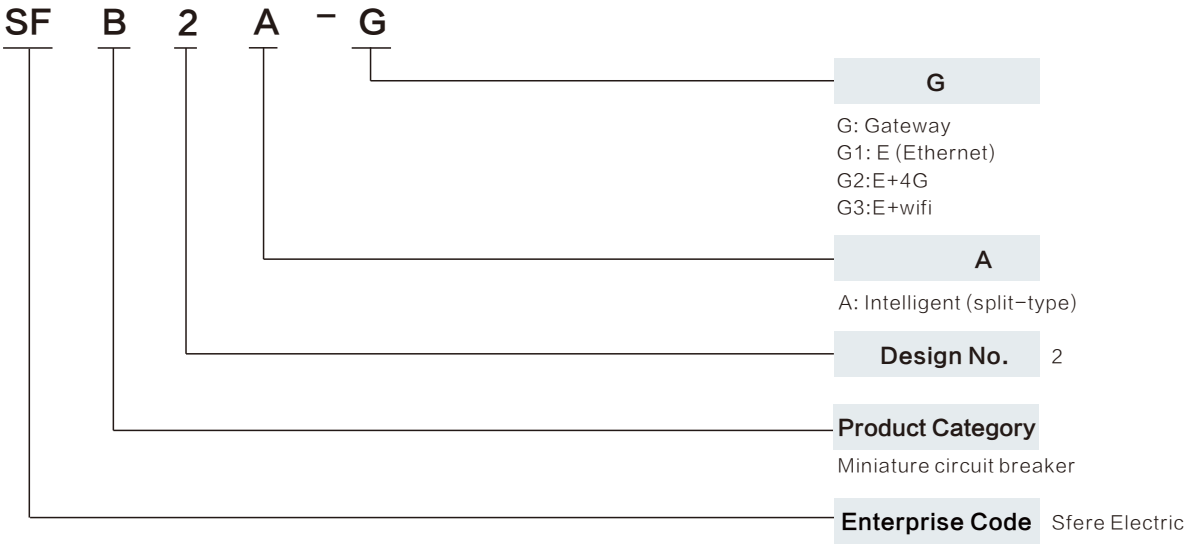
Number of Poles	1P+N	2P	3P+N	4P
A(mm) type 63	53.5 ± 1	71.5 ± 1	115.5 ± 1.5	133.5 ± 1.5
B(mm)	72 ± 0.8	75 ± 0.8		



Model Selection Table



Model Selection Table



Product Introduction

SFB2A-series intelligent miniature circuit breaker is a new type of IoT circuit breaker, which is applicable for AC 230V/400V, 50Hz distribution network. It is mainly used to link the load at the end of the line and switch on and off the line to avoid damage and loss caused by hidden safety hazards such as line overvoltage, undervoltage, overload, leakage and overheating of running equipment. This product integrates multiple functions such as remote control, data measurement monitoring, and safety status monitoring. It is a multi-functional IoT product that realizes the intelligent power management and control of homes, buildings, apartments, street lamps, municipal engineering and other application environments.

☐ SFB2A-80

Product Features

- ☑ Automatic re-making
- ☑ Leakage self-inspection
- ☑ 6000A breaking capacity
- ☑ Mechanical structure overload protection
- ☑ Overvoltage/undervoltage automatic protection
- ☑ Surge, overtemperature & short-circuit protection
- ☑ Cloud platform remote monitoring & data analysis
- ☑ GB/T 10963.1、GB/T 16917.1

Model Selection

Items	SFB2A-80☐☐1P	SFB2A-80☐☐2P	SFB2A-80☐☐3P	SFB2A-80☐☐4P
Rated voltage (Ue)	AC 230V	AC 230V	AC 400V	AC 400V
Rated current (In)	10A/16A/20A/ 25A/32A/ 40A/50A/63A/80A	10A/16A/20A/ 25A/32A/ 40A/50A/63A/80A	10A/16A/20A/ 25A/32A/ 40A/50A/63A/80A	10A/16A/20A/ 25A/32A/ 40A/50A/63A/80A
Rated residual operating current (I△n)	–	30mA Type A	–	30mA Type A
Rated running short-circuit breaking capacity (Ics)	6000A	6000A	6000A	6000A
Rated frequency (f)	50Hz	50Hz	50Hz	50Hz

Model Selection

Item	SFB2A-series Miniature Circuit Breaker
Local leakage self-inspection	■
APP operating leakage self-inspection	■
Leakage self-inspection	■
Voltage/current monitoring	■
Load limit	■
Short-circuit protection	■
Overload mechanical protection	■
Leakage protection	■
Overload & overcurrent protection	■
Undervoltage alarm	■
Electric energy metering	■
Overvoltage protection	■
Switch overtemperature protection	■
Lightning surge protection	■
Local manual push rod	■
Maintenance safety switch	■
Electric control	■
Remote control	■
Safety information recording	■
Mobile APP management	■
Power consumption statistics	■
Platform centralized management	■

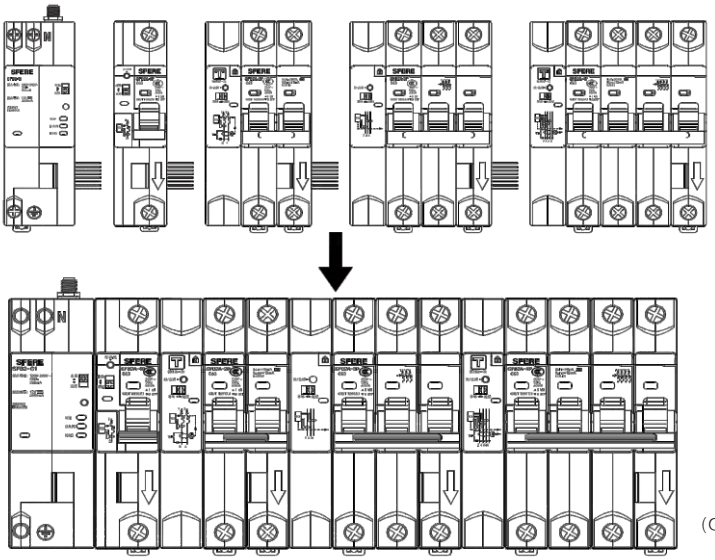
SFB2A Intelligent

Main Technical Parameters

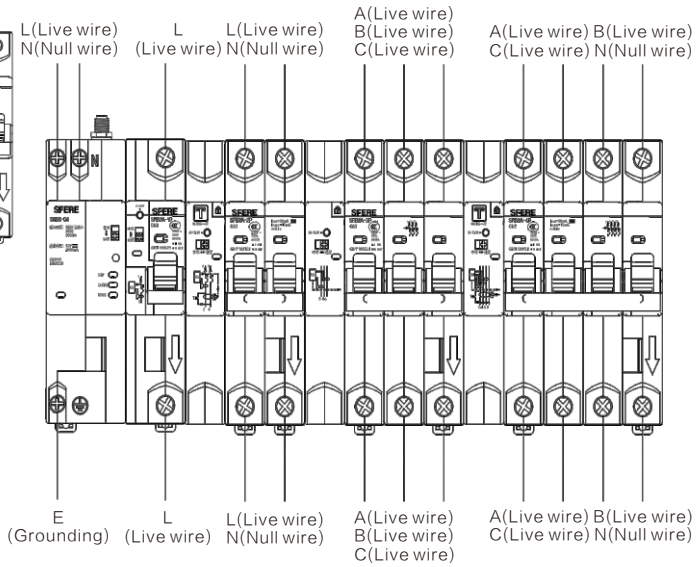
Items	Parameters
Rated current (A)	16/32/63/80（1P/2P），63/80（3P/4P）
Dimension (L × W × H)	27 × 76 × 113（1P），54 × 76 × 113（2P），72 × 76 × 113（3P） 90 × 76 × 113（4P）
Rated working voltage, Ue (V)	AC230（1P/2P），AC400（3P/4P）
Rated impulse withstand voltage (kV)	4
Standard	1P/3P：IEC60898-1　　2P/4P：IEC61009-1
Rated frequency	50Hz
Rated insulation voltage	500V
Rated short-circuit capacity	6000A
Tripping type	Type C/Type D
Communication type	RS-485
Leakage type	2P/4P: leakage current >20mA; disconnection in 40ms
Overvoltage protection value	1P/2P alarm: >250V，breaking: >270V，re-making: 230V 3P/4P alarm: >430V，breaking: >475V，re-making: 400V
Undervoltage protection value	1P/2P alarm: <195V，breaking: <175V，re-making: 230V 3P/4P alarm: <350V，breaking: <335V，re-making: 400V
Overtemperature protection value	Alarm: >80℃，breaking: >85℃
Mechanical/electrical life	10000 times
Power-on delay time	7s
Automatic making time	3s
Automatic breaking time	2s
Protection level	IP20
Pollution class	CLASS 2
Use environment	The ambient air temperature shall be -5° C to +40° C, and the daily average temperature shall not be more than +35° C. Atmospheric conditions: +40P, relative humidity of air: 50% or higher at lower temperature Altitude: W2000M
Installation environment	In the places with no obvious vibration or impact, the product shall be installed on TH35-7.5 standard rails specified in GB/T 19334-2003.

Typical Wiring

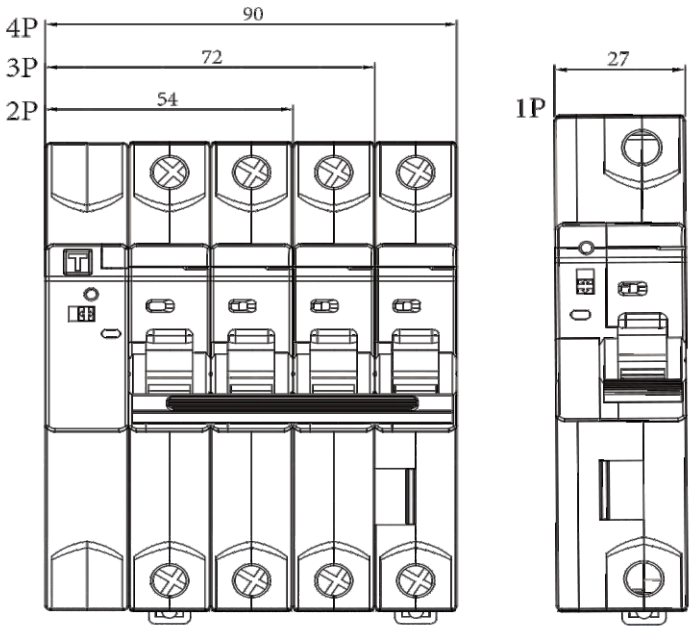
Installation Combination

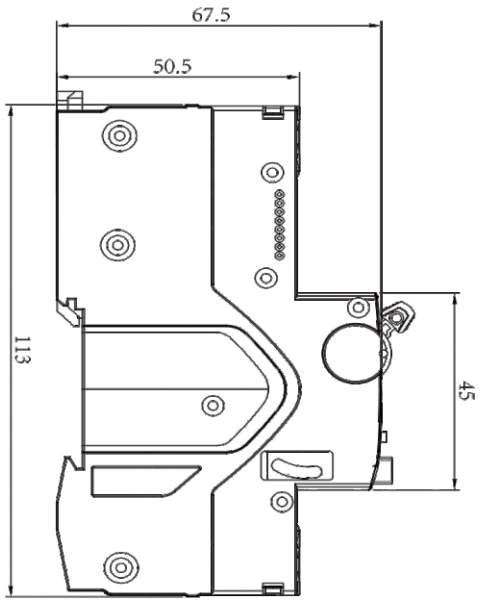


Wiring

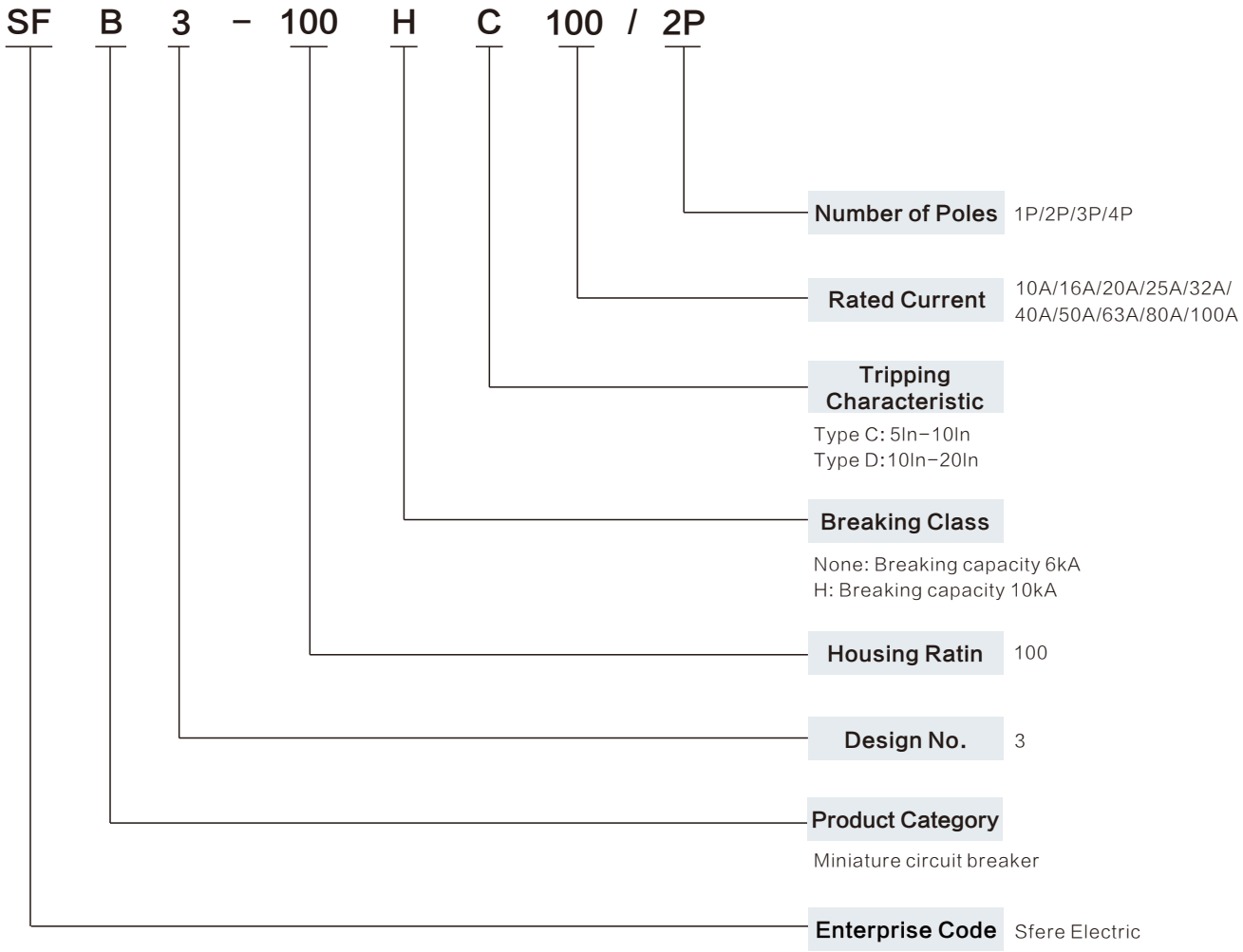


Dimension (mm)





Model Selection Table



Applicable Range

SFB3-100 series high breaking circuit breakers are applicable for places with AC 50Hz or 60Hz, rated voltage of 400V and below, and rated current of 10A-100A. It is mainly used for overload and short-circuit protection of lighting, power distribution lines and equipment in office buildings, residences and similar buildings. It can also be used for infrequent line transfer under normal conditions.

△ Functions: Overload, short-circuit protection

△ Uses: Lighting for power distribution, and motor protection

△ Number of Poles: 1P/2P/3P/4P

△ Breaking Capacity: 6000A/10000A

△ Current: 10/16/20/25/32/40/50/63/80/100

SFB3-100-series Circuit Breaker

☐ SFB3-100

Structural Features

SFB3-100-series high circuit breaker is composed of plastic housing, operating mechanism, contact arc extinguishing system and tripping mechanism, etc. The housing is made of high flame-retardant and high-strength special plastic (DSM), which has strong impact resistance and light weight. The parts of the circuit breaker's operating mechanism are made of high-strength plastic and stainless steel, which ensure sensitivity and reliability while obtaining the lowest rotational inertia, so that the time from the beginning of the short-circuit trouble to the operation of tripping mechanism is very short. The tripping mechanism is composed of two parts: Bimetal overload reverse time limit tripping mechanism and short-circuit instant electromagnetic mechanism. The contact arc extinguishing system adopts a special arc guide angle and arc extinguishing chamber, with significant current limiting characteristics. With energy storage mechanism operation, the contacts close quickly, overcoming the adverse effects of the handle speed due to human operation, and improving the service life of the product (mechanical life of 20,000 times and electrical life of up to 10,000 times).

Main Technical Parameters

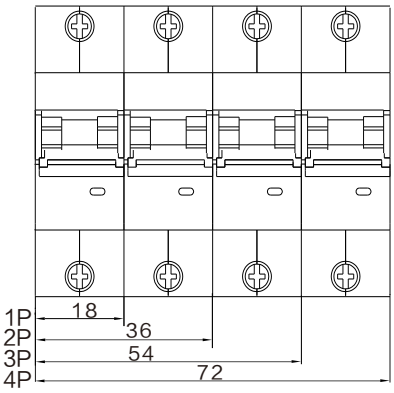
Product Name	SFB3-100	SFB3-100H
Applicable standard	IEC60898-1	
Product certification	CCC	

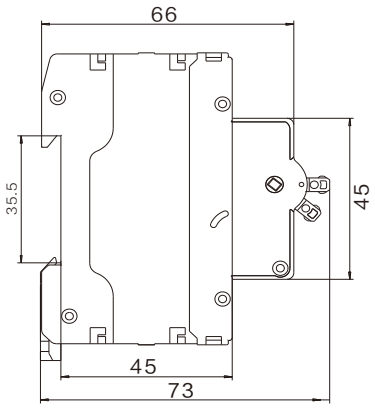
Electrical characteristics	SFB3-100	SFB3-100H
Number of poles	1P, 2P, 3P, 4P	1P, 2P, 3P, 4P
Rated frequency (Hz)	50/60	50/60
Housing current , I nm (A)	100	100
Rated current , I n (A)	10A/16A/20A/25A/32A/ 40A/50A/63A/80A/100A/	10A/16A/20A/25A/32A/ 40A/50A/63A/80A/100A/
Rated voltage , Ue (V)	AC230(IP)/AC400(2P/3P/4P)	AC230(IP)/AC400(2P/3P/4P)
Rated insulation voltage , Ui (V)	500V	500V
Rated impulse withstand voltage , Uimp (kV)	4kV	4kV
Rated limit short-circuit breaking capacity, Icu (kA)	6kA	10kA
Instantaneous tripping characteristics	C (5In-10In) D (10In-20In)	C (5In-10In) D (10In-20In)
Tripping form	Thermal magnetic trip	Thermal magnetic trip
Pollution class	Class 2	Class 2

Mechanical Characteristics	SFB3-100	SFB3-100H
Electrical life	10000	10000
Mechanical life	20000	20000
Protection level	IP20	IP20

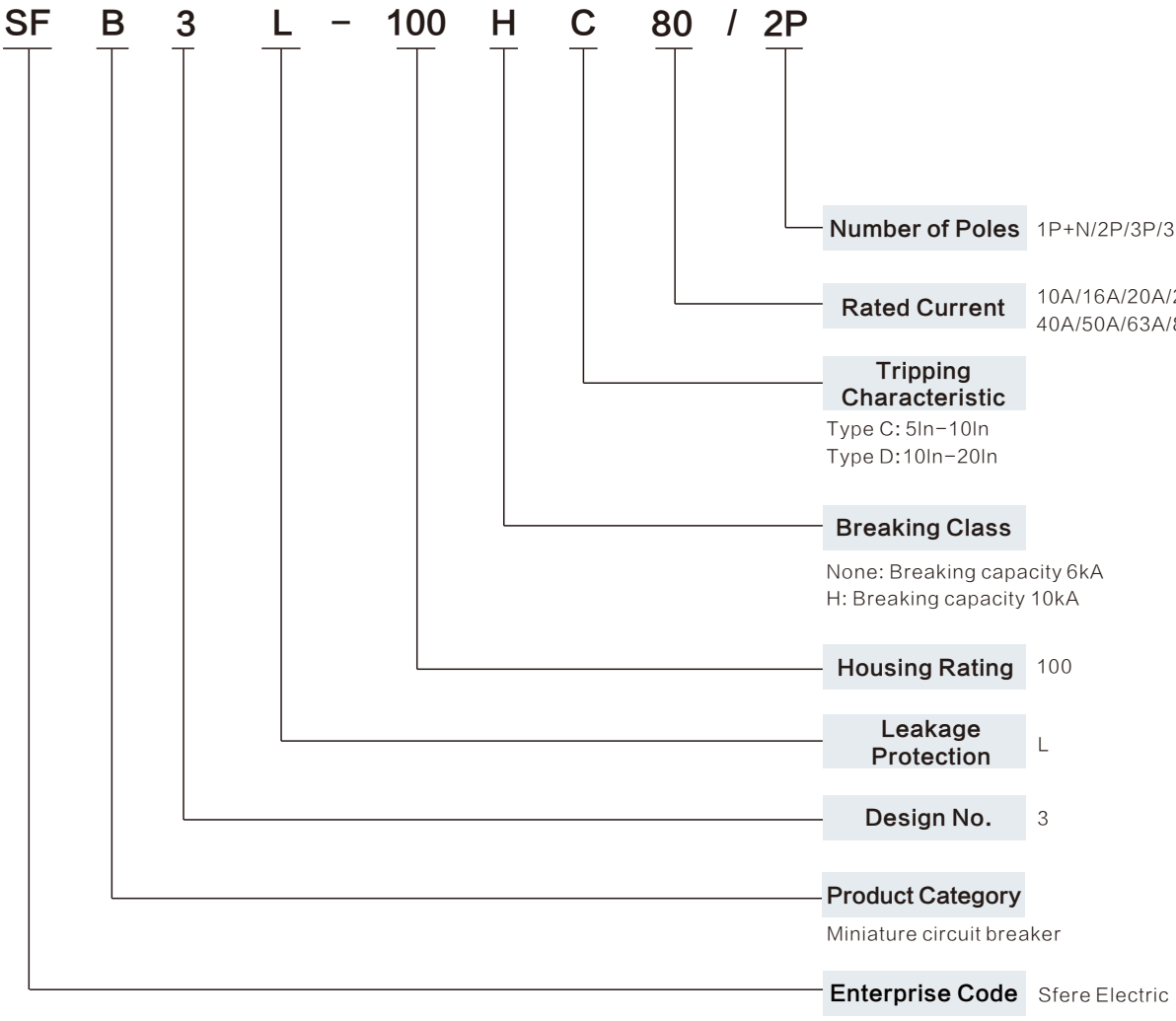
Normal Operating Conditions and Installation Characteristics	SFB3-100	SFB3-100H
Operating ambient temperature	-35℃~+70℃	-35℃~+70℃
Installation altitude	Up to 2000m	Up to 2000m
Wiring terminal	Screw crimping	Screw crimping
Maximum wiring capacity	30mm^2	30mm^2
Maximum limit torque	3.5N · m	3.5N · m
Installation category	Category Ⅲ	Category Ⅲ
Installation mode	TH35-7 .5(1 .0) standard rail	TH35-7 .5(1 .0) standard rail
Incoming mode	Incoming either from up or down	Incoming either from up or down

Outline and Installation Dimensions (Unit: mm)





Model Selection Table



Applicable Range

SFB1L–63 series leakage circuit breaker is applicable for the lines with rated working voltage of 400V and below, rated current of 6A–63A and frequency of AC 50Hz or 60Hz, and has leakage, electric shock, overload, short circuit and other protection functions. It is mainly used for protection of building lighting and power distribution system.

△ Functions: Overload, short–circuit protection

△ Uses: Lighting for power distribution, motor protection and other civil uses

△ Number of poles: 1P+N (breaking at pole N)/ 2P/ 3P/ 3P+N/ 4P

△ Breaking Capacity: 6000A/10000A

△ Current: 10A/16A/20A/25A/32A/40A/50A/63A/80A/100A

SFB3L–100 series Leakage Circuit Breaker

☐ SFB3L–100

Main Technical Parameters

Product Name	SFB3L–100	SFB3L–100H
Applicable standard	IEC61009–1	
Product certification	CCC	

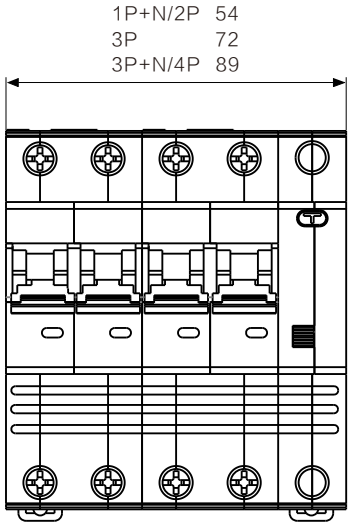
Electrical characteristics	SFB3L–100	SFB3L–100H
Number of poles	1P+N, 2P, 3P, 3P+N, 4P	1P+N, 2P, 3P, 3P+N, 4P
Rated frequency (Hz)	50/60	50/60
Housing current , I nm (A)	100	100
Rated current , I n (A)	10A/16A/20A/25A/32A/ 40A/50A/63A/80A/100A/	10A/16A/20A/25A/32A/ 40A/50A/63A/80A/100A/
Rated voltage , Ue (V)	AC230(IP+N/2P) AC400(3P/3P+N/4P)	AC230(IP+N/2P) AC400(3P/3P+N/4P)
Rated insulation voltage , Ui (V)	500V	500V
Rated impulse withstand voltage , Uimp (kV)	4kV	4kV
residual current feature	AC type	AC type
Residual leakage action current value	30mA、50mA	30mA、50mA
Instantaneous tripping characteristics	C (5In–10In) D (10In–20In)	C (5In–10In) D (10In–20In)
Tripping form	Thermal magnetic trip	Thermal magnetic trip
Pollution class	Class 2	Class 2

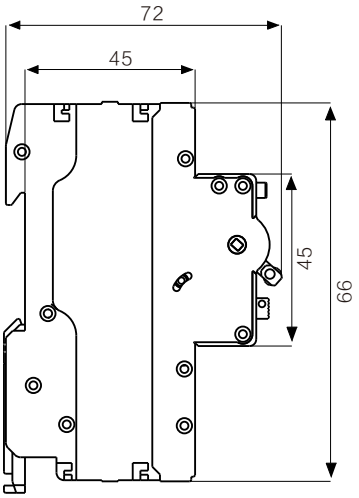
☐ SFB3L–100

Mechanical Characteristics	SFB3L–100	SFB3L–100H
Electrical life	10000	10000
Mechanical life	20000	20000
Protection level	IP20	IP20

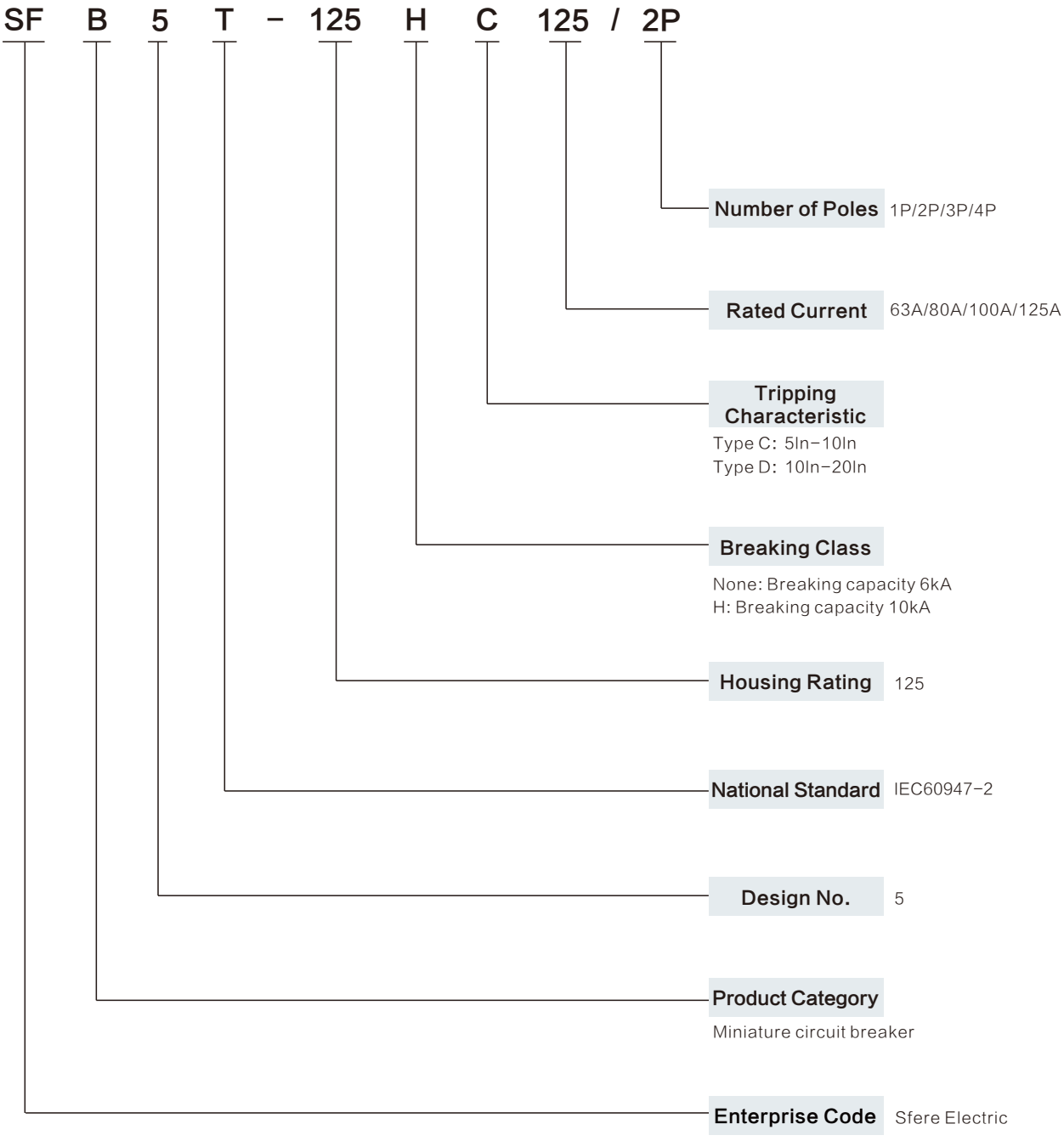
Normal Operating Conditions and Installation Characteristics	SFB3L–100	SFB3L–100H
Operating ambient temperature	–35℃~+70℃	–35℃~+70℃
Installation altitude	Up to 2000m	Up to 2000m
Wiring terminal	Screw crimping	Screw crimping
Maximum wiring capacity	35mm^2	35mm^2
Maximum limit torque	3.5N · m	3.5N · m
Installation category	Category Ⅱ and Category Ⅲ	Category Ⅱ and Category Ⅲ
Installation mode	TH35–7 .5(1 .0) standard rail	TH35–7 .5(1 .0) standard rail
Incoming mode	Incoming either from up or down	Incoming either from up or down

Outline and Installation Dimensions (Unit mm)





Model Selection Table



Product Overview

SFB5T-125 series circuit breaker (hereinafter referred to as circuit breaker) is mainly used for overload and short-circuit protection in distribution lines with the frequency of AC 50Hz, rated working voltage of 230V/400V, rated current up to 125A, rated limit short-circuit breaking capacity up to 10000A, and also for infrequent on-off operation and transfer of lines. This circuit breaker is mainly used in various places such as industrial, commercial, high-rise buildings and civil houses.

SFB5T-125 series Circuit Breaker

Product Parameters

☐ SFB5T-125

Product Name	SFB5T-125	SFB5T-125H
Applicable Standard	IEC60947-2	
Product Certification	CCC	

Electrical Characteristics	SFB5T-125	SFB5T-125H
Number of poles	1P, 2P, 3P, 4P	1P, 2P, 3P, 4P
Rated frequency (Hz)	50/60	50/60
Housing current, Inm (A)	125	125
Rated current, Ie (A)	63A/80A/100A/125A	63A/80A/100A/125A
Rated voltage, Ue (V)	AC230(IP)/AC400(2P/3P/4P)	AC230(IP)/AC400(2P/3P/4P)
Rated insulation voltage, Ui (V)	690V	690V
Rated impulse withstand voltage, Uimp (kV)	4kV	4kV
Rated operating short-circuit breaking capacity, Ics (kA)	6kA	7.5kA
Rated limit short-circuit breaking capacity, Icu (kA)	6kA	10kA
Instantaneous tripping characteristics	C (8In ± 20%) D (12In ± 20%)	C (8In ± 20%) D (12In ± 20%)
Tripping form	Thermomagnetic tripping	Thermomagnetic tripping
Pollution class	Ⅲ	Ⅲ

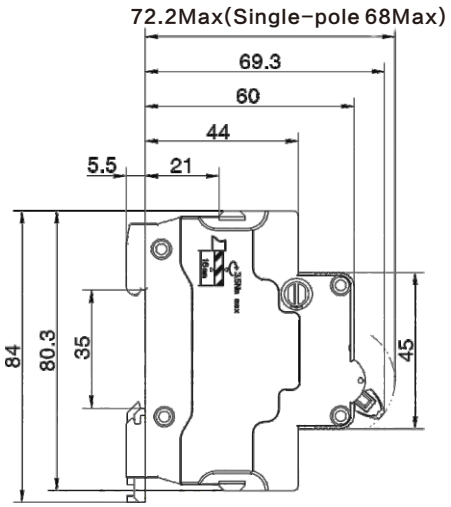
Mechanical Characteristics	SFB5T-125	SFB5T-125H
Electrical life	10000	10000
Mechanical life	20000	20000
Protection level	IP20	IP20

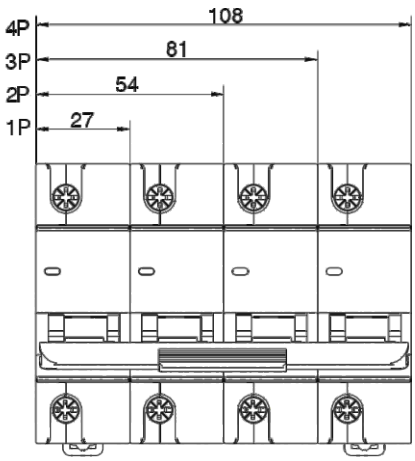
Normal Operating Conditions and Installation Characteristics	SFB5T-125	SFB5T-125H
Operating ambient temperature	-35℃~+70℃	-35℃~+70℃
Installation altitude	Up to 2000m	Up to 2000m
Wiring terminal	Screw crimping	Screw crimping
Maximum wiring	50mm²	50mm²
Maximum limit torque	3.5N · m	3.5N · m
Installation category	Category Ⅲ	Category Ⅲ
Installation mode	TH35-7.5 standard rail	TH35-7.5 standard rail
Incoming mode	Incoming from top or bottom	Incoming from top or bottom

Conductor Requirements and Sectional Area of Copper Conductor

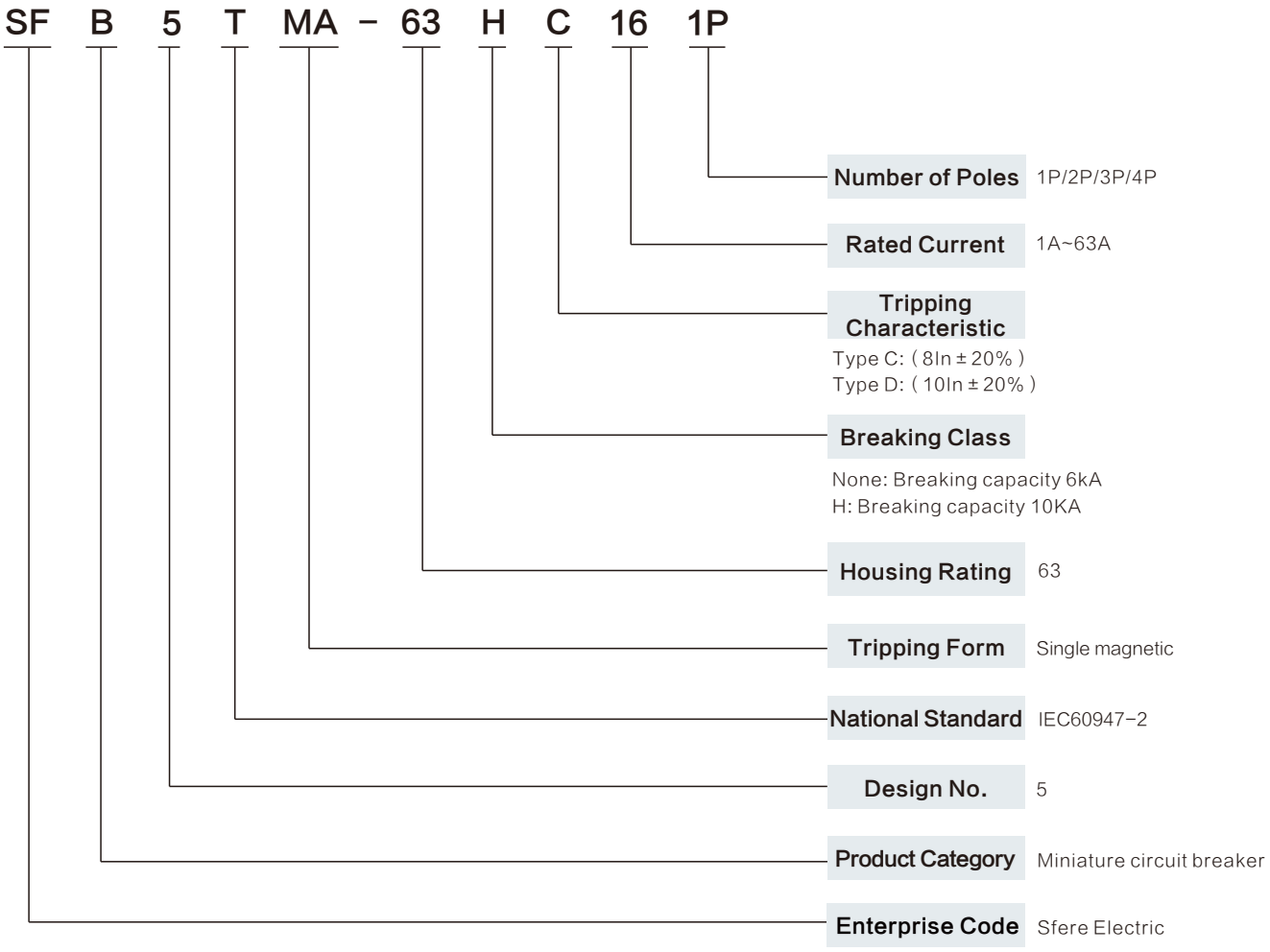
Sectional Area, S (mm^2)	Rated Current, In (A)
16	63A
25	80A
35	100A
50	125A

Dimension (mm)





Model Selection Table



Product Overview

SFB5TMA-63 single-magnetic circuit breaker (hereinafter referred to as circuit breaker) is mainly applicable for power distribution network with the frequency of AC 50Hz/60Hz, rated current of 1A-63A, and rated voltage of 230V or 400V. It is suitable for low-voltage terminal distribution in medical IT distribution systems, motor protection and building fire protection systems as a short-circuit protection switch, and can also be used in conjunction with thermal relays or motor starters for overload protection.

Product Parameters

Product Name	SFB5TMA-63	SFB5TMA-63H
Applicable standard	IEC60947-2	IEC60947-2
Product certification	CCC	CCC

Mechanical Characteristics	SFB5TMA-63	SFB5TMA-63H
Electrical life	10000	10000
Mechanical life	20000	20000
Protection level	IP20	IP20

SFB5TMA-63 series Miniature Circuit Breaker

Product Parameters

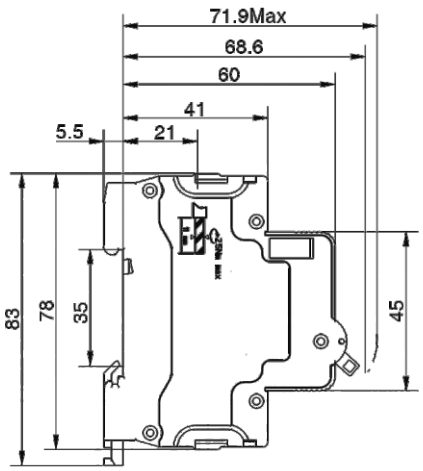
☐ SFB5TMA-63

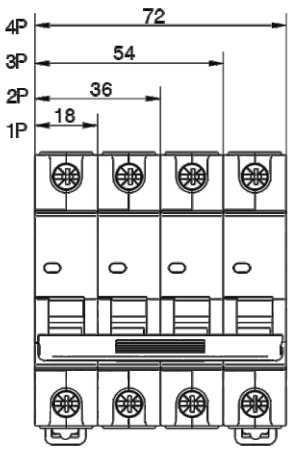
Electrical Characteristics	SFB5TMA-63	SFB5TMA-63H
Number of poles	1P/2P/3P/4P	1P/2P/3P/4P
Rated frequency (Hz)	50/60	50/60
Housing current, Inm (A)	63	63
Rated current, In (A)	1/2/3/4/5/6/7/8/9/10/ 16/20/25/32/40/50/63	1/2/3/4/5/6/7/8/9/10/ 16/20/25/32/40/50/63
Rated voltage, Ue (V)	AC230/400(1P)/AC230(2P)/ AC400(2P/3P/4P)	AC230/400(1P)/AC230(2P)/ AC400(2P/3P/4P)
Rated insulation voltage, Ui (V)	690	690
Rated impulse withstand voltage, Uimp (kV)	6	6
Rated operating short-circuit breaking capacity, Ics (kA)	6	7.5
Rated limit short-circuit breaking capacity, Icu (kA)	6	10
Instantaneous tripping characteristics	C(8In ± 20%)/D(12In ± 20%)	C(8In ± 20%)/D(12In ± 20%)
Tripping form	Magnetic tripping	Magnetic tripping
Pollution class	Class 3	Class 3

Normal Operating Conditions and Installation Characteristics	SFB5TMA-63	SFB5TMA-63
Operating ambient temperature	-35℃~+70℃	-35℃~+70℃
Installation altitude	Up to 2000m	Up to 2000m
Wiring terminal	Screw crimping	Screw crimping
Maximum wiring capacity	16mm^2	16mm^2
Maximum limit torque	2.5N · m	2.5N · m
Installation category	Category Ⅱ and Category Ⅲ	Category Ⅱ and Category Ⅲ
Installation mode	TH35-7.5(1.0) standard rail	TH35-7.5(1.0) standard rail
Incoming mode	Incoming from top	Incoming from top

☐ SFB5TMA-63H

Outline and Installation Dimensions (mm)





CPS

Control and Protection Switch SFCP

Model Selection Table

SF CPS 2 – 125 C / 33 M 100 FK M F B

Display Type
B:LED /E:LCD

Function Code
F:Fire protection
LE:Residual current protection
G:Isolation
T:Communication

Control Voltage M:AC220V

Accessory Code
See accessory configurations

Rated Current
1A/4A/6.3A/12A/16A/32A/45A/50A/63A/100A/125A

Trip
M: Infrequently start of motor protection
L: Power distribution protection

Number of Poles
3 poles
(33:3 pole with 3-pole protective pole, 30:3 pole without protective pole)

Breaking Capacity Standard type (can be omitted)

Housing Rating 45/125

Design No. 2

Product Type
Control and Protection Switch

Enterprise Code Sfere Electric

☐ **Accessory Configurations**

Model	Accessory Type	Code	Normally open 13 14	Normally open 23 24	Normally closed 31 32	Normally closed 51 52	Transfer 41 42 44	Fault (fire alarm) 95 (201) 98 (202)
SFCPS2	Standard configuration + auxiliary	FK	√	√	√	√	√	√

Note: 95(201)/98(202) share a pair of contacts (basic type is 95/98 and fire protection type is 201/202).

Normal Working Environment

☐ Ambient Temperature: -5℃ to 40℃; Daily average temperature: ≤35℃.
☐ Altitude ≤2,000m.
☐ When the maximum temperature is +40℃, the relative humidity is ≤50%; when the monthly average minimum temperature is +20℃, the relative humidity is ≤90%.
☐ Protection Level: IP20.
☐ Pollution Class: Class-3.
☐ Installation Category: The main circuit of 690V system is Category-Ⅲ, the main circuit of 380V system is Category-IV, and the control circuit is Category-Ⅱ.

Functions and Features

This product adopts modular single structural form, integrates the comprehensive functions of the circuit breaker (fuse), contactor, overload (over-current) protector, over voltage, under voltage, phase loss protector, voltmeter, ammeter, residual current protection, isolator and other electrical components. MCU digital processing technology is applied with high measurement accuracy, good linearity, accurate and reliable fault resolution and strong anti-interference ability.

☐ The product has the functions of remote automatic control and local direct manual control.

☐ The product has the functions of panel indication and electromechanical signal alarm.

☐ The product has coordinated time protection features (with long delay, short-circuit short delay, short-circuit instantaneous three-section protection features).

☐ The product has many functions such as open phase, over current, stall, blocking, short circuit, under current, over voltage, under voltage, residual current protection, three-phase unbalance, phase loss, isolation, startup timeout, fire protection, fault signal output and remote shunt etc.

☐ The product has a monitor that can display various operations, faults and other states with LED (LCD). It has the functions of voltmeter and ammeter.

☐ Various parameters of the product can be set and queried; as SFCPS2 adopts MCU E2PROM memory technology, it can be stored without power after parameter setting and has the function of fault memory, which is convenient for fault query and analysis.

☐ The product has RS485 communication interface and open field bus (Mod Bus protocol etc.), which are convenient for user's system integration and intelligent management.

☐ Load Service Category:

☐ The motor protection type is applicable to AC-42, AC-43, AC-44, DC-41, DC-43, DC-45, DC-46 and other service categories.

☐ The power distribution protection type is applicable to AC-40, AC-41, AC-45A and AC-45B.

Main Technical Parameters

Model	Rated Current of Main Body	RatedWorking Current of Controller,Ie(A)	Adjustment Range for Rated Working Current of Controller,Ir1(A)	Control Power Range of 400V(kW)	Service Category	Rated Voltage(V)	Rated Frequency (Hz)	Rated Impulse Withstand Voltage(kV)	Trip Class
SFCPS2-45	16	1	0.2 ~ 1	0.12 ~ 0.37	Motor type AC-42 AC-43 AC-44 Distribution type AC-40 AC-41 AC-45A AC-45B	400	50	8	10A 10 20 30 Optional
		4	1 ~ 4	0.55 ~ 1.5					
		6.3	2.4 ~ 6.3	1.1 ~ 3					
		12	4 ~ 12	1.5 ~ 4					
		16	6.4 ~ 16	3 ~ 7.5					
	45	25	10~20	5~12					
		32	12.8 ~ 32	5.5 ~ 15					
		45	16 ~ 45	7.5~18.5					
SFCPS2-125	63	45	18~45	7.5~18.5					
		50	20~50	7.5~22					
	125	63	25.2 ~ 63	11 ~ 30					
		100	40 ~ 100	22 ~ 37					
		125	50~125	22 ~ 55					

☐ Capacity of switching on, bearing and short-circuit current breaking (accuracy ±20%)

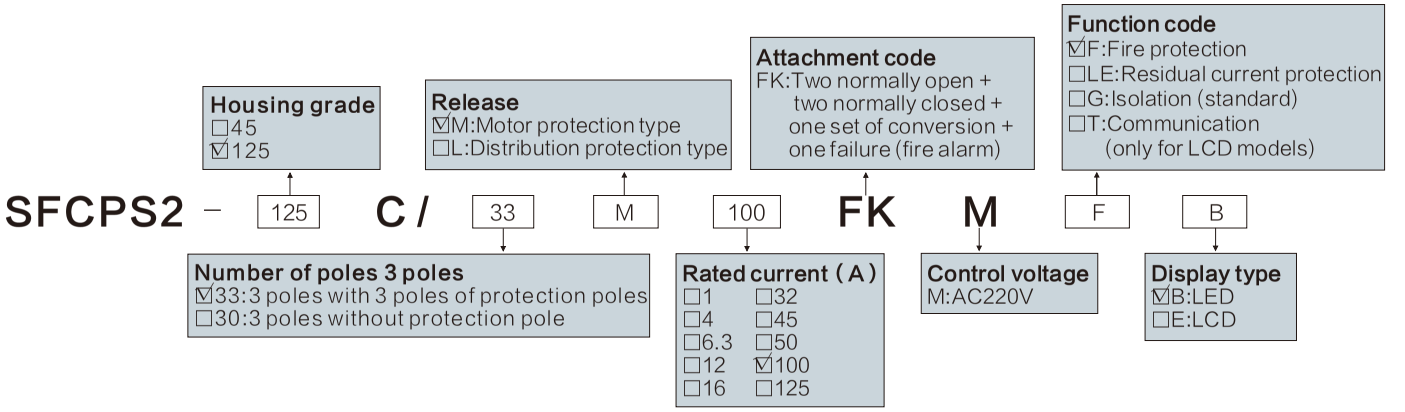
Model	Rated Voltage, Ue	In (A)	Rated Flow, Ics (kA)	Expected Agreed Test	Service Life of Switch (10,000 times)	Start/Hold Capacity (VA)	Closed/Disconnected Time (ms)
SFCPS2-45	AC400V	16	15kA	30Ie	(AC43) Electrical:100 Mechanical:1000	180/12	9~25/7~20
		32					
		45		25Ie			
SFCPS2-125		63	35kA	20Ie	(AC43) Electrical:50 Mechanical: 400	370/25	12~35/7~20
		80					
		100					
		125					

Order specification

User	× × × Co.,Ltd	Quantity	100	Date	2021.1.1

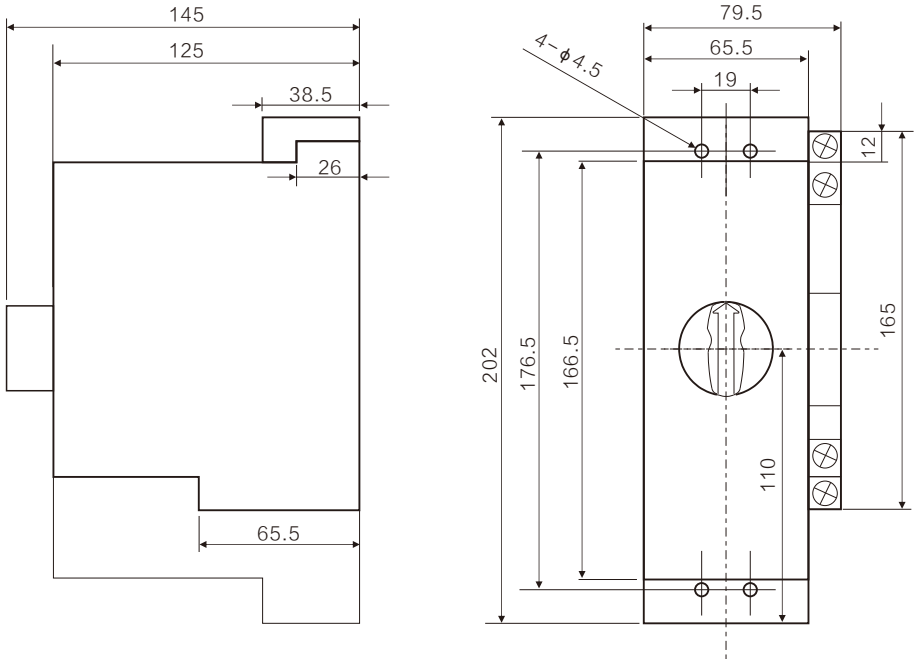
Model example:

SFCPS2 – 125 C/ 33 M 100 FK M F B



Outline and Installation Dimension Drawing (unit: mm)

☐ SFCPS2-45 Installation Dimension Drawing



☐ SFCPS2-125 InstallationDimensionDrawing