JUTRION

JUW1

Series Air Circuit Breaker

Fixed & Draw-Out Configurations

2000 A Frame

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General

The JUW1 series intelligent low-voltage air circuit breaker (hereinafter called ACB) is suitable for distribution networks with frequency of AC 50Hz, rated voltage up to 660V (690V) and below and rated current ranging from 200A to 6300A. It's used to distribute electrical energy and protect lines and power equipment from overload, undervoltage, short circuit, single-phase grounding and other faults. The ACB has intelligent protection function and precise selective protection, can improve power supply reliability and avoid unnecessary power outages. Meanwhile, it has open type communication interface and can be used for four remote operations to meet the requirements of the control center and automation system. The ACB has pulse withstand voltage of 8000V at altitude of 2000 meters (corrected according to standards for different altitudes, with maximum voltage not exceeding 12000V). The ACB without intelligent controller and sensor can be used as isolator, marked as —/ |×— .
Standard: GB 14048.2, IEC60947-2

Type Designation

JU	W	1	-	□	/	□
↓	↓	↓		↓		↓
①	②	③		④		⑤

Code	Meaning
①	Company code
②	Air Circuit Breaker
③	Design No.

Code	Meaning
④	Rated current in scope of frame current
⑤	Number of poles (4 poles are marked with 4, 3 poles can be omitted)

◎Classification
1. Classified by installation method
a. Fixed type
b. Draw-out type
2. Classified by the number of poles: 3P, 4P
3. Classified by operation method
a. Electric operation
b. Manual operation (for maintenance and repair)
◎Type of release
Intelligent controller, undervoltage instantaneous (or delayed) release
◎ Intelligent controller performance
a. The intelligent controller is classified into H type (communication type), M type (ordinary intelligent type), and L type (economic type);
b. Equipped with overload long delay inverse time limit, short delay inverse time limit, definite time limit and instantaneous functions. The required protection characteristics can be set by the user;
c. Single phase grounding protection function;
d. Display function: setting current display, action current display and voltage display of each line (voltage display should be proposed when ordering);
e. Alarm function: overload alarm;
f. Self inspection function: overheating self inspection, microcomputer self-diagnosis;
g. Test function: It can test the action characteristics of the controller.

Normal working and installation condition

◎Ambient air humidity

The upper limit value shall not exceed +40°C, the lower limit value shall not be less than -5°C, and the 24-hour average value shall not exceed +35°C:

Note: For working condition with lower limit of -10°C or -25°C, the user should declare to our factory;

For working condition where the upper limit value exceeds +40°C or the lower limit value is below -10°C or -25°C, the user should consult with our factory.

◎ The altitude of the installation site shall not exceed 2000m

◎ Atmospheric condition

The relative humidity of the atmosphere does not exceed 50% when the ambient air temperature is +40°C. At lower temperature, there can be higher relative humidity. The average maximum relative humidity in the wettest month is 90%, and the average minimum temperature in that month is +25°C, and the condensation on the product surface due to temperature change should be considered. The user should consult with our factory for condition beyond the regulation.

◎ Protection level: IP30

◎ Utilization category: Category A or B

◎ Installation category

For the circuit breaker and undervoltage release with rated working voltage of 660V (690V) and below, the installation category of primary coil of power transformer is IV; and the installation category of auxiliary and control circuit is III.

◎ Installation condition

The circuit breaker should be installed according to the requirement of this manual, and the vertical inclination of the circuit breaker should not exceed 5° (the inclination of mining circuit breaker should not exceed 15°).

Technical data and performance

◎ 1. The rated current of the circuit breaker is shown in Table 1

Table 1

Rated frame current Inm A	Rated current In A
2000	400、630、800、1000、1250、1600、2000
3200	2000、2500、2900、3200
4000	3200、3600、4000
6300	4000、5000、6300

◎ 2. The rated short-circuit breaking capacity and short-term withstand current of the circuit breaker are shown in Table 2, and the arc distance of the circuit breaker is "zero" (i.e. there is no arc outside the circuit breaker)

Table 2

Rated frame current Inm A		2000	3200	4000	6300
Rated ultimate short-circuit breaking capacity Icu(KA)O-CO	400V	80	100	100	120
	690V	50	65	65	85
Rated short-time making capacity n×Icu(KA)/-cosΦ	400V	176/0.2	220/0.2	220/0.2	264/0.2
	690V	105/0.25	143/0.2	143/0.2	187/0.2
Rated service short-circuit breaking capacity Ics(KA)O-CO-CO	400V	65	80	80	100
	690V	50	50	65	75
Rated short-time withstand current Icw (KA) 1s, delay 0.4s, O-CO	400V	50	65	65/80(MCR)	85/100(MCR)
	690V	40	50	50/65(MCR)	65/75(MCR)

Note: The breaking capacity in the table is the same for the upper and lower incoming lines.

◎ 3. The maximum power consumption of the circuit breaker is 360W. The variation of the rated continuous current of the circuit breaker under different ambient temperatures is shown in Table 3

Table 3

JUW1 / Ambient temp. °C	400A	630A	800A	1000A	1250A	1600A	2000A
40	400A	630A	800A	1000A	1250A	1600A	2000A
50	400A	630A	800A	1000A	1250A	1550A	1900A
60	400A	630A	800A	1000A	1250A	1550A	1800A

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◎ 4. Intelligent overcurrent controller protection characteristic and function

4.1 Overcurrent controller protection characteristic

4.1.1 The setting value Ir (I/In) and error of the controller are shown in Table 4

Table 4

Long delay	Short delay		Instantaneous		Ground fault		
Ir1	Ir2	Error	Ir3	Error	Ir4		Error
(0.4-1) In	(0.4-15) In	±10%	In-50kA(Inm=2000A) In-75kA(Inm=3200~4000A) In-100kA(Inm=6300A)	±15%	Inm=(2000~4000A) (0.2~0.8)In Max 1200A Min 160A	Inm=6300A (0.2-1.0)In	±10%

Note: When simultaneously having three-section protection(required), the setting value cannot cross.

4.1.2 For long delay over current protection inverse time limit action characteristic $I^2TL=(1.5Ir1)^2tL$, the action time of(1.05-2.0)Ir1 is shown in Table 5, with time error of ± 15%.

Note: tL-Setting time for long delay of 1.5Ir1, TL -Action time for long delay

Table 5

1.05Ir1	1.3Ir1	1.5Ir1 setting time (s)	15	30	60	120	240	480
>2h non action	<1 h non action	2.0Ir1 f action time (s)	8.4	16.9	33.7	67.5	135	270

4.1.3 Short delay over current protection characteristic

The short delay over current protection is of definite time limit. If the low multiple is required to be the inverse time limit, its characteristic is as follows: $I^2Ts=(8Ir1)^2ts$, ts is the generally designed delay time; when the overload current is greater than 8Ir1, it automatically switches to definite time limit characteristic, which is shown in Table 6. The time limit error is ±15%.

Table 6

Delay time (s)				Returnable time (s)			
0.1	0.2	0.3	0.4	0.06	0.14	0.23	0.35

4.1.4 The overcurrent tripping protection characteristic is shown in Figure 1, and the ground fault protection characteristic is shown in Figure 2

4.2 M type intelligent controller function

a. Ammeter function

It displays the operating current and ground leakage current of each phase, normally displays the maximum phase current, and also displays the current or time value of setting, testing and fault.

b. Voltmeter function

It displays the voltage of each line, and normally displays the maximum value.

c. Remote monitoring and self-diagnosis function

① The controller has local fault self-diagnosis function

When the computer malfunctions, error "E" display or alarm can be sent, and the computer can be restarted. If the user needs it, the circuit breaker can also be opened.

② When the local ambient temperature reaches 80°C, alarm can be sent and the circuit breaker can be opened at low current (when required by the user).

③ The intelligent controller has overload, grounding, short circuit, load monitoring, pre-alarm, and trip indication (OCR) signals output through contact or optocoupler, making it easy for users to use for external remote control. The contact capacity is DC28V, 3A; AC125V, 3A.

d. Setting function

Various parameters of the controller can be adjusted with the four buttons: Set, +, -, and Store. Press the Set to the desired state (indicated by the status indicator light), then press the + or - to adjust the parameter to the desired value, and then press the Store button again. The store light illuminates once to indicate that the setting value has been locked. The protection parameter of the controller shall not be set across. After the controller is powered off and reset, press the Set button again to check the various parameters set circularly.

e. Test function

By using buttons such as Set, +, -, Trip, Non-trip and Reset, various protection characteristics of the controller can be checked. Use the Set, +, and - buttons to adjust simulated fault test current (note: do not store and lock), and then press the Trip or Non-trip button to test. The controller can enter fault handling. When pressing the Trip button, the circuit breaker breaks, when pressing the Non-trip button, the circuit breaker doesn't break, and the controller's various indicating states are normal. After the test, you need to press the Reset or Clear light button once before proceeding with other tests.

Note: For the convenience of the test, regardless of whether the grounding leakage is set at the tripping or alarm position, the test will be treated as tripping, and the priority is lower than overload protection. Once malfunction occurs during the test, the controller automatically stops all tests and enters fault handling.

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f. Load monitoring function

Set two setting values: ILC1 setting range (0.2-1) In and ILc2 setting range (0.2-1) In, ILc1 delay characteristic is inverse time limit characteristic, and its time setting value is 1/2 of the long delay setting value; there are two types of ILc2 delay characteristics. The first is the inverse time limit characteristic, with time setting value of 1/4 of the long delay setting value. The second is the fixed time limit characteristic, with delay time of 60 seconds. For these two delay functions, the former is used to cut off the unimportant load when the current approaches the overload setting value, while the latter is used when the current exceeds the setting value of ILc1, causing a delay of cutting off the unimportant load at the lower level, causing the current to decrease and maintain power supply for the main circuit and important load circuit. When the current drops to ILc2, after a certain delay, a command is sent to reconnect the cut off circuit at the lower level, restoring power supply of the entire system. The user can choose either of the two types of monitoring protection mentioned above, and the monitoring characteristic is shown in Figure 3 and Figure 4.

g. MCR tripping and simulated tripping protection can be turned off according to user requirement, and generally need to be turned off when conducting short delay breaking test

① MCR on/off protection is mainly used when the line is in fault state (when the controller is powered on), and the controller has the function of breaking the circuit breaker at low short-circuit current. The factory setting is 10kA with error of ±20%, and the set current can be determined according to the protection requirement.

② The controller has the function of directly sending trip signal without processing the signal by the host chip when there is an extremely large short-circuit current.

h. Thermal memory function

After the controller is overloaded or has a short circuit delay trip, it has memory function that simulates the characteristic of bimetallic sheets before the controller is powered off. The overload energy is released after 30 minutes, and the short delay energy is released after 15 minutes. During this period, if overload and short delay faults occur, the tripping time will become shorter, the controller will power off, and the energy will automatically reset.

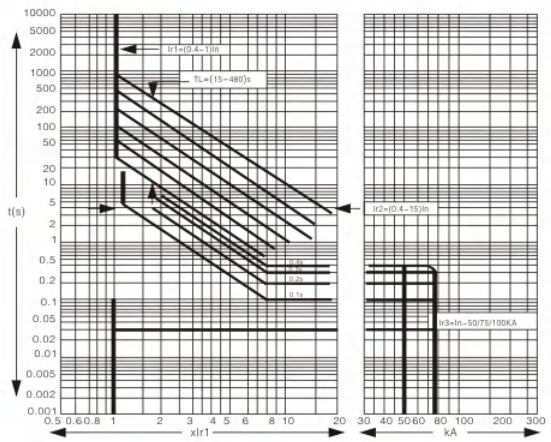


Figure 1

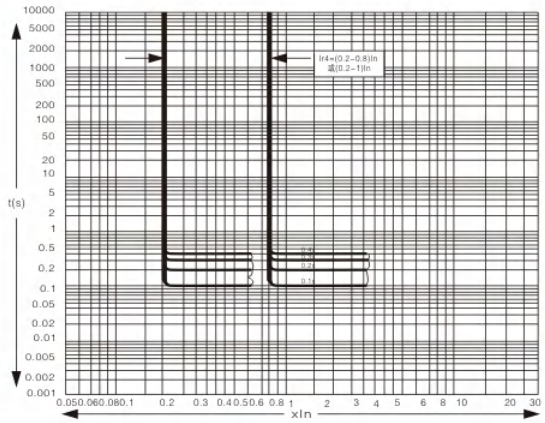


Figure 2

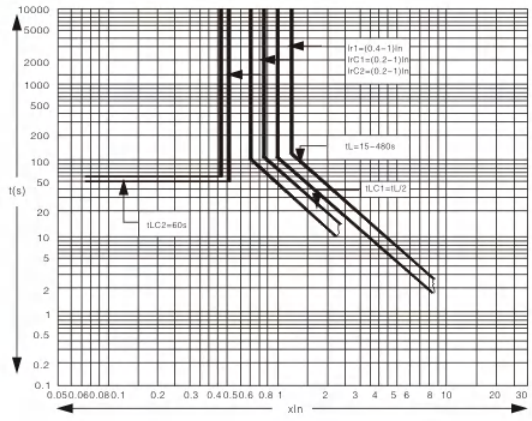


Figure3

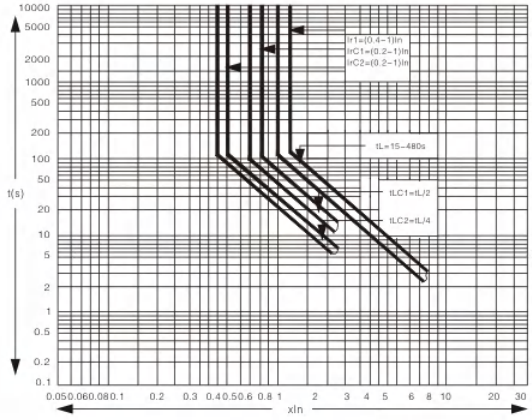


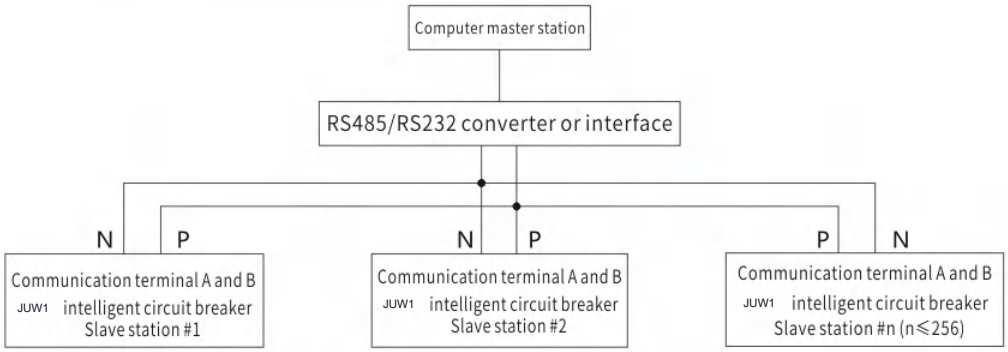
Figure4

4.3 H type intelligent controller

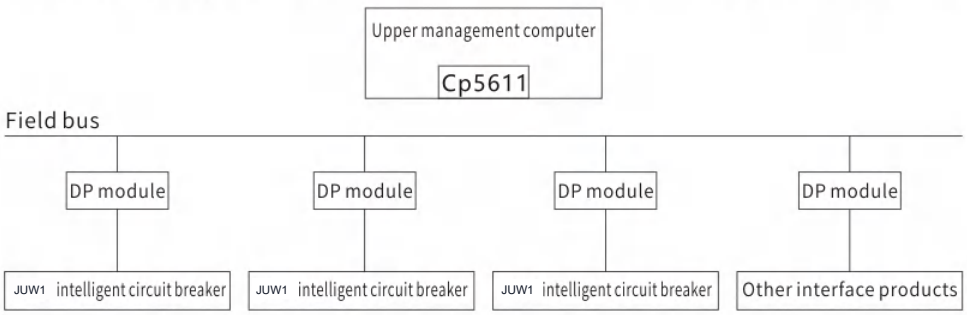
In addition to having all the functions of the M type, it also has serial communication interface. Through the communication interface, a local area network system (hereinafter referred to as the system) with a master-slave structure can be formed, with 1-2 computers as the master station. If the intelligent circuit breaker or other communicable components are used as the slave station, the system network structure is shown in the following figure.

For circuit breaker unit, the system can achieve long-distance "four remote" functions for monitoring of various power grid parameters and operating parameters, monitoring of the current operating status of intelligent circuit breaker, adjustment and download of various protection limit parameters and control of opening and closing operations of intelligent circuit breaker. The system is suitable for the construction and renovation of power distribution monitoring system in various power stations, power plants, small and medium-sized substations, industrial and mining enterprises, buildings, etc.

The connection diagram of the dedicated communication protocol interface is as follows:



The connection diagram of circuit breaker product based on the universal DP protocol is as follows:



4.3.1 System composition

(a) Hardware structure of data communication network system

△The intelligent circuit breaker provides standard RS485 communication interface, which is led out from the No. 10 and 11 outgoing lines of the circuit breaker;

△The communication medium connected to the system: Class A shielded twisted pair.

(b) Main characteristic of the network

△Bidirectional serial data transmission method, the product can provide multiple communication protocol modes: "Data Communication and Its Criteria for Low Voltage Apparatus V1.0", PROFIBUS-DP, MODEBUS, etc.

△Strict master-slave mode, that means the master station is the initiator and controller of communication, and the slave station can only communicate with the master station and cannot directly communicate with other slave stations.

△The communication baud rate is 9600bit/s, and the communication distance is 1.2km. For typical applications of PROFIBUS-DP communi cation baud rate, it can reach 187.5kbit/s.

(3) Monitoring software

YSS2000 configuration software can achieve the required configuration application of monitoring and management software according to different project requirements. For intelligent circuit breaker, it can achieve operation monitoring and various daily management functions.

4.3.2 System function

(a) Remote control

Remote control refers to the operation and control of energy storage, closing and opening of circuit breaker of each slave station in the system through the master station computer. The operator selects the corresponding object from the system interface, clicks the remote control button with the mouse, and the system provides the current operating status of the corresponding object. After the operator inputs the operation password, they can send remote control command for "closing" or "opening". The system passes the command to the corresponding circuit breaker slave station. After receiving the commands, the slave station performs operations such as breaking, closing and energy storage according to the established sequence, and reports the remote control result to the master station.

(b) Remote adjustment

Remote adjustment refers to setting the protection setting value of the slave station through the master station computer. In the master station computer, there are protection setting tables for all slave stations. The operator selects the corresponding object from the system interface, clicks the remote adjustment button with the mouse, and the system provides the current settings of all protection setting values for the corresponding object, as well as the protection setting table for that object. After the operator inputs the operation password, they can select the required parameter from the parameter table, and then click the corresponding button. The master station downloads the parameter to the corresponding slave station, and report the result of remote debugging. After receiving command, the slave station modifies its own protection setting value.

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© Remote measurement

Remote measurement refers to the real-time monitoring of the power grid operating parameter of each slave station through the master station computer. The communication sub-station reports the working parameter to the upper computer as follows: real-time A, B, C, N phase current value of each sub-station, voltage value of UAB, UBC, UCA, etc.

△ The fault record can record the following fault parameters

The current value of A, B, C, and N phases during the fault, the voltage value of UAB, UBC and UCA, the fault type, and the fault action time, and it can also record the fault in the fault database.

△ The computer displays the current real-time current and voltage of each sub-station through bar chart, absolute value table and other methods, and displays the operating status of each node through real-time curves.

(d) Remote communication

Remote communication refers to viewing the model, closing and opening status, various protection setting values, as well as the operation and fault information status of the slave station through the master station computer. The parameters reported from the slave station circuit breaker to the upper computer mainly include: switch model, switch status (on/off), fault information, alarm information, various protection setting values, etc.

(e) Other system functions

In addition to the four remote operation control function, the system can also perform various management functions: accident alarm (information screen, screen pushing, event printing, accident dialing, sound alarm), event recording, maintenance listing, shift handover management, load trend analysis and various reports printing.

4.3.3 L type intelligent controller

The L type controller adopts code switch and toggle switch setting methods, and has overload long delay, short circuit short delay, instantaneous and ground leakage four-section protection characteristics. It also has functions such as fault status and load current light column indication, but there is no digital display, and its functions are not as complete as the M and H types. The user can choose it for general situations.

◎ 4.4 Operating performance of circuit breaker

The operating performance of the circuit breaker is represented by the number of operation cycles, as shown in Table 7

Table 7

Rated frame current (A)	Total number of operation cycles
2000	10000
3200、4000	5000
6300	2000

◎ 4.5 The working voltage and required power of the shunt release, undervoltage release, motor operating mechanism, energy release (closing) electromagnet and intelligent controller of the circuit breaker are shown in Table 8

Table8

Required power / Rated working voltage / Item			AC (50Hz)		DC	
			220V	380V	110V	220V
Shunt release			24VA	36VA	24W	24W
Undervoltage release			24VA	36VA	-	-
Closing electromagnet			24VA	36VA	24W	24W
Electric operating mechanism	Rated frame current of circuit breaker	2000A	85VA	85VA	85W	85W
		3200A、4000A	110VA	110VA	110W	110W
		6300A	150VA	150VA	150W	150W
Intelligent controller supply voltage			AC220V、AV380V、DC220V、DC110V			

Note: The reliable operating voltage range of the shunt release is 70%~110%, and that of the closing electromagnet and operating mechanism are 85%~110%

◎ 4.6 The performance of the undervoltage release of the circuit breaker is shown in Table 9

Table9

Category		Undervoltage delay release	Undervoltage instantaneous release
Release action time		1,3,5s delay	Instantaneous
Release action voltage value	35%~70%Ue	The circuit breaker can reliably open	
	≤35%Ue	The circuit breaker cannot close	
	(85 ~ 110%) Ue	The circuit breaker can reliably close	
If the supply voltage recovers to 85% Ue within 1/2 delay time		The circuit breaker doesn't open	-

Note: The accuracy of the delay time is ±10%

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◎4.7 Performance of auxiliary contact

4.7.1 The conventional thermal current of the auxiliary contact is 6A

4.7.2 Auxiliary contact form: 4NO, 4NC.

4.7.3 Abnormal making and breaking capacity of auxiliary contact

The making and breaking capacity determined by the use of auxiliary contact under abnormal usage conditions is shown in Table 10

Table10

Utilization category	Making			Breaking			Number of making/breaking operation cycles and operation frequency		
	I/Ie	U/ Ue	COSΦ or T0.95	I/Ie	U/ Ue	COSΦ or T0.95	Number of operation cycles	Number of operation cycles per minute	Power-on time (s)
AC-15 DC-13	10 1.1	1.1 1.1	0.3 6Pe	10 1.1	1.1 1.1	0.3 6Pe	10	6 (or the same operating frequency as the main circuit)	0.05

Note: When Pe≥50W, the upper limit of T0.95=6Pe≤300ms

4.7.4 The making and breaking capacity of auxiliary contact under normal condition is shown in Table 11

Table11

Utilization category	Making			Breaking		
	I/Ie	U/ Ue	COSΦ or T0.95	I/Ie	U/ Ue	COSΦ or T0.95
AC-15	10	1	0.3	1	1	0.3
DC-13	1	1	6Pe	1	1	6Pe

◎4.8 Key lock in open position

The circuit breaker is equipped with an "open position key lock" accessory (supplied according to order requirement), which can lock the circuit breaker in the open position. At the moment, neither the closing button nor the release (closing) electromagnet can close the circuit breaker.

Structure overview

The fixed type circuit breaker mainly consists of contact system, intelligent controller, manual operating mechanism, electric operating mechanism and mounting plate;

The draw-out type circuit breaker mainly consists of contact system, intelligent controller, manual operating mechanism, electric operating mechanism and draw-out seat.

The circuit breaker is arranged in a three-dimensional form, with the characteristics of compact structure and small volume. The contact system is enclosed in insulated base plate, and the contact of each phase is also separated by insulated plate, forming small compartments. The intelligent controller, manual operating mechanism and electric operating mechanism are arranged in front of each other to form independent units. If one of the units is damaged, the entire unit can be removed and replaced with a new one.

The draw-out type circuit breaker consists of plug-in circuit breaker and a draw-out seat. The guide rail inside the draw-out seat can be pulled in and out, and the inserted circuit breaker is located on the guide rail to get in and out of the draw-out unit. The main circuit is connected through the insertion connection between the busbar on the inserted circuit breaker and the bridge contact on the draw-out seat.

The draw-out type circuit breaker has three working positions: "connection" position, "test" position, and "disconnection" position. The position change is achieved by turning the handle in or out. The indication of the three positions is displayed by the pointer on the draw-out seat crossbeam.

When in the "connection" position, both the main circuit and the secondary circuit are connected; when in the "test" position, the main circuit is disconnected and separated by insulation partition, and only the secondary circuit is connected for some necessary action tests; when in the "disconnection" position, both the main circuit and the secondary circuit are disconnected. The draw-out type circuit breaker has mechanical interlocking device, the circuit breaker can only be closed in the connection position or test position, and cannot be closed in the middle position between connection and test.

◎1. Inter locking mechanism of circuit breaker (suitable for draw-out type and fixed type). The user can use interlocking mechanism to switch two or three sets.

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1.1 Lever interlocking

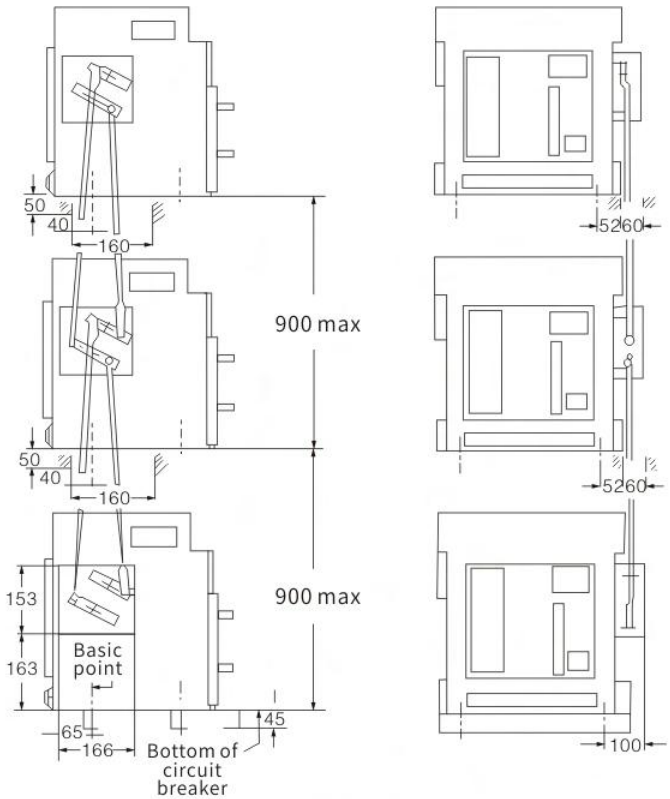

Figure 5(A)

Three vertically mounted circuit breakers interlocked with lever. If two circuit breakers are interlocked, only the top circuit breaker needs to be removed.

1.2 Soft interlocking (both horizontal and vertical can be equipped)

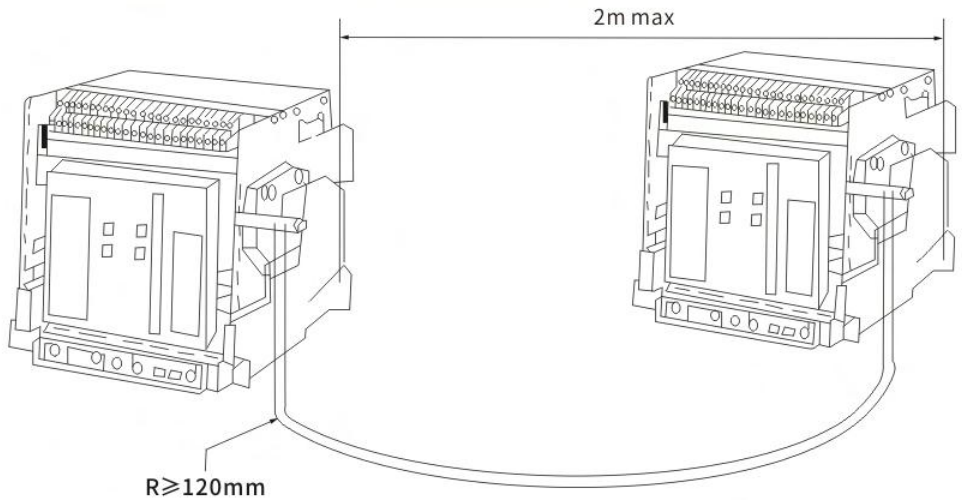

Figure 5(B)

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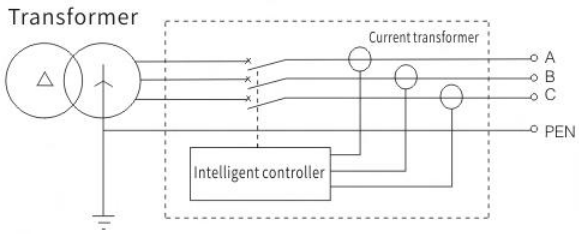
Internal connection

1. Ground fault protection circuit

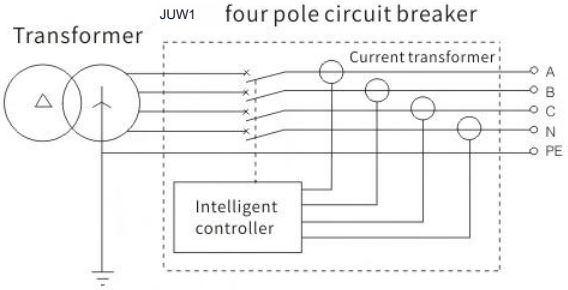
JUW1 three pole circuit breaker



3PT type

Differential type ground fault protection, where the signal only takes the vector sum of three-phase current (three-phase imbalance)

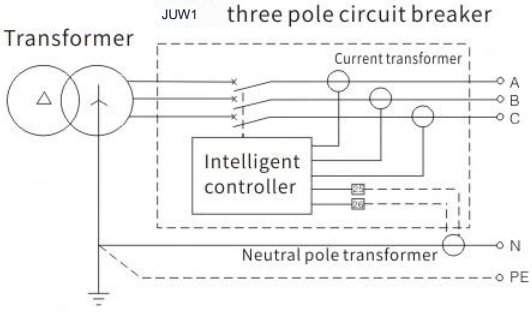
JUW1 four pole circuit breaker



4PT type

Differential type ground fault protection, where the signal only takes the vector sum of three-phase current and N-phase current

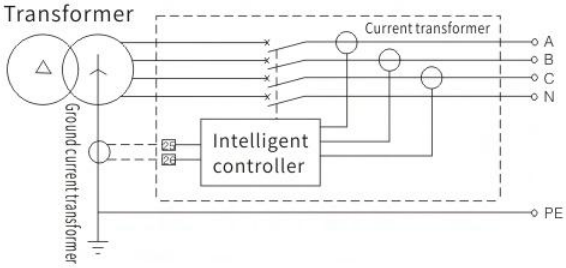
JUW1 three pole circuit breaker



(3P+N) T type external neutral pole current transformer

Differential type ground fault protection, with the signal taken as the vector sum of three-phase current and N-phase current

JUW1 three pole or four pole circuit breaker



(3P+N) W type external ground current transformer

Ground current type ground fault protection, with the signal directly taken between the neutral point of the main power supply and the ground

2. External single-phase ground protection function

External current transformer (neutral pole current transformer or ground current transformer) is provided as an accessory to user. The user shall insert it into the busbar and connect the wiring (with a length of 2m) to the secondary wiring terminals # 25 and # 26 of the circuit breaker.

The center cut-out dimension of the external current transformer (maximum allowable size of the perforated busbar) is as follows:

Model	Width	Height
JUW1 -2000 JUW1 -4000 / 4	61	21
JUW1 -3200 and above (except for JUW1 -4000/4)	87	31

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3. Wiring terminal

There are a total of 47 wiring terminals for the circuit breaker, which are simple and convenient for user to use. The wiring diagram is shown in Figures 7A and 7B

Figure 7A (M type or L type controller with basic function)

Other wirings of intelligent controller:

#1, #2 AC working power input (input from DC power modules U1 and U2 during DC)

#12 Overload pre-alarm signal output

#14 Instantaneous short delay trip signal output

#15 Long delay trip signal output

#16 Ground (or zero) fault trip signal output

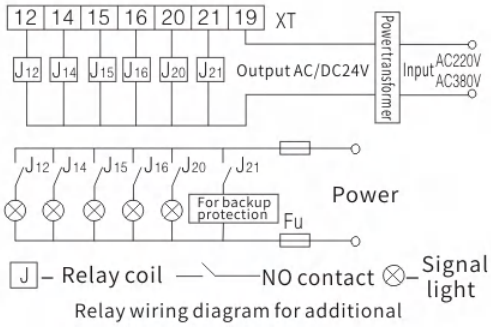
#19 Signal output common line

#20 Self-diagnosis signal output

#21 Trip signal (available for shunt or undervoltage actuators)

#25, 26 External neutral pole or ground current transformer input

Figure 7A



Relay wiring diagram for additional function of circuit breaker

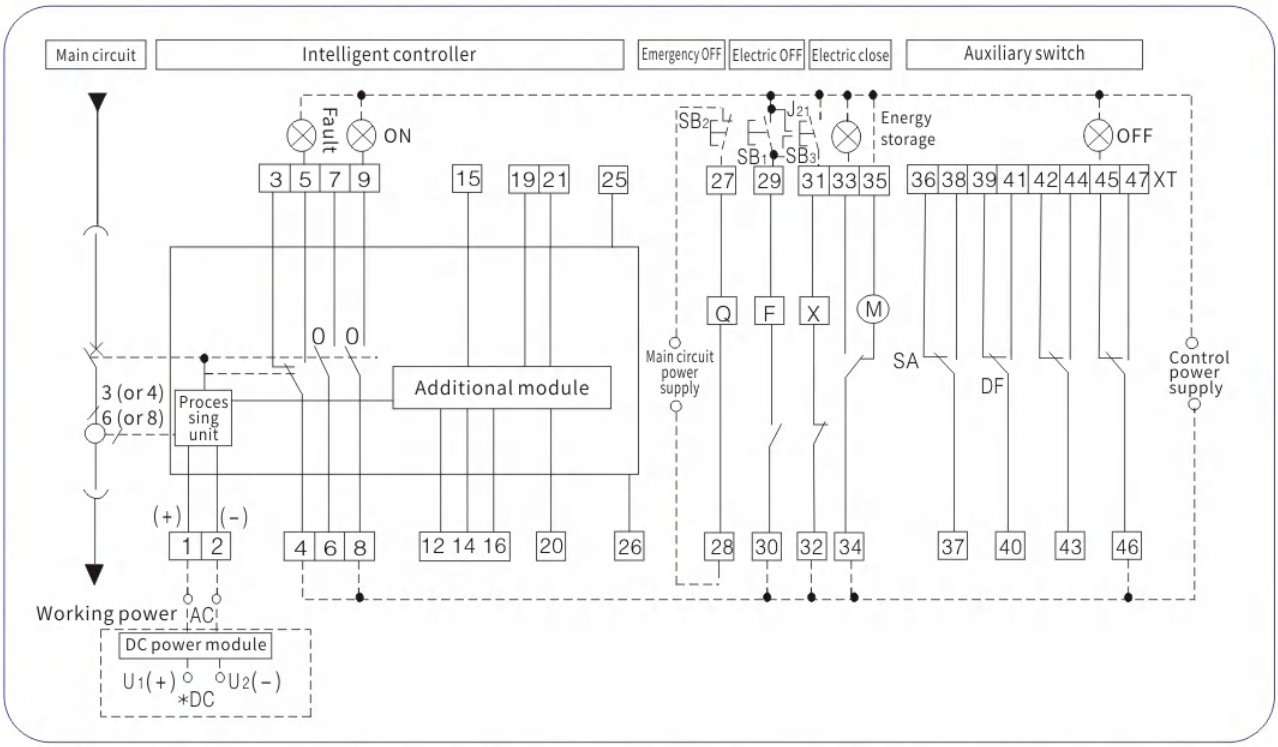
1) The controller signal output drives the external relay J to output contact action signal through terminals 12, 14-16, 20 and 21.

2) The power transformer (user needs to specify the input voltage value in the order specification) is provided by the manufacturer. The power transformer can be inserted into the standard guide rail together with the relay base, and installed by the user in the appropriate position of the switchgear.

3) Relay model: HH62P, AC/DC24V, provided by user.

4) Output conditions of self-diagnosis signal: a. The internal temperature of the controller is>80°C; b. The chip is not working properly; c. The controller loses power.

5) The user can choose to connect to J12, J14~J16, J20 and J21 according to actual needs



Note: (1) If the control supply voltage of F, X and M is different, they should be connected to different power supplies separately.

(2) Terminal #35 can be directly connected to the power supply (automatic energy pre-storage) or connected in series to the normally open button and then connected to the power supply (manual energy pre-storage).

(3) If requested by the user, terminals # 6~# 7 can output normally closed contact.

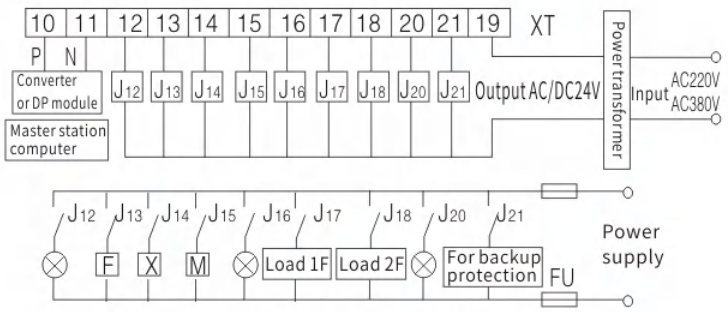
(4) Additional accessories are provided by the user.

(5)*When the working power of the intelligent controller is DC power, DC power module must be added (at this time, terminals #1 and #2 cannot be directly connected to AC power). The secondary wiring is shown in the figure (DC power supply DC110V or 220V is input from U1 (+) and U2(-), and the two output terminals of the DC power module are respectively connected to terminals 1(+) and 2(-) of the secondary wiring base).

SB1 shunt button (provided by user)
SB2 undervoltage button (provided by user)
SB3 closing button (provided by user)
X closing electromagnet
M energy storage motor
XT wiring terminal
DF auxiliary contact
F shunt release
SA motor microswitch
Q undervoltage release or undervoltage delay release
O NO contact (3A/AC380V)
⊗ Signal light (provided by user)

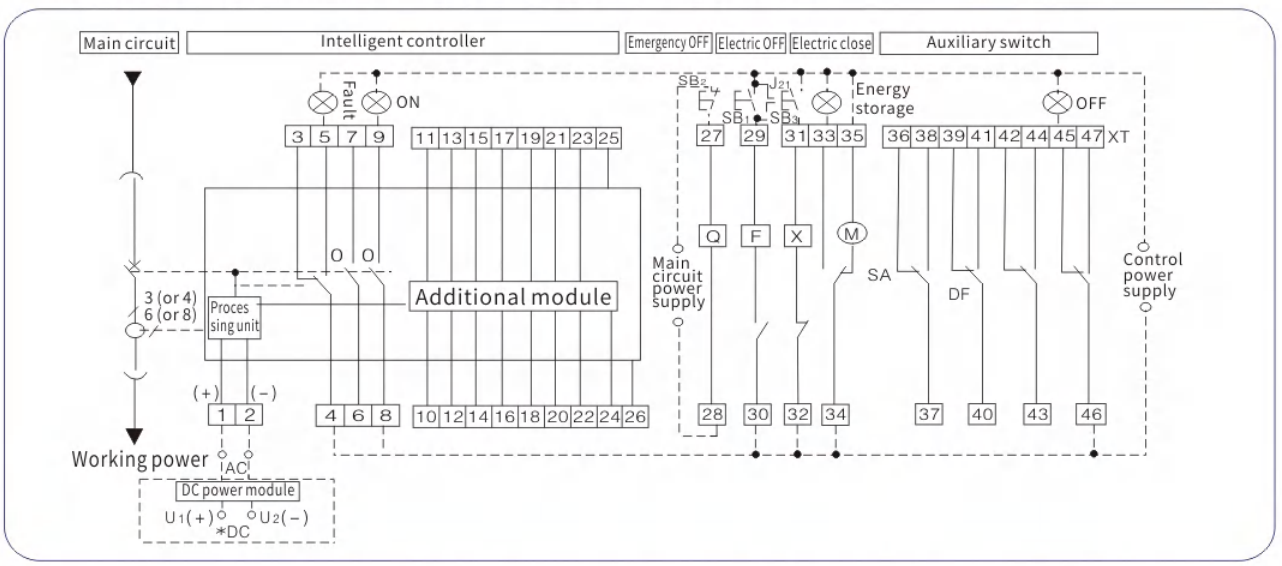
Figure 7B (M type controller with additional function or H-type)
Other wirings of intelligent controller:
#1, #2 AC working power input (input from DC power modules U1 and U2 during DC)
#10 RS485 communication P terminal (simplex) remote adjustment and remote communication
#11 Rs485 communication N terminal (simplex) remote control
and remote measurement, etc
#12 Overload pre-alarm signal output
#13 Communication remote control shunt trip output
#14 Instantaneous short delay trip signal output or communication remote control closing output
#15 Long delay trip signal output or communication remote control energy storage output
#16 Ground (or zero) fault trip signal output
#17 Unloading 1 signal output
#18 Unloading 2 signal output
#19 Signal output common line
#20 Self-diagnosis signal output
#21 Trip signal (available for shunt or undervoltage actuators)
#22 Voltage signal phase A
#23 Voltage signal phase B } Directly input from the main circuit
#24 Voltage signal phase C
#25, 26 External neutral pole or ground current transformer input

Figure 7B



Relay wiring diagram for additional function of circuit breaker

1) The controller signal output drives the external relay J to output contact action signal through terminals 12~18, 20 and 21.
2) The RS485y232 converter, DP module and power transformer (the user needs to specify the input voltage value in the order specification) are provided by the manufacturer. The power transformer can be inserted into the standard guide rail together with the relay base and installed by the user in the appropriate position of the switchgear.
3) Relay model: HH62P, AC/DC24V, provided by user.
4) Main station computer is provided by user.
5) Terminals 13~15 output can be used for opening, closing, and other functions of communication remote control. The trip signals of corresponding terminals 14 and 15 are no longer output at this time. The normally open contact of the corresponding relay can be connected in parallel with the corresponding manual control button, which can achieve both manual control and remote control. If remote control function is not required, terminals 14 and 15 can be connected to two signal lights in series through the normally open contacts of relays J14 and J15, and the corresponding signal can be remotely output. Please specify whether remote control function is required in the order specification, and the manufacturer will determine the corresponding function output by terminals 14 and 15 based on this. Terminal 21 output drives relay J21 for backup protection.
6) Output conditions of self-diagnosis signal: a. The internal temperature of the controller is>80°C; b. The chip is not working properly; c. The controller loses power.
7) The user can choose to connect to J12, J14~J16, J20 and J21 according to actual needs.



Note: (1) If the control supply voltage of F, X and M is different, they should be connected to different power supplies separately.
(2) Terminal #33 can be directly connected to the power supply (automatic energy pre-storage) or connected in series to the normally open button and then connected to the power supply (manual energy pre-storage).
(3) If requested by the user, terminals # 6~#7 can output normally closed contact.
(4) Additional accessories are provided by the user.
(5)*When the working power of the intelligent controller is DC power, DC power module must be added (at this time, terminals #1 and #2 cannot be directly connected to AC power). The secondary wiring is shown in the figure (DC power supply DC110V or 220V is input from U1(+) and U2(-), and the two output terminals of the DC power module are respectively connected to terminals 1(+) and 2(-) of the secondary wiring base).

SB1 shunt button (provided by user)
SB2 undervoltage button (provided by user)
SB3 closing button (provided by user)
X closing electromagnet
M energy storage motor
XT wiring terminal
DF auxiliary contact
F shunt release
SA motor microswitch
Q undervoltage release or undervoltage delay release
O NO contact (3A/AC380V)
⊗ Signal light (provided by user)

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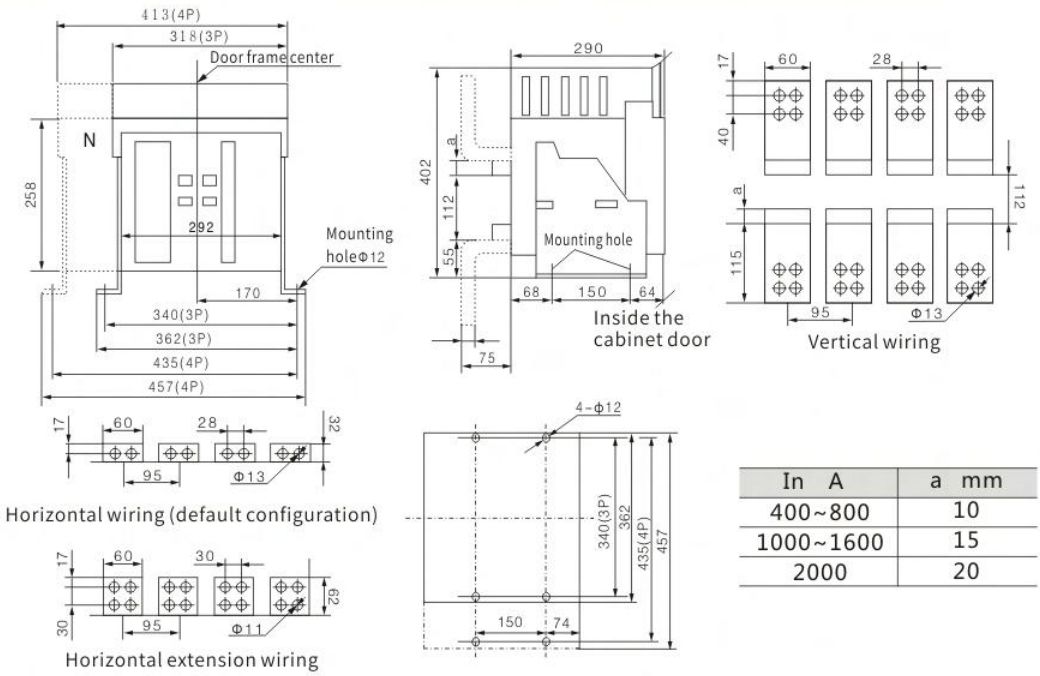
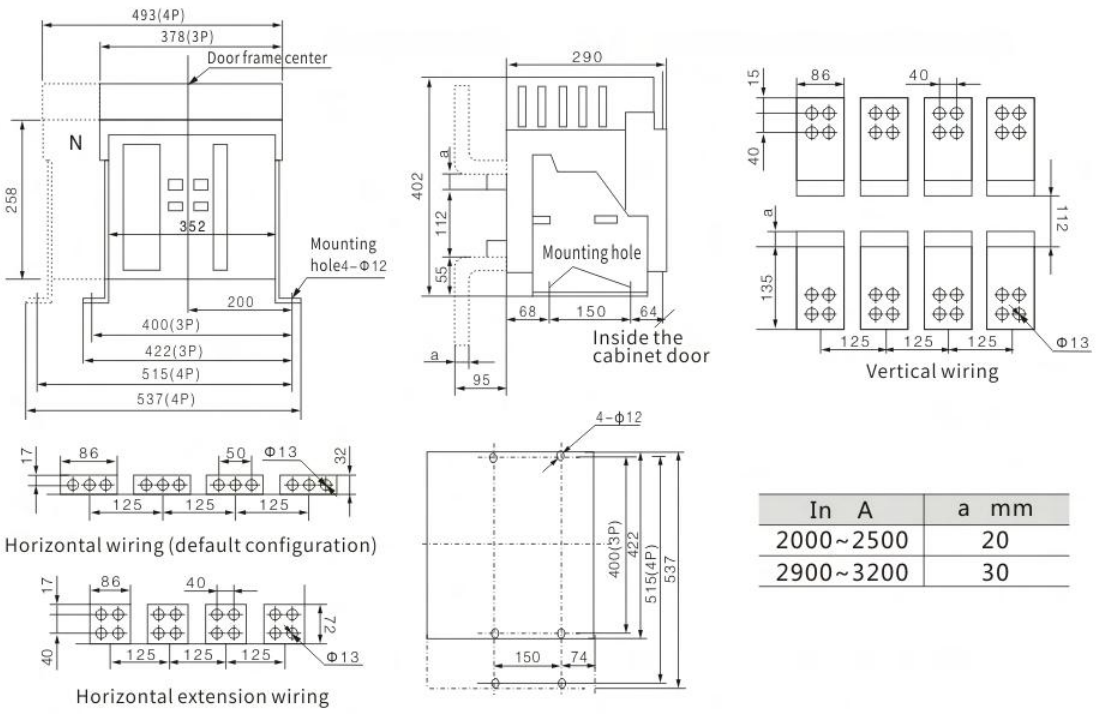
Outline and installation dimension

1. The outline and installation dimension of fixed type circuit breaker is shown in Figures 8 and 9



In A	a mm
400~800	10
1000~1600	15
2000	20

Figure 8 Outline and installation dimension of fixed type circuit breaker (JUW1 -2000, 2000/4)



In A	a mm
2000~2500	20
2900~3200	30

Figure 9 Outline and installation dimension of fixed type circuit breaker (JUW1 1-3200, 3200/4)

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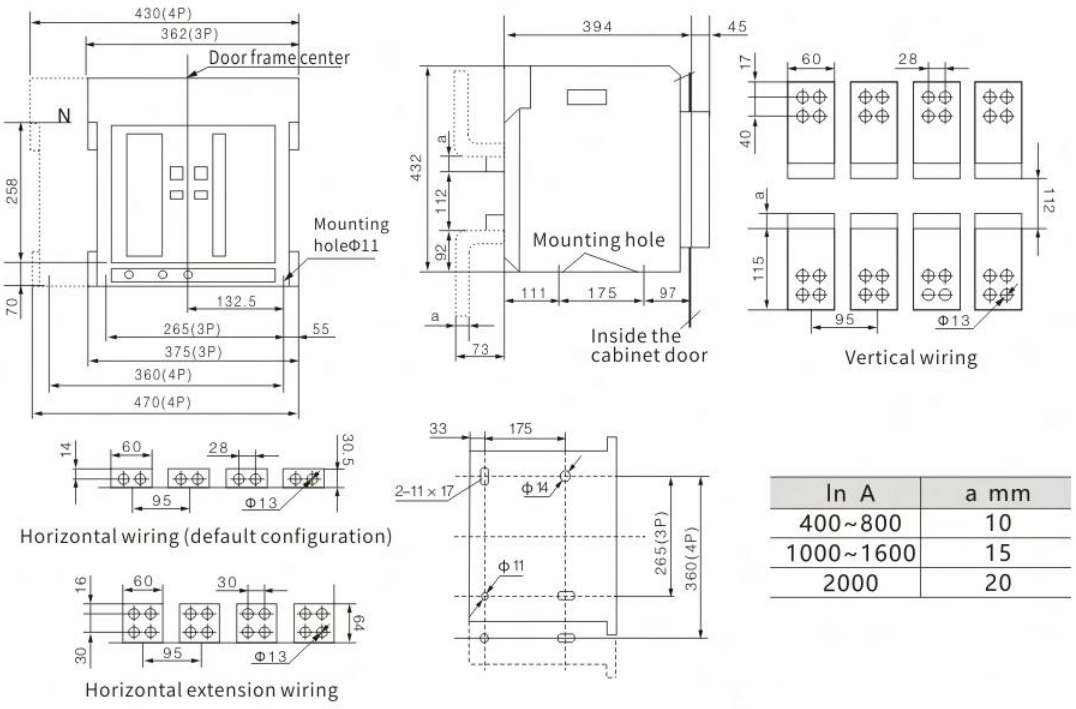
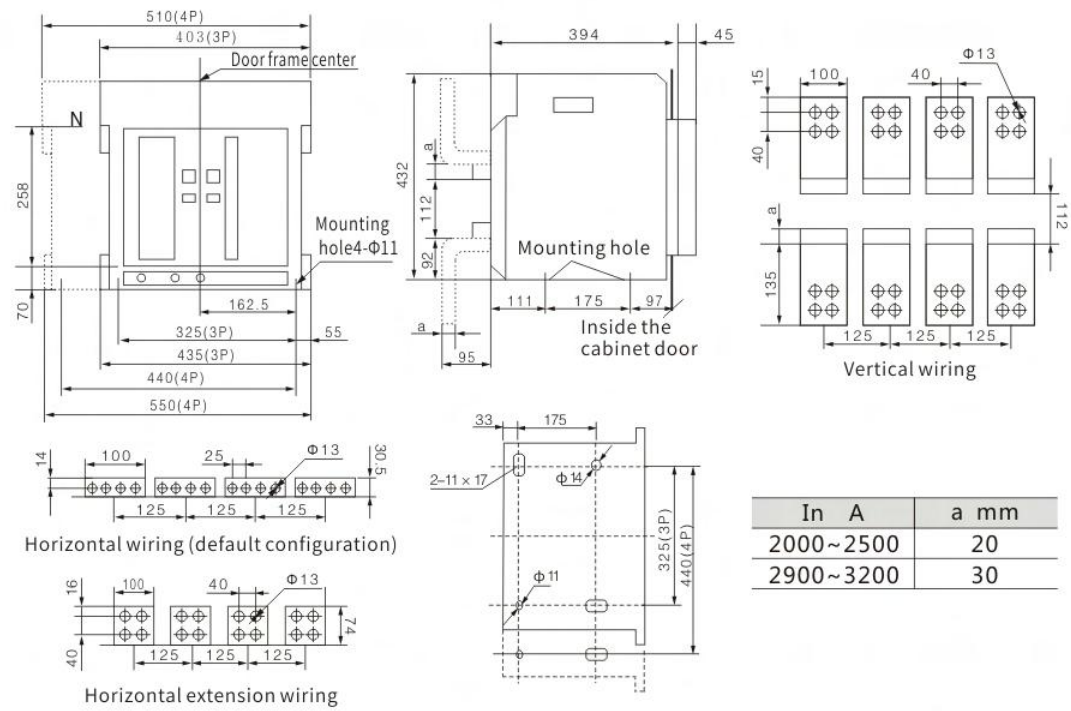
◎ 2. The outline and installation dimension of the draw-out type circuit breaker is shown in Figure 10, 11, 12, 13, 14, 15 and 16



In A	a mm
400~800	10
1000~1600	15
2000	20

Figure 10 Outline and installation dimension of the draw-out type circuit breaker (JUW1 -2000, 2000/4)



In A	a mm
2000~2500	20
2900~3200	30

Figure 11 Outline and installation dimension of the draw-out type circuit breaker (JUW1 1-3200, 3200/4)

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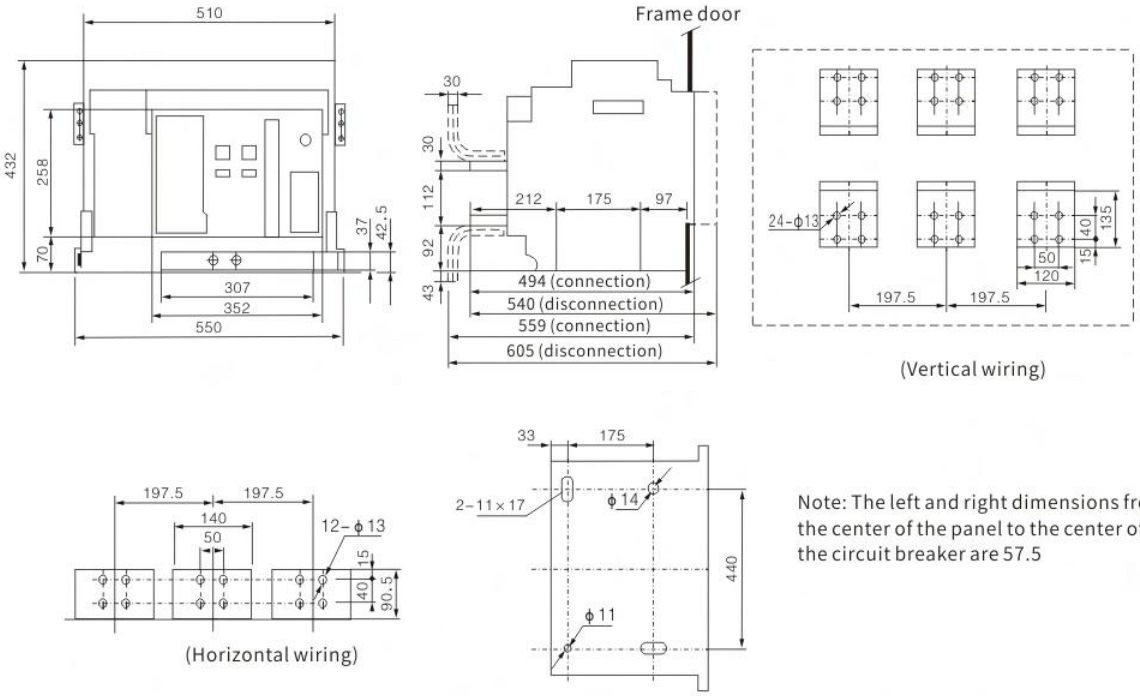

Figure 12 Outline and installation dimension of the draw-out type circuit breaker (JUW1 -4000/3)

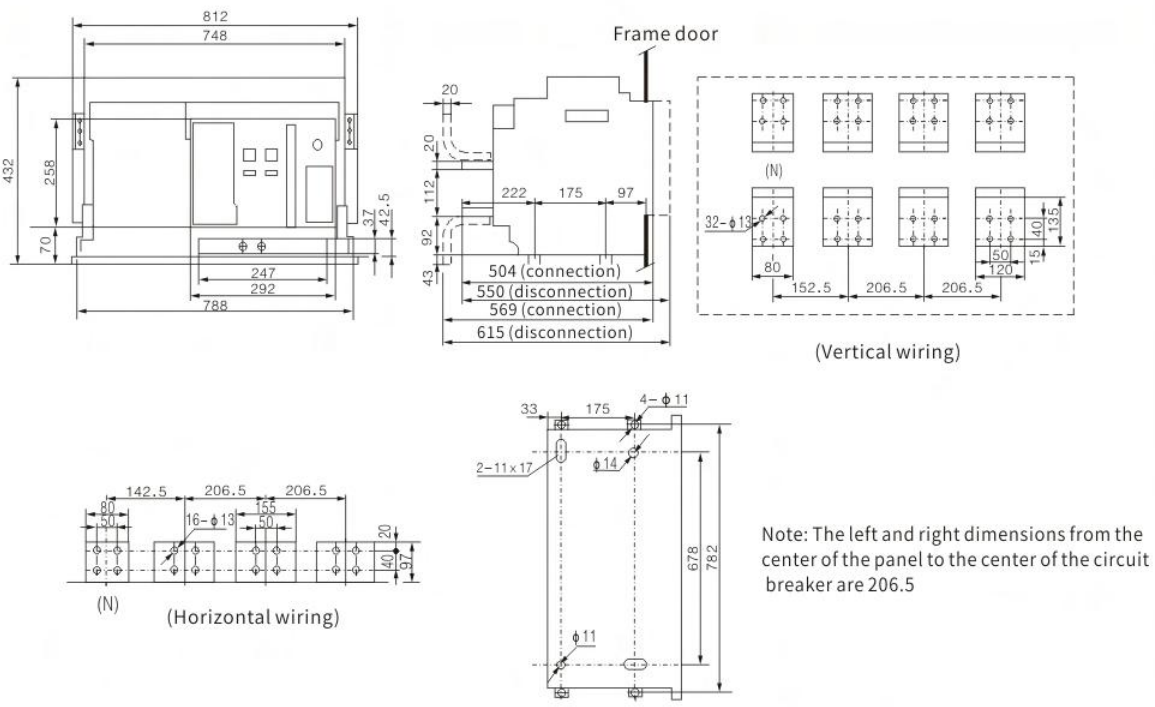

Figure 13 Outline and installation dimension of the draw-out type circuit breaker (JUW1 1-4000/4)

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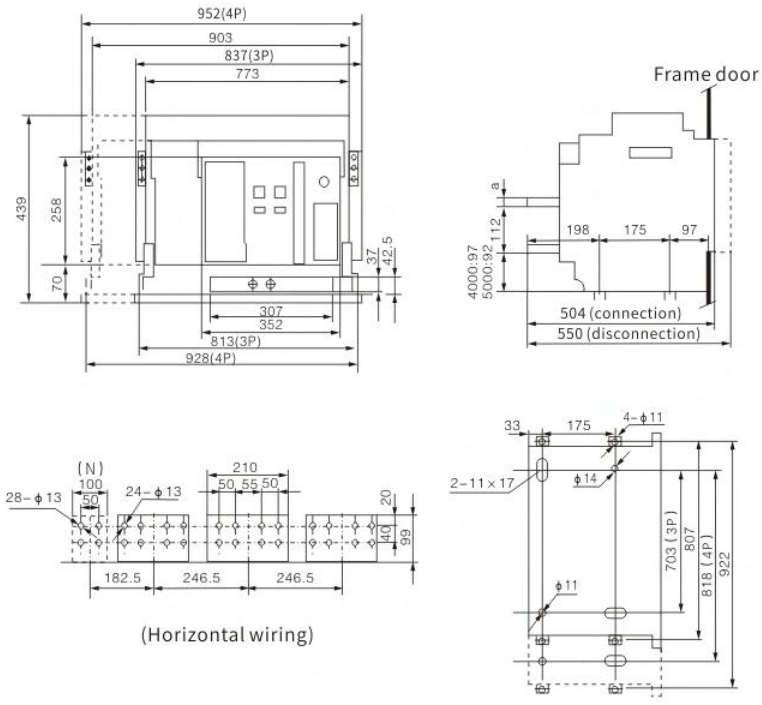
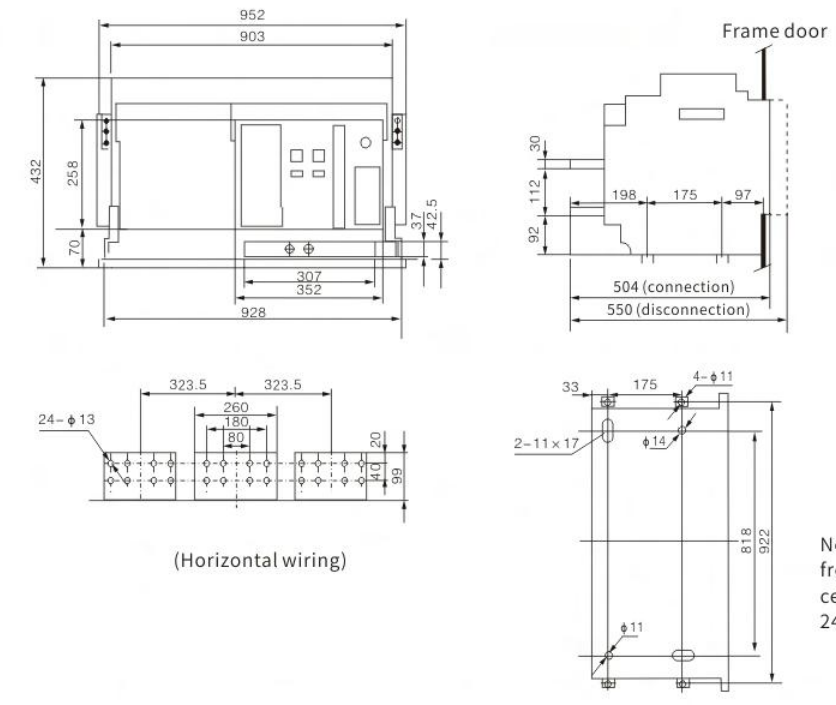


Note: The dimensions from the center of the panel to the center of the circuit breaker are 189 (3P) and 246.5 (4P)

In A	a mm
4000	20
5000	30

Figure 14 Outline and installation dimension of the draw-out type circuit breaker (JUW1 -6300/3, 6300/4 In=4000A.5000A)



Note: The left and right dimensions from the center of the panel to the center of the circuit breaker are 246.5

Figure 15 Outline and installation dimension of the draw-out type circuit breaker (JUW1 -6300/3 In=6300A)

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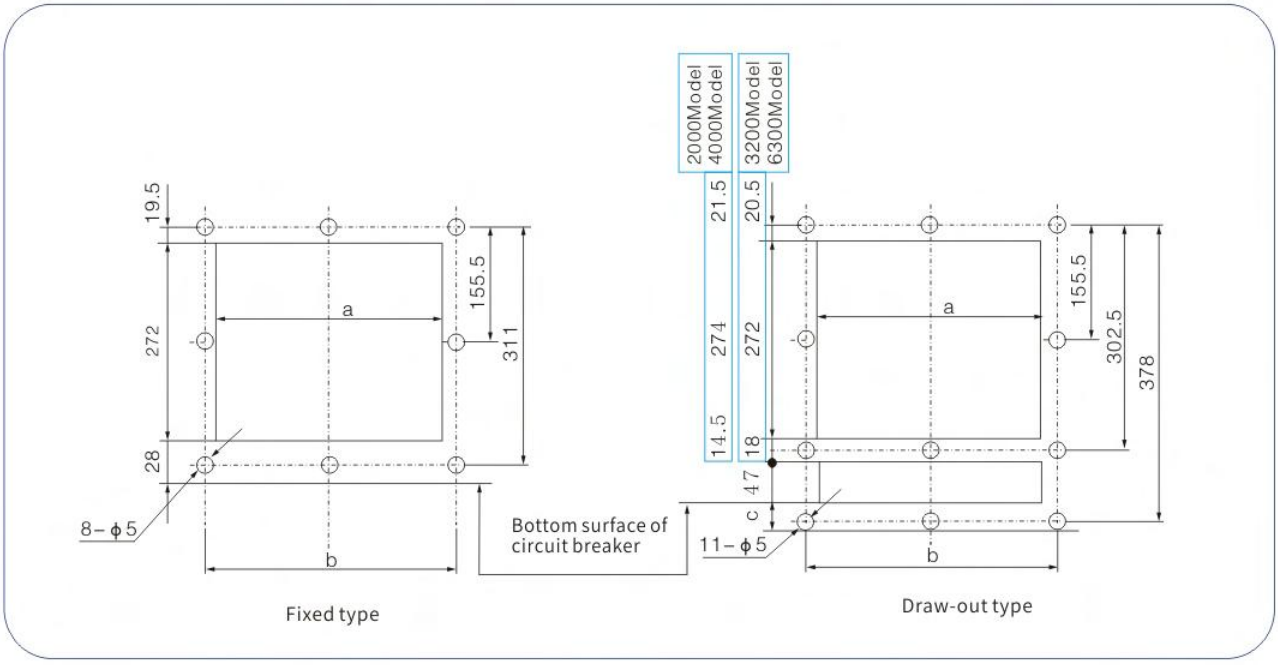
◎ 3. The specification and quantity of copper bar to be connected by users is shown in the table below

Rated current	Specification of external copper busbar	Qty. per pole	Rated current	Specification of external copper busbar	Qty. per pole
630A	40×5	2	2900A	100×10	3
800A	50×5	2	3200A	120×10	3
1000A	60×5	2	3600A	120×10	4
1250A	80×5	2	4000A	120×10	4
1600A	100×5	2	5000A	120×10	5
2000A	100 x5	3	6300A	120×10	6
2500A	100×5	4			



l nm	a mm	b mm	c mm
2000	302	345	0
3200、4000/3	366	405	0
4000/4	302	345	0
6300	366	405	0

◎ 4 Common fault and troubleshooting

No.	Fault phenomenon	Cause	Troubleshooting
1	The circuit breaker cannot be closed	●The undervoltage release has no supply voltage and is not connected. ●After the intelligent controller acts, the red button on the upper part of the controller panel does not reset. ●The operating mechanism has not stored energy. ●Draw-out type body in "connection" or " test" position ●The "open position key lock" is in the locked state	●Check the circuit and connect the power supply of the undervoltage release. ●Press the reset button. ●Manually or electrically store the energy of the mechanism ●Use the handle to swing the circuit breaker body to the "connection" or "test" position. ●Use a dedicated key to open the keylock.
2	The circuit breaker cannot store energy electrically	●The power supply of the electric operating mechanism is not connected. ● Insufficient power capacity	●Check the circuit and turn on the power supply. ●Check that the operating voltage should be greater than 85% Ue.
3	The electromagnet can't make the circuit breaker close.	● No supply voltage ● Insufficient power capacity	● Check the circuit and turn on the power supply. ● Check that the operating voltage should be greater than 85% Ue.
4	The shunt release cannot disconnect the circuit breaker	●No supply voltage ●Insufficient power capacity	● Check the circuit and turn on the power supply. ● Check that the operating voltage should be greater than 85% Ue.
5	The fault current exceeds the long delay, short delay and instantaneous setting value, and only instantaneous actions occurs, no short delay or long delay actions.	●The setting value of long delay, short delay and instantaneous setting is unreasonable, and the setting is within the same current value range.	● According to the principle of Ir1<Ir2<Ir3 and considering its action range, reset it.
6	Frequent tripping of circuit breaker	●The overload operation on site causes the overload protection to trip. Due to the failure of timely power cutoff and clearing of the overl oad thermal memory function, the circuit breaker recloses.	●Power off the controller once, or close the circuit breaker after 30 minutes
7	The crank handle of the draw-out type circuit breaker cannot be inserted into the circuit breaker	●The draw-out type guide rail or circuit breaker body is not fully pushed in.	●Push the guide rail or circuit breaker body to the bottom
8	The draw-out type circuit breaker body cannot be pulled out when in the disconnected position	●The crank handle is not pulled out. ●The circuit breaker has not fully reached the "disconnection" position.	●Pull out the crank handle. ●Fully swing the circuit breaker to the " disconnection" position.

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Ordering specification

(please tick √ or fill the number in□)

Client		Order quantity		Order date	
Model	□ JUW1-2000 [I frame] □ JUW1-3200 [II frame] □ JUW1-4000 [III frame] □ JUW1-6300 [IV frame]	□ Fixed type □ Draw-out type	□ 3P □ 4P	Rated current In=□ A Rated voltage	□AC380 (4100) V □AC660 (690) V

Intelligent controller	Model("F" indicates generator protection)		Basic function		Optional additional functions or accessories
	L type	□ M	Long time delay, short time delay, instantaneous, single-phase ground fault protection	1. Various off state indications and value display 2. Ammeter 3. Fault memory 4. Thermal memory 5. Test	□ 1. Load monitoring, □ mode 1 □ 2. Voltmeter, □ mode 2 □ 3. MCR ON/OFF and analog trip □ 4. Signal unit for pre-alarm, self-diagnosis and OCR trip alarm
		□ M/F	Long delay, short delay, instantaneous, pre-alarm		
	M type	□ H	1. Long delay, short delay, instantaneous, load monitoring; 2. Single-phase ground fault protection; 3. Various status indications and value display 4. Ammeter; 5. Voltmeter; 6. Fault memory; 7. Thermal memory 8. Test; 9. RS485 serial interface; 10. Alarm fault status Control power supply		□ MCR ON/OFF and analog trip □ RS485/232 converter □ DP module
		□ H/F			
	Control power supply		□ AC220V □ AC380V □ DC220V □ DC110V		

Accessory	□ Undervoltage release		□ AC220V □ AC380V □ Undervoltage instantaneous release □ Undervoltage delay release □1s □3s □5s		
	□ Shunt release		□ AC220V	□ AC380V	□DC220V □DC110V
	□ Energy release(closing) electromagnet		□ AC220V	□ AC380V	□ DC220V □ DC110V
	□Electric operating mechanism		□ AC220V	□ AC380V	□ DC220V □ DC110V
	□Mechanical interlock		□Horizontal interlock □ Vertical interlock		□ Door interlock
	□Open position key lock		□Lock	□Key (please fill in the quantity)	
	□Door frame				
	□External single-phase ground current transformer		□ Differential type (3P+N) T □ Ground current type (3P+N) W		
	□Power transformer (for relay)		Input □AC220V □AC380V□DC220V□DC110V		Output □AC24V □DC24V
Connection	□Horizontal connection (regular supply)		□ Vertical connection		
Remark					

Note: 1) If the user selects the controller, additional functions or accessories can be added, and additional fees will be required.

2) The long delay setting value of the L type controller is 10% of In, with each gear decreasing.

3) When selecting H type controller, please indicate which communication protocol it is based on.

①Dedicated communication protocol

②DP protocol

③Modbus protocol

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JUTRION

JUW1

Series Air Circuit Breaker

Fixed & Draw-Out Configurations

1600 A Frame

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General

The JUW1-1600 series intelligent air circuit breaker (hereinafter called ACB) is suitable for distribution networks with frequency of AC 50Hz, rated working voltage up to 690V and rated current ranging from 200A to 1600A. It's used to distribute electrical energy and protect lines and power equipment from overload, short circuit, undervoltage, single-phase grounding (leakage) and other faults. The ACB has intelligent protection function and precise selective protection, can improve power supply reliability and avoid unnecessary power outages. Meanwhile, it has open type communication interface, which is convenient for fieldbus connection, and can be used for four remote operations to meet the requirements of the control center and automation system. Equipped with corresponding leakage transformer and intelligent controller, leakage protection can be achieved.

The circuit breaker has isolation function and is represented by symbol  .

The circuit breaker with rated working current of 630A and below can also be used for overload, short circuit, phase loss, undervoltage and ground protection of motor in AC 50 (60) Hz, 400V distribution network. Under normal condition, the ACB can also serve for infrequent switching of circuit and infrequent starting of motor.

Standard: GB14048.1, GB14048.2, IEC60947-2

Type Designation

Code	Meaning
①	Company code
②	Air Circuit Breaker
③	Design No.

Code	Meaning
④	Rated current in scope of frame current
⑤	Number of poles (4 poles are marked with 4, 3 poles can be omitted)
⑥	Rated current

- Classification by utilization category:

Main circuit: category A (non selective), category B (selective), and AC-3 (direct operation motor)
Auxiliary circuit: AC-15, DC-13;

- Installation method: fixed type, draw-out type;
- Transmission method: electric motor transmission, manual;
- Number of poles: 3P, 4P;
- Type of release: intelligent controller, shunt release, undervoltage instantaneous (or delayed) release;
- Classification of intelligent controller:

2M type: economic type (basic function)
3M type: basic type (basic function+ intelligent function)
3H type: advanced type (basic function+ intelligent function +communication interface).

Normal working and installation condition

- Ambient air humidity: The upper limit shall not exceed +40°C; the lower limit shall not be less than -5°C; the average value within 24 hours shall not exceed +35°C;
- Note: For working condition where the upper limit value of the ambient air used exceeds +40°C or the lower limit value is below -25°C, the user should consult with the manufacturer.
- Altitude: The altitude of the installation site shall not exceed 2000m.
- Atmospheric condition: When the maximum temperature is +40°C, the relative humidity of the air does not exceed 50%.
- At lower temperatures, there can be higher relative humidity, such as 90% at 20°C. Special measures should be taken for occasional condensation caused by temperature change.
- Pollution level: level 3
- The circuit breaker is installed inside the cabinet and equipped with door frame, with protection level of IP40.
- Te installation category of main circuit of circuit breaker, coil of undervoltage release, primary coil of power transformer is IV; and the installation category of auxiliary and control circuit is III.
- Utilization category: category B.
- Transportation and storage condition for circuit breaker: -25°C to 55°C, up to 70°C in a short period of time (within 24 hours).
- The circuit breaker should be installed in place without explosion hazard and conductive dust sufficient to corrode metal and damage insulation, and the vertical inclination of the circuit breaker should not exceed 5°.

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Technical data and performance

1. The rated current of the circuit breaker is shown in Table 1

Table 1

Rated frame current Inm (A)	Rated current In (A)
1600	200、400、630、800、1000、1250、1600

2. Rated insulation voltage Ui of circuit breaker: 690V; Rated working voltage Ue: 400V, 690V.

3. The rated short-circuit making and breaking capacity of the circuit breaker should not be less than 2.1 Icu.

4. The rated short-circuit breaking capacity and short-term withstand current of the circuit breaker are shown in Table 2.

5. Intelligent controller protection characteristic

5.1 The characteristic curve of over current release protection is shown in Figure 1, and the characteristic curve of ground fault protection is shown in Figure 2.

5.2 The setting value and error of the intelligent controller are shown in Table 3.

Table2

Rated frame current Inm (A)	1600		Incoming method	Arcing distance
Rated ultimate short-circuit breaking capacity Icu (kA) O-CO	AC400V	⩾80	Upper or lower incoming line	Zero arc
	AC690V	⩾50		
Rated service short-circuit breaking capacity Ics (kA) 0-CO	AC400V	⩾65		
	AC690V	⩾50		
Rated short time withstand current Icw (kA) Is O-CO	AC400V	⩾42		
	AC690V	⩾35		

Table3

Overcurrent tripping characteristic	Setting value range		Factory setting value
	2M/2H	3M/32H	
Long delay Ir	(0.4~1)In+OFF	(0.4~1)In+OFF	1In、120s
Short delay Isd	(1.5 ~ 15)In+OFF	(1.5 ~ 15)In+OFF	6In、20s
Instantaneous Ii	1In ~ 50kA+OFF	1In ~ 50kA+OFF	10In
Ground fault Ig	(0.2~1)In+OFF	(0.2~1)In+OFF	0.4In、0.2s

Note: 1. OFF indicates that the overcurrent release protection characteristic is in the off state.

2. Unless otherwise specified by the customer, the product is set to the factory setting value when leaving the factory. If the customer needs to set the value, please refer to the intelligent controller user's manual.

5.3 Intelligent controller long delay overcurrent protection inverse time limit action characteristic

Intelligent controller long delay overcurrent protection inverse time limit action characteristic: $I^2T_R = (1.5I_R)^2 t_R$ (where t_R: time setting time for long delay $1.5I_R$, I_R: long delay set current, T_R: long delay action time), see table 4 for action time, with return coefficient of not less than 0.9, and return current of $0.9I_R$.

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Table 4

Current setting value	Action time										Accuracy
	2M/2H				3M/3H						
1.05IR	>2h non action				>2h non action						±15%
1.3IR	⩽ 1h action				⩽ 1h action						
1.5IR	30s	60s	120s	240s	15s	30s	60s	120s	240s	480s	
2.0IR	16.9s	33.7s	67.5s	135s	8.4s	16.9s	33.7s	67.5s	135s	270s	
7.2IR	1.3s	2.6s	5.2s	10.4s	0.65s	1.3s	2.6s	5.2s	10.4s	21s	
Tripping level	-	10A	10	20	-	-	10A	10	20	30	

Note: The above is the setting time for distribution and motor protection. The setting time for generator protection can be negotiated between the user and the company.

5.4 Intelligent controller short circuit short delay action characteristic:

Short circuit short delay overcurrent protection is generally of definite time limit. If low multiple is required as the inverse time limit, its characteristic is as follows: $I^2T_s = (8I_R)^2$tsd (Ts is the short delay setting time, tsd is the short delay action time). When the overload current is $8I_R$, it automatically switches to the definite time limit characteristic, and its action characteristic is shown in Table 5.

5.5 Intelligent controller short-circuit instantaneous action characteristic:

The instantaneous action time of the short circuit (including the inherent breaking time of the circuit breaker) should be less than 30ms, and its action characteristic is: 0.85Ii non-action, >1.15Ii action.

Table 5

Protection method		Action time			Accuracy
		2M/2H		3M/3H	
Definite time limit	Tripping time setting value tsd	200ms	400ms	0.1s~1s (0.1s differential)	±10%
	Maximum breaking time	230ms	460ms		
	Non-tripping duration	140ms	330ms		
Inverse time limit characteristic		None		The curve is the same as that of the overload delay, but the curve speed is 10 times faster	
Action characteristic		⩽ 0.9Isd non action			
		>1.1 Isd delay action			

5.6 The action characteristic of ground fault protection is of definite time limit, and it delay characteristic complies with Table 6.

Table 6

Protection method		Action time					Accuracy
		2M/2H				3M/3H	
Definite time limit	Tripping time setting value tsd	200ms	400ms	600ms	800ms	0.1s~1sOFF (0.1s differential, OFF position only alarms without trip)	±10%
	Maximum breaking time	230ms	460ms	650ms	850ms		
	Returnable time	140ms	330ms	560ms	760ms		
Action characteristic		⩽ 0.8Isd non action					
		>1.0 Isd delay action					

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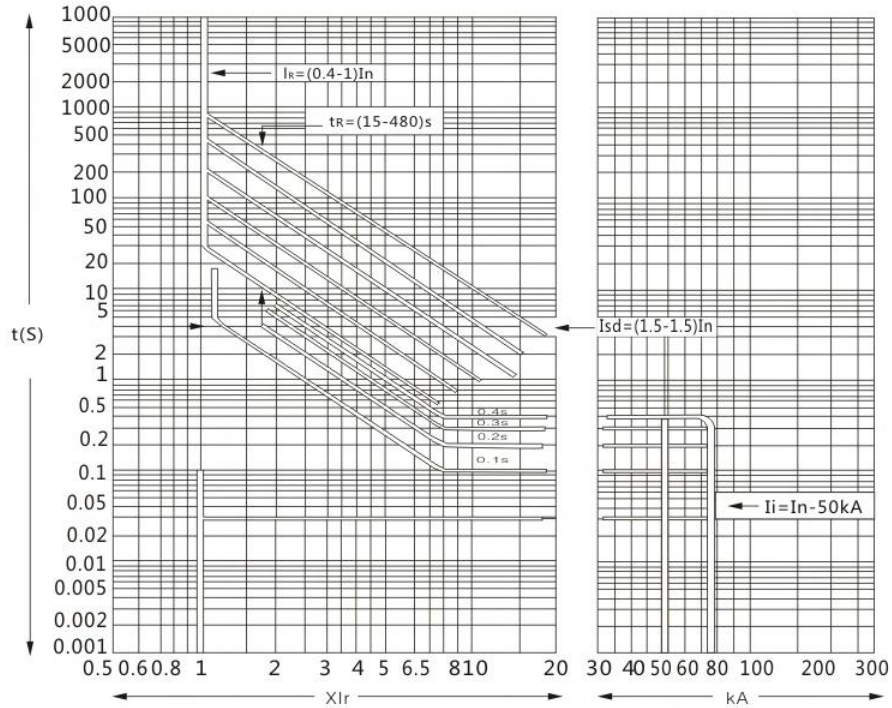


Figure 1 Overcurrent release protection characteristic curve

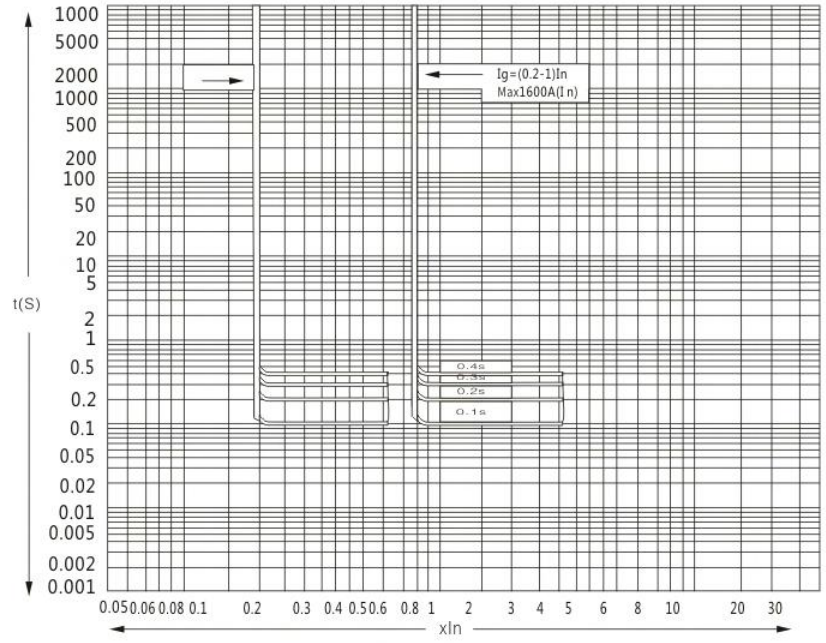


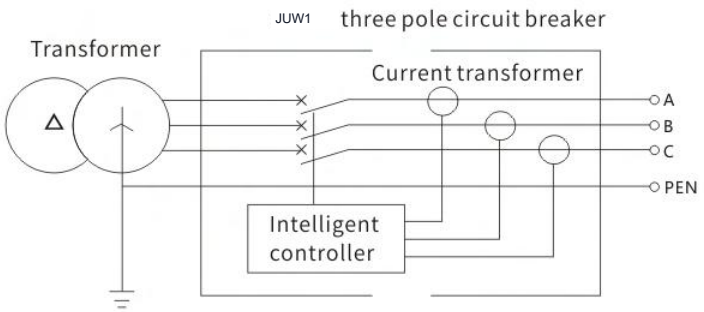
Figure 2 Ground fault protection characteristic curve

5.7. Residual current protection is achieved by connecting external leakage transformer for detecting residual current signal, with delayed action characteristic. Its delay characteristic complies with Table 7 (excluding the inherent working time of 20ms).
Rated residual operating current IΔn: 3A, 10A, 20A, 30A.
The minimum value of rated residual non-operating current (IΔno) is 0.51ΔN.

Ultimate non driving time (at 2IΔn)	0.06s	0.1s	0.2s	0.3s	0.4s	0.5s	1s
Residual current	Maximum breaking time (s)						
I△n	0.36	0.50	1.00	1.50	2.00	2.50	5.00
2I△n	0.18	0.25	0.50	0.75	1.00	1.25	2.50
5I△n、5I△n	0.07	0.10	0.20	0.30	0.40	0.50	1.00

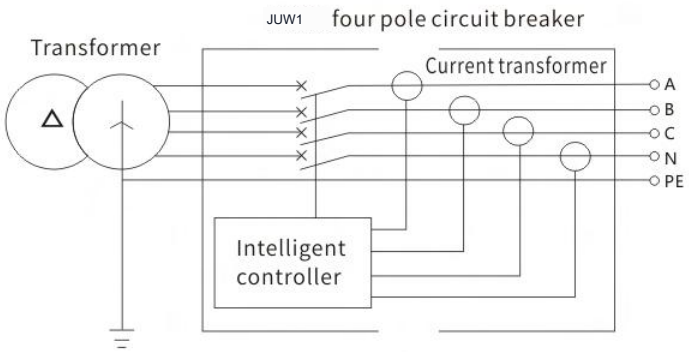
5.8 Ground or residual current protection methods

It is a protective function of the equipment due to the residual current to the ground. According to the magnitude of leakage current, it is classified into ground protection and residual current protection. Ground protection is the protection provided by the controller based on the vector sum of three-phase current and neutral current. According to the number of poles in the circuit breaker, there are three protection methods: 3PT, 4PT and (3P+N) T (see Figure 3). Residual current protection refers to the controller directly taking the output current signal of the external current transformer for protection. With high protection sensitivity, it's especially suitable for protection of low ground currents of tens of amperes. There are two methods for sampling grounding signal, one is rectangular transformer (ZCT1) sampling and the other is circular transformer (ZT100) sampling with a diameter of 100mm.



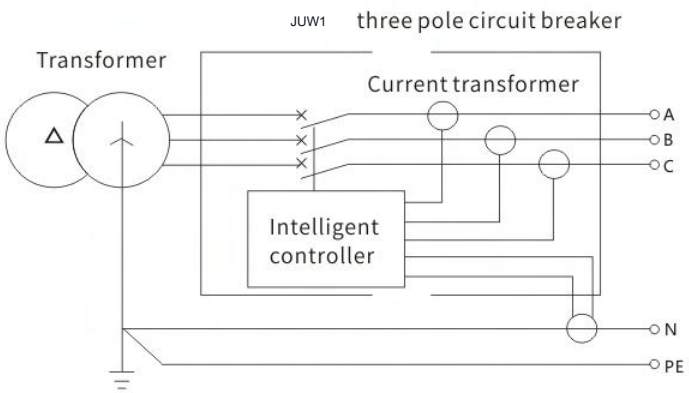
3PT type

Differential type ground fault protection, where the signal only takes the vector sum of three-phase current (three-phase imbalance)



4PT type

Differential type ground fault protection, where the signal only takes the vector sum of three-phase current and N-phase current



(3P+N) T type

External neutral pole transformer

Differential type ground fault protection, with the signal taken as the vector sum of three-phase current and – phase current

Figure 3 Ground protection method

6. The working voltage and required power consumption of the circuit breaker's shunt release, undervoltage release, electric operating mechanism, energy release (closing) electromagnet and intelligent controller are shown in Table 8.

Table 8

Item	AC (50Hz)		DC	
	220V	380V	110V	220V
Shunt release	24VA	36VA	24W	24W
Undervoltage release	24VA	36VA	-	-
Closing electromagnet	24VA	36VA	24W	24W
Electric operating mechanism	85VA	85VA	85W	85W
Intelligent controller supply voltage	AC220V、AC380V、DC220V、DC110V、DC24V			

Note: 1. The working voltage of the controller is DC24V, and the primary side of the transformer or power module can provide voltages of AC380V, 220V (50Hz) or DC220V, 110V.

2. The reliable operating voltage range of the shunt release is 70%~110%, and that of the closing electromagnet and operating mechanism are 85%~110%

7. The performance of the undervoltage release of the circuit breaker is shown in Table 9

Table 9

Category		Undervoltage delay release	Undervoltage instantaneous release
Release action time		1,3,5s delay	Instantaneous
Release action voltage value	35%~70%	The circuit breaker can reliably open	
	≤35%Ue	The circuit breaker cannot close	
	(85~110%) Ue	The circuit breaker can reliably close	
If the supply voltage recovers to 85% Ue within 1/2 delay time		The circuit breaker doesn't open	-

Note: The accuracy of the delay time is ±10%

8. Performance of auxiliary contact

8.1 The conventional thermal current of the auxiliary contact is 6A, the rated working voltage is 127V, 220V, 380V for AC and 110V, 220V for DC, and the control capacity is 300VA/Ue (AC) and 60W/Ue (DC);

8.2 Auxiliary contact form:4NO,4NC. Special forms should be specified when ordering.

9. Open position key lock (optional)

The circuit breaker is equipped with an "open position key lock" accessory (supplied according to order requirement), which can lock the circuit breaker in the open position. At the moment, neither the closing button nor the release (closing) electromagnet can close the circuit breaker. It's suitable for interlocking between long-distance circuit breakers.

10. Steel cable mechanical interlocking or linkage type mechanical interlocking (optional) can achieve interlocking of two or three circuit breakers installed horizontally or vertically in different states.

11. Door interlocking (optional)

When the circuit breaker is in the "connection" or "disconnection" position, it is prohibited to open the cabinet door. If the cabinet door is opened, and the circuit breaker is in the "test" position, the cabinet door can be closed without disconnecting the circuit breaker.

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Intelligent controller function list

Table 10

Controller model	2M/2H	3M	3H
Overload long delay protection	√	√	√
Short circuit short delay protection	0	√	√
Short circuit instantaneous protection	√	√	√
Ground imbalance protection	0	√	√
Current imbalance protection	-	0	0
Leakage protection	-	0	0
Function test	√	√	√
Fault memory	√	√	√
Signal contact output	0	0	0
Thermal memory	√	√	√
Self-diagnosis	√	√	√
MCU working indication	√	-	-
Current column display	√	-	-
Ammeter	-	√	√
Making and breaking, out-of-limit adjustment	0	0	0
Load monitoring	-	0	0
Fault status indication and numerical display	-	√	√
Physical measurement	-	√	√
Communication	-	-	√
Contact wear indication	-	0	0
Zone interlock	-	√	0
Harmonic measurement	-	√	0
Voltage protection	-	√	0
Historical memory of grid parameter	-	√	0

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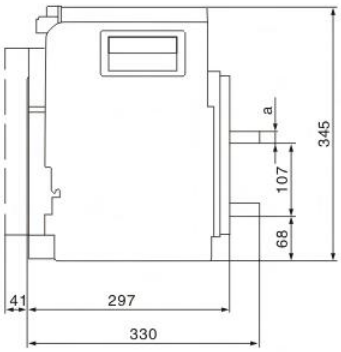
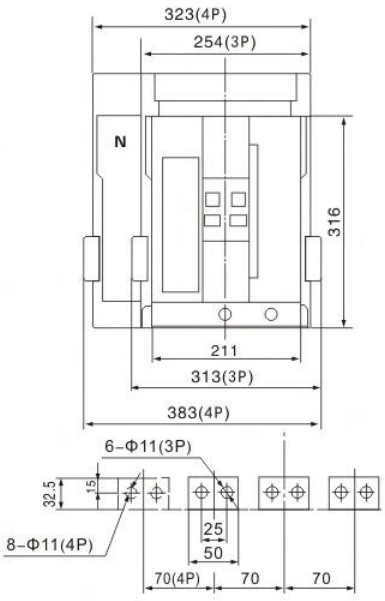
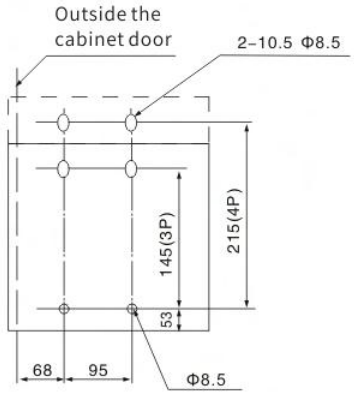
(Draw-out type) installation dimension



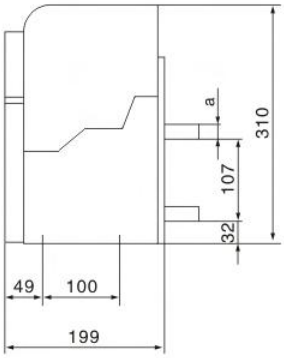


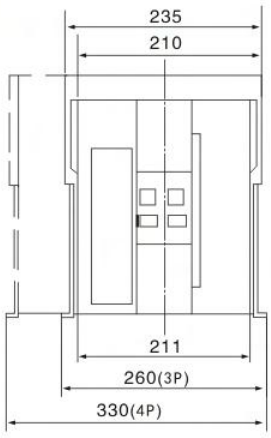


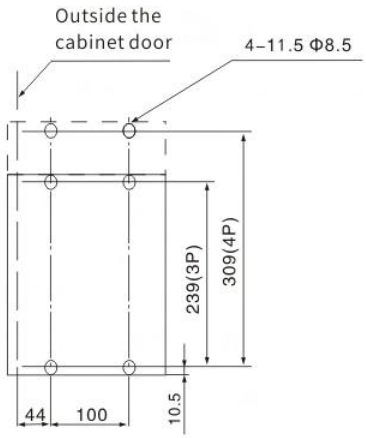
(Bottom plate mounting hole)

In(A)	a(mm)
200~630	6
800~1000	10
1250~1600	15

(Fixed type) installation dimension

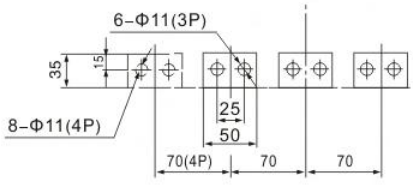




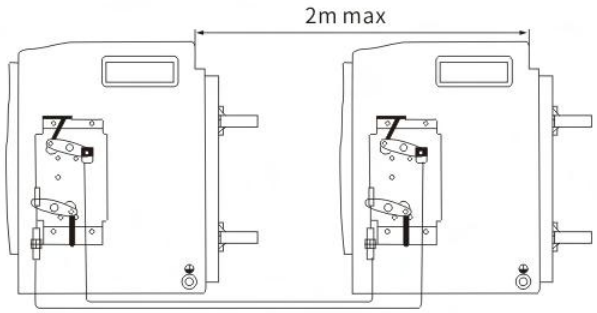


(Bottom plate mounting hole)

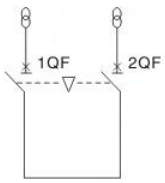
In(A)	a(mm)
200~630	6
800~1000	10
1250~1600	15



Steel cable interlocking of two horizontally placed or stacked circuit breakers



Circuit diagram Possible operating mode

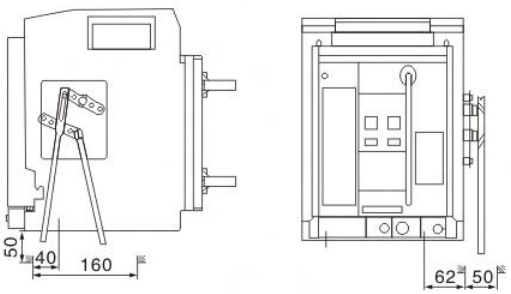


1QF	2QF
0	0
0	1
1	0

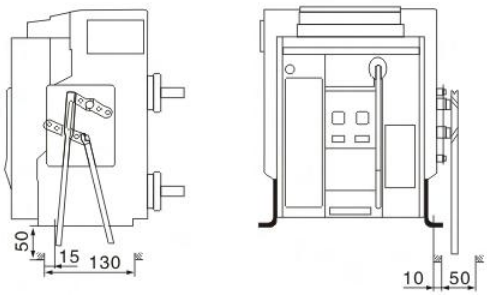
Linkage interlocking of two stacked circuit breakers

Note: The length of the steel cable for steel cable interlocking is usually 2.5m, and 1.5m steel cable can also be provided, but the user needs to indicate when ordering.

Draw-out type



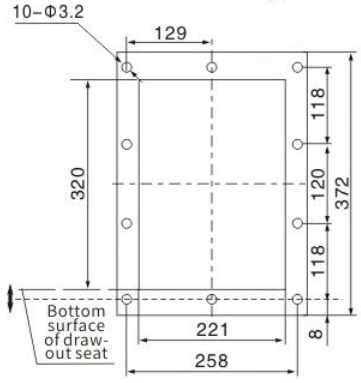
Fixed type



Note: The spacing between the upper and lower mounting plates is 0.6m~0.7m.
"The "opening" locking device: it can lock the opening button of the circuit breaker in the pressed position. At this time, the circuit breaker will not be able to close. After the user chooses to install it, the factory provides lock and key; three circuit breakers are equipped with three identical locks and two keys.

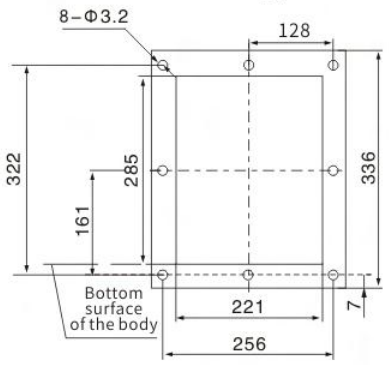
Circuit breaker door frame opening size and installation dimensions

Draw-out type



(Door frame opening size)

Fixed type



(Door frame opening size)

Tips: This product is a draw-out type with "disconnection", "test" and "connection" three position locking device to prevent user from misoperation. When in the corresponding indication position, if the red button pops up, it cannot proceed to the next step without resetting.

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Circuit breaker control circuit wiring diagram

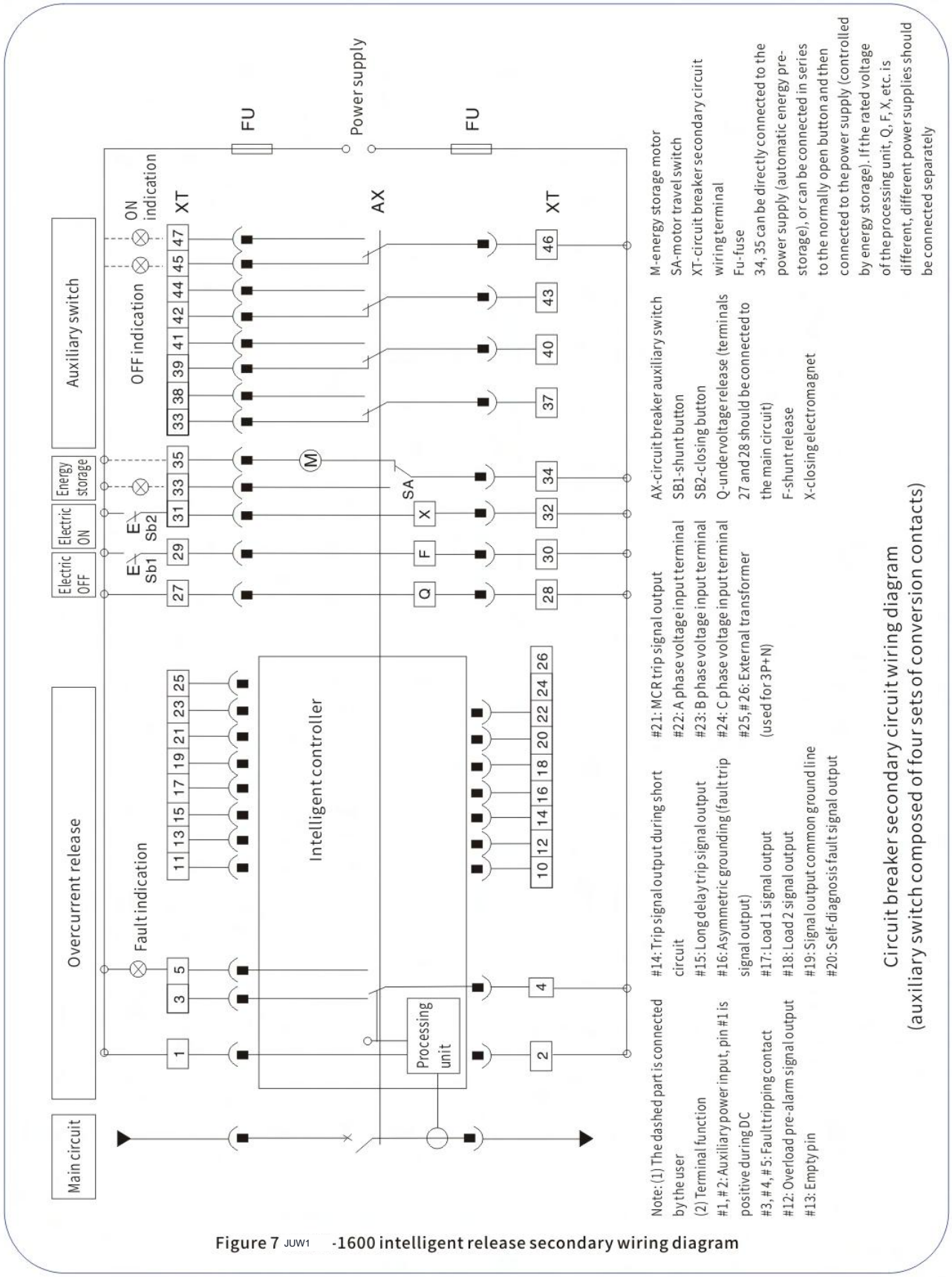
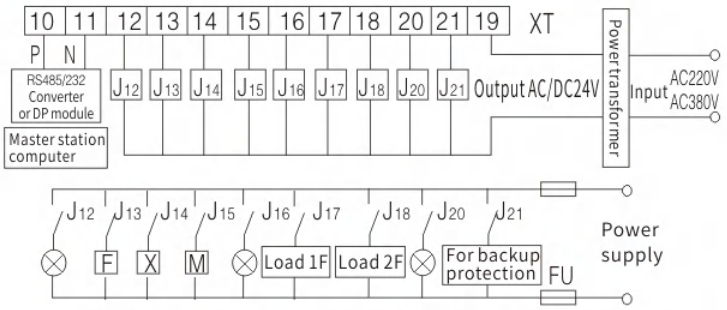


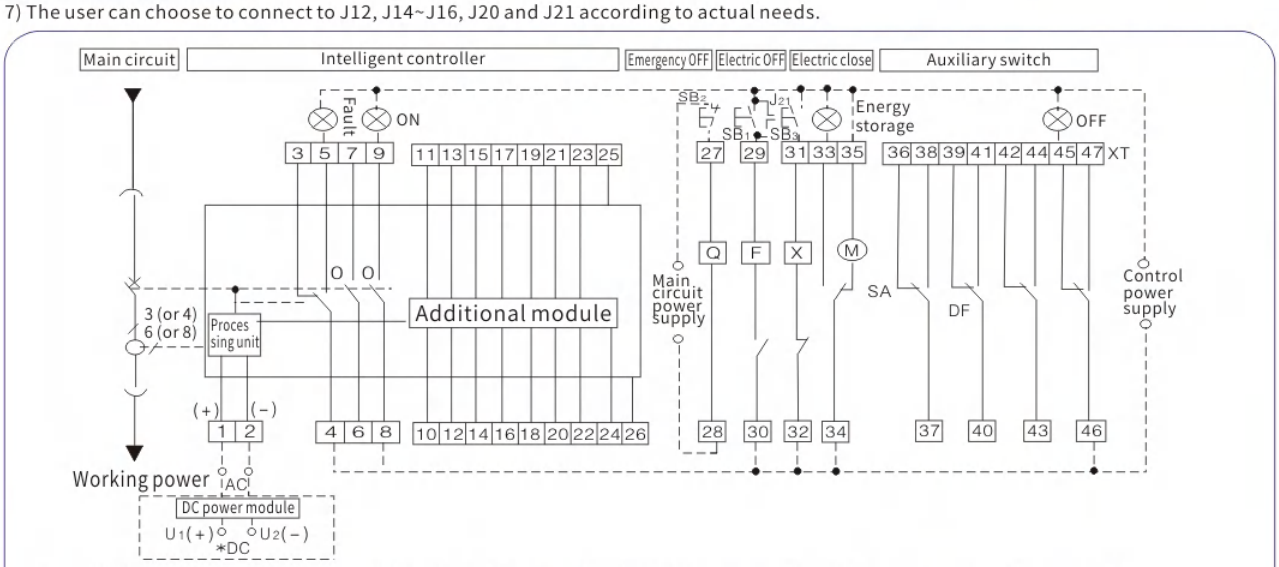
Figure 7 JUW1 -1600 intelligent release secondary wiring diagram

Other wirings of intelligent controller:
#1, #2 AC working power input (input from DC power modules U1 and U2 during DC)
#10 RS485 communication P terminal (simplex) remote adjustment and remote communication
#11 Rs485 communication N terminal (simplex) remote control and remote measurement, etc
#12 Overload pre-alarm signal output
#13 Communication remote control shunt trip output
#14 Instantaneous short delay trip signal output or communication remote control closing output
#15 Long delay trip signal output or communication remote control energy storage output
#16 Ground (or zero) fault trip signal output
#17 Unloading 1 signal output
#18 Unloading 2 signal output
#19 Signal output common line
#20 Self-diagnosis signal output
#21 Trip signal (available for shunt or undervoltage actuators)
#22 Voltage signal phase A
#23 Voltage signal phase B } Directly input from the main circuit
#24 Voltage signal phase C
#25, 26 External neutral pole or ground current transformer input



Relay wiring diagram for additional function of circuit breaker

1) The controller signal output drives the external relay J to output contact action signal through terminals 12~18, 20 and 21.
2) The RS485y232 converter, DP module and power transformer (the user needs to specify the input voltage value in the order specification) are provided by the manufacturer. The power transformer can be inserted into the standard guide rail together with the relay base and installed by the user in the appropriate position of the switchgear.
3) Relay model: HH62P, AC/DC24V, provided by user.
4) Main station computer is provided by user.
5) Terminals 13~15 output can be used for opening, closing, and other functions of communication remote control. The trip signals of corresponding terminals 14 and 15 are no longer output at this time. The normally open contact of the corresponding relay can be connected in parallel with the corresponding manual control button, which can achieve both manual control and remote control. If remote control function is not required, terminals 14 and 15 can be connected to two signal lights in series through the normally open contacts of relays J14 and J15, and the corresponding signal can be remotely output. Please specify whether remote control function is required in the order specification, and the manufacturer will determine the corresponding function output by terminals 14 and 15 based on this. Terminal 21 output drives relay J21 for backup protection.
6) Output conditions of self-diagnosis signal: a. The internal temperature of the controller is>80°C; b. The chip is not working properly; c. The controller loses power.
7) The user can choose to connect to J12, J14~J16, J20 and J21 according to actual needs.



Note: (1) If the control supply voltage of F, X and M is different, they should be connected to different power supplies separately.
(2) Terminal #33 can be directly connected to the power supply (automatic energy pre-storage) or connected in series to the normally open button and then connected to the power supply (manual energy pre-storage).
(3) If requested by the user, terminals # 6~#7 can output normally closed contact.
(4) Additional accessories are provided by the user.
(5)*When the working power of the intelligent controller is DC power, DC power module must be added (at this time, terminals #1 and #2 cannot be directly connected to AC power). The secondary wiring is shown in the figure (DC power supply DC110V or 220V is input from U1(+) and U2(-), and the two output terminals of the DC power module are respectively connected to terminals 1(+) and 2(-) of the secondary wiring base).

SB1 shunt button (provided by user)
SB2 undervoltage button (provided by user)
SB3 closing button (provided by user)
X closing electromagnet
M energy storage motor
XT wiring terminal
DF auxiliary contact
F shunt release
SA motor micro switch
Q undervoltage release or undervoltage delay release
O NO contact (3A/AC380V)
⊗ Signal light (provided by user)

Figure 8 JUW1-1600H intelligent release (LCD display type) secondary wiring diagram

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1. Controller user wiring diagram

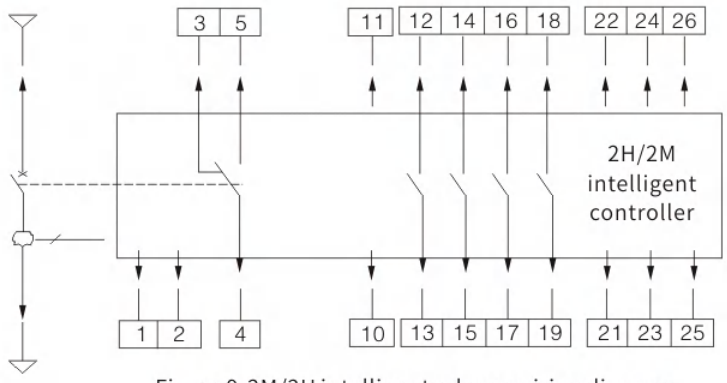

Figure 9 2M/2H intelligent release wiring diagram

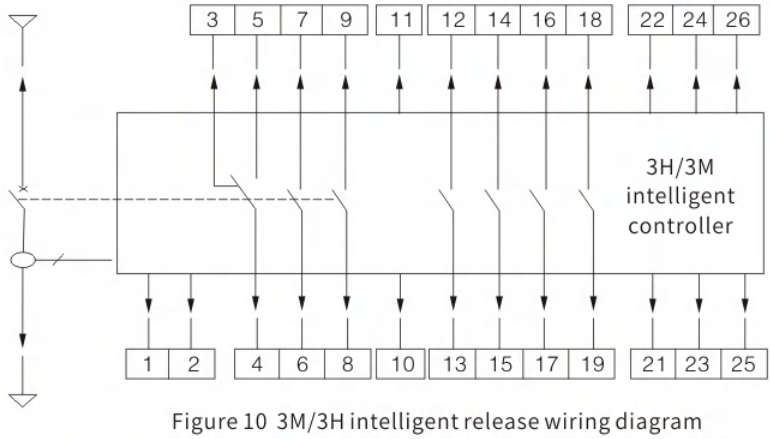

Figure 10 3M/3H intelligent release wiring diagram

Pin definition (relay in default state)

Wire number	Function	Note
1#、2#	Auxiliary power input terminal, regardless of polarity	
3#、4#、5#	Controller status output	
6#、7#	Normally open node	
8#、9#	Normally open node	
10#	Communication outgoing line for 2H type networking	485A
11#	Communication outgoing line for 2H type networking	485B
12#、13#	Load monitoring 1 output (relay contact signal)	Relay 1 contact output
14#、15#	Load monitoring 2 output (relay contact signal)	Relay 2 contact output
16#、17#	2H remote control opening (2M pre-alarm)	Relay 3 contact output
18#、19#	2H remote control closing (2M tripping)	Relay 4 contact output
20#	Ground wire	
21#	UN neutral line input	
22#、23#、24#	Three phase voltage input terminals A, B and C respectively	
25#、26#	External N-phase transformer input terminal	

Note: The four relay contact functions can be programmed as instantaneous fault alarm, grounding alarm, imbalance alarm, short delay alarm, overload fault alarm, fault trip alarm, load 1 alarm, load 2 alarm, self-diagnosis alarm, power grid fault alarm, remote opening and closing.

Ordering specification

(Please tick √ or fill in the number in , one specification one sheet)

Client		Order quantity (set)		Order date / Delivery date	
Model	JUW1-1600	Number of poles	□3P □4P	Installation method	□ Fixed type □ Draw-out type
Rated working voltage	□AC400V □AC690V	Rated current In=		A	

Intelligent controller	Type	□ 3H type	□ 3M type	□ 2M/2H type
	Basic function	□ Overload long delay protection □ Grounding or residual current protection	□ Short circuit delay protection □ Fault memory function	□ Short circuit instantaneous protection □ Test function
	Optional function	□ Ammeter function □ Load monitoring function	□ Thermal simulation function □ MCR function	□ Communication function □ Self-diagnosis function
	Grounding method	□3PT	□4PT	□ (3P+N) T (additional transformer required) ★
	Controller power supply	□AC400V		
		□AC230V		
Standard accessory	Shunt release	□AC400V	□AC230V	
	Closing electromagnet	□AC400V	□AC230V	
	Electric operating mechanism	□AC400V	□AC230V	
	Auxiliary switch	□ Standard type (4 sets of conversion contacts)		
Optional accessory	Undervoltage release	□AC400V	□ Undervoltage instantaneous release	
		□AC230V	□ Undervoltage delay release	□1S □2S □3S
	Opening position lock	□ 1 lock 1 key	□ 2 locks1 key	□ 3 locks 2 keys
	Mechanical interlock	□ Steel cable interlock (2 sets)	□ 2 lever interlocked switches	
	Other accessories	□ Door interlock □ Extended bar	□ Draw-out seat three position lock □ Others	
	Connection	□ Horizontal wiring	□ Vertical wiring	□ Special wiring

Note: When the user chooses the optional function with "★", additional fees will be required. If the user has any other special requirement for ordering, please consult with the manufacturer.

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Dual power automatic conversion system

Structure Introduction

Two mechanically interlocked JUW1 circuit breakers equipped with automatic transfer controller can form dual power automatic transfer system. The controller has complete plastic shell installed on the box or cabinet door, and reliable electronic components, relays and integrated circuits are used inside the controller.

The power conversion system is an intelligent dual power switching module that integrates programmable function, automated measurement, LCD display and digital communication. It integrates digitization, intelligence and networking, achieving automation in the measurement and control process and reducing human operational error, and is an ideal product for dual power switching. The dual power automatic switching controller is composed of microprocessor as the core, which can accurately detect three-phase voltage of two circuits, make accurate judgment and handle voltage abnormality (over voltage, undervoltage, phase loss, over frequency, under frequency), and after the adjustable delay (0-9999s), the command relay sends closing or opening command to the circuit breaker to complete the conversion between power supplies, ensuring the continuity and safety of power supply.

Performance and characteristic

◎The system type can be set to #1 mains supply #2 mains supply, #1 mains supply #2 power generation, # 1 power generation #2 mains supply, #1 power generation #2 power generation;
◎The LCD is 128x64 with back light, displayed in two languages (Simplified Chinese and English), and it can be operated with touch of button;
◎It collects and displays three-phase voltage and frequency parameter of two circuits;
◎It owns protection functions for over voltage, undervoltage, phase loss, reverse phase sequence, over frequency and under frequency;
◎Equipped with automatic/manual state switching, the switch can be forced to close and open in manual mode;
◎All parameters can be programmed on site, secondary password is used to prevent non professional personnel from misoperation;
◎On site, it can be set to loaded/unloaded mode for the trial operation of the generator set;
◎Equipped with switch reclosing and power outage retrip function;
◎Real time clock display;
◎It has the ability to start and stop the generator set at a fixed time, it can be set for single operation, once a month or once a week, and can also be set to operate with or without load.
◎It can control the cyclic operation of two generator sets, and the operating time and interval shutdown of the generator set can be set.
◎The equipped RS-485 isolated communication interface applies Mod Bus communication protocol, it has remote control, remote signaling, and remote measurement functions. It can remotely control the start and stop of the generator set, as well as the opening and closing functions of the ATS;
◎It can query the current controller status (including internal switching value such as input port, over voltage, undervoltage, etc.);
◎It's suitable for various wiring types (three-phase four-wire, three-phase three-wire, single-phase two-wire, two-phase three-wire types).

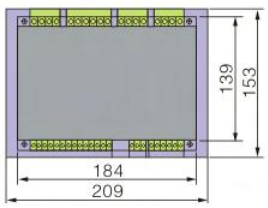
Parameter configuration

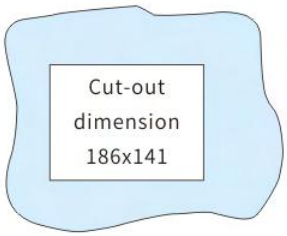
The parameter that the controller can set includes: normal voltage delay of one circuit, abnormal voltage delay of one circuit, normal voltage delay of two circuits, abnormal voltage delay of two circuits, switch conversion interval, on/off time, generator startup delay, generator shutdown delay, over voltage threshold, undervoltage threshold, over/under frequency threshold, power switching priority, system type, time and date, programmable input/output port function and communication parameter, etc. It can also be equipped with current display (The current transformer needs to be provided by user) and current overload alarm function.

The user can adjust and program on site through the controller manual according to the on-site operation needs to meet the electricity demand.

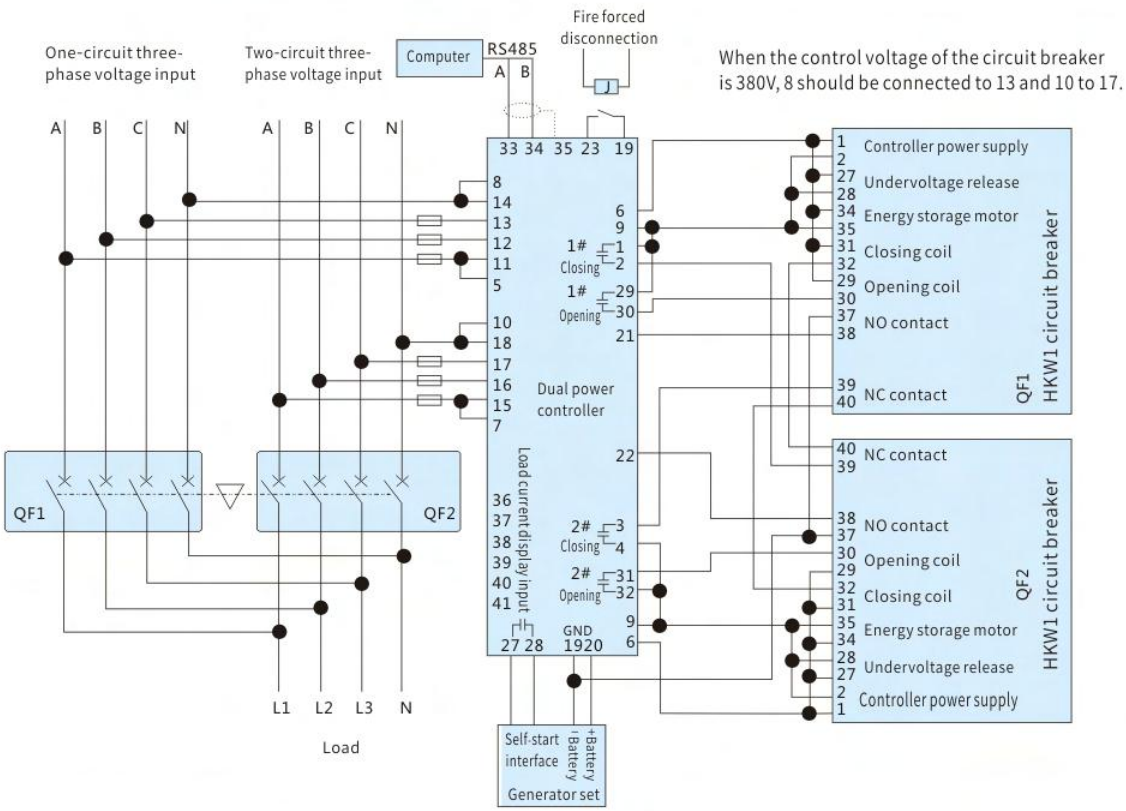
Controller panel, outline and mounting hole dimension (unit: mm)

Fault alarm light
LCD display screen
Screen flip button/Add button: it's used to switch the screen display interface and as the parameter increase button when adjusting parameter configuration.
Menu button/confirmation button: Press and hold this button to enter the menu interface, and long press and hold this button to exit the current operation and return to the main interface display. When the controller malfunctions and alarms, pressing and holding the button can eliminate the malfunction alarm.
In manual mode, press this button to close the circuit II circuit breaker.
Double-break button: Press this button to break both circuits I and II.
Test button: Press this button to directly enter the test interface.
In manual mode, press this button to close the circuit I circuit breaker.
Press this button to set the controller to automatic mode.





Application wiring diagram



Note: 19 represents the common point for the closing position signal of two circuit breakers, 21 represents the QF1 circuit breaker status signal, and 22 represents the QF2 circuit breaker status signal.

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JUTRION

JUW1

Series Air Circuit Breaker

Fixed & Draw-Out Configurations

2500-4000 A Frames

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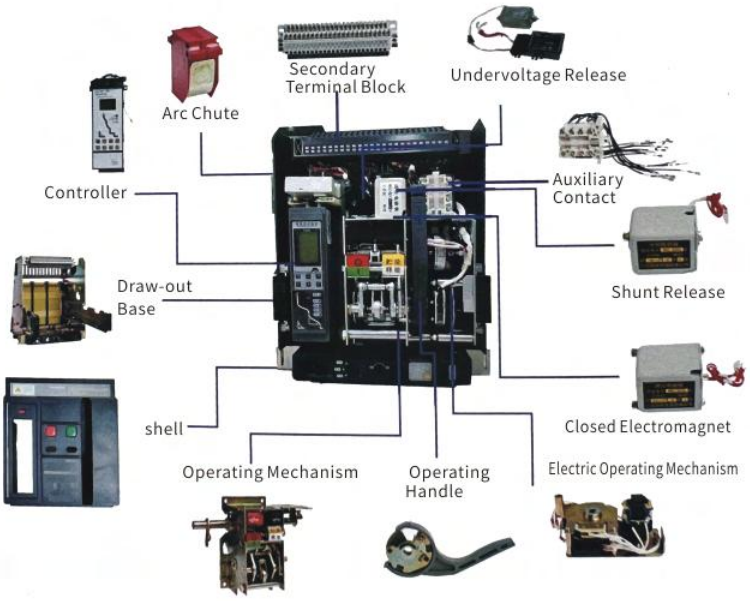
Draw-out Type Structure Exploded Diagram



General

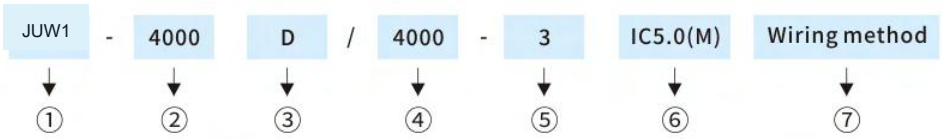
The JUW1-2500-4000 series air circuit breaker (hereinafter called ACB) is suitable for AC 50Hz, with a rated operating voltage of 400V/690V/800V/1140V. It is used to distribute electrical energy and protect lines and power equipment from overload, undervoltage, short circuit, and grounding faults. The ACB employs a highly selective and multifunctional intelligent controller, offering comprehensive protection functions. It is particularly suitable for power distribution networks requiring improved power supply reliability and to avoid unnecessary power outages. The 6.0 and 8.0 models feature a communication interface for easy connection to a fieldbus, enabling remote measurement, remote adjustment, remote control, and remote communication—four remote functions—to meet the requirements of control automation. Leakage protection can be achieved by configuring a leakage current transformer and a corresponding intelligent controller.ACB with a rated operating current of 1000A and below can also be used in AC 50Hz, 400V power distribution networks for overload, short circuit, undervoltage, and grounding fault protection of motors. Under normal conditions, they can be used for infrequent starting of motors.

The product has passed the China Quality Certification Center (CQC) certification.

The circuit breaker has isolation function and is represented by symbol  .

Standard: IEC60947-1, IEC60947-2, IEC60947-4-1

Type Designation



Code	Meaning
①	Product Model
②	Frame Current
③	Installation Method: Fixed Type (F) Draw-out Type Type (D)
④	Rated Current
⑤	Poles
⑥	Controller Type
⑦	Wiring method: S: Horizontal wiring; C: Vertical wiring

Normal working and installation condition

◎ Circuit breakers should be installed in a dry, dust-free environment, free from corrosive gases and explosive media, and should not be subjected to impact. If the environment cannot meet these conditions, the protection level of the complete set of equipment should be increased accordingly.

◎ Ambient temperature: Electrical and mechanical properties shall be suitable for ambient temperatures ranging from -5°C to +40°C, the average value within 24h shall not exceed +35°C

◎ Relative humidity: At a maximum temperature of +50°C, the relative humidity of the air shall not exceed 50%. Higher relative humidity is permissible at lower temperatures; for example, at 20°C, the relative humidity may reach 90%.

◎ Altitude: ⩽2000m

◎ Installation: Vertically installed, inclination between the mounting plane and the vertical planes hould not exceed ±5°

◎ Pollution level: Level 3

◎ Application Category: B

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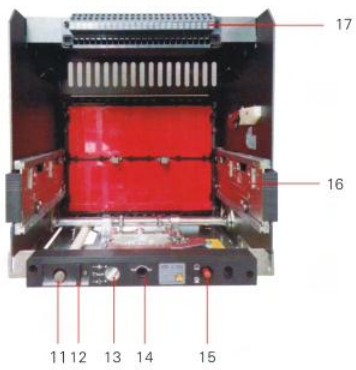
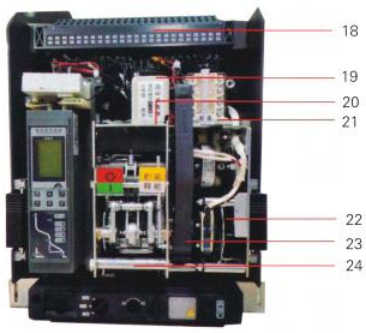
Preparation before installation

Before installation, use a 500VDC megohm meter to check the insulation resistance of the circuit breaker according to regulations. The insulation resistance should not be less than 500MΩ when the ambient temperature is 25°C±5°C and the relative humidity is 50% to 70%.

The insulation resistance test locations are: when the circuit breaker is closed, between each phase and the ground; when the circuit breaker is open, between each phase and each poles.

Structure of ACB





S/N	Function Name
1	Fault trip reset button
2	Open position
3	Closing button (I)
4	Open button (O)
5	Intelligent control unit
6	Main contact position indicator: I: Closed, O: Open
7	Closeable indicator
8	Energy storage/release indicator
9	Manual energy storage handle
10	Technical parameters
11	Crank handle and storage hole (draw-out type only)
12	Draw-out type "separate" position safety padlock
13	Closing, test, connection position indication
14	Crank handle operation hole
15	Three-position latch reset button
16	Sliding rail (draw-out type only)
17	Control circuit terminal (fixed)
18	Control circuit terminal (moving)
19	Shunt release
20	Closing electromagnet
21	Auxiliary switch
22	Electric motor energy storage motor
23	Manual energy storage
24	Handle operating mechanism

Technical date

Model			JUW1	JUW1
Rated frame current Inm (A)			2500	4000
Rated operational current In (A)			(400)630A,800A,1000A, 1250A,1600A,2000A,2500A	2000A,2500A,2900A,3200A 3600A,3900A,4000A
Rated operational voltage Ue (V)			50Hz AC400V,500V, 690V,800V,1140V	50Hz AC400V,500V, 690V,800V,1140V
Rated insulation voltage Ui (V)			1140V	1140V
Rated impulse withstand voltage Uimp (kV)			12	12
Power-frequency withstand voltage U (V), 1 min			AC50Hz 3500	AC50Hz 3500
Pole			3P/4P	3P/4P
Rated ultimate short-circuit breaking capacity Icu (kA)		400V	100	100
		690V	65	80
		800/1140V	50	50
Rated short-circuit breaking capacity Ics (kA)		400V	100	100
		690V	65	80
		800/1140V	50	50
Rated short-time withstand current Icw (kA)		400V	100	100
		690V	65	80
		800/1140V	50	50
Total breaking time (without additional delay) (ms)			12~18	12~18
Closing time (ms)			≤60	≤60
Operational performance	Electrical life (times)		2000	2000
	Mechanical life (times)	Maintenance-free	10000	10000
		Maintenance required	20000	20000

Basic and optional functions of intelligent controller

IC5.0(M)

Digital display type

Basic functions	optional functions
Overload long delay, short circuit short delay, short circuit instantaneous protection	Signal contact output
Function test	MCR and over-limit tripping
Fault memory	Voltage measurement
Thermal memory	
Self-diagnosis	
Current measurement	
Fault status indication and value display	
Ground fault protection	

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IC6.0(3M)
IC8.0(3H)

LCD display type

Basic functions	optional functions
Overload long delay, short circuit short delay, short circuit instantaneous protection	Current unbalance protection
Function test	Signal contact output
Fault memory	Load monitoring
Thermal memory	MCR and over-limit tripping
Self-diagnosis	Power measurement
Current measurement	Power factor measurement
Fault status indication and value display	Energy measurement
Communication function (3H)	Zone selective interlocking (ZSI)
Contact wear indication (3H)	Harmonic measurement
Operation count record (3H)	Voltage protection
Ground fault protection	Voltage measurement

Intelligent controller function

Controller Model	IC5.0(M)	IC6.0(3M)	IC8.0(3H)
Long-time delay overload protection	■	■	■
Short-time delay short-circuit protection	■	■	■
Short circuit instantaneous protection	■	■	■
Ground fault protection	■	■	■
Current unbalance protection	-	□	□
Function test	■	■	■
Fault memory	■	■	■
Signal contact output	□	□	■
Thermal memory	■	■	■
Self-diagnosis	■	■	■
MCU operating indication	-	-	-
Current bar graph display	-	-	-
Current measurement	■	■	■
MCR and over-limit tripping	□	□	□
Load monitoring	□	□	□
Fault status indication and value display	■	■	■
Voltage measurement	□	□	■
Power factor measurement	-	□	■
Power measurement	-	□	□
Energy measurement	-	□	□
Communication function	-	-	■
Contact wear indication	-	□	■
Zone selective interlocking	-	□	□
Harmonic measurement	-	□	□
Voltage protection	-	□	□
Operation count record	-	□	■

Note: ■: Basic functions; □: Optional functions; -- : The function is not available.

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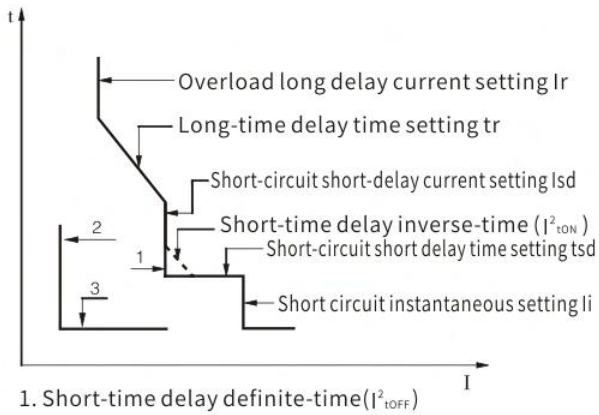
Overcurrent Protection Function



1. Short-time delay definite-time(I^2t_{OFF})
2. Ground fault current setting Ig
3. Ground fault delay time tg

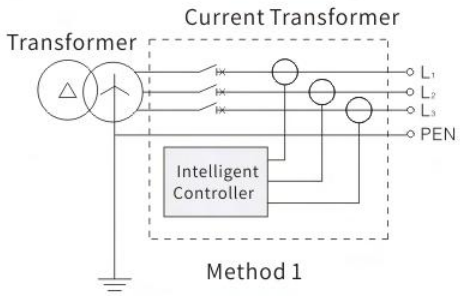
■ Overload long delay protection
- ◆ Overload long-delay inverse-time protection, adjustable setting current Ir
- ◆ Overload long delay time tr adjustable

■ Short-time delay protection (can be turned OFF)
- ◆ Short-circuit short-delay inverse time limit (I2ton), adjustable setting current Isd
- ◆ Short-circuit short delay time tsd adjustable

■ Short circuit instantaneous protection
- ◆ Short-circuit instantaneous (can be turned OFF), current Ii is adjustable

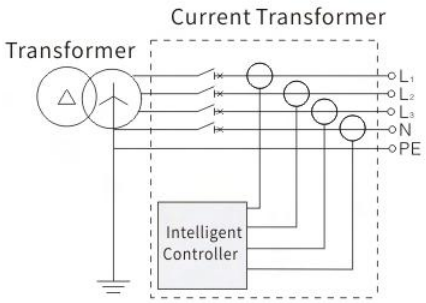
■ Short circuit fault protection (can be turned OFF)
- ◆ Ground fault definite or inverse time protection, adjustable setting current Ig.
- ◆ Delay time is adjustable tg
- ◆ When the delay time is set to OFF, only an alarm is issued without tripping

◆ Special characteristics of long-delay, short-delay, instantaneous, and grounding protection



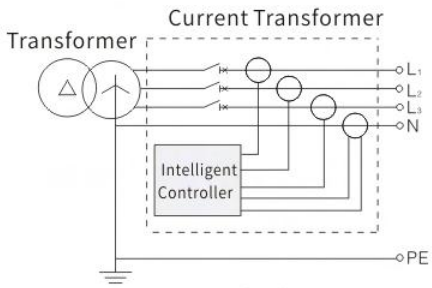
Method 1

■ Method 1: In TN-C, TN-C-S, and TN-S power distribution systems, JUW1 three-pole circuit breakers are selected without the addition of an external neutral line N current transformer
- ◆ The ground fault protection signal takes the vector sum of the three-phase current
- ◆ The protection features are time-limit or inverse-time-limit protection



Method 2

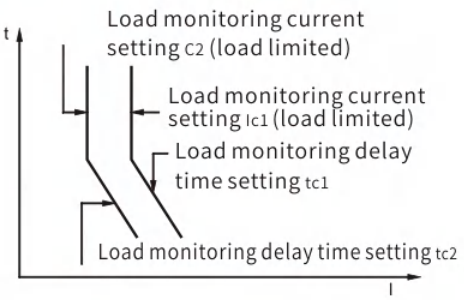
■ Method 2: Use JUW1 four pole circuit breaker in TN-S distribution system
- ◆ The grounding fault protection signal takes the vector sum of three-phase current and N-phase current
- ◆ The protection features are time-limit or inverse-time-limit protection



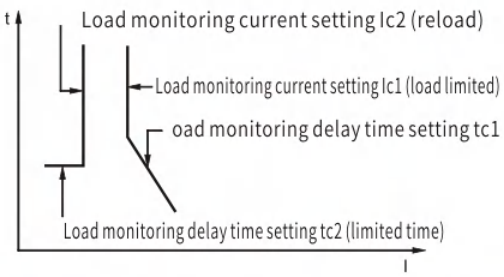
Method 3

■ Method 3: Use JUW1 three pole circuit breaker in TN-S distribution system
- ◆ An external neutral current transformer (N) is used for ground fault protection (connected to secondary circuit terminals 25, 26). The maximum distance between the transformer installation location and the circuit breaker is 2 meters
- ◆ The grounding fault protection signal takes the vector sum of three-phase current and N-phase current
- ◆ The protection features are time-limit or inverse-time-limit protection

Load monitoring function



Operating characteristics of two load limit settings



A load limit, a reload setting action characteristic

◆Used to monitor less critical loads and ensure power supply to the main system

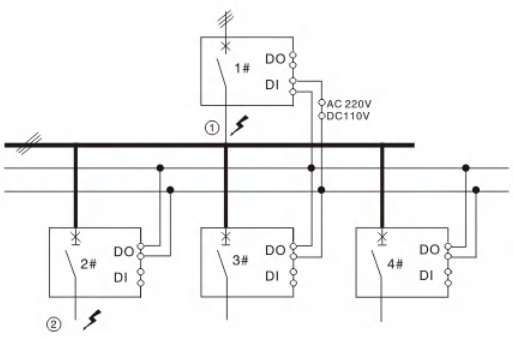
◆There are two methods for load monitoring, and users can choose one of them. The load monitoring current setting values are I_{c1} and I_{c2}, generally taking $I_{c1} \geqslant I_{c2}$

◆Method 1: It can control two subordinate loads. When the operating current of the main circuit exceeds I_{c1} and I_{c2} successively, the contact signals are delayed by t_{c1} and t_{c2} respectively, and the controller sends instructions to disconnect the two controlled loads

◆Method 2: Only control one lower level load. When the operating current of the main circuit exceeds I_{c1}, a contact signal will be sent out after a delay of t_{c1}, and the controller will issue a command to disconnect this load. If the operating current of the main circuit is lower than I_{c2} and lasts for t_{c2} after disconnecting this load, the controller can send a signal again to command the disconnected load to be connected (reloaded) and restore power supply to the load

◆The load monitoring signals (1) and (2) corresponding to I_{c1} and I_{c2} are output as contact signals through the secondary circuit terminals of the circuit breaker. When the signal is issued, it is simultaneously indicated by the LED of the intelligent controller

Zone Selective Interlocking



Zone Selective Interlocking diagram

Zone Selective Interlocking includes short-circuit interlocking and ground fault interlocking.In the same power circuit with two or more circuit breakers that are interconnected,

◆When a short circuit or ground fault occurs on the outgoing side of a downstream circuit breaker (circuit breaker #2 to #4) (e.g., position ②), the downstream circuit breaker trips and sends a regional interlocking trip signal to the upstream circuit breaker. Upon receiving the regional interlocking trip signal, the upstream circuit breaker (circuit breaker #1) performs a time delay according to the short circuit or ground fault protection settings. If the fault current is eliminated during the delay process, the protection resets, and the upstream circuit breaker does not operate. If the fault current is still not eliminated after the downstream circuit breaker trips, the upstream circuit breaker operates according to the short circuit or ground fault protection settings, disconnecting the faulty line.

◆When a short circuit or ground fault occurs between the upstream circuit breaker (circuit breaker #1) and the downstream circuit breakers (circuit breaker #2 to #4) (e.g., location ①), the upstream circuit breaker, having not received a regional interlocking signal, trips instantaneously, quickly disconnecting the faulty line.

◆Parameter Settings:

The upstream circuit breaker must have at least one DI configured as Zone Selective Interlocking detection.

The downstream circuit breaker must have at least one DO configured as Zone Selective Interlocking signal output.

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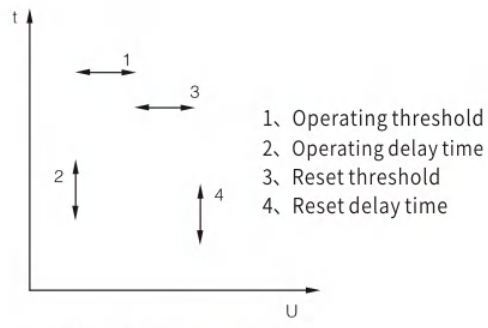
Voltage protection

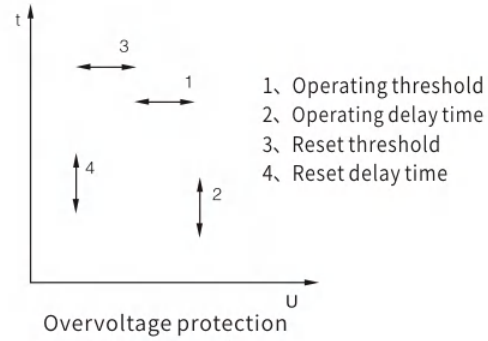


Undervoltage protection operating principle

■Undervoltage protection

◆The intelligent controller measures the true RMS value of the primary circuit voltage. When all three line voltages are less than the set value (i.e., the maximum value of the three line voltages is less than the undervoltage protection set value), the undervoltage protection activates. When the maximum value of the three line voltages is greater than the reset value, the alarm is reset.

◆Action characteristics: When the maximum voltage is less than the action threshold (1), an alarm or trip delay is initiated. When the action delay time (2) expires, an alarm or trip signal is issued, and the undervoltage fault is activated. When the maximum voltage is greater than the return threshold (3), a return delay is initiated. When the return delay time (4) expires, the alarm is deactivated, and the undervoltage fault is reset.

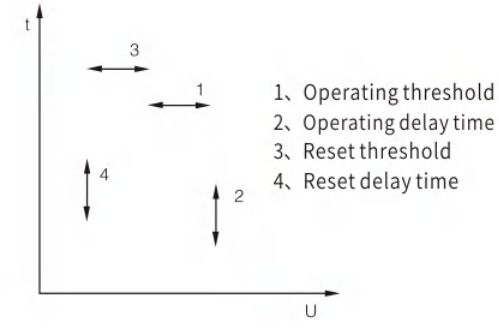


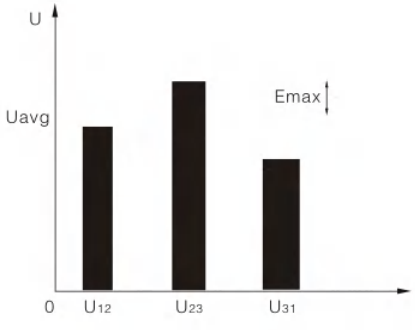
Overvoltage protection operating principle

■ Overvoltage protection

◆The intelligent controller measures the true RMS value of the primary circuit voltage. Over voltage protection activates when all three line voltages are greater than the set value (i.e., the minimum of the three line voltages exceeds the over voltage protection set value); alarm activation is reset when the three line voltages are less than the set value.

◆Action characteristics: When the minimum line voltage is greater than the action threshold (1), an alarm or trip delay is initiated. When the action delay time (2) expires, an alarm or trip signal is issued, and the over voltage fault is activated. When the execution mode is alarm, after the alarm is activated, when the minimum line voltage is less than the return threshold (3), a return delay is initiated. When the return delay time (4) expires, the alarm is deactivated, and the over voltage fault is reset.





Voltage unbalance

■ Voltage unbalance ratio protection

◆The voltage unbalance ratio protection operates based on the unbalance ratio between the three line voltages. The intelligent controller measures the voltage unbalance ratio; when the voltage unbalance ratio exceeds the threshold value, the protection activates; when the voltage unbalance ratio falls below the reset value, the alarm is reset.

◆Action characteristics: When the voltage unbalance ratio is greater than the action threshold (1), an alarm or trip delay is initiated. When the action delay time (2) expires, an alarm or trip signal is issued, and the voltage unbalance ratio fault is activated. When the execution mode is alarm, after the alarm is activated, when the voltage unbalance ratio is less than the return threshold (3), a return delay is initiated. When the return delay time (4) expires, the alarm is deactivated, and the voltage unbalance ratio fault is reset.

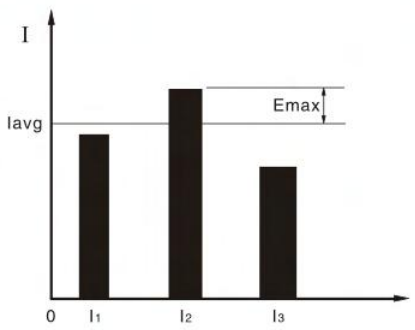
◆Voltage unbalance ratio calculation method:

$$U_{unbal}=\frac{E_{max}}{U_{avg}}\times 100\%$$

$$U_{avg}=\frac{U_{12}+U_{23}+U_{31}}{3}$$

Maximum difference between line voltage and average value

The average value of the sum of the effective values of the three-phase line voltage values



Current unbalance

■ Current unbalance ratio protection

◆Current unbalance ratio protection provides protection against phase loss and three-phase current unbalance.The protection operates according to the unbalance ratio among the three-phase currents.

◆Current unbalance ratio calculation method

$$I_{unbal}=\frac{|\ E_{max}\ |}{I_{avg}}\times 100\%$$

$$I_{avg}=\frac{I_1+I_2+I_3}{3}$$

Maximum difference between current per phase and Iavg

The average value of the sum of the effective values of the three-phase line currents

■Harmonic measurement

◆The intelligent controller can measure fundamental current, fundamental line voltage, fundamental phase voltage, fundamental power, as well as the harmonic current content (HRIh), harmonic voltage content (HRUh), total harmonic current distortion rate [THD, thdi], total harmonic voltage distortion rate [THDu, thdu], and harmonic content rate (HR) of each odd order harmonic current from 3 to 31 times

◆The ratio (expressed as a percentage) of the root mean square value of the h-th harmonic component to the root mean square value of the fundamental component in the periodic flow rate.

The h-th harmonic current content is represented by HRIn.

$$HRI_h=\frac{I_h}{I_{1-1}}\times 100\%$$

Note: In the formula, In is the h-th harmonic current of phase A (root mean square value).

The voltage content of the h-th harmonic is represented by HRUh.

$$HRU_h=\frac{U_h}{U_{12-1}}\times 100\%$$

Note: In the formula, Ih is the h-th harmonic line voltage of phase A-B.

Total Harmonic Distortion (THD, thd)

The ratio of the harmonic content in a periodic alternating current to the root mean square value of its fundamental component (THD) is expressed as a percentage.

$$THDi=\frac{\sqrt{\sum_{h=2}^{\infty} I^2_h}}{I_{1-1}}\times 100\%$$

$$THDi=\frac{\sqrt{\sum_{h=2}^{\infty} U^2_h}}{U_{1-1}}\times 100\%$$

Note: In the formula, Ih is the h-th harmonic current (RMS value) of phase A; Un is the h-th harmonic line voltage (RMS value) between phases A-B.

The ratio (thd) of the harmonic content in a periodic alternating current to the root mean square value of that periodic alternating current is expressed as a percentage.

$$thdi=\frac{\sqrt{\sum_{h=2}^{\infty} I^2_h}}{I_{1-1}}\times 100\%$$

$$thdu=\frac{\sqrt{\sum_{h=2}^{\infty} U^2_h}}{U_{1-1}}\times 100\%$$

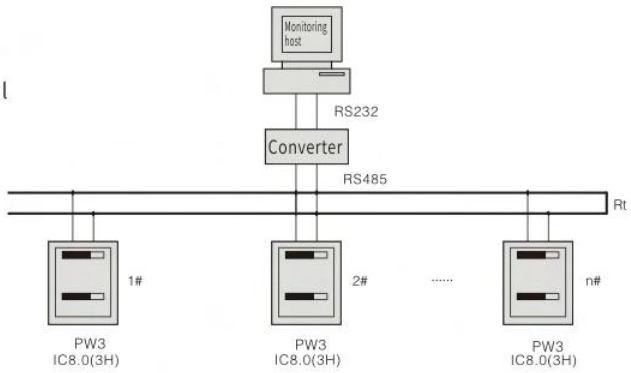
Note: In the formula, Ih is the h-th harmonic current (RMS value) of phase A; Un is the h-th harmonic line voltage (RMS value) between phases A-B.

Communication

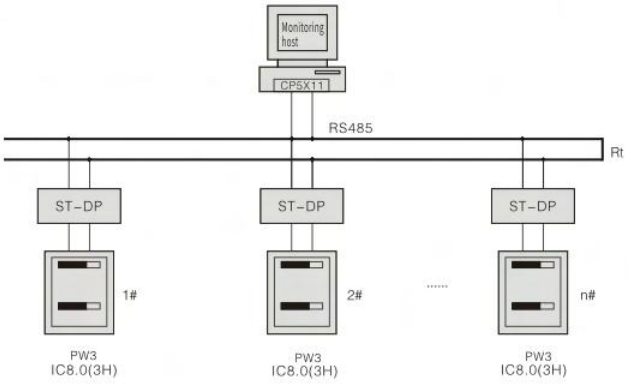
The circuit breaker can be remotely controlled via the communication port, enabling four remote functions: remote control, remote communication, remote adjustment, and remote measurement.

The communication protocol uses Modbus-RTU, Profibus-DP, or Device mode, with a standard RS-485 interface. Baud rate and communication address can be set via a programmer. The maximum wiring distance is 1.5km, and one line can connect up to 250 communicable circuit breakers simultaneously. The communication line is a twisted-pair shielded cable, and the communication distance can be extended by adding a medium-voltage relay.

◆Communication network connection diagram 1
Apply Modbus-RTU protocol



◆Communication network connection diagram 2
Apply Profibus-DP protocol



ST-DP is a communication module, and the main station uses SIEMENS' CP5X11.
Rt: Network terminal resistance, typically 120Ω

Contact wear indication

The intelligent controller panel can display the current wear status of the contacts. The factory display value is 100%, indicating that the contacts are not worn. When the displayed value drops to 60%, an alarm signal is issued to remind the user to take timely maintenance measures. After the contacts are replaced, they can be restored to the initial wear value through settings.

Self-diagnosis

An alarm signal will be issued immediately if the microprocessor of the intelligent controller malfunctions or the ambient temperature around the microprocessor exceeds 80℃±5℃.

MCR and HSISC protection

◆MCR function: When the circuit breaker encounters a short-circuit short-delay fault during the closing process or when the controller is energized and initialized, it can immediately switch to instantaneous tripping.

◆HSISC Function: During normal operation, when the short-circuit current exceeds a certain limit, the controller sends a signal to trip the circuit breaker. This function is unaffected by the short-circuit instantaneous protection setting.

Connection, disconnection, and over-limit tripping protection actions		
Connect/Disconnect	Action Threshold	15kA~100kA(Step sizekA)
	Default Setting Value	50kA (InNot Greater Than2000A)60kA (InGreater Than2000A)
Over-Limit Trip	Action Threshold	15kA~100kA (Step size1kA)
	Default Setting Value	65kA(W3-2500)，80kA(W3-4000,W3-7500)

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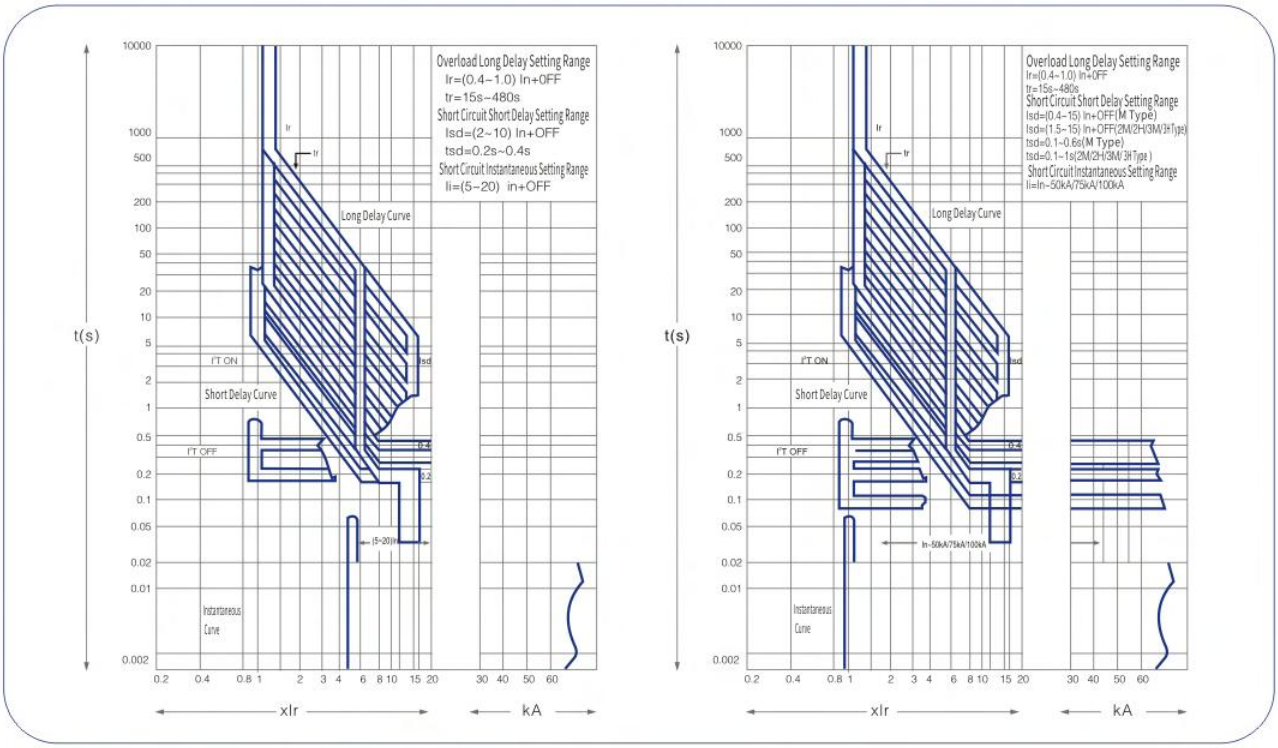
Fault Memory Function

After the circuit breaker trips due to a fault, the intelligent controller can display the fault type, fault phase, fault current value, and tripping time.

Signal Contact Output

The controller has an adjustable signal contact output function. Please contact our company for specific signal output details.

Default Contact Settings				
	Contact 1	Contact 2	Contact 3	Contact 4
IC5.0(M)/IC7.0(3M)	Load Monitoring 1	Load Monitoring 2	Self-Diagnostic Fault Alarm	Fault Trip
IC8.0(3H)	Load Monitoring 1	Load Monitoring 2	Remote Control Opening	Remote Control Closing



Overload Long Delay Protection

Setting Current Ir Adjustment Range		IC5.0(M)/IC7.0(3M) IC8.0(3H)	(0.4~1.0)xIn+OFF (Adjusted in 1A increments)					
Operating Time Tolerance ±15%	Current	Operating Time						
	≤1.05Ir	No operation within 2 hours						
	≥1.3Ir	Operating within 1 hour						
	1.5Ir	Setting Time	15	30	60	120	240	480
	2.0Ir	Operating Time	8.4	16.9	33.8	67.5	135	270
	7.2Ir	Operating Time	0.65	1.3	2.6	5.2	10	21
Thermal Memory Function		30min+OFF Can be cleared upon power failure						
N-Phase Overload and Overcurrent Characteristics		100%In or 50%In (Applicable to 3P+N or 4P products)						

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Short-circuit short-delay protection

<table>
<tr><td colspan="3" rowspan="2">Setting current Isd adjustment range</td><td>IC5.0(M)</td><td colspan="5">(0.4~15)xIn+OFF (Adjusted in 1A increments)</td></tr>
<tr><td>IC5.0(3M)/IC8.0(3H)</td><td colspan="5">(1.5~15)xIn+OFF (Adjusted in 1A increments)</td></tr>
<tr><td rowspan="5">Current tolerance ±10%,
Operating time tolerance ±15%</td><td rowspan="3">IC5.0(M)</td><td>Current</td><td colspan="6">Operating time</td></tr>
<tr><td>I≥Isd, I≤8Ir</td><td colspan="6">Inverse time T=(8Ir)²×tsd/I² I-Actual current</td></tr>
<tr><td>I≥Isd, I≤8Ir,
Or I≥Isd, I≤8Ir
Inverse time OFF</td><td>Time delay setting time tsd(s)</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td><td>0.5</td></tr>
<tr><td rowspan="2">IC5.0(3M)
IC8.0(3H)</td><td>Timed delay</td><td>Time delay setting time tsd(s)</td><td colspan="5">0.1-1s (0.1s increments) + OFF (Time delay off, Inverse time on)</td></tr>
<tr><td>Inverse time characteristic</td><td>Curve speed</td><td colspan="5">Curve is the same as the overload long delay curve,
curve speed is 10 times faster than the overload long delay</td></tr>
<tr><td>Thermal memory function</td><td></td><td></td><td colspan="6">15min+OFF(Can be eliminated by power failure)</td></tr>
</table>

<table>
<tr><td>Resettable time(s)</td><td>0.06</td><td>0.16</td><td>0.26</td><td>0.35</td><td>0.44</td></tr>
</table>

Short-circuit instantaneous protection

Setting current Ii adjustment range	IC5.0(M)/IC7.0(3M) IC8.0(3H)	In~50kA+OFF(JUW1 -1600/2500) In—75kA+OFF(JUW1 -4000/7500)

Ground fault protection

Setting current Ig adjustment range(A)		IC5.0(M)/IC7.0(3M) IC8.0(3H)	(0.2~1.0)xIn+OFF (M/2H minimum 100A)	
Current tolerance ±10%, Operating time tolerance ±15%	IC5.0(M)	Time limit	Setting time Tg(s)	0.1~1s 0.1-1s increments
	IC7.0(3M) IC8.0(3H)	Time limit	Setting time Tg(s)	0.1~1s 0.1-1s increments

Load monitoring

Mode 1	Setting current I_{c1}, I_{c2} adjustment range (A)	(0.2~1.0)x In+OFF
	Delay characteristic t_{c1}, t_{c2} (S)	tc1=(0.2~0.8)x tr , tc2(0.2~0.8)x tr
Mode 2	Setting current I_{c1}, I_{c2} adjustment range (A)	(0.2~1.0)In+OFF
	Delay characteristic t_{c1}, t_{c2} (S)	tc1=(0.2~0.8)x tr
		Time limit tc2=60s

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Voltage unbalance protection

Operating threshold	2%~30%(Difference1%)	
Operating Delay Time(s)	0·2~60(Difference 1%)	
Reset threshold (when the operating mode is set to "Alarm")	2%~30%(Difference1%)Not greater than the operating threshold	
Reset delay time (s) (when the operating mode is set to "Alarm")	0.2~60(Difference1%)	
Alarm contact output	Optional	
Operating characteristic	Actual voltage unbalance / Set value	Conventional tripping time
	<0.9	No trip
	⩾1.1	Definite-time operation
Note: Delay time tolerance±10%		

Undervoltage protection

Operating threshold	100-Reset threshold (Step size 1)	
Operating delay time(s)	0.2~60(Step size0.1)	
Reset threshold (V)	Operating threshold to 1200 V (Step size 1)	
Reset delay time(s)	0.2~60(Step size0.1)	
Trip or alarm characteristic	Voltage ratio (Umax / Operating threshold)	Conventional tripping or Alarm time
	<0.9	Definite-time tripping or alarm, contact (optional) output
	⩾1.1	No tripping or no alarm, with no contact output
Note: Delay time tolerance±10%		

Current Unbalance Protection

Unbalance ratio setting range	40%~100%+OFF
Trip or alarm characteristic	⩽0.9δ, No trip
	<1.1δ, Time-delay operation
Delay time (s)	0.1~1.0s+OFF(OFF:Alarm Only, No Trip, difference 0.1 s)

Overvoltage protection

Operating threshold	Reset threshold to 1200 V (Step size 1)	
Operating delay time (s)	0.2~60(Step size 0.1)	
Reset threshold (V)	100~Operating threshold (Step size 1)	
Reset delay time (s)	0.2~60(Step size 0.1)	
Trip or alarm characteristic	Voltage ratio (Umax / Operating threshold)	Conventional tripping or Alarm time
	<0.9	Definite-time tripping or alarm, contact (optional) output
	⩾1.1	No tripping or no alarm, contact (optional) output
Note: Delay time tolerance±10%		

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Earth Leakage Protection

Operating current I△n(A)	0.5~30(Difference0.1A)	
Delay time I△n(s)	0~0.83	
Operating characteristic	Current multiple I/I△n	Conventional tripping time
	<0.8	No trip
	⩾1.0	Definite-time operation

Note: Delay time tolerance±10%

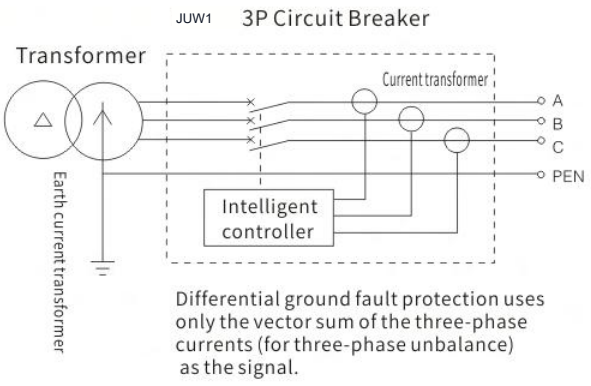
Leakage protection delay

Setting time(s)	0.06	0.08	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.83	Instantaneous
Fault current	Maximum breaking time(s)											
I△n	0.36	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	0.04
2I△n	0.18	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	0.04
5I△n	0.072	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	0.04
10I△n												

If no specific requirements are provided by the user, the intelligent controller is set as follows:

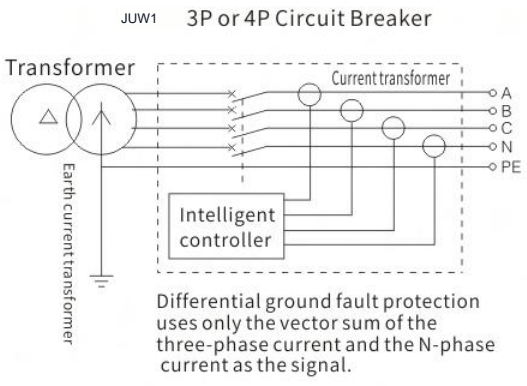
Overload long-time delay protection	Ir	1In
	tr	60s
Short-circuit short-time delay protection	Isd	6In
	tsd	0.4s
Short-circuit instantaneous protection	Ii	10In
Ground fault protection	Ig	0.8In Or1200A(Take the minimum value)
Load monitoring	Ic1	1In
	Ic2	1In

Single-phase ground fault leakage protection refers to metallic ground fault protection with fault currents exceeding several hundred amperes, generally used in neutral-point directly grounded systems. The controller has two different protection modes: differential type (T), where the controller provides protection based on the vector sum of the three-phase current and the neutral phase current, and can be divided into 3PT and 4PT (3P+N) forms; and ground current type (W), where the controller directly takes the output current signal from an additional current transformer between the neutral point of the main power supply and ground for protection. An external neutral pole current transformer or current transformer is added between the N-line and P-stage of the transformer.



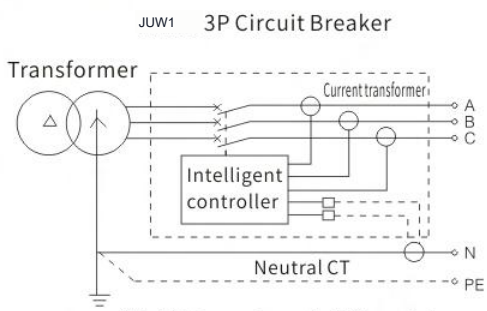
Differential ground fault protection uses only the vector sum of the three-phase currents (for three-phase unbalance) as the signal.

3PT grounding differential type



Differential ground fault protection uses only the vector sum of the three-phase current and the N-phase current as the signal.

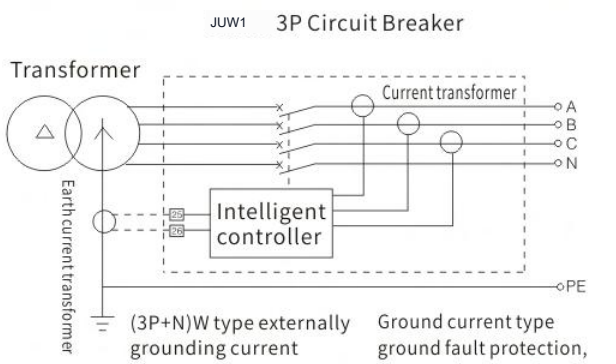
4PT grounding differential type



(3P+N)T type external neutral current transformer

Differential ground fault protection uses only the vector sum of the three-phase current and the N-phase current as the signal.

(3P+N)T type grounding differential type

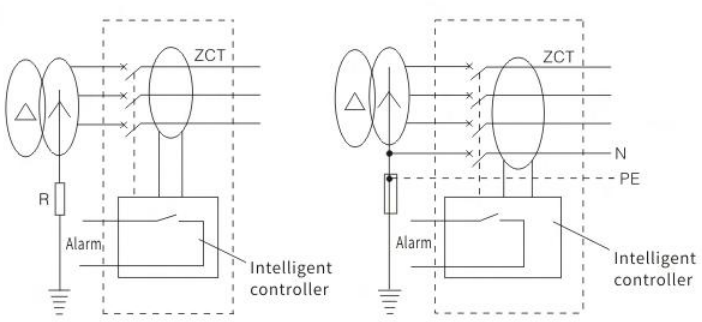


(3P+N)W type externally grounding current transformer

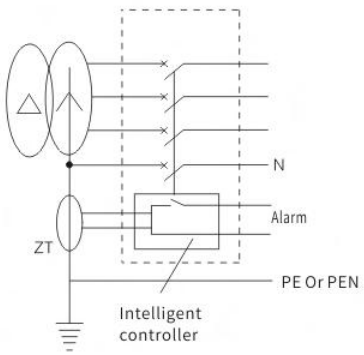
Ground current type ground fault protection, the signal is directly taken from the neutral point of the main power supply and ground.

Grounding current type

Leakage protection mainly uses zero sequence transformers to obtain signals, which is suitable for grounding protection in high resistance grounding systems as well as direct grounding systems. Generally, it only alarms and does not trip. When necessary, the circuit breaker can also be disconnected. The connection method is shown in the following figure. In addition, there are two types of grounding wires for load circuits (ZCT) or transformers (ZT)



Leakage load circuit type



Leakage transformer grounding wire type

Power consumption (ambient temperature +40°C)

Power consumption is the total loss measured when the circuit breaker carries a frame-rated current of Inm.

Model	Power Consumption (W)	
	Fixed Type	Draw-out Type
JUW1-2500	240	360
JUW1 -4000	600	800

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Diversity Factor

The table below shows the circuit breaker's ability to continuously carry current under ambient operating temperatures and meeting the heating conditions specified in the IEC standard.

Ambient working temperature		+40℃	+45℃	+50℃	+55℃	+60℃
Continuous current carrying capacity	Inm=1600A	1Inm	0.98Inm	0.95Inm	0.90Inm	0.87Inm
	Inm=2500A	1Inm	0.97Inm	0.91Inm	0.87Inm	0.82Inm
	Inm=4000A	1Inm	0.96Inm	0.90Inm	0.86Inm	0.80Inm

For altitudes exceeding 2000m in the applicable working environment, the power frequency withstand voltage can be corrected according to the table below:

Altitude(m)	2000	3000	4000	5000
Power Frequency Withstand Voltage(V)	3500	3150	2500	2000
Operating Current Correction Factor	1	0.93	0.88	0.82
Short Circuit Breaking Capacity Correction Factor	1	0.83	0.71	0.63

Copper Busbar Specifications

Frame Rating Current Inm(A)	Rated Current In(A)	Copper Busbar Specifications	
		Number of Busbars	Dimensions(mmxmm)
2500	630	2	60×5
	800	2	60×5
	1000	2	60×8
	1250	2	80×5
	1600	2	100×5
	2000	3	100×5
	2500	2	100×10
4000	2000	2	100×5
	2500	3	100×8
	2900	3	100×10
	3200	4	100×8
	3600	4	100×10
	3900	4	120×10
	4000	4	120×10

The specifications in the table are the copper busbar specifications used when the circuit breaker is installed in an open environment at a maximum ambient temperature of 40°C and meets the heating conditions specified in the IEC standard.

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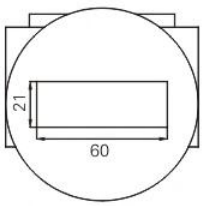
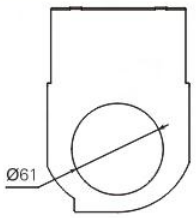
External neutral (N-phase) current transformer (T)

When used in a (3P+N) power distribution system with a three-pole circuit breaker (in this case, the intelligent controller unit should be of type IU4.0), it should be installed on the neutral line N, with a maximum installation distance of 2m.

Specifications are as follows:



JUW1 -2500 Frame
630A-2500A

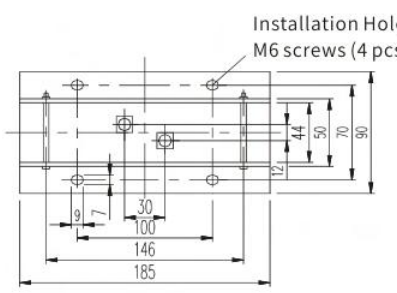


JUW1 -4000 Frame
2000A-4000A

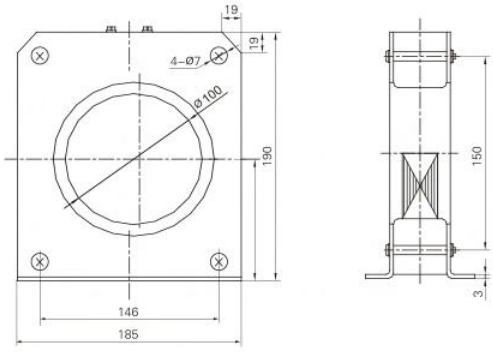
If the N-phase busbar is too wide and the existing external N-phase current transformer cannot meet the requirements, a flexible current transformer can be provided. The flexible current transformer can connect to a busbar with a width of 100mm or more.

External grounding current transformer

When the controller is used for grounding protection, the grounding current protection (W) is a ZT100 transformer with the following transformation ratio: controller rated current 1A (below 3200A) and controller rated current/5A (3200A and above).

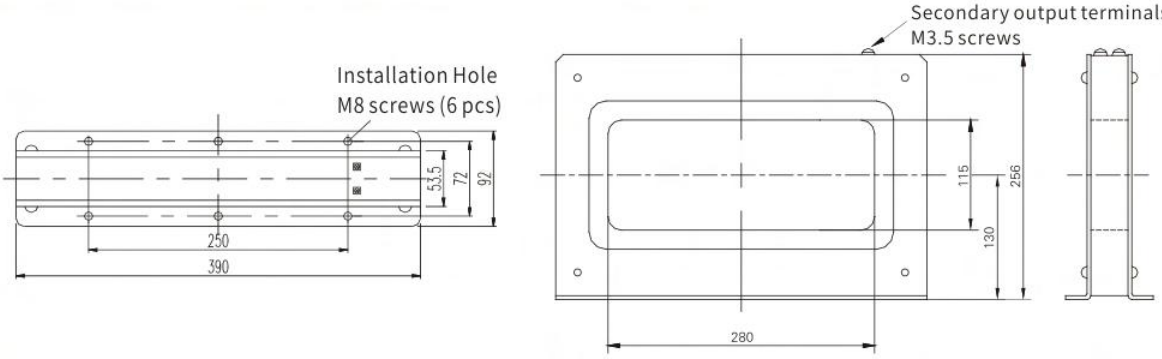


ZT100 Grounding Transformer



External zero-sequence leakage current transformer

The controller is used when the grounding protection is leakage protection (E). The external zero-sequence leakage current transformer is a ZCT1 transformer with a transformation ratio of 30A/20mA.



ZCT1 leakage current transformer

◆Drawer position electrical indicator

When the drawer-type circuit breaker body and drawer base are in the "Disconnected", "test" and "connected" positions respectively, the electrical indication devices for the three positions can output electrical status signals corresponding to these three positions respectively. The devices are installed inside the drawer.

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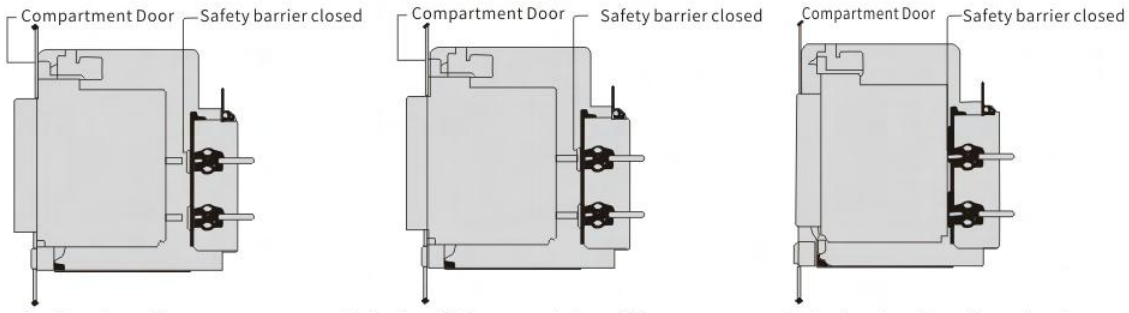
Characteristics

Rated operational voltage Ue(V)	230
Conventional heating current Ithe(A)	10
Rated Operational Current Ie(A)	1.5

Disconnected Position, Test Position, Connected Position

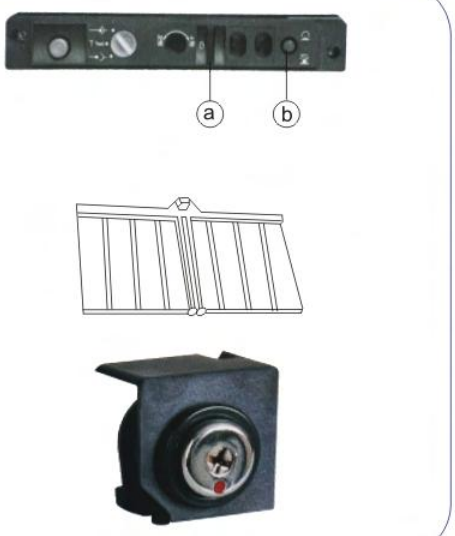


Main circuit and auxiliary circuit are both disconnected, safety barrier is closed.

Main circuit disconnected, auxiliary circuit connected, safety barrier closed, necessary tests can be performed.

Main circuit and auxiliary circuit both connected, safety isolation barrier open.

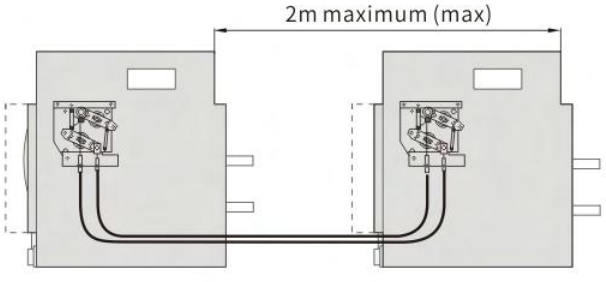
Circuit breaker drawer base connection, test, and disconnection device



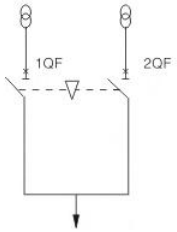
◆Padlock device (padlock provided by the user)
◆User draw-out type lock in "Disconnect," "Test," or "Connect" position
◆Interlocking and unlocking device for circuit breaker separation, test, and connection positions
◆Used to automatically lock the hand crank handle in the "separate," "test," and "connect" positions, preventing malfunctions caused by improper operation of the hand crank handle.
◆Locked Position Release
◆After the red interlock device pops out, to operate the handle again, the red interlock device must be pressed first before operating the hand crank.
◆Phase Spacing Plate
◆Vertically installed between the terminal blocks of the fixed part of the drawer-type circuit breaker, it strengthens the insulation at the busbar connection and prevents arcing from spreading into the circuit breaker.
◆Three-lock Two-key
The three-lock two-key mechanical interlock is designed for three non-adjacent circuit breakers. When two circuit breakers need to be closed, first insert the key into the lock hole of the two circuit breakers, press and hold the open button, and turn clockwise. At this time, the circuit breaker can be closed, but the key cannot be removed. To remove the key, the circuit breaker must be opened by pressing the open button, turning the key counterclockwise, and removing it. At this time, the circuit breaker will not be able to be closed.

Mechanical Interlocking

Two horizontally mounted circuit breakers with cable interlocking or two stacked circuit breakers with pole interlocking



Circuit Diagram



Possible Operating Modes

1QF	2QF
0	0
0	1
1	0

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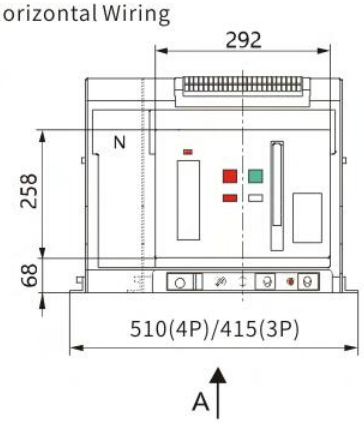
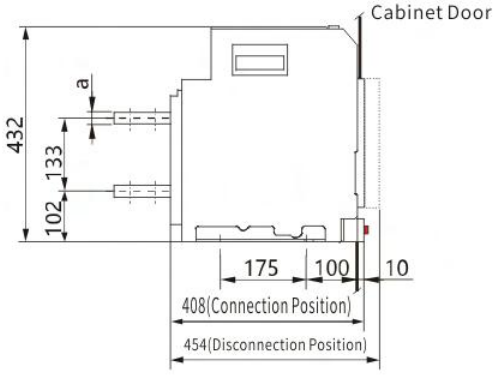
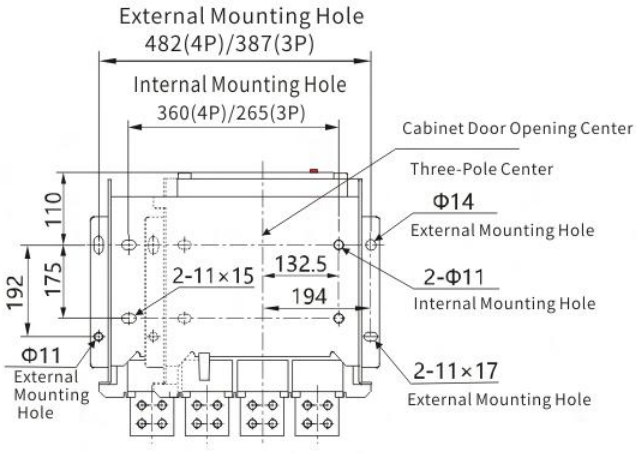
JUW1 -2500 Model Outline and Installation Dimensions

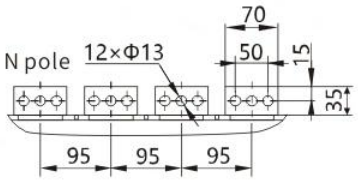
Horizontal Wiring



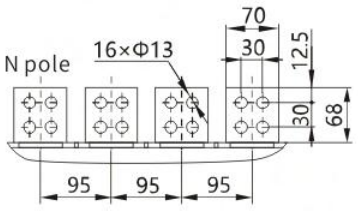




A Direction Installation Dimensions

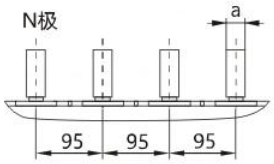


Horizontal Short Busbar (Standard)

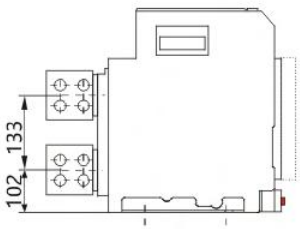


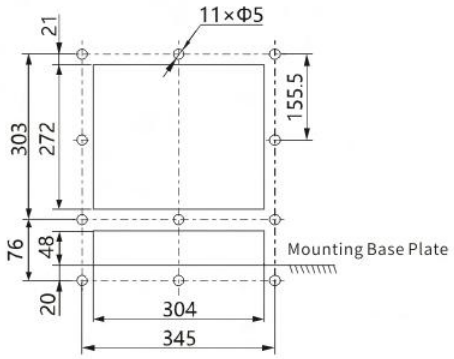
Horizontal Long Busbar (Customized)

Vertical Wiring

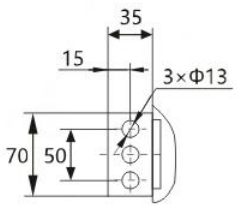


Horizontal Long Busbar (Standard)

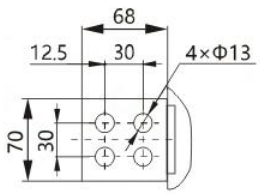




Cabinet Door Opening Center



Vertical Short Busbar (Standard)



Vertical Long Busbar (Customized)

Rated Current (A)	Dimension B (mm)
400~1600A	15
2000~2500A	20

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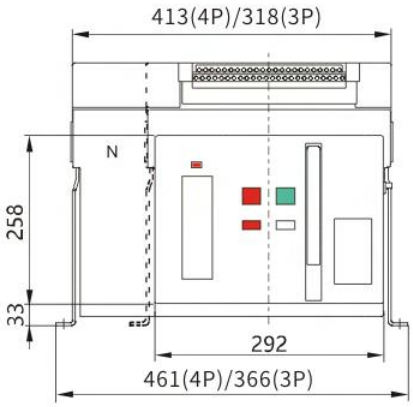
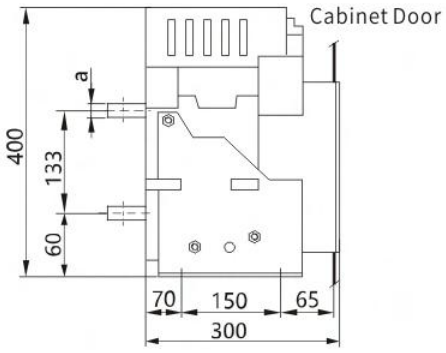
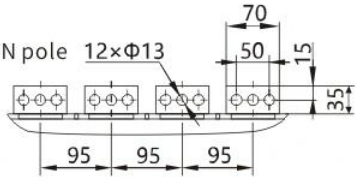
JUW1 -2500 Fixed Circuit Breaker External and Installation Dimensions Drawing

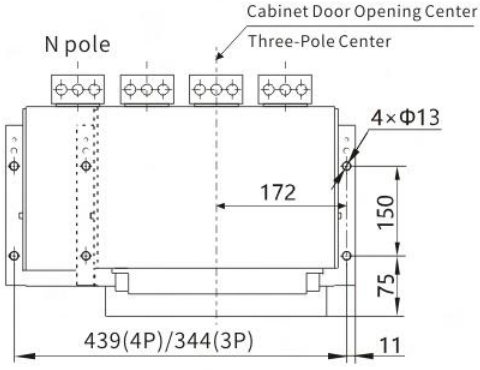
Horizontal Wiring



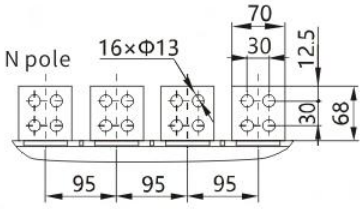




Horizontal Short Busbar (Standard)

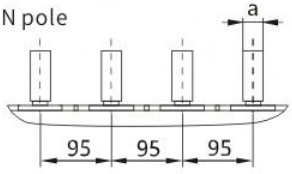


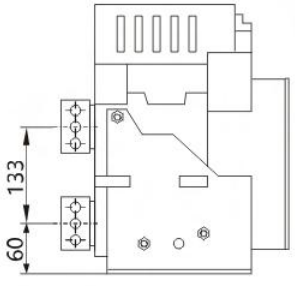
Installation Dimensions

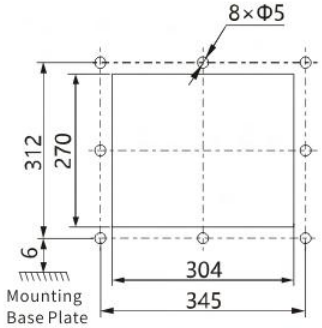


Horizontal Long Busbar (Customized)

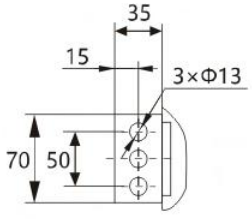
Vertical Wiring



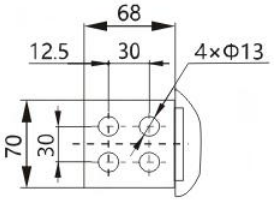




Cabinet Door Opening Center



Vertical Short Busbar
(Standard)



Vertical Long Busbar
(Customized)

Rated Current (A)	Dimension B (mm)
400~1600A	15
2000~2500A	20

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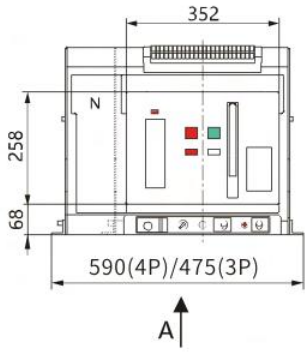
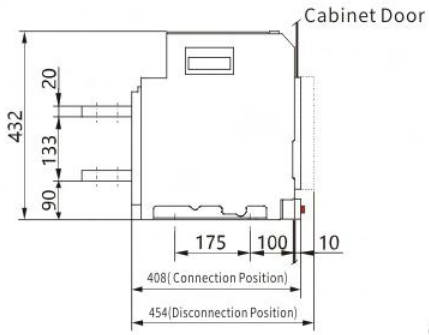
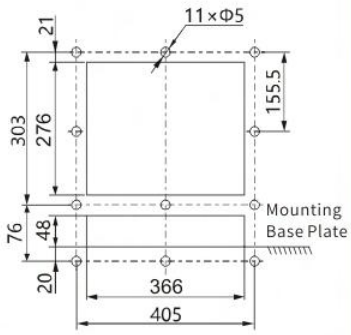
JUW1 -4000 Fixed Type Outline and Installation Dimensions

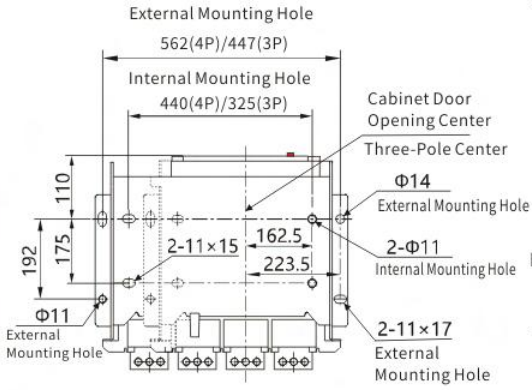
Horizontal Wiring



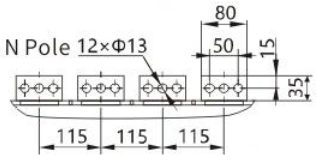




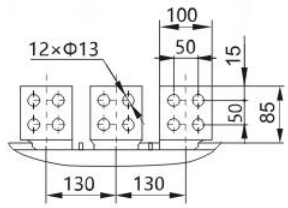
Cabinet Door Opening Center



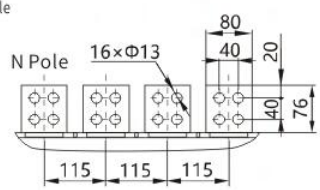
A Direction Installation Dimensions



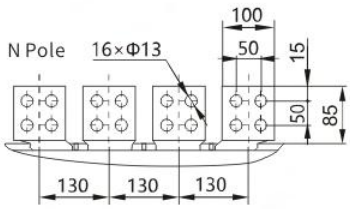
2000A-2900A/ Horizontal Short Busbar (Standard)



3200A-4000A/3P Horizontal Busbar

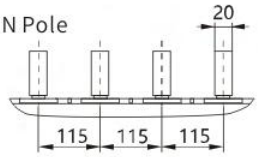


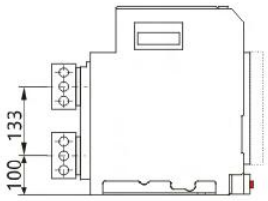
2000A-2900A/Horizontal Long Busbar (Customized)



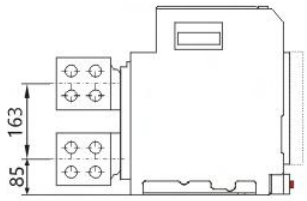
3200A-4000A/4P Horizontal Busbar

Vertical Wiring

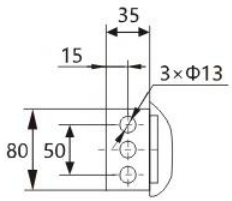




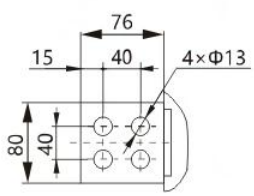
2000A-2900A/Vertical Busbar



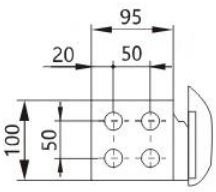
3200A-4000A/Vertical Busbar



2000A-2900A/Vertical Short Busbar (Standard)



2000A-2900A/Vertical Long Busbar (Customized)



3200A-4000A/ Vertical Busbar

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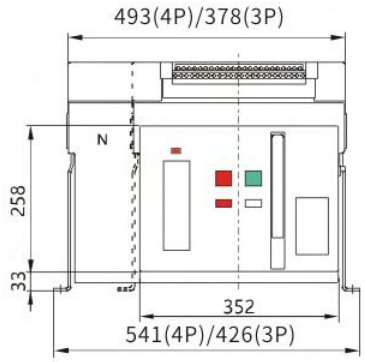
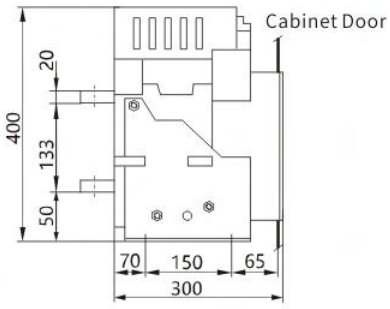
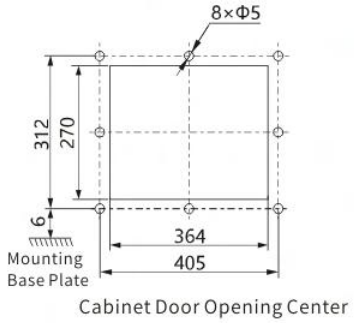
JUW1 -4000 Draw-out Type Outline and Installation Dimensions

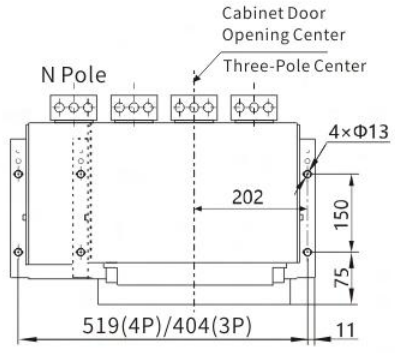
Horizontal Wiring



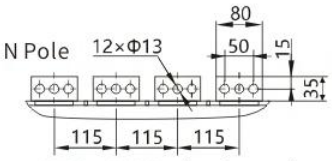




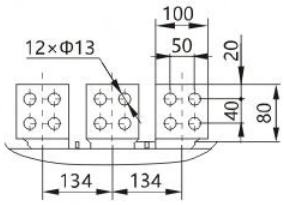
Cabinet Door Opening Center



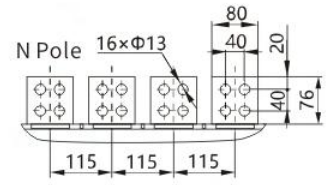
Installation Dimensions



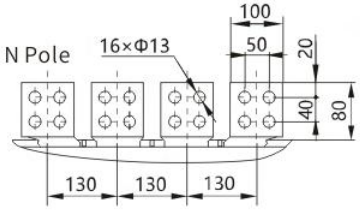
2000A-2900A /Horizontal Short Busbar (Standard)



3200A-4000A/3P Horizontal Busbar

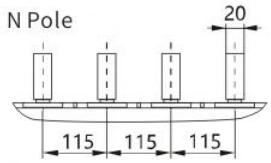


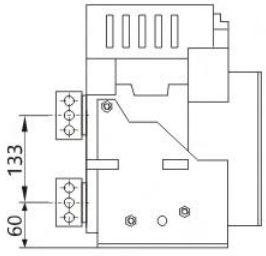
2000A-2900A/Horizontal Long Busbar (Customized)



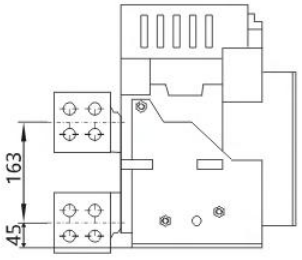
3200A-4000A/4P Horizontal Busbar

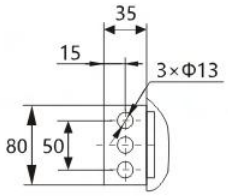
Vertical Wiring



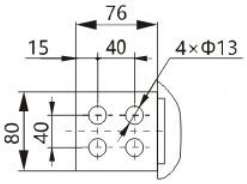


2000A-2900A/Vertical Busbar

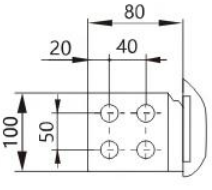




2000A-2900A/Vertical Short Busbar (Standard)



2000A-2900A/Vertical Long Busbar (Customized)



3200A-4000A/ Vertical Busbar

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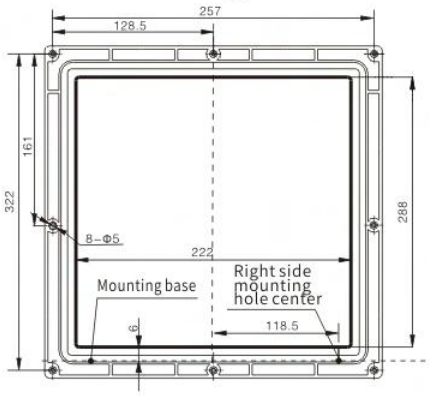
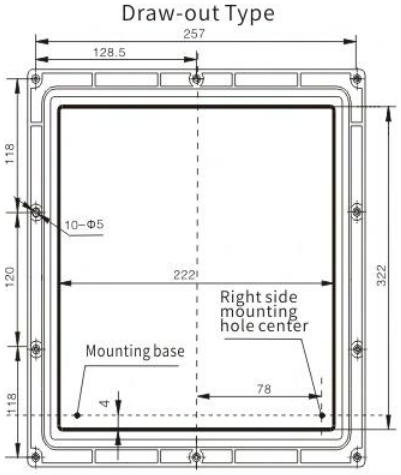
Outer frame dimensions and hole spacing of mounting holes

JUW1 -1600(200A-1600A 3P/4P)

Fixed Type

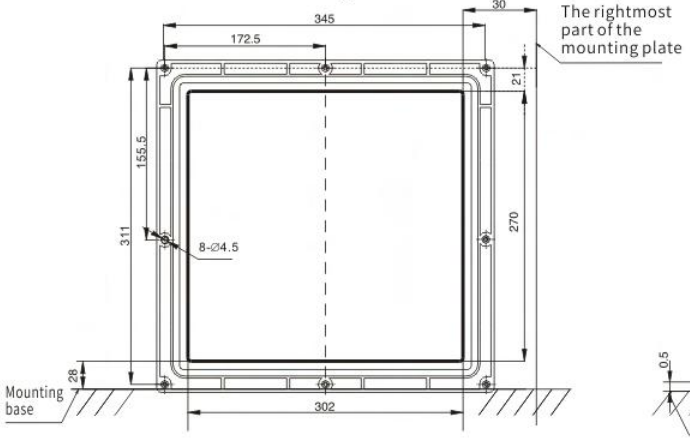


Draw-out Type

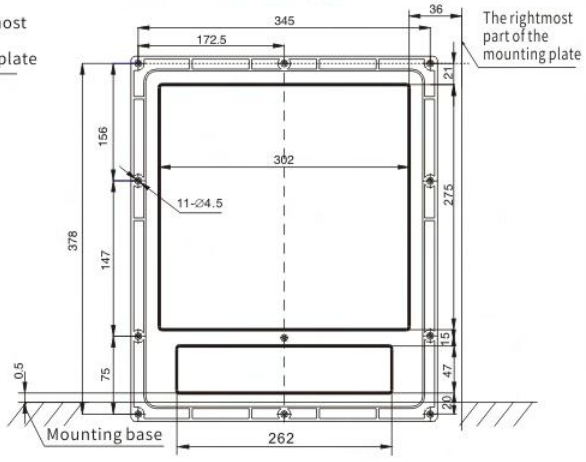


JUW1 -2500(630A-2500A 3P/4P)

Fixed Type

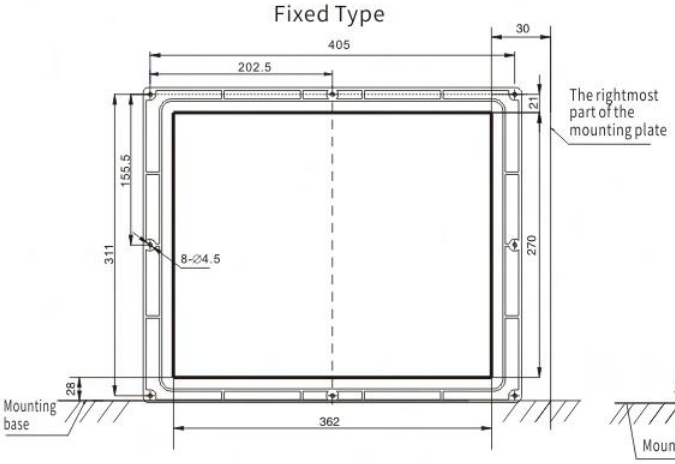


Draw-out Type

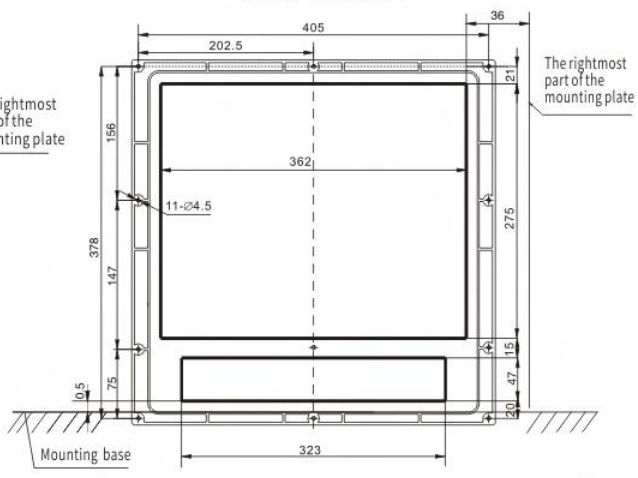


JUW1 -4000(2000A-4000A 3P/4P)

Fixed Type



Draw-out Type



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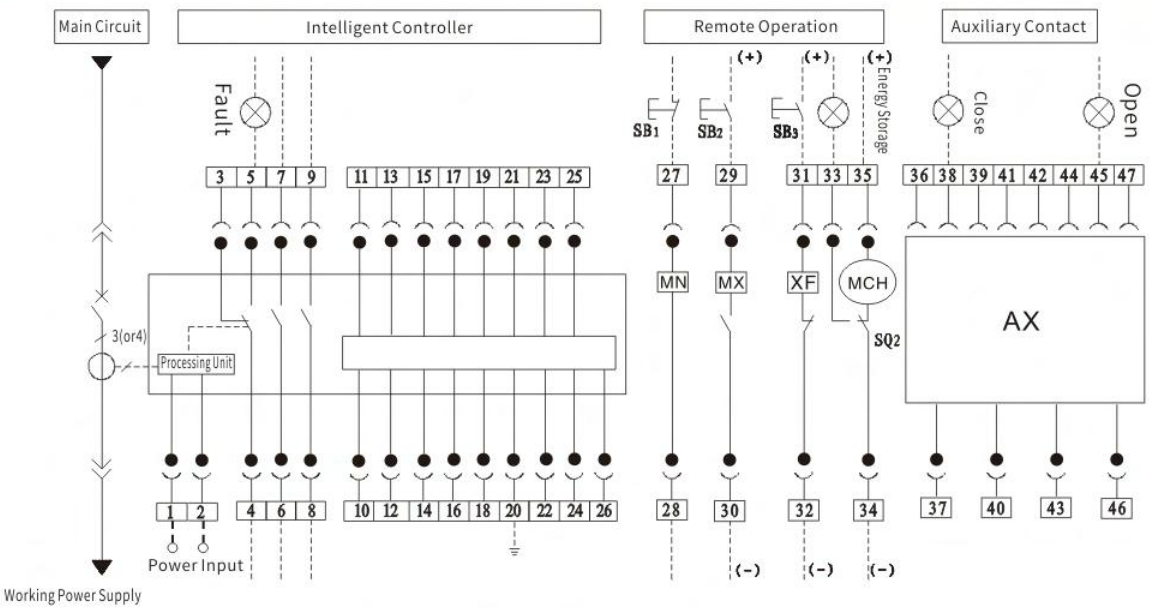
Electrical Accessories

JUW1 Electrical Circuit Diagram (Configured with IC5.0(M)/IC7.0(3M)Intelligent Controller)



SB1 Undervoltage Button
SB2 Shunt Release Button
SB3 Closing Button

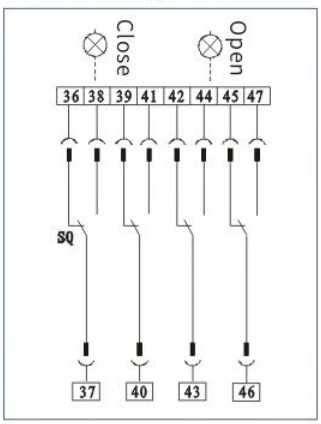
MN Undervoltage/Loss Instantaneous or Delayed Trip Unit
XF Closing Electromagnet
MX Shunt Release Unit

MCH Energy Storage Motor
AX Auxiliary Contact
SQ2 Motor Micro Switch

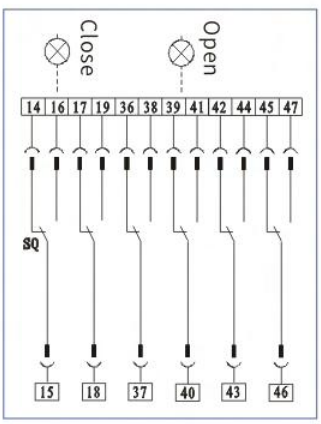
Note:
1、If the control power supply voltages of MX, XF, and MCH are different, they can be connected to different power supplies respectively. XF and MX are short-time operating elements with a power-on time of (50ms ± 10ms).
2、Terminal 35# can be directly connected to the power supply (automatic pre-energy storage), or connected in series with a normally open button before connecting to the power supply (manual pre-energy storage).
3、Buttons and indicator lights are to be provided by the user.
4、When the intelligent controller's operating power supply is AC, a power supply module is not required; terminals 1# and 2# can be directly connected to the power supply.
5、Position indicator contacts are optional for the user.

AX auxiliary contact types for user use:

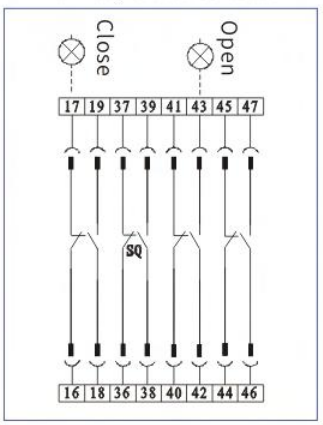
I Four sets of changeover contacts (default configuration)



II Six sets of changeover contacts



III Four normally open and four normally closed contacts



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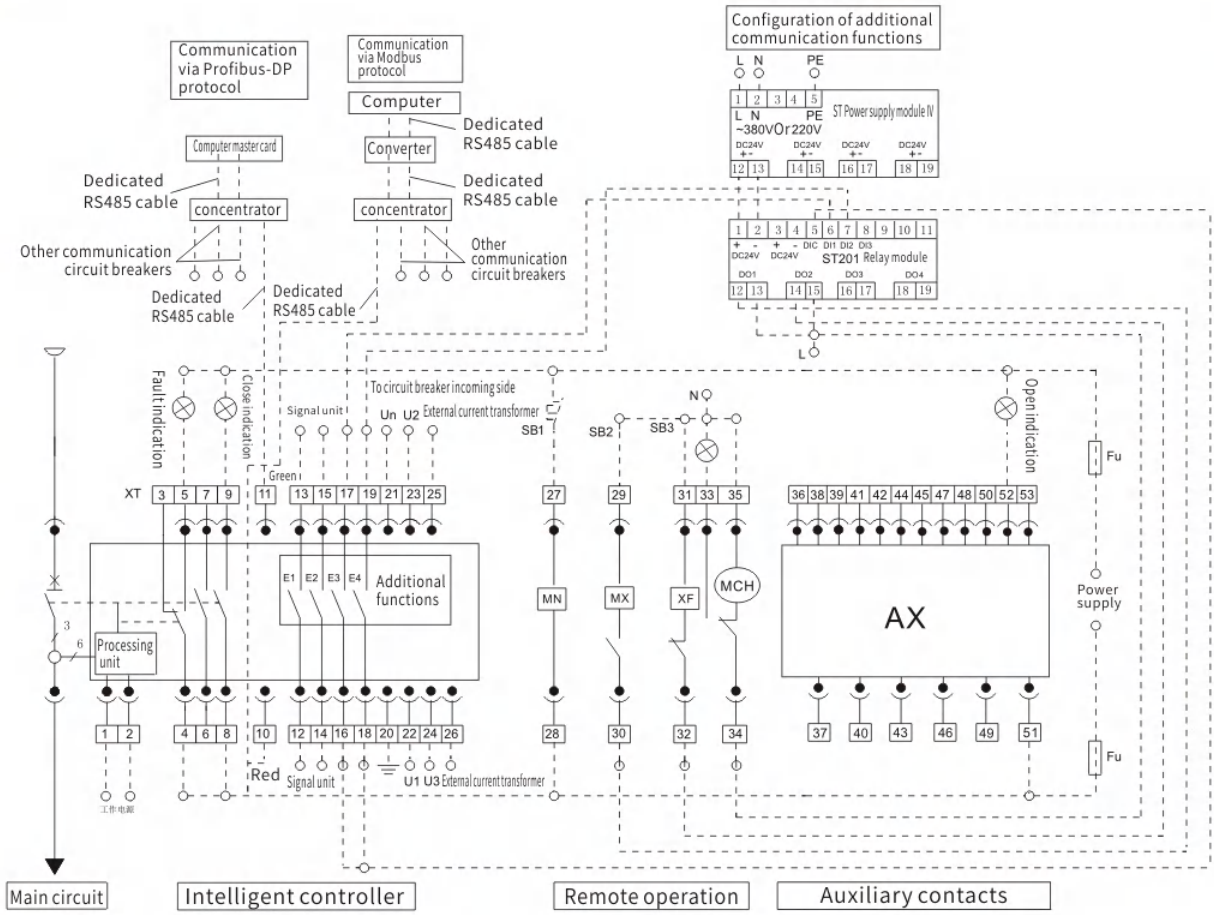
JUW1

Electrical Circuit Diagram (Configured with IC6.0(2H)/IC8.0(3H) Intelligent Controller)



SB1 Undervoltage Button
SB2 Shunt Release Button
SB3 Closing Button

MN Undervoltage/Loss Instantaneous or Delayed Trip Unit
XF Closing Electromagnet
MX Shunt Release Unit

MCH Energy Storage Motor
AX Auxiliary Contact
SQ2 Motor Micro Switch

1 # and 2 #: Pin is the input terminal of the auxiliary power supply, and pin 1 # is the positive terminal during DC
3 #, 4 #, 5 #: Fault tripping contact output (four for common terminal), contact capacity: AC380V, 5A
6 #, 7 #, 8 #, 9 #: Two sets of auxiliary contacts for circuit breaker status, contact capacity: AC380V, 5A
10 # and 11 #: The pins are RS485 A and RS485 B communication leads, respectively
12 #, 13 # (contact 1, load 1 alarm), 14 #, 15 # (contact 2, load 2 alarm), 16 #, 17 # (contact 3, remote control opening), and 18 #, 19 # (contact 4, remote control closing): The controller outputs four sets of signal contacts. Contact capacity: 5A/240V, AC7A/24VDC
20 #: The pins is a protective ground wire.
21 #~24 #: The pins are voltage signal input terminals, with 21 # N-phase voltage input, 22 # A-phase voltage input, 23 # B-phase voltage input, and 24 # C-phase voltage input.
25 # 26 #: The pins are the input terminal of the external transformer

Note:
1、If the control power supply voltages of MX, XF, and MCH are different, they can be connected to different power supplies respectively. XF and MX are short-time operating elements with a power-on time of (50ms ± 10ms).
2、Terminal 35# can be directly connected to the power supply (automatic pre-energy storage), or connected in series with a normally open button and then connected to the power supply (manual pre-energy storage).
3、Buttons and indicator lights are to be provided by the user.
4、The input phase voltages of 21#, 22#, 23#, and 24# should not exceed 690V.
5、When the intelligent controller's operating power supply is AC, a power supply module is not required; terminals 1# and 2# can be directly connected to the power supply.
6、Position indicator contacts are optional for the user.

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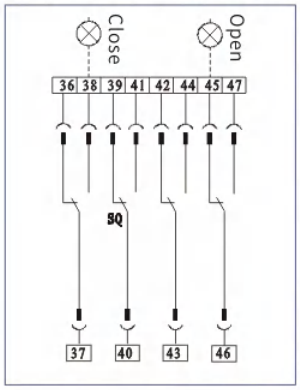
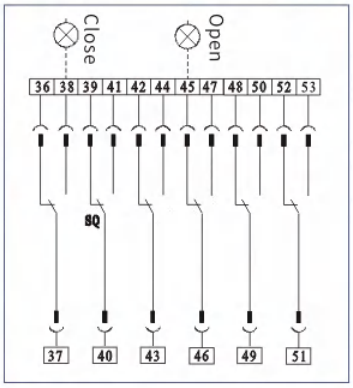
AX auxiliary contact for user use:

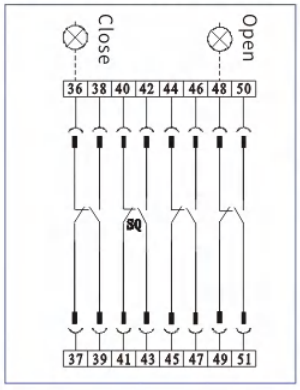
I Four sets of changeover contacts (default configuration)



II Six sets of changeover contacts



III Four normally open and four normally closed contacts



Installation and Usage Warnings

To ensure your personal safety and the safety of your electrical equipment, please ensure the following before putting the circuit breaker into operation:

◆Carefully read the instruction manual before installing and using the circuit breaker.
◆The circuit breaker must be used under normal operating conditions.
◆Before installation, check that the circuit breaker's specifications meet the usage requirements.
◆Before installation, use a 500V megohmmeter to measure the circuit breaker's insulation resistance. At an ambient air temperature of 20°C±5°C and a relative humidity of 50%-70%, it should not be less than 500MΩ. Otherwise, it should be dried until the insulation resistance meets the requirements before use.
◆When installing the circuit breaker, its mounting surface should be horizontal and secured with M10 bolts.
◆During installation, please check for any conductive foreign objects falling into the circuit breaker.
◆During installation, the conductive busbar connected to the circuit breaker should be flat and free of additional mechanical stress.
◆During installation, the circuit breaker must be reliably grounded, and the grounding point should be clearly marked with a grounding symbol.
◆After the circuit breaker is installed, the following operational tests must be performed before energizing the main circuit to ensure everything is normal before officially energizing.
◆Carefully check for any foreign objects inside the circuit breaker. If any are found, they must be thoroughly removed. The circuit breaker must be thoroughly cleaned.
◆Connect the secondary circuit according to the relevant wiring diagram, and check that the operating voltages of the shunt trip unit, closing electromagnet, electric operating mechanism, and intelligent controller match the actual power supply voltage. Then energize the secondary circuit.
◆After the electric operating mechanism has stored energy, press the closing button (electric or manual), and the circuit breaker will close.
◆Press the opening button (electric or manual), and the circuit breaker should open.
◆Use the intelligent controller's test function to reliably open the circuit breaker. After the test is complete, press the RESET button.
◆When manually storing energy, move the handle on the front panel up and down seven times. The panel will then display "Storing Energy" and you will hear a "click" sound, indicating the energy storage is complete. The circuit breaker can only be put into operation after the above-mentioned tests have proven its normal operation!

Maintenance

◆During use, all rotating parts should be regularly lubricated.
◆Dust should be cleaned regularly to maintain good insulation of the circuit breaker.
◆The contact system should be inspected regularly, especially after each short-circuit current interruption.
◆Inspection items:
◆Whether the arc-extinguishing chamber is intact
◆Whether the contact is in good contact
◆Whether the fasteners of all connections are loose

Ordering Guidelines

(please tick √ or fill the number in☐)

Client		Order quantity		Order date	
JUW1-					
Installation structure	☐ Fixed type ☐ Draw-out type				
Poles	☐ 3P ☐ 4P ☐ 3P+N (With external N current transformer)				
Rated current	In= A				
Product type	☐ None - Standard (Regular) ☐ GD - Plateau, Low temperature ☐ TH - Humid and hot				
Intelligent controller	Controller voltage	☐ AC230V ☐ AC400V ☐ DC110V ☐ DC220V			
	Controller type	☐ IC5.0 (M Digital Standard) ☐ IC6.0 (3M LCD) ☐ IC8.0 (3H LCD + Communication)			
Factory parameter setting	Overload long delay current Ir=___A Time tr=___s; Short-circuit instantaneous current Ii=____A Short-circuit short-delay current I_{sd}=___A Time t_{sd}=___s; Ground fault current Ig=___A Time t_g=___s Note: Unless otherwise specified, the controller's current and time settings are set according to the factory default values.				
Wiring method	Frame size 2500	☐ Horizontal wiring (standard) ☐ Vertical wiring			
		☐ Mixed wiring (horizontal top, vertical bottom) ☐ Mixed wiring (vertical top, horizontal bottom)			
	Frame size 4000	☐ Horizontal wiring (standard) ☐ Vertical wiring			
		☐ Mixed wiring (horizontal top, vertical bottom) ☐ Mixed wiring (vertical top, horizontal bottom)			
Auxiliary contact	Frame size above 2500	☐ 4 sets of auxiliary changeover contacts (standard) ☐ 6 sets of auxiliary changeover contacts (with common point) ☐ 4 normally open and 4 normally closed (no common point)			
		☐ 6 normally open, 6 normally closed (no common point) ☐--☐ normally open ☐ normally closed			
Shunt release	☐ AC230V ☐ AC400V ☐ DC110V ☐ DC220V				
Closing electromagnet	☐ AC230V ☐ AC400V ☐ DC110V ☐ DC220V				
Energy storage motor	☐ AC230V ☐ AC400V ☐ DC110V ☐ DC220V				
☐Undervoltage release	☐ AC230V ☐ AC400V ☐ Instantaneous type ☐ Delay type--☐S				
☐No-voltage release	☐ AC230V ☐ AC400V ☐ Delay type--☐S				
Mechanical interlock	Two circuit breakers ☐ Steel cable interlocking ☐ Linkage Interlocking				
Open position lock	☐ One lock-One key ☐ Two locks-Two keys ☐ Three locks-Two keys ☐ Five locks-Three keys ☐ ABC lock				
Other optional components	☐ Phase barrier ☐ Connection test and disconnection position indication contact signal outputs (one normally open and one normally closed).				
	☐ Push-button lock ☐ Counter (Frame size above 2500) ☐ Temperature alarm protection device (3M or 3H controller must be selected)				
	☐ -ST-201 Relay module ☐ -Power module (default to be consistent with the working power supply of the controller)				
Dual power automatic switching device	☐ ATS Controller Notes: 1. Equipped with mechanical interlock, please select the type 2. The undervoltage protector is already included, there is no need to select another undervoltage protector 3. Electrical contacts must be selected for AC230V operating voltage.				

Note: ■ Basic configuration, ☐ Optional configuration (mark √ in ☐ if selected)

1. The regular ordering of the product is for distribution protection type
2. If the user chooses the controller, additional functions can be added, but additional fees will be charged

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