

Our goal is the sea of stars!

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Giantele®

GTW1

Air circuit breaker



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ZHEJIANG ZHEGUI ELECTRIC CO., LTD.

1. purpose and scope

GTW1 Series intelligent universal circuit breakers (hereinafter referred to as the breaker), suitable for AC 50Hz, rated current rated voltage of 400V, 690, 630A~6300A distribution network, mainly used to distribute power and protection circuit and power supply equipment from overload, undervoltage, short circuit, single-phase grounding fault of hazards. The circuit breaker has a variety of intelligent protection function, can be selective protection and precise to avoid unnecessary power, improving reliability of power supply. Simultaneously with the open communication interface, remote, control and automation system to meet the requirements. Impulse withstand voltage circuit breakers at an altitude of 2000 metres 8000V (different altitude correction according to the standard, up to 12000V). The intelligent controller for circuit breaker without and sensors for use in isolation, labeled —/|— .

Breaker IEC60947-2 low-voltage switchgear and controlgear Part II: low-voltage circuit breakers and GB14048.2-2001 the low-voltage switchgear and control equipment such as low-voltage circuit breaker standard.

2. types and what they mean

GT W1- □ / □

- Number of Poles (3: three pole, 4: four pole)
- Shell grade rated current
- Design number
- Intelligent air circuit breaker

2.2 classification
2.2.1 installation
A.-fixed
B.-drawer
2.2.2 number of poles: three-pole and four-pole
2.2.3-by mode of operation
A. Electrical operated
B. manual operation (repair and maintenance)
2.3 tripping device type
Intelligent controller, under the instantaneous voltage (or delayed) release, and shunt release.
2.4 performance intelligent controller
A. intelligent controller are: h-type (communications), m (General Intelligence), l-(budget);
B. overload for long-time inverse-time overcurrent, short delay inverse time, definite and instantaneous functions. Composition can be set by users themselves need protection;
C. single phase grounding fault protection features;
D. display: the display, operation current display setting current, line voltage display (voltage display should be made at time of order);
E. alarm: overload alarm.
F. self-inspection function: hot post, computer diagnosis;
G. test function: test controller operation characteristics.

3. normal working conditions and installation parts

3.1 ambient air temperature
Upper limit value of not more than + 40 ℃, the lower limit is not lower than-5 c, 24h average no more than + 35 c;
Note: the minimum value is-10 ℃-25 ℃, working conditions, user factory should be affirmed;
Top value exceeding + 40 ℃ or lower limit below-10 ℃-25 ℃ work conditions, the user shall consult with the factory.
3.2 installation site altitude does not exceed 2000m.
3.3 atmospheric conditions
Relative temperature differences in the atmosphere when the ambient air temperature + 40 ℃does not exceed 50%, can have higher relative temperatures at lower temperatures, most wet month of average monthly maximum relative humidity of 90%, and the monthly mean minimum temperature of + 25 ° c and for taking into account the temperature changes that occur on the surface of gel. Set, the user shall consult with the factory.
3.4 pollution level 3
3.5 protection degree: IP30, circuit breaker installed in the Cabinet Chamber and installed sealing frame protection class IP54.
3.6 use category: class b or class a
3.7 install class
Rated voltage of 660V (690V) and below undervoltage tripping of circuit breaker, power transformer primary coil used for installation category IV secondary circuit and control circuit installation category III.
3.8 installation conditions
Fault should be installed according to the requirements of this specification, circuit breaker the vertical inclination does not exceed 5 degrees (mine breaker inclination does not exceed 15 degrees).

4. technical data and performance.

4.1 rated circuit breaker ampere meter, see table 1.

Table 1

Shell grade rated current InmA	Rated current InA
2000	630、800、1000、1250、1600、2000
3200	2000、2500、2900、3200
4000	3200、3600、4000
6300	4000、5000、6300

4.2 breakers of rated short circuit breaking capacity and short-time withstand current see table 2, circuit breakers arcing distance as "zero" (that is, outside the circuit breaker no flying no ARC), as shown in table 2.

Table 2

Shell grade rated current Inm A		2000	3200	4000	6300
Rated limited short-circuit breaking capacity Icu O-CO (KA)	400V	80	100	100	120
	690V	50	65	65	85
Rated short-circuit making capacity (KA) NX Icu/cosO	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 short circuit breaking capacity Ics O-CO-CO (KA)	400V	50	65	65	100
	690V	40	65	65	75
Rated short-time withstand current lewv 1S delay 0.4s,O-CO (KA)	400V	50	65	65/80(MCR)	85/100(MCR)
	690V	40	50	50/65(MCR)	65/75(MCR)
Note: the line breaking capacity in the same.					

4.3 circuit breaker the maximum dissipation power is 360W. Circuit breaker rated continuous current in different ambient temperatures, as shown in table 3.

Table 3

Ambient temperature GTW1	630A	800A	1000A	1250A	1600A	2000A
40	630A	800A	1000A	1250A	1600A	2000A
50	630A	800A	1000A	1250A	1550A	1900A
60	630A	800A	1000A	1250A	1550A	1800A
Note: 2500A and above capacity-reducing factor of 0.9, 6300A 4000A did not fall in.						

4.4 had intelligent current controller and protective function of overcurrent protection characteristics
4.4.1.1 Ir setting of controllers (I/In) and the error, as shown in table 4.

Table 4

Long time delay	Short delay		Instantaneous		Ground fault		
Ir1	Ir2	Errors	Ir3	Errors	Ir4		Errors
(0.4-1)In	(0.4-15)In	±10%	In−50KA(Inm=2000A) In−75K(Inm=3200~4000A) In−100KA(Inm=6300A)	± 150%	Inm=2000~4000A (0.2~0.8)In max 1200A	Inm=6300 (0.2~1.0)In	± 10%
Note: when both (required) three protection, the setting value cannot be crossed.							

4.4.1.2 delay inverse-time overcurrent protection characteristics I2TI= (1.5IRl "u (1.05~0.2) Ir 1 time is shown in table 5, a time error of ± 15%

Note: tL-long time 1.5Irl the whole time, TL long delay time, as shown in table 5.

Table 5

1．05 I r I	1.3Irl	Setting time of 1.5Irl s	15	30	60	120	240	480
>2H doesn't work	<1H doesn't work	2.0Irl time s	84	16.9	33.7	67.5	135	270

4.4.1.3 short delay time overcurrent protection characteristics

Short-delay over-current protection for setting time limits, if low expansion for inverse time-time, its characteristic: I2Ts = (8Ir) 2ts,TS, designed for general delay time when VHF >8Irl, automatically convert time characteristic, time characteristic, as shown in table 6.

Time error is ± 15%

Table 6

Delay time s				Returns the time s			
0.1	0.2	0.3	0.4	0.06	0.14	0.23	0.35

4.4.1.1 over-current tripping characteristic as shown in Figure 1, ground-fault protection features as shown in Figure 2.

M-mode intelligent controller functions.

A. ammeter function.

Displays the current of each phase and the earth leakage current, display the maximum phase current, can also display tuning, testing and fault current value or values.

B. voltmeter function displays the line voltage, normal maximum.

C. remote monitoring and diagnostic capabilities.

① controller with native self diagnosis function.

Issues an error when the computer fails the "e" display or alarm, and restart the computer, user needs, circuit breaker can also be broken.

② authorities when the ambient temperature reaches 80 degrees centigrade, alarm, and in smaller current (when a user needs to) breaking the breaker.

③ intelligent controller with overload protection, grounding, short circuit, load monitoring, alarm, trip directions (OCR) signals through electric shock or optocoupler outputs

An external remote control user, contact capacity DC28V, 3 a; AC125V、3A。

D. setting capabilities

Use Set + - Storage Four button the controller parameters are set。 Press Set To the whole set. State（Status indicator）, Then press + or - Key adjust the parameters to the desired value, And then press Storage, Stored light setting is locked。Controller parameters must not cross set。Controllers after power loss reduction, And then press the key, Recycled checks set various parameters。

E. Test function

Use Set + - Release Do not release Reset Key mapping, Check on the controller characteristics of protection。 Use Set + - key adjust the test of an analog fault current（Note: do not stored lock）, Then press Release or Do not release key test, Controller troubleshooting。press Release key, Shear line equipment Division, press Do not release key, Circuit breaker does not break, While the controller indicates normal state。Tests need to be Reset or Clear lamps key, can other tests。

Note: to test, setting of earth leakage trip or alarm location, test release, with a priority less than overload protection. Test procedure in the event of failure, the controller automatically stops all tests failed to address.

F. load monitor

Set two a whole set value, ILC1 whole set range (0.2~1) In,Ilc2 whole set value range (0.2~1) In,ILC1 delay characteristics for anti-time characteristics, its time whole set, and value for extended Shi whole set worth 1/2;ILc2 characteristics has two species, first species for anti-time characteristics, its time whole set value for extended Shi whole set value of 1/4, second species for set time, its extended time for 60s. This II species delay function, former for current close overload whole set value time broken subordinate not important load, which is for Dang current over ILc1 whole set value, makes delay points broken subordinate not heavy load Hou, current declined, makes main circuit and important load circuit and keep power, dang current Xia down to Ilc2 Shi, by must delay Hou issued instruction again connected subordinate has resection had of circuit, recovery whole system of power. The two types of monitoring and protection, choose one user, monitor properties as shown in Figure 1, Figure 2, a.

G.MCR release and simulated trip protection, according to user requirements can be turned off, breaking tests generally require short delay shutoff.

① MCR through broken clasp protection is mainly used in fault status close (Controller powered on moments), the controller has a low short circuit currents

Circuit-breaker function. Factory setting 10KA, error ± 20%, set current can be set according to user requirements.

② When the controller has a large short-circuit current, the signal without chip to handle, tripping signal functions directly.

H. thermal memory function

Controller overload or short-circuit delay after release, until the controller is not powered down, with simulation of bimetallic characteristics of memory overload energy 30min release ends, short delay end of 15min release of energy during overload, short delay faults, tripping time is shorter, the controller off, automatic zero energy.

Monitoring features

Figure 1

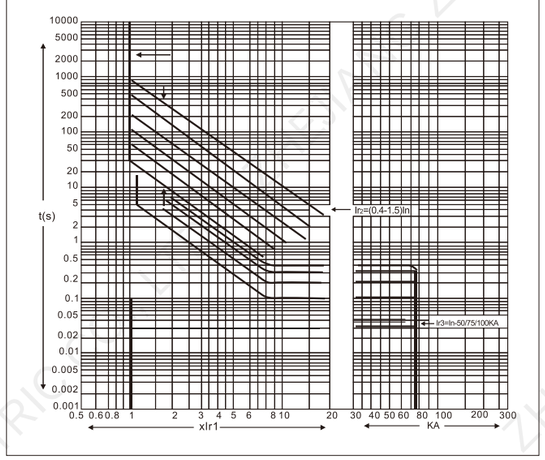


Figure 2

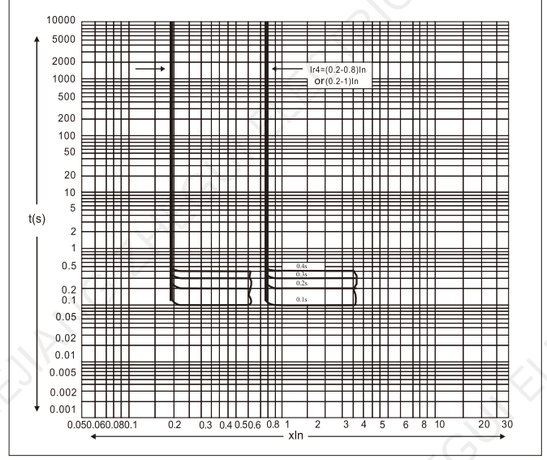


Figure 3

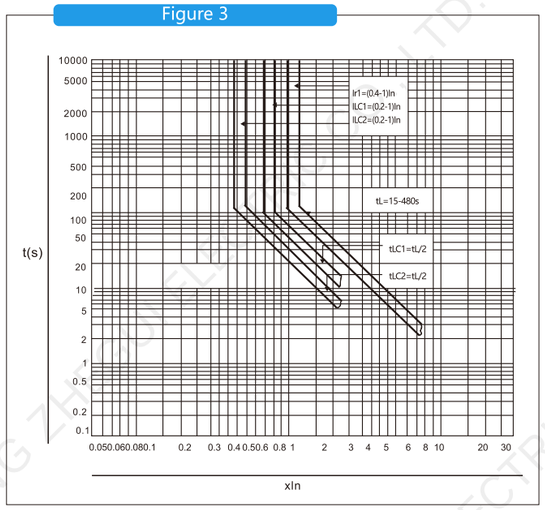
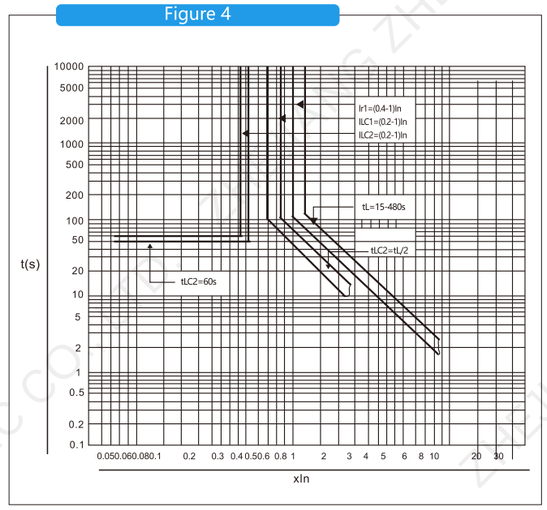


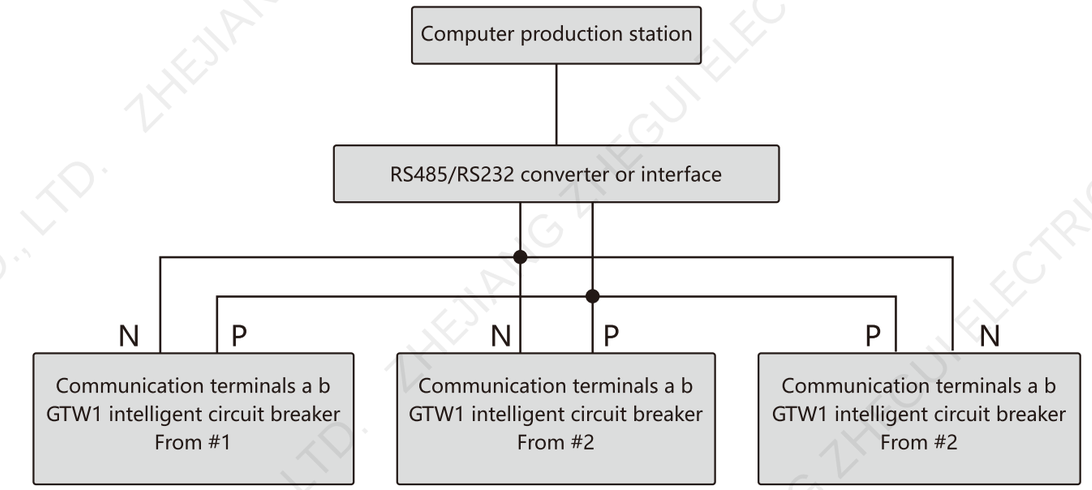
Figure 4



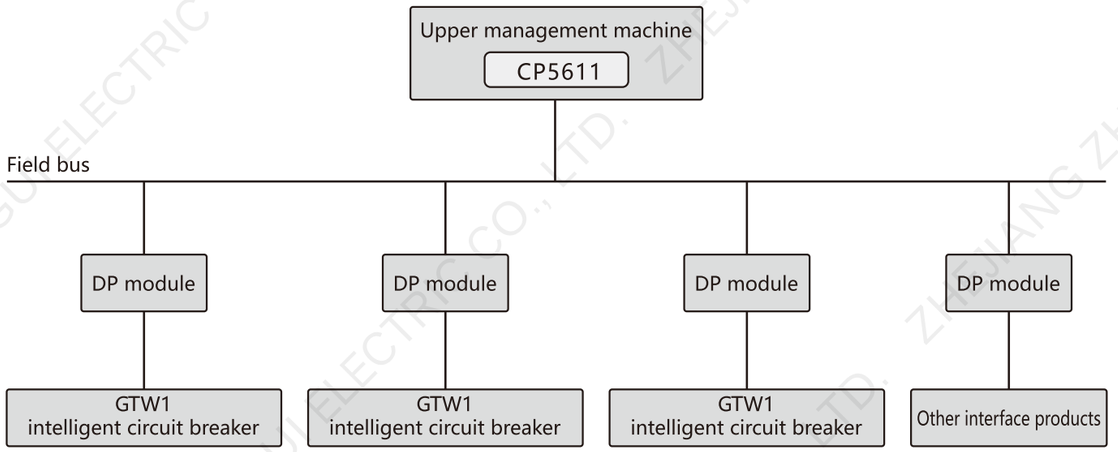
4.4.3H-intelligent controller

In addition to the functions of m-all, with serial communication interface, through the communication interface can be a slave of the giant network systems (hereinafter referred to as system), 1-2 computers as the main station, a number of intelligent circuit breaker or other communication elements as a slave, systems network architecture shown in the following figure. Circuit breaker unit, the system can achieve a distance of "four remote" feature, a variety of parameters and parameters of power system monitoring, intelligent circuit breaker current running status monitoring, protection, limited adjustment of parameters and download, intelligent circuit breaker points, operations control. System is suitable for a variety of power plants, electric power plants, and small substations, industrial and mining enterprises, such as digital distribution monitoring system construction and renovation.

Dedicated communication protocol interface of the connection diagram is as follows:



Circuit breaker products based on common DP protocol connection diagram is as follows:



4.4.3.1 system structure

A. hardware structure of data communication network system

Intelligent circuit breaker provides standard RS485 communication interface, from the circuit breaker terminals 10 and 11th, leads;

System of communication media: category a shielded twisted-pair cable. B. the main characteristic of the network

Bi-directional serial data transmission, products provide a variety of communications protocols: the low voltage electrical data communication protocol V1.0 PROFIBUS-DP MODEBUS and so on.

Strict master-slave mode, the primary station is the initiator of communication and control, communications from the station can only be used with the main station, rather than communicating directly with other stations.

Communication baud rate to 9600bit/s, communication 1.2km, typical for PROFIBUS-DP communication baud rate up to 187.7kbit/s.

C. monitoring software
Software according to different requirement, the desired configuration monitoring and management software applications. Intelligent circuit breaker, running monitoring operation and a variety of daily management functions can be realized.
4.3.2 system functions
A. remote control
Remote control by means of master in the computer system of each slave breaker store, closed and disconnected operation control. Operator interface select the appropriate object from the system, using the mouse to click the remote control button system that provides the current operating state of the object. Operator after you enter the user ID password, issue a remote "" or "" directive. System passes the instructions from the station to the appropriate circuit breaker, from the stand after receiving the instruction, that is, according to the established time off, closing and storage operations, and report to the master remote control results.
B. remote adjustment
Remote adjustment is through the main station from the station computers to the protection setting value to set. On the master computer have all the setting from the table setting of protection of station, the operator interface, select the object from the system, use the mouse to click the remote control button. System that provides the current settings for all protection setting value of the corresponding object, and the object's protection setting value, the operator after you input your password, you can select the parameter in the parameters table, and then click the appropriate button, master will download to the appropriate parameters of the slave, and reports the results of remote control. From the stand after receiving the instruction, to revise their protection setting value.
C. telemetry
Remote sensing refers to the computer through the main station on the run from the station's power grid parameter real-time monitor. Communication up to submit work parameters are as follows: the real time a, b, c, and n current value, UAB, UBCA, UCA voltage values, and so on.
Fault logging records the following parameters when a, b, c, and n current value, UAB, UBC, UCA voltage value, faults, fault time, and the failure is logged in the failed database.
Computers in a bar chart, table displays the current absolute value current and voltage in real time, real time curve displays the health of each node.
D. far away
Remote refers to models of the master computer to view the slave; closed and disconnected state. The protection setting value, and run from the station and fault conditions and other information.
Submission to PC from circuit breaker parameters are: switch model, switch (/min), fault information, alarm set integer-valued information, protection and so on.
E. other functions of the system
Apart from four remote control functions, the system can also be used for a variety of management functions: alarm (information screen, image promotion, events, print, voice dialing, alarm), recording, repair tone, shift management, load analysis, multiple report printing.
L-type intelligent controller
L-pull switch and controller using dip switches tuning mode, overload of long delays, short delay time, instantaneous and ground fault four protection features, as well as a failed State, load current lamp indicates the functions, but no digital display functions, functions less than m and h-complete. Selects for the users in the General case.
4.5 the performance of circuit breakers
Circuit breakers operation operation cycles, as shown in table 7.

Table 7

Shell grade rated current (a)	Total number of operating cycles
2000	10000
3200、4000	5000
6300	2000

4.6 the circuit breaker shunt release, under-voltage release, motor-operated institutions, energy release (close) electromagnets, intelligent controller operating voltage and power requirements, see table 8.

Table 8

Project required power			AC(50Hz)		DC	
			220V	380V	110V	220V
Shunt release			24VA	36VA	24W	24W
Undervoltage release			24VA	36VA	–	–
Closing electromagnet			24VA	36VA	24W	24W
Electric operation mechanism	Rated current of breaker housing	2000A	85VA	85VA	85W	85W
		3200、4000A	110VA	110VA	110W	110W
		6300A	150VA	150VA	150W	150W
Intelligent controller power supply voltage						
Note: reliable operation voltage range shunt tripping device for 70%~110%, closing electromagnet and operator for 85%~110%						

The performance of voltage release under 4.7 circuit breakers, see table 9.

Table 9

Category		Undervoltage delay tripping device	Under voltage instantaneous trip
Release action time		Delay 1.3.5s	Instantaneous
Breaker tripping voltage value	35%~70%Ue	Reliable circuit breaker disconnect	
	≤35%Ue	Circuit-breaker cannot be closed	
	(85~110%)Ue	Circuit breaker is reliably closed	
½ delay time if the power when the voltage is restored to 85%Uc		Circuit breaker disconnect	
Note: the delay time accuracy is ± 10%			

4.8 the performance of auxiliary contact
4.8.1 of conventional thermal current of auxiliary contact for 6 a.
4.8.2 auxiliary contact form: four normally open normally closed four.
4.8.3 auxiliary contact of abnormal making and breaking capacity

As determined by the use of auxiliary contact switch breaking capacity under normal use conditions, as shown in table 10.

Table 10

Using categories	Connect			Division			Switching operation cycles and operating frequency		
	I/Ie	U/Ue	COS0 or TO.95	I/Ie	U/Ue	COS0 or TO.95	Number of operation cycles	Frequency of operating cycles per minute	Power up Time (s)
AC-15	10	1.1	0.3	10	1.1	0.3	10	6 (or frequency with the main loop operation)	0.05
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe			
Note: when Pe -6Pe ≥ 50W.To.95 ceiling less than 300ms									

4.8.4 auxiliary contacts making and breaking capacity under normal conditions, as shown in table 11.

Table 11

Using categories	Connect			Division		
	I/Ie	U/Ue	COS0 or T0.95	I/Ie	U/Ue	COS0 or T0.95
AC-15	10	1	0.3	1	1	0.3
DC-13	1	1	6Pe	1	1	6Pe

4.9 disconnected position keys

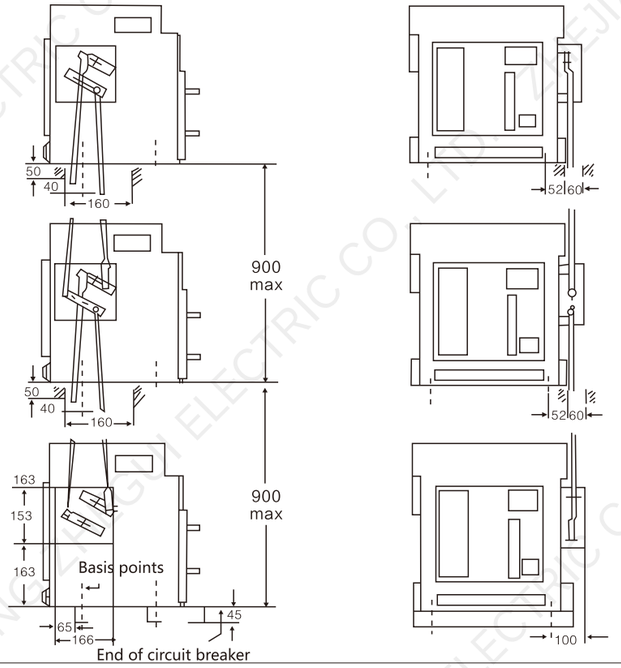
Circuit breakers with "disconnected position key lock" attachment (order). Disconnect circuit breaker can be locked in position, whatever the closing button or release (close) electromagnet cannot make the circuit breaker closed.

5. architecture overview

Fixed circuit breaker main contacts system, intelligent controller, manual, and electric operation, install Board;
Drawer type circuit breaker main contacts system, intelligent controller, manual operating mechanisms, electric operating mechanisms, seat the drawer;
Circuit breaker for the stereoscopic arrangement, has the characteristic of compact structure, small size. Closed contact system within the insulated floor, the contacts are separated by insulation boards for each phase, to form a small, intelligent controller, manual operating mechanism, electric operator formed in front of its separate units in the order, such as one unit is broken and can be removed as a whole put on new one.
Circuit breaker by insert breaker with drawers and drawer seat. Pull the seat rails into the drawer, insert the circuit breaker is located on the guide rail in and out of drawers, by inserting a circuit breaker on the bus and drawers on the bridge contact insert the coupling connected to the primary circuit.
Drawer type circuit breaker has three working positions: the "connected" position, the "test" position, "" separation of location, location transformation achieved through precession of the handle or spin out. Three indicators for the location of drawer low beam by instructions on the display.
When in the "connected" position, and secondary circuits are connected to the primary loop; when in the "test" position, the main circuits disconnected and insulated partitions, only the secondary circuit connecting, make any necessary action tests; when in "isolated" position, main circuit and all secondary circuits disconnected.
And drawer type circuit breakers with mechanical interlock device, circuit breaker only to connect or experimental locations to make the circuit-breaker closed, and in connection with the middle of the test circuit breaker cannot be closed.

5.1 circuit breakers interlocking mechanism (for drawer type, fixed), users can separate interlocking mechanism for two or three conversions, see Figure 5 a, B5.1.1 lever interlock

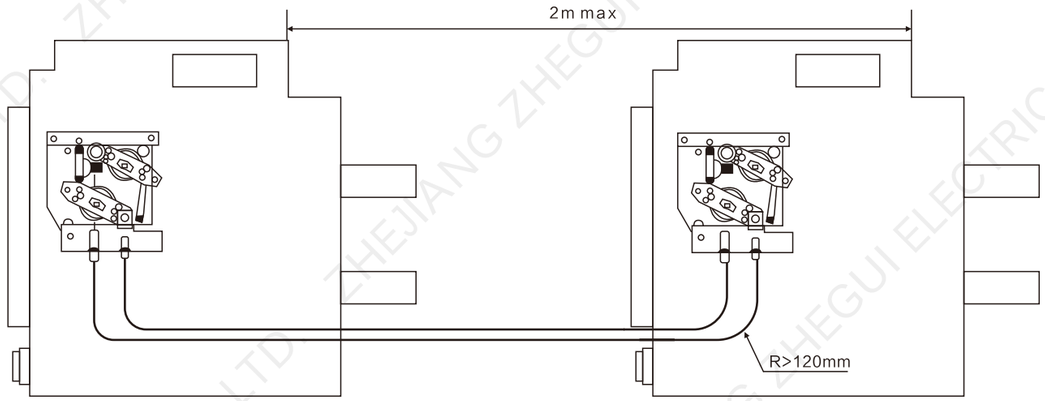
Figure 5A



3 vertical lever interlock installed circuit breaker. 2 circuit breakers interlocking just removed the top of the device.

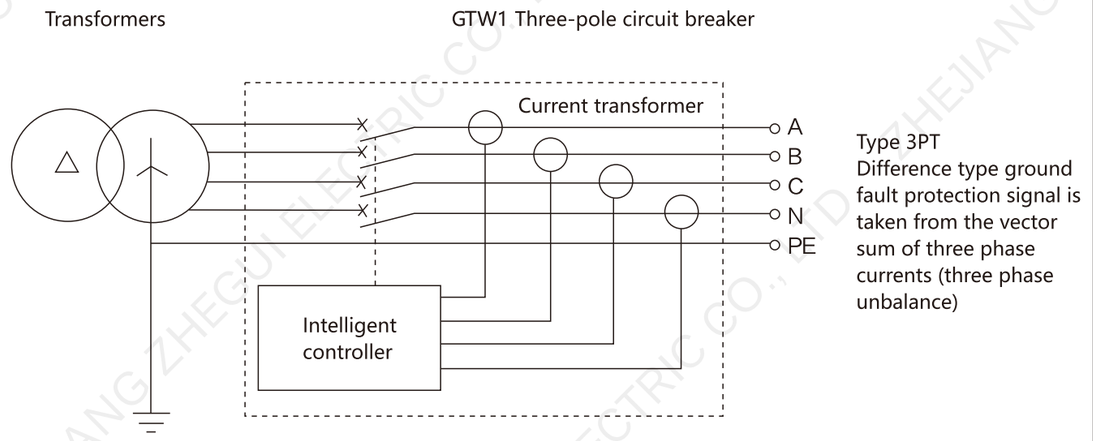
5.1.2 soft interlock (horizontal, vertical)

Figure 5B

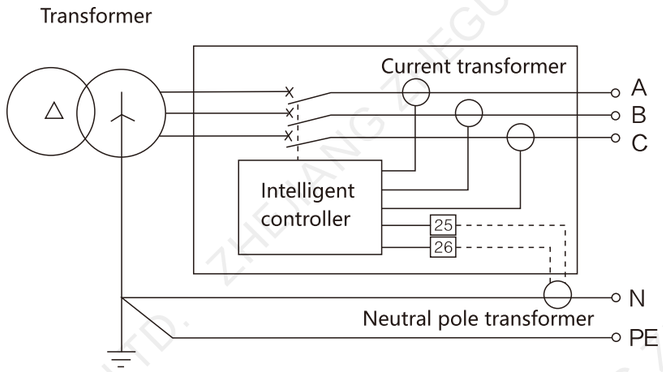


5.2 ground fault protection circuit is shown in Figure 6 a, b, c, DC.

GTW1 three-pole circuit breaker figure 6A

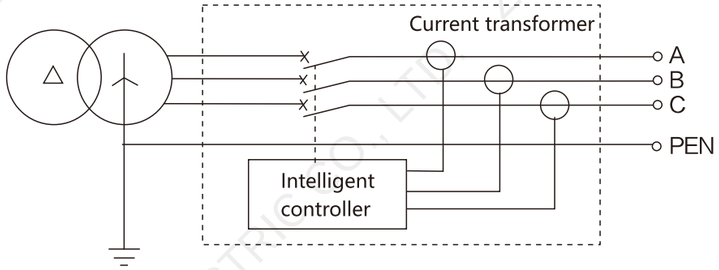


GTW1 pole circuit breaker 6B



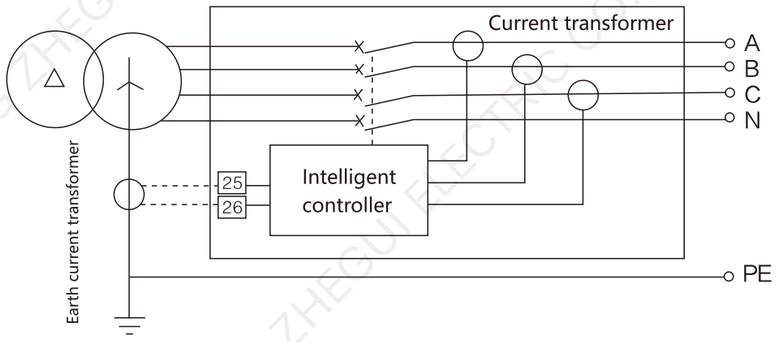
Type 4PT
Difference type ground fault protection signal is only taken from three phase current and N phase current vector

GTW1 pole circuit breaker 6C



(3P+N) T type
The neutral pole transformer, the difference type ground fault protection, the signal takes three phase current and the N phase current vector and

GTW1 pole or pole circuit breaker 6D



(3P+N) W type
Grounding fault protection of the ground current in the external neutral electrode, the signal is directly connected to the neutral point of the main power supply.

5.3 external single-phase grounding protection function
External type transformer (neutral pole transformer or ground current transformer) as the form of attachment to the user. By the user to be set into the bus, and the line (length 2m) connected to the two wiring terminals, #25 circuit breaker #26.

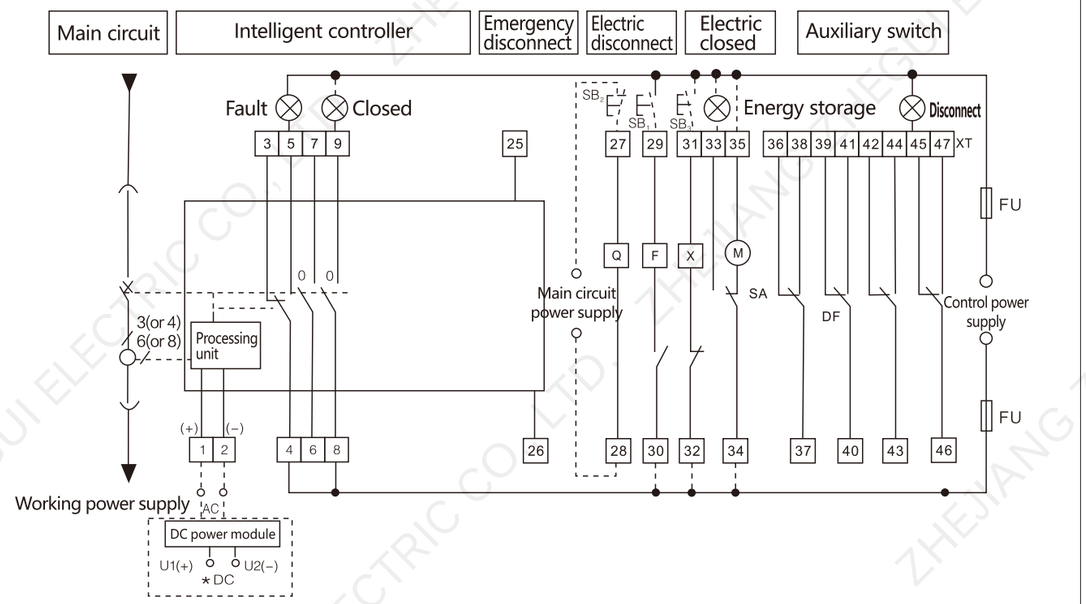
The external transformer center hole (through bus through the maximum allowable size as follows):

type	Width	Width
GTW1-2000 GTW1-4000/4	61	21
GTW1-3200And above (except GEW1-4000/4 outside)	87	31

5.4 terminal
There are 47 general terminal blocks of the circuit breaker, which is simple and easy to use. The wiring diagram is shown in figure 7A, B, C

Controller for the m or l-basic function of figure 7A

Intelligent controller wiring #1, power AC power input (DC, U1, U2, from the DC power module input) #265, #26 external neutral electrode or ground current transformer input



Note:
1. If f, x, m, control supply voltage is different in each different power supplies. For short-term work in f, x, time is not more than 4S.
2. #35 terminal can be connected directly to the power supply (automatic storage), and can also be daisy-chained always on button plug in the power supply (manual energy).
3. If the user, #6-#7 output terminals normally closed contact.
4. external attachment user-owned.
5.* When DC power is intelligent controller of power, shall be increased by the DC power supply module (#1, # terminals are not directly connected to the AC power). Secondary wiring as shown in the diagram (DC power supply DC 110V or 220V from U1 (+), U2 (-) input, output end of the DC power supply module separately and the second terminal block terminals 1 (+), 2 (-)).

SB1 shunt button (user-owned)
SB2 undervoltage button (user-owned)
SB3 closing button (user-owned)
DF auxiliary contacts
F shunt tripping device
SA motor micro switch
X closing electromagnet
M Stored energy motor
XT terminal
FU fuse box (User-owned)
Q under voltage release or undervoltage delay tripping device
0 normally open contact (3A/AC380V)
⊗ Signal (user-owned)

Intelligent controller for other wiring

#1, #2 AC power supply input (DC DC power supply module U1, U2)

#12 overload alarm signal output

#14 transient short time delay tripping signal output

#15 long time tripping signal output

#16 ground (or zero) fault trip signal output

#19 signal output common lines

#20 diagnosis signal output

Signal signal1 release (available to shunt or undervoltage actuators)

#65, 26 external electric transformer neutral or on the input

1. the controller signal input to Terminal 12, 14~16, 20, 21, led relay j external output contact signals.

2. the power supply transformer (user needs to input voltage value specified in the order specification) provided by the manufacturer. Power transformers together with relay base into the standard rail, installed in the switch cabinet position by the user.

3. relay type: HH62P, AC/DC24V, user-owned.

4. diagnostic signals output condition:

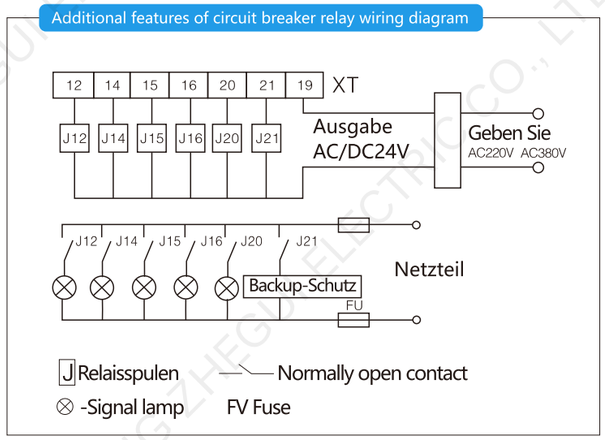
A, the temperature inside the controller > 80 ℃

B, chip is not working properly;

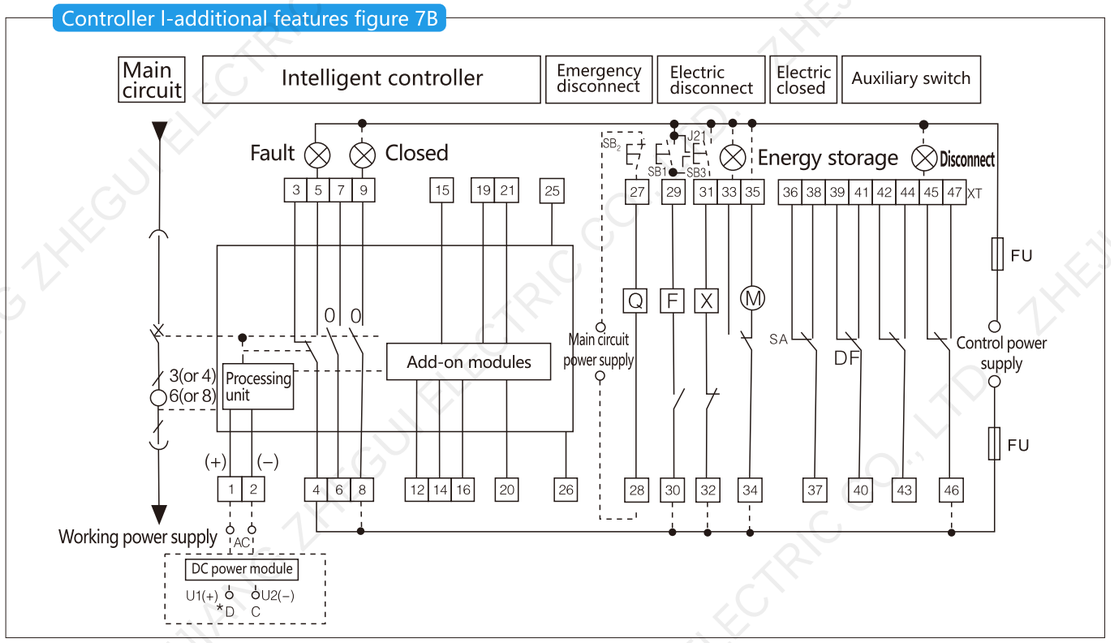
C. controller power.

5. the user can according to their actual needs, self-selected J12, J14-J16, J20, J21.

Additional features of circuit breaker relay wiring diagram



Controller I-additional features figure 7B



Note:

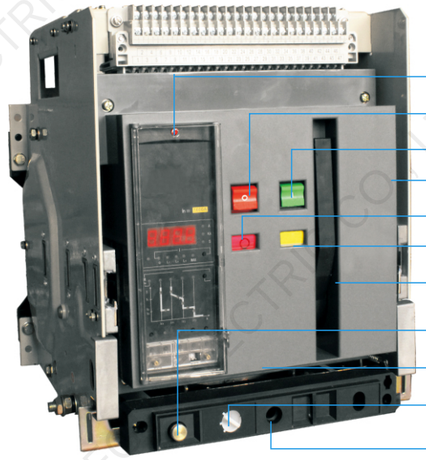
1) f, x, m, control power supply voltage is not the same as each of the different power supplies. For short-term work in f, x, time is not more than 4S.
2) Terminal #35 can be connected directly to the power supply (automatic storage), and can also be daisy-chained always on button plug in the power supply (manual energy).
3) if the user, #6~#7 output normally closed contact.
4) plus annexes user-owned.
5) * when DC power is intelligent controller of power, shall be increased by the DC current module (#1, are not directly connected to the AC power terminals are not directly connected to the AC power at this time).

Secondary-wiring as shown in figure (DC110V or 220V DC power supply from U1 (+), U2 (-) input, output end of the DC power supply module separately and the second terminal block terminals U1 (+), U2 (-)).

SB1 shunt button (user-owned)	X closing electromagnet	DF auxiliary contacts
SB2 undervoltage button (user-owned)	M-energy motor	F shunt tripping device
SB3 closing button (user-owned)	XT terminal	SA motor micro switch

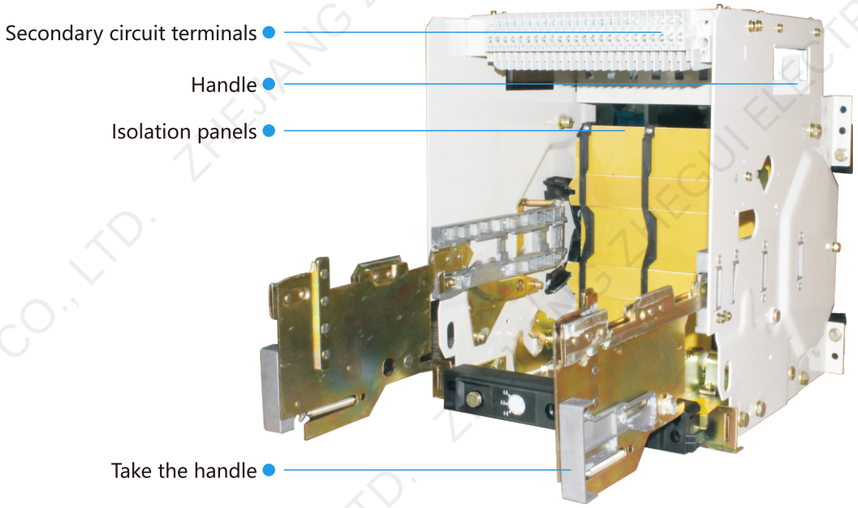
Q under voltage release or undervoltage delay tripping device 0 normally open contact (3A/AC380V) ⊗Signal (user-owned)

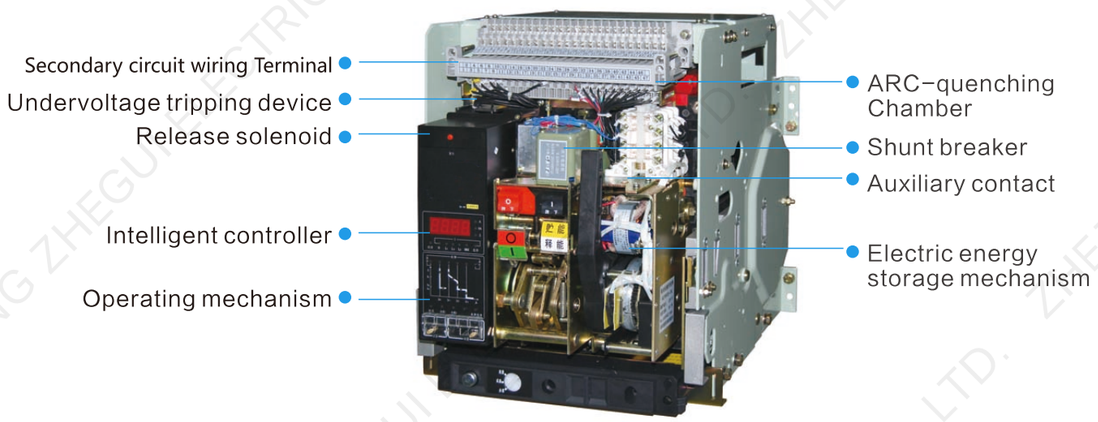
6. circuit breaker positive instructions



- Fault trip indicator, reset button
- The off button
- Close button
- Disconnect the position lock
- Opening closing instructions
- Storage-release handle
- Manual storage handle
- Shake the handle and its repository
- Panel
- Position indication
- Access device

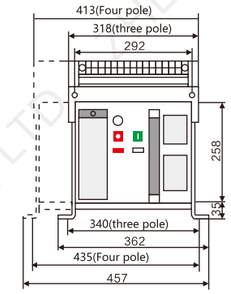
7.GTW1 Series intelligent universal circuit breaker drawer

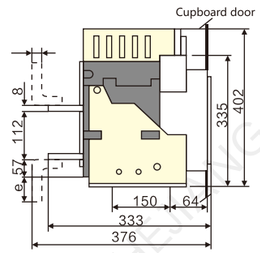


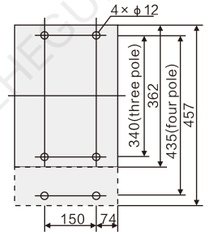


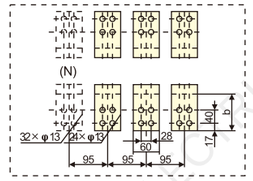
8.the outline and installation dimensions

8.1 mounting dimensions fixed circuit breaker, dimensions (GTW1-2000/3, 2000/4)

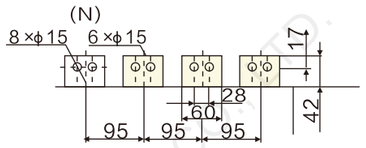








Fixed horizontal connection special order

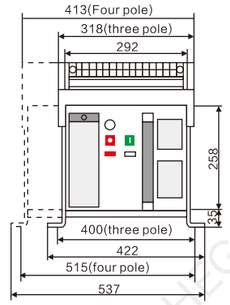


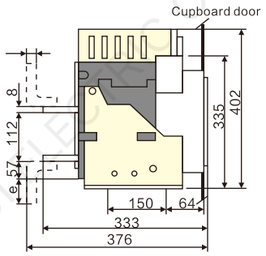
Horizontal connection

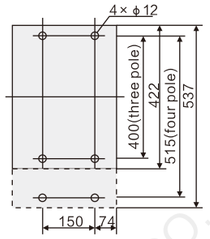
4P switching Center with eccentric Panel hole Center distance for 47.5mm

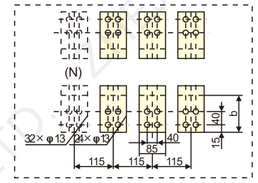
In	a mm	b mm
400-800A	10	95	38
1000-1600A	15	105	48
2000A	20	115	58

8.2 installation dimensions fixed circuit breaker, dimensions (GTW1-3200/3, 3200/4)

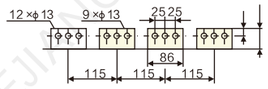




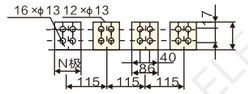




Vertical connection



Horizontal wiring

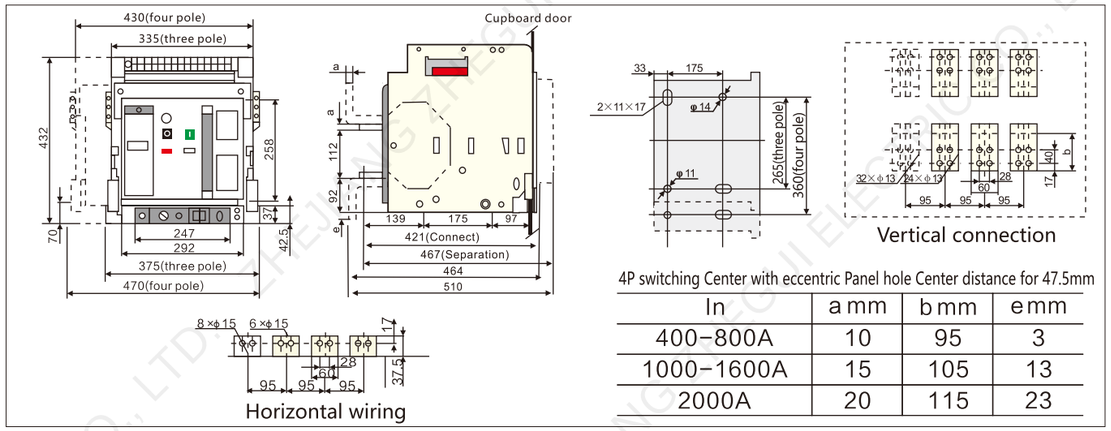


Fixed horizontal connection special order

4P switching Center with eccentric Panel hole Center distance for 60mm

In	a mm	b mm
2000A,2500A	20	115
3000A,3200A	30	135

8.4 installation drawer sizes and dimensions (GTW1-2000/3, 2000/4)



4P switching Center with eccentric Panel hole Center distance for 47.5mm

In	a mm	b mm	e mm
400–800A	10	95	3
1000–1600A	15	105	13
2000A	20	115	23

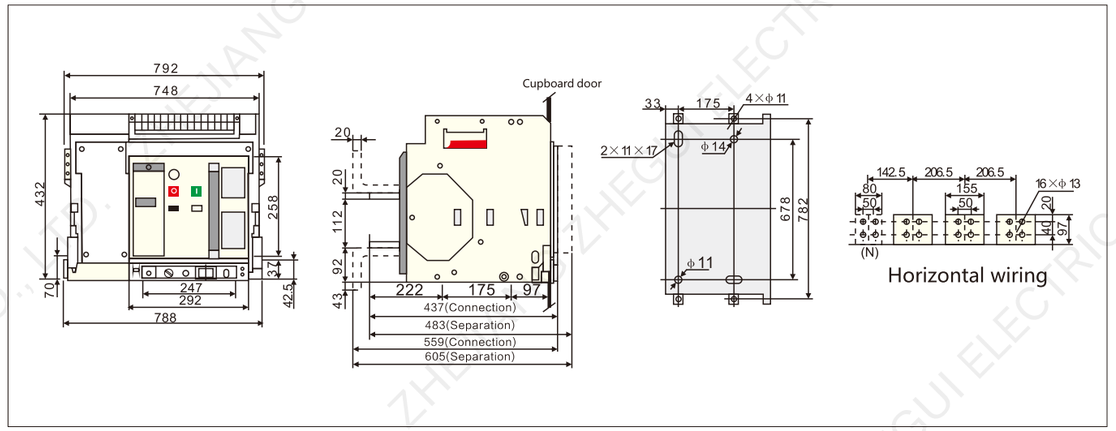
8.4 installation drawer sizes and dimensions (GTW1-3200/3, 3200/4)

4P switching Center with eccentric Panel hole Center distance for 60mm

In	amm	bmm	cmm	dmm	emm
2000A,2500A	20	115	482	528	23
2900A,3200A	30	135	502	548	43

8.5 drawer type circuit breaker mounting sizes and dimensions (GTW1-4000)

8.6 Drawer circuit breaker Installation dimensions and Overall dimensions(GTW1-4000/4)

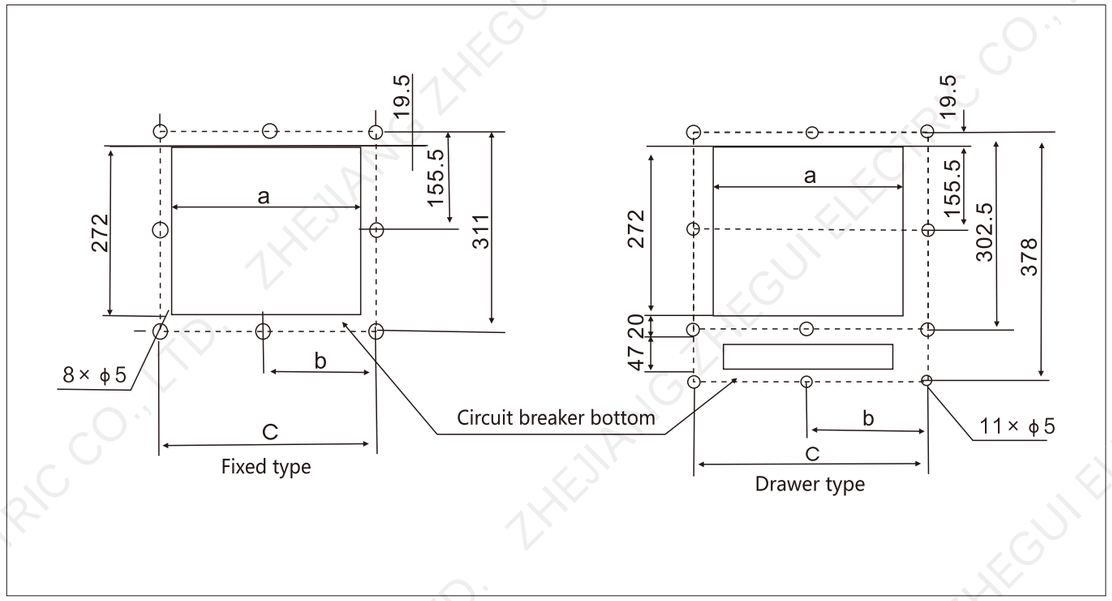


8.7 Drawer circuit breaker Installation dimensions and Overall dimensions(GTW1-6300、6300/4 In：4000、5000)

Inm	Busbar thickness amm
4000A	20
5000A	30

8.8 Drawer circuit breaker Installation dimensions and Overall dimensions(GTW1-6300 In：6300)

8.9 Panel bulkhead mounting dimensions figure



Inm	a mm	b mm	c mm
2000 Series	306	172.5	345
3200 Series	366	202.5	405
6300 Series			

9, specifications, the number of users connected with the copper bars shown in the table below

Rated current	An external bar.	Each pole number	Rated current	An external bar.	Each pole number
630A	40X5	2	3200A	120X10	3
800A	50X5	2	3600A	120X10	4
1000A	60X5	2	4000A	120X10	4
1250A	80X5	2	5000A	120X10	5
1600A	100X5	2	6000A	120X10	6
2000A	100X5	3			

10. trouble shooting

Failure phenomenon		Fault cause	Processing method
Circuit breaker cannot be stored	Circuit breakers cannot be fed manually	A, operating handle latch spring	Will spring back to its original location, or contact the manufacturer
		B, energy storage mechanism failure	Storage of mechanical failure, and contact manufacturers
	Circuit breaker not an electric energy storage	A, stored energy motor no power or is corrupted	Check that the motor is receiving power, if damaged replace motor
		B, small motor-operated control voltage	Check control voltage
		C, energy storage mechanism failure	Storage of mechanical failure, and contact manufacturers
Circuit breaker not closing	Undervoltage tripping device fails	A, under voltage release to power or voltage below 85%	Check whether the power, and then check the connection terminal up and down the cutter contact is good, if the voltage is too low to adjust the operating voltage
		B, undervoltage tripping coil or delay control part	Repair or replace undervoltage tripping device
		If CV is a suction undervoltage tripping device, a reaction spring fracture mechanism on the axis or shift	Service counter force spring plate
	Release solenoid failure	A, release energy solenoid control supply voltage is less than 85%	Adjust voltage
		BV release energy electromagnet damage	Contact with manufacturing plant, adjust release energy electromagnet
		C, energy release screw tripping electromagnet	The screw adjustment, so that the length of the top fastening device for plastic parts can.
	The shunt trip release screws are too long for the tripping shaft top dead		The screw short, top dead axle release release
	Works with drawer is not in place		Check the circuit breaker should be in test or connection position
	Intelligent controller for tripping killed by a plastic body release plastic parts		The intelligent controller will improve or with a file to two pieces of plastic joint part rasper
	Operation fault	A, release electromagnet following plastic parts on the body shifts	The release of the release of the electromagnet, the plastic parts reset
		B, the internal fault	Contact manufacturer for maintenance
	If it is a mechanical chain switches, connections do not release shaft lock or release status		Adjust the position of mechanical interlocking
			Current overload the trip switch or other reasons, the intelligent controller of the reset button to pop up, you must first reset button was pressed into the circuit breaker can be closing
Circuit breakers cannot be disconnected	Cannot disconnect	A, operating mechanism fault	Check operation, if you are stuck please contact the manufacturer
		B, tripping on the half shaft adjusting screw is not adjusted in place	Adjust the adjustment screw location
	Cannot disconnect electric	A, the shunt tripping device is not energized or power supply voltage is less than 85%	Power on or adjust the operating voltage
		BV shunt Tuotuo buckle device damage	Contact with factory replacement controller
		C, operating mechanism fault	Contact with the manufacturer, the replacement of the shunt tripping device
	Switch short circuit or over	A, controller damage	Check operation, if jam occurs, please contact manufacturers
		B, transformer signal line damage or contact with the controller is not good, no signal input controller	Repair or replacement of transformer
		CV stuck inside, can not make the trip signal intelligent controller mechanism tripping	Please contact the manufacturer
Drawer type circuit breaker in separation	The circuit breaker is not fully achieved "separating position" after the drawer is rolled out and the handle is pulled out.		Will contact suppliers
			The wave out, you can pull the breaker
	There are foreign bodies into the drawer, causes rocking in and out of institutions his teeth stuck fault breaker body hook in a drawer on the hinge plate		Check to exclude foreign body, if still cannot take, and contact the manufacturer
Drawer type circuit breaker	There are foreign bodies into the drawer, resulting in rocking in and out of institutions his teeth stuck		Check to exclude foreign body, if still cannot take, and contact the manufacturer
	Circuit Breakers rated current ontology drawers do not match (that is, line thickness)		Check circuit breaker body Busbar Busbar thickness thickness and drawers are the same
	Circuit breaker within the ontology is not fully inserted into the drawer, and forcibly shake		All circuit breaker body shake it again
	Upper and lower terminal die		Terminal block parts
Nothing displayed on the controller	Intelligent controller not connected to voltage		Working voltage
	Intelligent controller for internal faults		Contact with the factory
Controller instructions	Intelligent controller for internal faults		Contact with the factory
	External sources of strong electromagnetic interference		Clear external electromagnetic interference

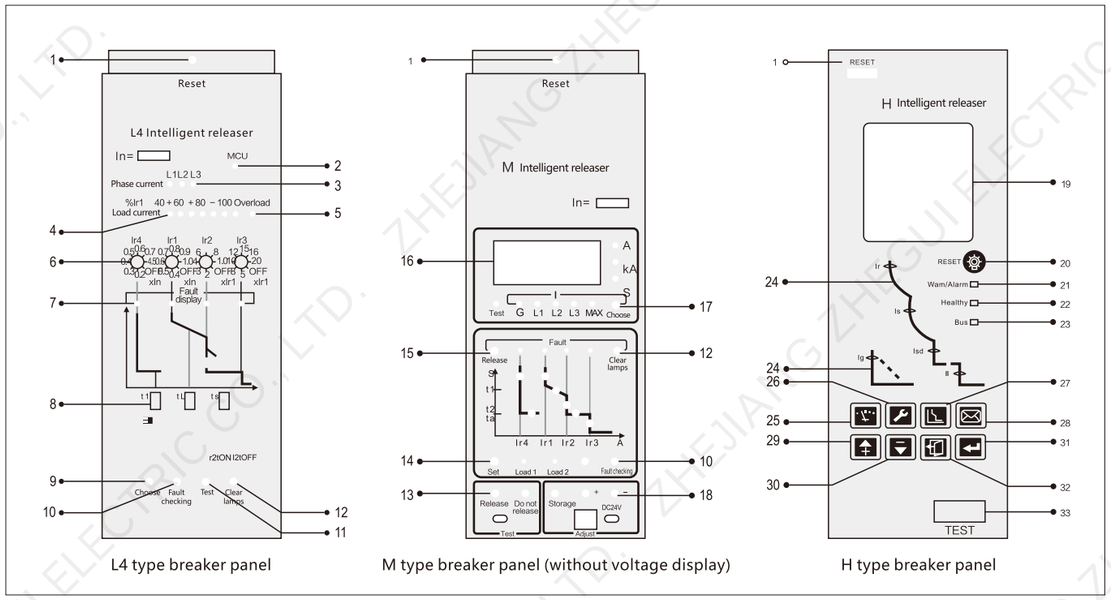
11. the installation

1. before installation check the circuit breaker specifications meet the requirements.
2. before installation with a 500V Megger insulation resistance check circuit breaker, at ambient temperature of 20 ± 5 degrees centigrade and relative humidity should be not less than 50%~70% IOMO, or drying, insulation resistance meets the requirements before use.
3. circuit breaker install circuit breaker should be in vertical with M10 screw fastening. Drawer type circuit breakers should take a breaker that will fasten the drawer after circuit breaker roll back into the drawer.
4. installation of reliable protective earth circuit breaker, is located in a significant grounding tags fixed circuit breaker should be in strict compliance with the security zone.
5. circuit-breakers after the installation is completed, and in accordance with the relevant wiring diagram wiring, before the circuit is powered up (drawer type circuit breaker reset the "pilot" position), the following test shall be performed.
5.1 check for undervoltage tripping, shunt trip and release solenoids, electric energy storage mechanism and plug in the power supply of the rated voltage is consistent with, and turned on the secondary circuit (undervoltage tripping device must be powered on, circuit breaker to operate).
5.2 check whether smart reset button Reset, only the reset button placed in the reset position, circuit breakers can be closed.
5.3 the handle moving up and down on the Panel seven shows after "energy storage" and hear "clicking" sound, that is, storage end, press the "I" button or release electromagnet power, reliable circuit breaker closed, move handle to storage again.
5.4 using motor operation can, in the motor power motor power to the panel display "energy storage", and "clicking" sound, storage end motor shuts off, press the "I" button or release electromagnet power, reliable circuit breaker closed, as well as motor power storage can prepare for the next closed.
5.5 after the circuit-breaker closed, with undervoltage tripping, shunt release, on the Panel "0" button or controller shall make the breaker tripping test button.

12. intelligent controller

1. controller tuning pressing the smart controller "setting" button, and display ILC1-ILC2-Ir4-Ir1-t1-Ir2-t2-Ir3 setting data, such as the factory setting of the data does not meet user needs can be reset according to the following requirements. Controller long delay current whole set, by "clear lamp" key Hou, by "set" key, until long delay current state indicates lamp bright, displayed long delay factory current whole set value, according to need can in (0.4~1.0) In range within whole set, by "+" key can makes current increases or reduced, each by once to <2% interval increases or decreases until close need of current weizhi, whole set finished, by once "storage can" key, storage indicates lamp bright once and out, said long delay current whole set value has storage end, original whole set value automatically disappeared.
Controller long delay time whole set, long delay current whole set end Hou, again by once "set" key, long delay Shi time state indicates lamp bright, displayed long delay Shi time factory whole set value (1.5Ir, and action time whole set value), by "+" or key, time can increased can reduced, each by once time increased or reduced 1 time times, until need of time weizhi. Setting is completed, press the "storage" storage indicator again and went out to indicate a long delay time set end, original setting automatically disappears. Short delay, and instantaneous v load monitoring, grounding protection action value whole set and action time whole set method and long delay same, for these protection characteristics whole timing, must by moving "set" key, makes its State led of location and whole set parameter consistent, grounding protection time whole set value in "OFF" location said fault State spring alarm not off buckle; instant moving whole set in "OFF" location (is greater than 50KA for "OFF" location), said the protection canceled, off buckle device in whole set process in the, Once a fault signal automatic blocking feature, enter the fault State. Controller parameters of protection, must not cross set up. For reclosing ILc2 set value is less than the ILc1. Controller when the setting of all parameters, press once again the "clear light" key or power reset time, release is in the running state.
2. controller tests
Controller setting, in front of the circuit breaker is put into operation, the controller protection function can be checked:
2.1 circuit breaker roll to "test" position.
2.2 with the "set" button in order to view various features of the set value.
2.3 using "set", "+", "-", brings up a simulated test current, be careful not to store lock.
2.4 by "off buckle" or "not off buckle" key, by "off buckle" key Shi, test indicates lamp bright, corresponding of State indicates lamp flashing, by action time Hou, circuit breaker device disconnect, displayed action time, while fault led and off buckle device indicates lamp bright; by "not off buckle" key, process and by "off buckle" key same, but circuit breaker device constantly open, off buckle led not bright.
2.5 overload test, press the "set" button to delay State, view the overload setting value, and then to other current status, press the "+", key, 1.3Ir1 the current to current, press the "test" key to enter the overload test State, the controller according to the law of inverse-time delay and indicates faults and test status. Other characteristics similar to, after the test, press the "clear light" to enter the normal operating state, must be accompanied by a mechanical "reset" closed circuit breaker.
3. controller use rules
Controller tuning, check the 1min without pressing, the automatic key enters the running state, but if a failure occurs, are automatically blocked key function, enter the fault State. Intelligent controller with heat and memory function, power after the test, you must overload energy release after the end of, the next test, otherwise the operating time will be reduced.
3.1 setting check – controller "clear light", after trouble-free case, press the "set" button, the cycle indicating various status and set that corresponds to the current and time. Check is complete, click the "clear light" key, 1min automatically without pressing ENTER to normal working condition.

3.2 network operating current and voltage check – controller "clear light", after trouble-free continuous pressing "select" button, the Recycle value indicating the current of each phase and ground current, display the maximum phase current. Such as tripping device with voltage display module, the current show "select 1", voltage display press the "option 2", then cycle indicates that the line voltage, normal display maximum line voltage. Controller "clear light" after clicking "Troubleshooting" button displays the last fault status and fault currents, testing or fault tripping and press "select" key. Recycled indicating testing or fault currents or time values. State memory.
3.3 reduction – in the case of auxiliary power breakers before closing you must first press the controller "clear light" button, the controller enters the normal state, then click on institution the "reset" button, close circuit breaker.
3.4 Control Panel structure



L4 type breaker panel | M type breaker panel (without voltage display) | H type breaker panel

1. "the reset button" in: circuit breaker faults, test and release the button and then press, to again close circuit breaker.
2. "the MGU" led: constant when the microcontroller (MCU) works fine.
3. "current" LEDs: L1, L2, L3 phase current current value is displayed when the largest one.
4 "load currents of light" led: displays the percentage of load current and the value of IM.
5. the "overload" led: lights when load current is over long delay protection overload currents, overload long delay start delay start delay or alarm.
6. "the Ir4," "Ir1", the "Ir2", "Ir3": ground, long time, instantaneous, short delay coding switches.
7. "fault" light: indicates that the fault type.
8. the "tG", "tL", "tS": long delay, overload, short circuit earthing fault delay time.
9. the "select" button: L1, L2, L3 phase current.
10. "Troubleshooting" button: press this key after fault tripping circuit breaker, to indicate the tripping cause of failure, with memory after a power failure.
11. the "test" key: pressing this key line of instantaneous tripping test, resulting in instantaneous tripping ed.
12. the "clear light" key: release set, test, failure, and then press some key to reset the breaker, and return to the normal state.
13. "release" and "release" key: test function.
14. the "set" button: check or set various protection features or current time, pressing this key cycles indicate status.
15. "LED" illuminated: can indicate a variety of State and category.
16. "the current and time display": displays the current time value.
17. the "select" button: normal operation cycle shows the phase current, fault or fault or fault check the status to cycle through the time value.
18. "storage", "+" and "-" keys: setting current time or use.
19.LCD interface not displaying.
20. the fault and alarm reset button.
21. "fault/alarm" LED: normal working hours, LED is not lit, when fault tripping, the red LED will blink fast, bright red LED constant in case of alarm.

22. the "normal" LED as long as ST40-3 powered on and working normally, green LED always blink.
23. Communications led, communication status indicator are as follows: Profibus, Huang-free communication, and communication and constant light. Modbus, Huang-free communication, and flashes when communications. Device Net, no blinking communication, communication and constant light.
24. the curve LED: curves hide the red LED light. Fault trip when the LED light is blinking indicates the fault type; protected parameter set, LED constant light indicates the current setting of the project.
25. measurements: key 1, switch to the measurement of default theme menu (under the password input screen for "down" key).
26. set: function keys 2, switch to the topic menu parameter setting (in the password input screen for "right").
27. protection: function key 3, the switching to parameter set the theme menu.
28. information: key 4, switching to history and maintaining the theme menu.
29. down: level up menu currently in use or change the selected parameter.
30. down: move down the menu currently in use, or the down arrow to change the selected parameter.
31. exit: exit the current level used by access to the previous menu or cancel the current parameters of the selected.
32. option: go to next menu point to the current project, or the currently selected parameters, storage changes.
33. test port: front panel bottom has a 16 pin test port insert a plug-type portable power box or unit.

13. accessories

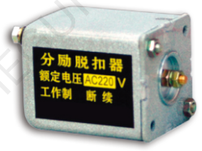
1. under-voltage tripping device



- Undervoltage release if it is not being powered, electric or manual the circuit-breaker cannot be closed.
- Undervoltage release is divided into instant action and delay action in two ways.
- Undervoltage delay release time 0-7 seconds optional is not adjustable.
- the ½ delay time, when the power voltage is restored to 85%Ue above, circuit breaker disconnect.
- Operating characteristics.

Rated operating voltage Ue (v)	AC230 AC400
Tripping voltage	(0.35~0.7)Ue
Reliable switching voltage	(0.85~1.1)Ue
Reliable out of gate voltage	≤0.35Ue
Power consumption	20VA

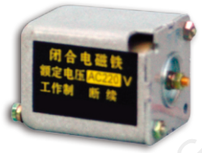
2. shunt tripping device



- Shunt power breaker instantaneous disconnect, remote operation.
- Operating characteristics.

Rated operating voltage Ue (v)	DC230 DC400
Tripping voltage	
Power consumption	250W
Break-time	

3. the closing electromagnet



- Motor storage after the closing electromagnet power can make the operator can instantly spring storage, circuit breaker closed quickly.
- Operating characteristics

Rated operating voltage Ue (v)	AC230 AC400	DC230 DC400
Tripping voltage	(0.85~1.1)Us	
Power consumption	56VA	250W
Break-time	50±10(ms)	

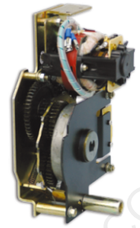
4, auxiliary contacts



- Auxiliary contacts of a standard form for the conversion of 4 groups of contacts (2 normally open normally closed 2), special type for 6 Group contact (normally closed 3 normally open 3).
- Technical parameters

Rated voltage (v)		Rated thermal current Ith (a)	Rated capacity control
AC	230	10	300VA
	400	6	100VA
DC	220	0.5	60W

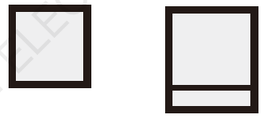
5, electric operator



- Motor energy and breaker automatic storage function, to ensure that the circuit breaker tripping could immediately after closing.
- Circuit breaker can also be manually fed.
- Operating characteristics

Rated control supply voltage Ue (v)	AC230 AC400	AC230 DC220
Tripping voltage	(0.85~1.1)Us	
Power consumption	250VA/380VA	200W
Storage time	<4s	
Operating frequency	A maximum of 3 times per minute	

6, bolts and gaskets



Installing cabinets on the room's door, play a role in sealing, protection class IP40 (protection class IP20 when circuit breakers installed separately).

7, phase interval plates



Installed on the terminal block and white, used to increase the circuit breaker insulating ability.

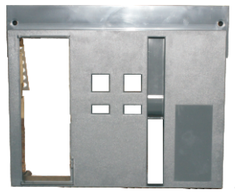
8, key lock



- Broken button of the circuit breaker can be locked in the down position, then, circuit breaker closing operation is not possible.
- After the user has rotated, factories provide a lock and a key.
- A circuit breaker equipped with independent lock and two keys of the same,
- Three circuit breakers equipped with three lock and two keys of the same same

Note: universal circuit breaker key interlock when you need to pull out the key, you must first press the off button, counter-clockwise turn the key and pull out the key.

9, transparent protection cover



Installed in a small room on the door frame, protection class IP54. Apply to the drawer, fixed type circuit breaker and line with switch.

10, steel cables mechanical interlock



- As 2 horizontal or vertical three-pole or four-pole circuit breakers interlocking.
- Steel cables, when bending, should leave enough at the bend of the transition arc (generally greater than 120mm) to ensure the cables flexible movement.
- C. two mutually interlocked circuit breaker the maximum distance is 2m.
- Plug the drawer anti-misoperation device
- Only matches the rated current of the circuit breaker as shown signs for the body to be inserted in the drawer.
- Does not match the current rating cannot be inserted.