GEYA

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2018

Air Circuit breaker

Product catalog

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Everything for your electricity safety!

一切，为了您的用电安全！

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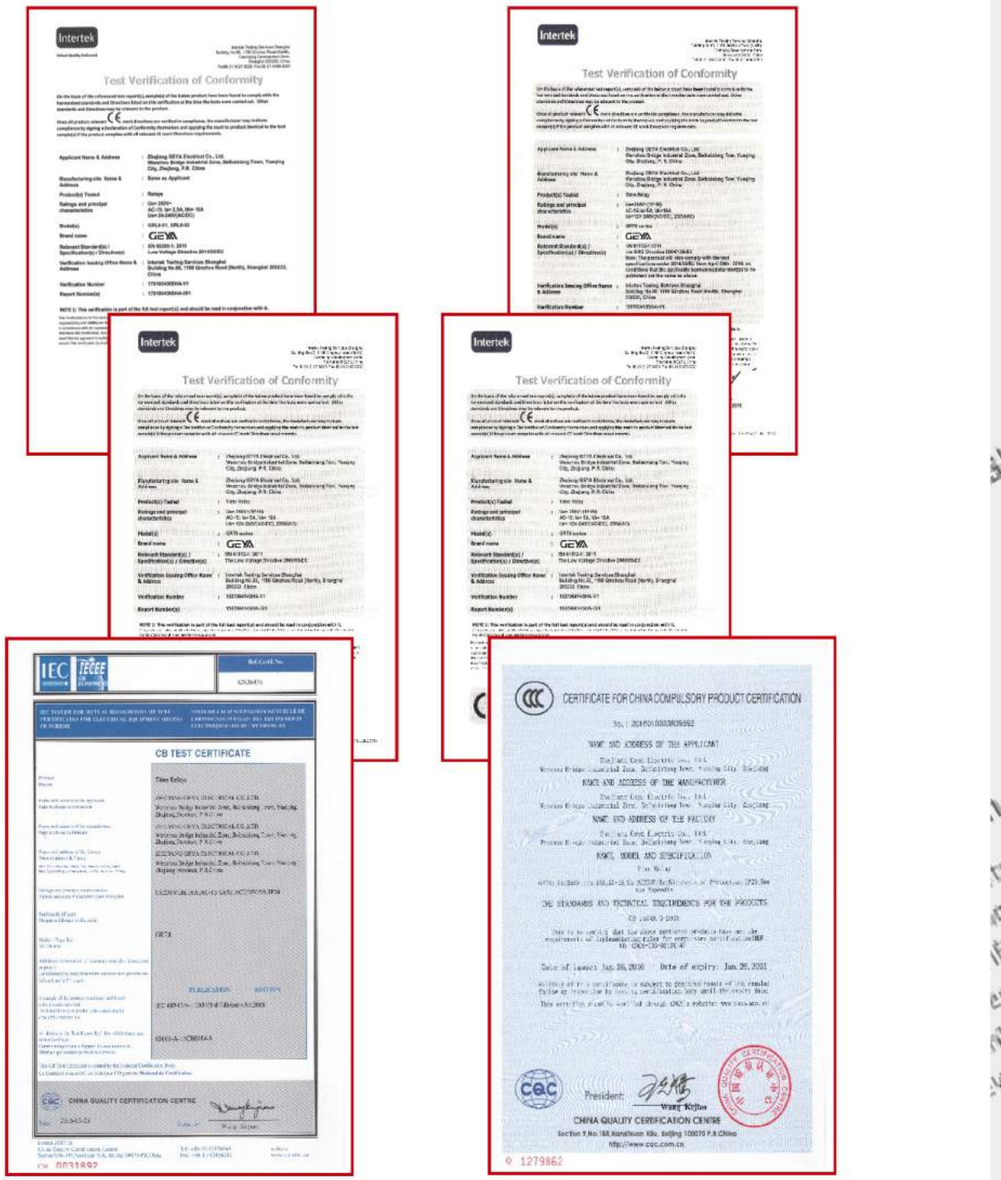
Introduction

Geya Electrical was established in 2005,and our head office is based in Wenzhou China.
Our products are exported to more than 20 countries and regions such as South America, Western Europe, the Middle East, Africa, Australia, South Asia,East Asia ,etc
Geya is ISO9001 Quality Assurance accredited and both quality and safety are of paramount importance to us Our products have SEMKO VDE and CE cerfificates
Our expenence and expertise Modem ,innovative products design ,Vast OEM expenence, Constant new products development,Strong R&D capabilities.Competitive prices,Excellent international market knowledge,Professinal dynainc and customer focused staff,Flexibletrading terms,Quality and timely delivenes.



CONTENTS

1 Usage and scope of application

GYW1 series intelligent circuit breakers (hereinafter referred to as circuit breakers), are suitable for distribution networks of AC 50Hz, rated voltage up to 660V (690V) and rated current of 630A~6300A, and are used to distribute electric energy and protect the circuit and power supply equipment from overload, under-voltage, short circuit, single-phase grounding and other failures. The circuit breaker has the intelligent protection function, of which the selective protection is accurate, enhancing the power supply reliability and avoiding the unnecessary power failure. Meanwhile, it is equipped with open communication interfaces, which enable the "four remote" functions, meeting the requirements of the control center and automation system. The impulse withstand voltage of the circuit breaker at an altitude of 2,000 meters is 8,000V (the voltage varies with different altitudes according to relevant standards, and the maximum value is 12,000V). When it is not equipped with any intelligent controller and sensor, the circuit breaker can be used as an isolator, with the mark
The circuit breaker complies with the requirements of the standards GB14048.2 "Low voltage switchgear and controlgear- Part 2: Low voltage circuit-breakers" and IEC60947-2 "Low-voltage switchgear and controlgear- Part 2: Circuit-breakers", etc.

2 Model meanings and classifications

○ Model and meaning

GY W 1 - □ / □

- Number of poles (number 4 for four poles, and no number for three poles)
- Shell grade rated current value of circuit breaker
- Design serial number
- Universal circuit breaker
- Enterprise code

○ Type

Classified by mounting methods
1. Fixed type
2. Withdrawable type
Classified by the numbers of poles: Three-pole, four-pole
Classified by operation modes:
1. Power operating,
2. Manually operated (for maintenance and repair)

○ Type of release

Intelligent controller, under-voltage instantaneous (or time-delay) release, shunt release.

○ Properties of intelligent controller:

1. Intelligent controllers are divided into: H-type (for communication), M-type (standard model), L-type (economical model);

2. It has various functions, such as overload long-delay inverse time-lag, short-delay inverse time-lag, constant time-lag and instantaneous time-lag. Users can themselves set the protection features according to practical needs;

3. Single phase grounding protection function;

4. Display function: Display of setting current, action current and voltages in each phase (voltage display function should be indicated when ordering);

5. Alarm function: Overload alarm;

6. Self-inspection function: Overheat self-inspection and microcomputer self diagnosis;

7. Test function: Test the operating characteristics of the controller.

3 Normal working and installation conditions

○ Ambient air temperature

The ambient working temperatures shall not be higher than +40℃ or lower than -5℃, and the average value of 24h shall not be higher than 35℃.

Note: If users' ambient working temperature exceed required values, they should discuss it with our company.

○ Atmospheric conditions

The atmospheric relative humidity should not be higher than 50% when the ambient working temperature is+40□, and should be comparatively higher in case of low working temperature; the maximum average relative humidity in the wettest month is 90%, and meanwhile the minimum average temperature of this month is +25□, considering the condensation on product surface due to temperature changes. If users' working conditions cannot meet the above-mentioned requirements, please discuss with our company.

○ Protection grade: IP30

○ Class of pollution: Ⅲ

○ Category of operation: Category B

○ Type of installation

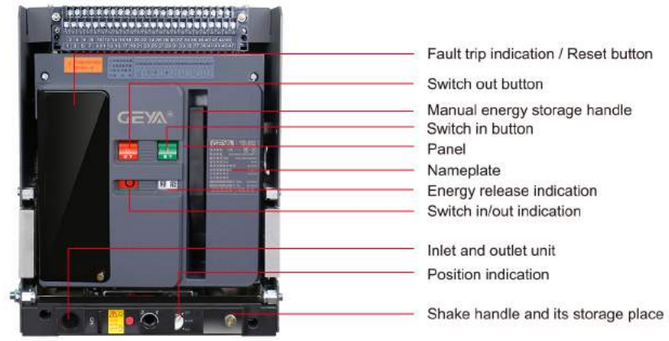
Circuit breakers with rated operating voltages of 660V (690V) or below and under-voltage release, the primary coil of power transformer adopts Type IV, and the installation type of auxiliary circuit and control circuit is Type III.

○ Installation conditions

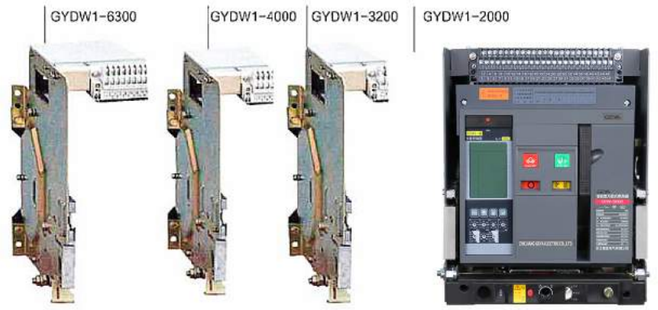
The circuit breaker should be installed as required by this Manual, with the vertical inclination of circuit breaker not more than 5° (the inclination of mine-used circuit breaker should not exceed 15°).

4 Introduction of structure

○ Front indication of circuit breaker



○ GYDW1 series Intelligent Universal Circuit Breakers



Withdrawable circuit breaker

1. Secondary circuit wiring terminal (static)
2. Drawer holder
3. Safety partition
4. Secondary circuit wiring terminal (dynamic)
5. Auxiliary contact
6. Shunt release
7. Under-voltage release
8. Switch in electromagnet
9. Operating mechanism
10. Electric energy storage mechanism
11. Intelligent controller
12. Panel

5 Technical data and performance

○ ated current of circuit breaker

Table 1

Shell grade rated current in mA	Rated current in A
2000	630、800、1000、1250、1600、2000
3200	2000、2500、2900、3200
4000	3200、3600、4000
6300	4000、5000、6300

○ The rated short-circuit breaking capacity and short-time withstand current of the circuit breaker, and the arcover distance of circuit breaker is "0" (i.e. there is no arcover outside the circuit breaker)

Table 2

Shell grade rated current in mA		2000	3200	4000	6300
Rated ultimate short-circuit breaking capacity Icu (kA) O-CO	400V	65	100	100	138
	690V	50	65	65	105
Rated operating short-circuit analysis capacity Ics (kA) O-CO-CO	400V	50	65	65	138
	690V	40	50	50	105
Rated short-time withstand current Icw (kA) 1s, delay 0.4s, O-CO	400V	50	65	65	138
	690V	40	50	50	105

Note: The breaking capacity in the table has the same upper and lower incoming lines

○ The maximum power consumption of circuit breaker is 360W. The changes of the rated continuous current of circuit breaker at different ambient temperatures are as shown in Table 3

Table 3

Inm		GYDW1-2000 (Frame I)						GYDW1-3200 (Frame II)					GYDW1-6300 (Frame III)		
In		630	800	1000	1250	1600	2000	2000	2500	2900	3200	4000/3	4000/4	5000	6300
Ambient temperature ℃	40	630A	800A	1000A	1250A	1600A	2000A	2000A	2500A	2900A	3200A	4000A	4000A	5000A	6300A
	50	630A	800A	1000A	1250A	1550A	1900A	2000A	2400A	2900A	2900A	3800A	3800A	4500A	6000A
	60	630A	800A	1000A	1250A	1550A	1750A	2000A	2250A	2900A	2850A	3600A	3600A	4200A	5400A

○ Protection features and functions of intelligent over-current controller

Protection features of over-current controller

1. The setting value Ir(I/In) and tolerance of the controller is as shown in Table 4

Table 4

InmA	Long delay Ir1	Short delay Ir2			Instantaneous Ir3			Grounding fault Ir4	
		L-type	M and H types	Tolerance	L-type	M and H types	Tolerance		Tolerance
2000	(0.4-1)In	(3-10)In	M:(0.4-15)Ir1 H:(1.5-15)Ir1	±10%	(3-10)In (10-20)In	In~50kA	±15%	Inm=2000~4000A (0.2~0.8)In Max. 1200A Min. 160A	±10%
⩾3200					(7-14)In	In~75kA In~100kA Inm=6300A		Inm=6300A (0.2~1)In	

Note: When there are three sections of protection at the same time, the setting values cannot be intersected, and should follow the sequence Ir1<Ir2<Ir3.

2. Long delay over-current protection reverse time-lag actuation characteristics where the actuation time of (1.05~2.0)Ir1 is as shown in Table 5, with a time tolerance of ±15%.

Note: tL- the setting time of long delay 1.5Irs, TL- the actuation time of long delay.

Table 5

1.05Ir1	1.3Ir1	1.5Ir1 setting time S	15	30	60	120	240	480
>2h no actuation	<1h actuate	2.0Ir1 actuation time S	8.4	16.9	33.7	67.5	135	270

3. Short delay over-current protection characteristics are as shown in Table 6

Table 6

Delay setting time ts (s)	0.1	0.2	0.3	0.4
Delayable time (s)	0.06	0.14	0.23	0.35
Actuation characteristics	I>8Ir1 constant time-lag actuation			
	$I < 8Ir1$ $T = \frac{(8Ir1)^2 ts}{I^2}$ T= actuation time			

○ Properties of M-type intelligent controller:

1. Ammeter function

It displays the running currents in each phase and the grounding leakage current; it normally displays the current in the maximum phase, and also displays the setting, testing and fault current values or time values.

2. Voltmeter function

It displays the voltages in each line and normally displays the maximum value.

3. Remote monitoring and self-diagnostic function

1) The controller has a self-diagnosis function on faults

When the computer fails, it can display a digit "E" representing running error or give an alarm, and reboot the computer at the same time; and if needed by users, it can also switch out the circuit breaker.

2) When the local ambient temperature reaches 80□, it sends out an alarm, and can switch out the circuit breaker at a smaller current (if required by users).

3) The intelligent controllers can output overload, short circuit, grounding, load monitoring, pre-alarm and release indication (OCR) signals through contacts or optocouplers, making it convenient for users to connect external remote control; the capacity of the contact is DC28V, 3A and AC125V, 3A.

4. Setting function

Various parameters of the controller can be tuned by pressing the four buttons . 设定 ⊞ ⊟ 贮存 Press the 设定 button to reach desired state (state indicator light), then press the ⊞or⊟button to tune the parameters into desired values; then press the 贮存 button again to and the storage indicator light blinks one time, indicating the setting value having been locked. The protection parameters of the controller should not be set intersecting with each other. After resetting the controller by reconnecting the power supply, press the 设定 button can circularly check various parameters that have been set.

5. Test function

Pressing the 设定 ⊞ ⊟ 脱扣 不脱扣 复位 buttons can set up a test current for fault analog (note: do not lock it by pressing the 贮存 button), then press the 脱扣 or 不脱扣 button to perform the test, and the controller can carry out fault handling. Press the button to switch out the circuit breaker, and press the button to keep the circuit breaker switched in, while various indication state of the controller keeps normal. After testing, it is necessary to press the 复位 or 清灯 button for once. Then, other tests can be performed.

Note: In order to make the tests convenient, no matter whether the grounding leakage is tuned into release or alarm position, it is regarded as release in the tests, with a priority less than overload protection. In case of faults during tests, the controller automatically stops all tests and goes into faults handling.

6. Load monitoring function

Set two setting values, with a setting range (0.2~1)In for ILC1 and a setting range (0.2~1)In for ILC2, and the delay characteristics of ILC1 is inverse time-lag, and its time setting value is 1/2 of long delay setting value; the delay characteristics of ILC2 are of two types, the first of which is inverse time-lag function and its time setting value is 1/4 of long delay setting value; while the second type is constant time-lag, and its delay time is 60s.Regarding both time delay functions, the former function is used to switch out subordinate unimportant load when the current approaches overload setting value; while when the current exceeds ILC1

setting value, switching out subordinate unimportant load with time delay, the current declines to maintain the power supply in main circuit and important load circuits, and when the current declines to ILC2, the other function sends out the order with certain time delay to re-connect the circuit that having been switched out, so as to resume the power supply for the whole system. Users may select either of the above-mentioned two monitoring protection, and the monitoring characteristics are as shown in Figure 3 and 4.

7. MCR release and analog release protection can be switched off if required by users, and are usually switched off in short delay breaking tests.

1) MCR switching on breaking protection is mainly used when the circuit is in fault switching in state (the moment when the controller is energized), and the controller has the function of switching out the circuit breaker at the low short-circuit current. Factory setting is 10kA, with a tolerance of ±20%, and its set-point current can be set according to users' requirements.

2) The controller has the function of directly sending off a release signal without being processed by the host chip in case of an extra-large short-circuit current.

8. Thermal memory function

After the release caused by overload or short circuit and before disconnecting power supply, the controller has the memory function of simulating the characteristics of bimetallic strips; the discharging of overload energy is finished in 30min and the discharging of short delay energy is finished in 15min, and the characteristics of overload and short delay over-current release protection are as shown in Figure1, and the characteristics of grounding fault protection are as shown in Figure 2.

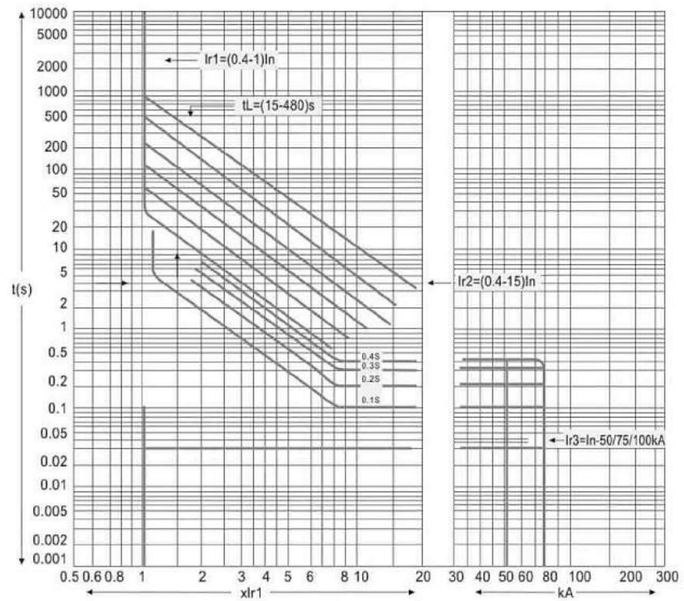


Figure 1

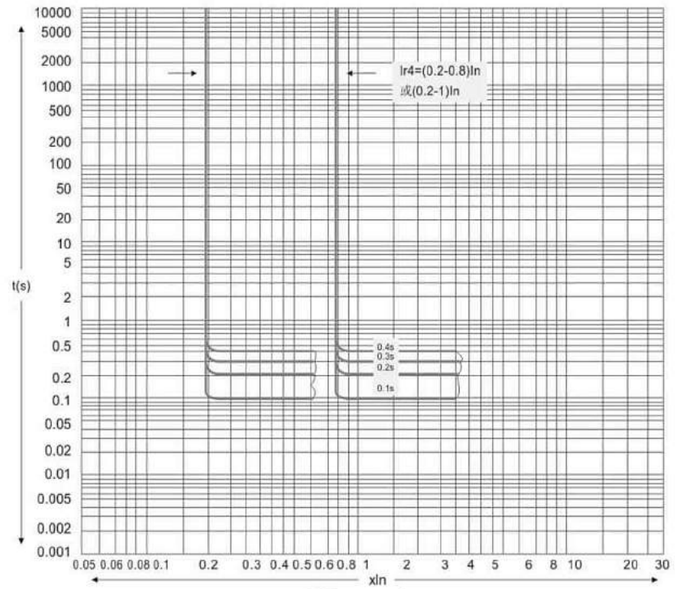


Figure 2

The characteristics of monitoring are as shown in Figure 3 and 4.

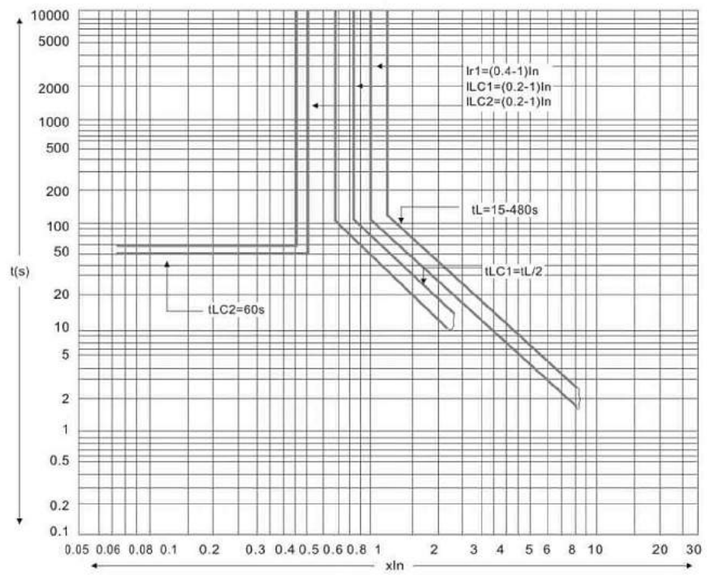


Figure 3

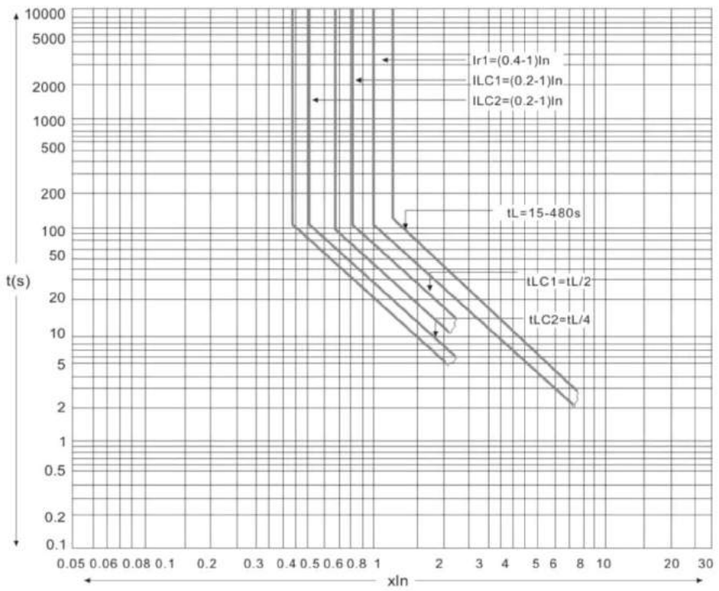
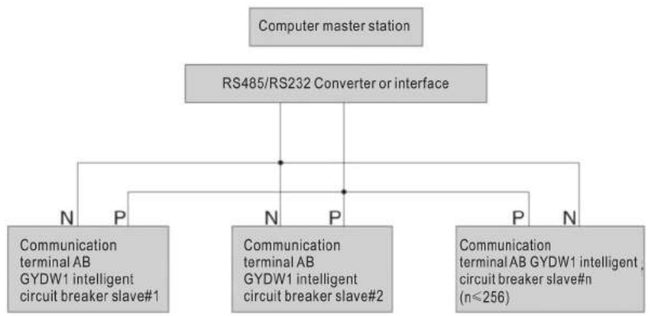


Figure 4

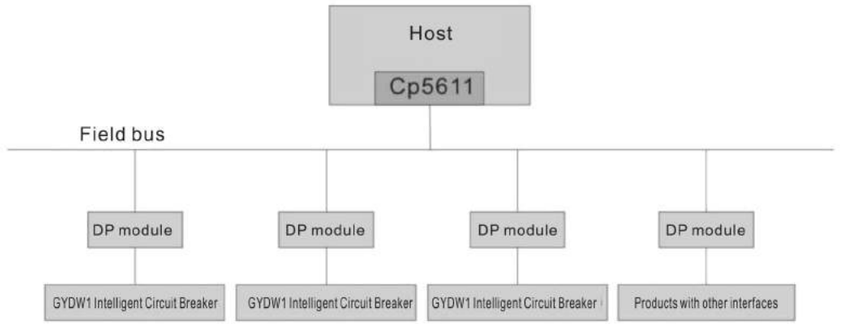
H-type intelligent controller

Except for all functions of L-type intelligent controller, L-type intelligent controller is also equipped with serial communication interfaces, through which a LAN system (hereinafter referred to as the System) in the master-slave structure can be constituted, consisting of 1-2 sets of computers as the master station and several intelligent circuit breakers or other communication components as the slave station, and the System network structure is as shown below; regarding the circuit breaker unit, the System can realize the "four remote" control functions: monitoring and measuring of various power grid parameters and operation parameters, monitoring and displaying of the current operation state of intelligent circuit breakers, adjusting and downloading of various protection threshold parameters, and switching in and out of intelligent circuit breakers, etc. The System is suitable for the construction and transformation of power distribution and monitoring systems in various power stations, power plants, power supply, medium-and-small substations, industrial and mining enterprises and buildings, etc.

The connection diagram of proprietary communications protocol interfaces is as follows:



The connection relationship diagram of universal DP protocol based circuit breaker products is as shown in the following figure:



Constitution of the System

Hardware structure of data communication network system

Intelligent circuit breaker provides standard RS485 communication interfaces, which are led out from the NO.10 and 11 outlets of the circuit breaker.

Communication medium for system connection: Shielded twisted pair of Class A.

Network main characteristics

The product adopts a bidirectional serial data transfer mode, making it capable of providing a variety of communication protocols: "Low voltage electrical equipment data transmission protocol V1.0", PROFIBUS-DP and MODBUS, etc.

Strict master-slave mode, i.e. the master station is the initiator and controller of communication and the slave station can only communicate with the master station rather than directly communicating with other slave stations.

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

Monitoring software

YSS2000 configuration software can realize the configuration application of required monitoring management software according to different engineering requirements. For intelligent circuit breakers, the operation monitoring and various daily management functions can be realized.

System function

Remote control

Remote control refers to controlling the storage, closing and breaking of the first slave station circuit breaker in the system through the master station computer. The operator selects corresponding objects from the system interface by clicking the remote control button with the mouse, and the system provides the current running state of corresponding objects. Operators can give remote controlling "switching in" or "switching out" instructions by inputting the operation passwords. The system transfers the instructions to corresponding circuit breaker slave station, which conducts switching out, switching in, energy storage and

other operations according to given timing sequence after receiving the instructions, and then report remote controlling results to the host station.

Remote adjustment

Remote adjustment refers to setting up the protection constant value of the slave station through the master station computer. The protection constant values tables of all slave stations are stored in the master station computer, operators select corresponding objects by clicking the remote adjustment button on the system interface, then the system displays all current protection constant values of corresponding objects as well as the their protection constant values tables; after inputting operation passwords, operators can select required parameters from the tables, and the host station download selected parameters to corresponding slave stations after operators clicking corresponding buttons, and report remote adjustment results to the host station. After receiving corresponding parameters, the slave station immediately modify its protection constant value.

Remote monitoring

Remote monitoring refers to monitoring the power grid operating parameters of each slave station through the host station in a real-time manner. The working parameters transferred to host computers by the communication substation are as follows: The real-time current values of phases A, B, C and N in each substation, the voltage values of UAB, UBC and UCA.

The fault record can record the following fault parameters.

Current values of phases A, B, C and N, voltage values of UAB, UBC and UCA, type and actuation time of fault, and record the fault in the fault database.

The computer displays the current real-time current values and voltages of each substation in bar diagrams, absolute value tables and other methods, and displays the running state of each node in real-time curve.

Remote communication

Remote communication refers to checking the models, switching in and out states, protection constant values, operating and fault information and other information of the slave stations through the master station computer. Parameters transferred to host computers by the slave station circuit breaker include: Switch type, switching states (in/out), fault information, alarm information and various protection constant values, etc.

Other functions of the system

In addition to the four remote control functions, the system can also carry out a variety of management functions: accident alarm (information screen, screen promotion, event printing, accident dialing, sound alarm), event record, maintenance hanging out, management of shift change, load trend analysis and printing of various types of reports, etc.

○ L-type intelligent controller

L-type intelligent controllers adopt the encoding switch and toggle switch setting method, which is featured with overload long delay, short-circuit short delay, instantaneous and grounding leakage four-section protection, and has the fault state, load current light indication function and other functions; but it has no digital display, and its functions are not as many as M and H type intelligent controllers. Users can select desired functions in general situations.

Operating performance of the circuit breaker is shown in table 7

table 7

Inm(A)	Number of operating cycles per hour	Mechanical life (number of times)		Electrical life (number of times)
		Maintenance free	Requiring maintenance	
2000	20	13500	20000	6500
3200	20	10000	20000	3000
4000	15	5000	10000	1500
6300	10	5000	10000	1000

The shunt release, under-voltage release, electric operating mechanism, energy releasing (switching in) electromagnet of circuit breakers, and the working voltages and required powers of intelligent controllers

table 8

Items \ Required power / Rated working voltage			AC (50Hz)		DC	
			220V(230V)	380V(400V)	110V	220V
Shunt release			24VA	36VA	24W	24W
Under-voltage release			24VA	36VA	-	-
Switching in electromagnet			24VA	36VA	24W	24W
Power operating mechanism	Shell grade rated current of circuit breaker	2000A	85VA	85VA	85W	85W
		3200A、4000A	110VA	110VA	110W	110W
		6300A	150VA	150VA	150W	150W
Power supply voltage of intelligent controllers			AC220V、AC380V、DC220V、DC110V			
Note: The reliable operating voltage range of the shunt release is 70%~110%, and that of the switching in electromagnet and operating mechanism is 85%~110%						

The under-voltage release performance of a circuit breaker is shown in

table 9

Type		Under-voltage delay release	Under-voltage instantaneous release
Actuation time of the release		Delay in 0.5, 1, 3, 5 and 10s	Instantaneous
Actuation voltage of the release	35%~70%Us	Reliable switching out of the circuit breaker	
	≤35%Us	Circuit breakers cannot be switched in	
	(85~110%)Us	Reliable switching in of the circuit breaker	
In 1/2 of delay time, if the power supply voltage restores to 85%Us		The circuit breaker keeps switching out	——
Note: The accuracy of delay time is ±10%			

Performance of auxiliary contacts

1. The conventional heating current of auxiliary contacts is 6A.
2. The forms of auxiliary contacts: The standard form is the 4-group switching contact, but different combining forms can also be supplied according to users' needs.

Shunt release

The circuit breaker can be switched out by remote operation.

table 10

Rated working voltage Us(V)	AC380	AC220	DC220、110
Actuation voltage (V)	(0.7~1.1)Us		
Instantaneous current (A)	0.7	1.3	1.3
Switching out time	Not greater than 30ms		

Switching in electromagnet

When the energy storage is finished, the switching in electromagnet can instantaneously release the energy storage spring force that operates the mechanism, so that the circuit breaker can be quickly switched in.

table 11

Rated working voltage Us(V)	AC380	AC220	DC220、110
Actuation voltage (V)	(0.85~1.1)Us		
Instantaneous current (A)	0.7	1.3	1.3
Switching out time	Not greater than 70ms		

Energy storage motor

The circuit breaker has motor-driven energy storage and automatic energy storage functions; manual energy storage is also available.

table 12

Rated working voltage Us(V)	AC380	AC220	DC220、110
Actuation voltage (V)	(0.85~1.1)Us		
Instantaneous current (A)	192VA		192W
Switching out time	Not greater than 5s		

Rated values of auxiliary contacts

table 13

Rated voltage (V)		Conventional heating current Ith (A)	Rated control capacity
AC	230	6	300VA
	400		
DC	220		60W

○ Abnormal switching in and out capacity of auxiliary contacts

The switching out capacity of the auxiliary contacts under abnormal operating conditions according to operations

table 14

Category of operation	Switching in			Switching out			Number of switching in and out cycles and operation frequency		
	I/Ie	U/Ue	cosΦ 或T0.95	I/Ie	U/Ue	cosΦ 或T0.95			
AC-15	10	1.1	0.3	10	1.1	0.3	10	6 (or the same with the operating frequency of the main circuit)	0.05
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe			
Note: when Pe≥50W, the ceiling of T0.95 =6Pe≤300ms									

The switching in and out capacity of contacts under normal conditions

table 15

Category of operation	Switching in			Switching out		
	I/Ie	U/Ue	cosΦ 或T0.95	I/Ie	U/Ue	cosΦ 或T0.95
AC-15	10	1	0.3	1	1	0.3
DC-13	1.1	1	6Pe	1	1	6Pe

Key lock at switching out position

The circuit breaker has a "key lock at switching out position" (supplied as ordered). It can lock the circuit breaker at the switching out position. At this moment, neither the switching in button nor the energy release (switching out) electromagnet switch in the circuit breaker.

6 Structure overview

Fixed circuit breakers are mainly composed of contact system, intelligent controller, manual operation mechanism, electric operation mechanism and installation board.

Withdrawable circuit breakers are mainly composed of contact system, intelligent controller, manual operation system, electric operation mechanism and drawer holder.

The circuit breaker adopts the three-dimensional layout, which is featured with compact structure and small volume. The contact system is enclosed in the insulating base, with the contact of each phase separated by insulating plates into small several chambers, while the intelligent controller, manual operation mechanism and electric operation mechanism separated into independent units sequentially in front of the contact system; if one unit is broken down, it can be independently removed and replaced by a new one.

A withdrawable circuit breaker consists of a plug-in circuit breaker and a drawer holder. The guide rails inside the drawer holder can be pulled in and out, and the circuit breaker is inserted on the guide rails for installation and removal, and the main circuit is connected through the connection of the busbar of plug-in circuit breaker with the bridge-type contact of drawer holder.

The withdrawable circuit breaker has 3 working positions: "connection" position, "test" position and "separation" position, and the change among three positions can be realized by screwing in or out the handle. The indications of each position are displayed by the pointer on the crossbeam of the drawer holder base.

When it is in the "connection" position, both the main circuit and the secondary circuit are turned on; when it is in the "test" position, the main circuit is turned off and separated by insulation board, and only the secondary circuit is switched on, making it possible to carry out some necessary action tests; when it is in the "separation" position, both the main circuit and the secondary circuit are turned off. Moreover, the withdrawable circuit breaker has a mechanically interlocking device, meaning the circuit breaker can be turned off only in the "connection" or "test" positions, and cannot be turned off in the positions between the "connection" and "test" positions.

※The interlocking mechanism of circuit breaker (applicable for withdrawable type and fixed type). Users can solely use the interlocking mechanism to conduct the conversion of two or three units; users can also adopt our company's RNQ1 double power automatic switching equipment to realize the automatic switching of double-circuit power supply. Refer to the

product catalog for details.

Lever interlock

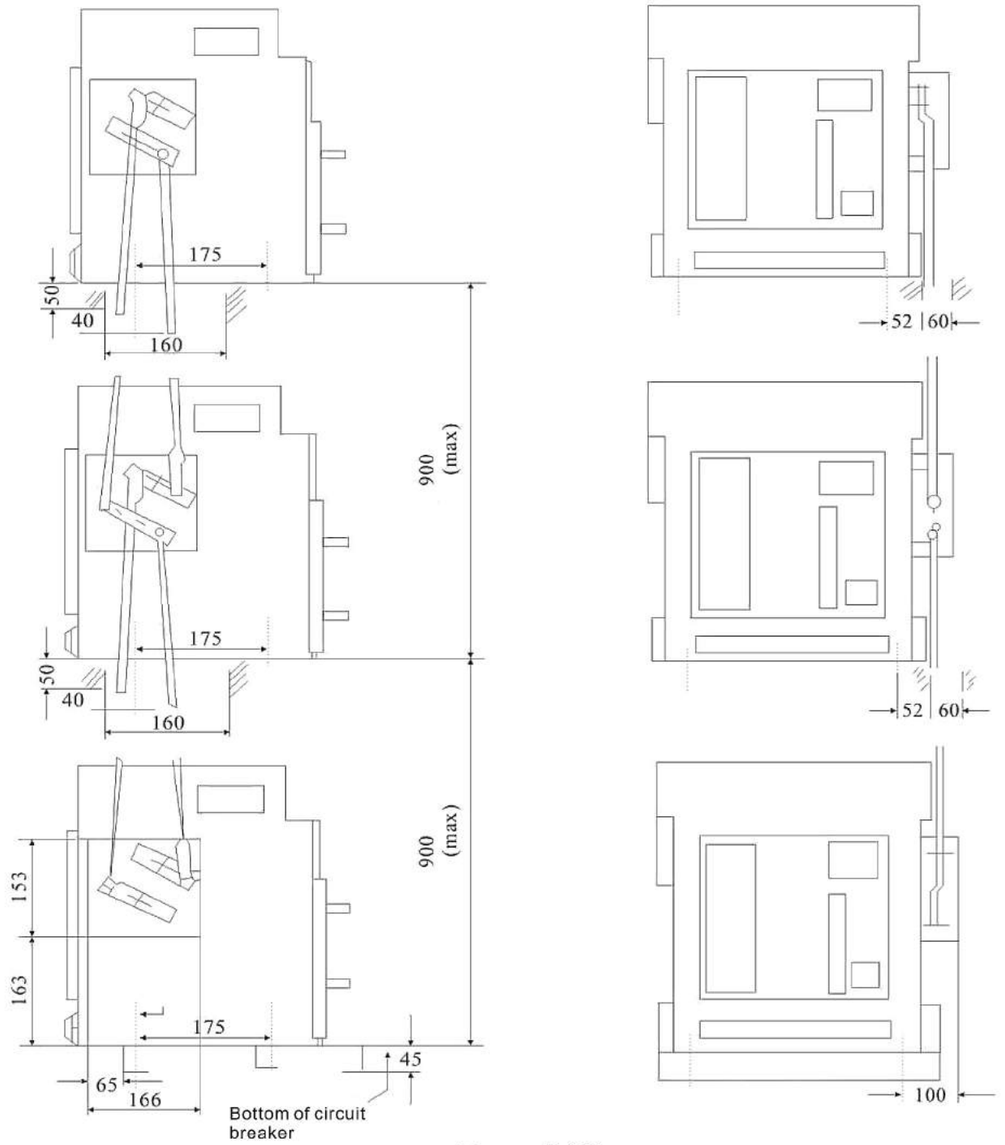


Figure 5 (A)

Three vertically mounted circuit breakers interlocked by the lever. If only 2 circuit breakers are interlocked, just remove the top circuit breaker.

Soft interlock (suitable for horizontal and vertical)

Figure 5 (B)

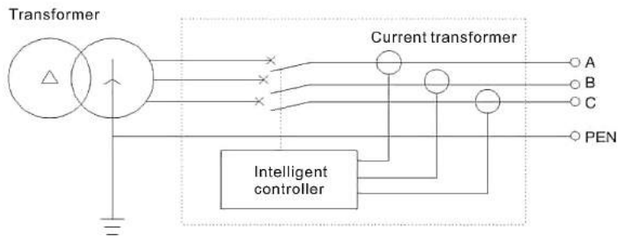
※Note: 1. If the steel wire rope needs to be bended, a transition arc of R≥120mm at the bending position is compulsory to ensure the flexibility of the steel wire rope.

2. Check the steel wire rope and make sure it is well lubricated to ensure its flexibility.

7 Internal Wiring Mode

Protection circuit of grounding fault

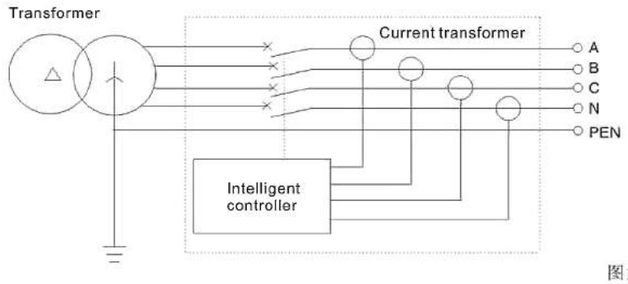
GYDW1 three-pole circuit breaker



3PT-type

Differential grounding fault protection; the signal only takes the vector sum of three-phase currents (three-phase unbalance)

GYDW1 Four-pole circuit breaker

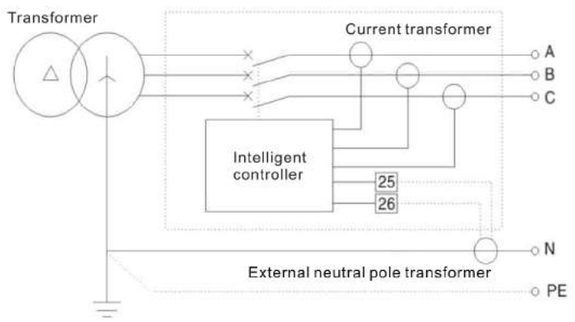


4PT-type

Differential grounding fault protection; the signal only takes the vector sum of three-phase current and N-phase current

图六(A)

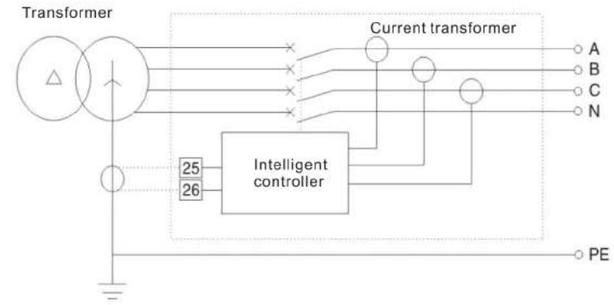
GYDW1 three-pole circuit breaker



(3P+N)T-type

Differential grounding fault protection; the signal only takes the vector sum of three-phase current and N-phase current

GYDW1 Four-pole circuit breaker



(3P+N)W-type

External grounding current transformer Ground current type grounding fault protection; the signal is taken directly between the neutral point of power supply and the ground

Figure 6 (B)

External single phase grounding protection function

The external transformer (neutral pole transformer or current transformer) is supplied to the user as an accessory. Users to install it into the busbar, and connect it cable (2m long) to the secondary wiring terminals #25 and #26 of the circuit breaker.

The center holes (the maximum allowable size through busbar) of the external transformer

Model	Width	Height
GYDW1 -2000 GYDW1-4000/4	61	21
GYDW1-3200 and above (Except GYDW1-4000/4)	87	31

Wiring terminal

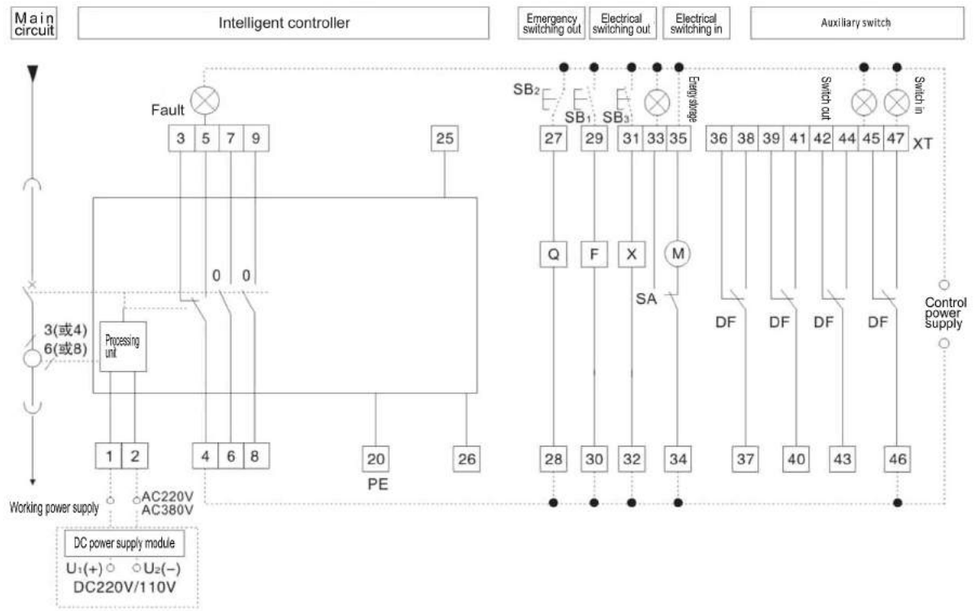
There are 47 wiring terminals in total on the circuit breaker, making it convenient for users' wiring operation; see Figure 7a, 7b and 7c for wiring diagrams

○ Figure 7a (the controller is M-type or L-type with basic functions)

Other wirings of the intelligent controller

#1, #2 Input terminals of operating power

#25, #26 Input terminals of external neutral pole or underground current transformer



□Note:

(1) If the F, X and M have different controlling supply voltages, they should be connected with different power supplies respectively.

(2) The terminal #35 can be directly connected with the power supply (automatically pre-storing energy), and can also be connected with the power supply after connected in serial with normally open button (manually pre-storing energy).

(3) If required by users, the terminals #6~#7 can output the normally closed contacts.

(4) Additional accessories are prepared by users.

(5) When DC power supply is used as the working power supply of the intelligent controller, the conventional configuration adopts a "built-in" (not specified by users) DC power supply module, and terminals #1 and #2 can be directly connected to the DC power supply, but DC power supply must be input through DC power supply modules U1(+) and U2 (-); two output terminals of the DC power supply module are connected to the secondary wiring terminals 1(+) and 2(-), respectively.

SB1 Shunt button (prepared by users), X Switching in electromagnet, DF Auxiliary contact, Q Under-voltage release or under-voltage delay release

SB2 Under-voltage button (prepared by users), M Energy storage motor, F Shunt release, O Normally open contact (3A/AC380V)

Sb3 switching in button (prepared by users), XT Wiring terminal, SA Motor micro-switch / Signal light (prepared by users)

○ Figure 7b (the controller is L-type or M-type with additional functions)

Other wirings of the intelligent controller

Terminals #1 and #2 are the input terminals of AC working current

#12, #13 and #14, #15 and #16, #17 and #18, #19 Four sets of signal contacts, respectively; see Table 17 for the output function.

#20 Protective grounding

#21 N-phase

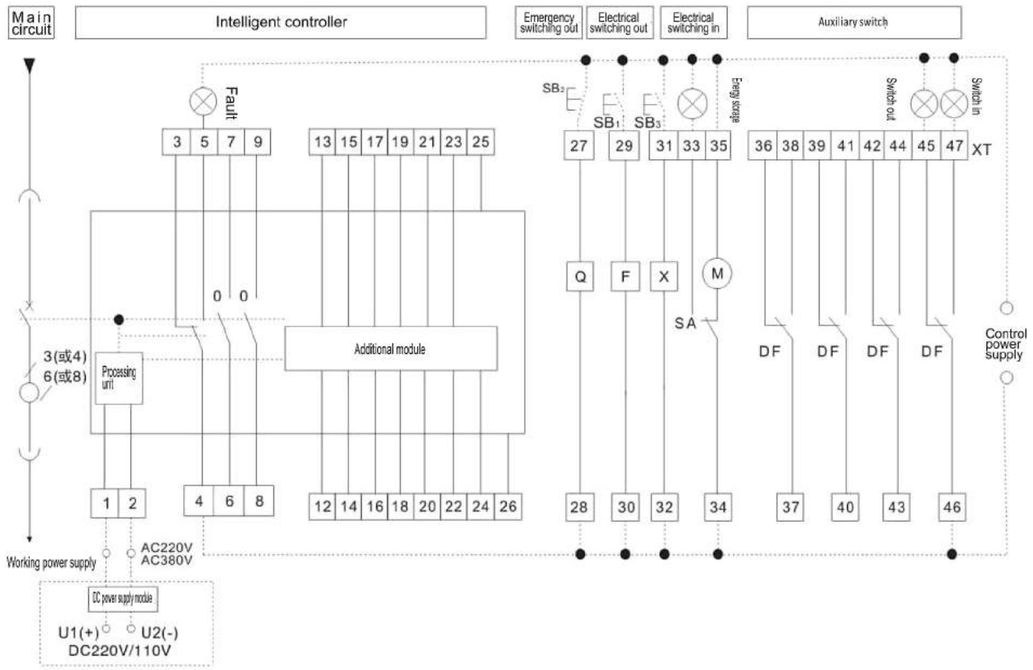
#22 A-phase

#23 B-phase

Voltmeter function voltage input end

#24 C-phase

#25, #26 Input terminals of external neutral pole or underground current transformer



Note:

(1) If the F, X and M have different controlling supply voltages, they should be connected with different power supplies respectively.

(2) The terminal #35 can be directly connected with the power supply (automatically pre-storing energy), and can also be connected with the power supply after connected in serial with normally open button (manually pre-storing energy).

(3) If required by users, the terminals #6~#7 can output the normally closed contacts.

(4) Additional accessories are prepared by users.

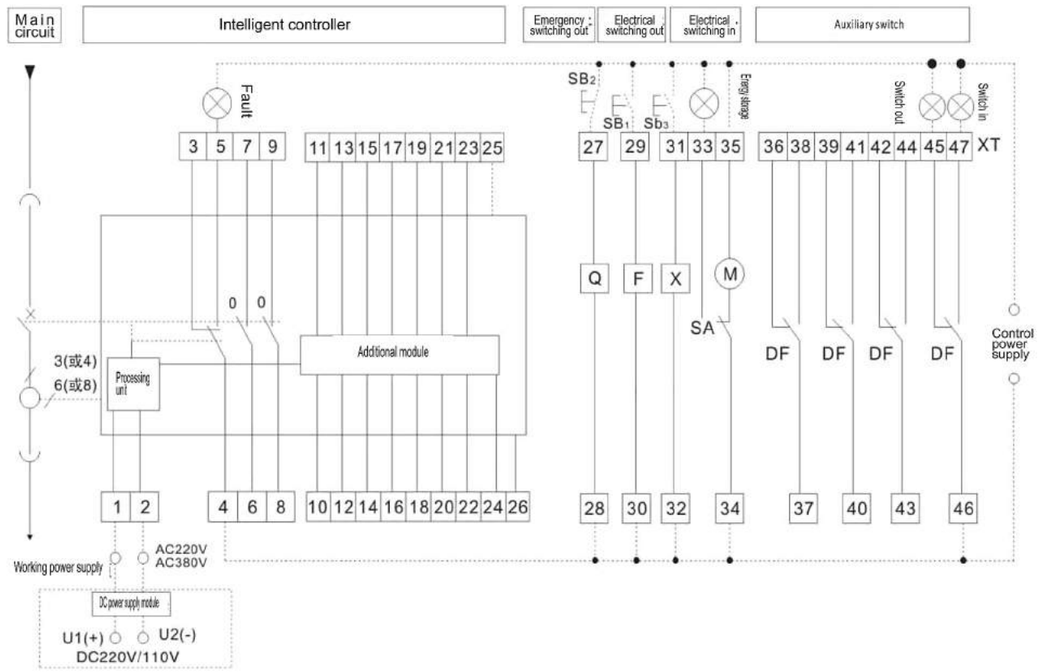
(5) When DC power supply is used as the working power supply of the intelligent controller, the conventional configuration adopts a "built-in" (not specified by users) DC power supply module, and terminals #1 and #2 can be directly connected to the DC power supply. If users adopt "external" DC power supply module, terminals #1 and #2 must not directly connected to the DC power supply which should be input through DC power supply modules U1(+) and U2 (-); the two output terminals of the DC power supply module are connected to the secondary wiring terminals 1(+) and 2(-), respectively.

SB1 Shunt button (prepared by users), X Switching in electromagnet, DF Auxiliary contact, Q Under-voltage release or under-voltage delay release

SB2 Under-voltage button (prepared by users), M Energy storage motor, F Shunt release, O Normally open contact (3A/AC380V)

Sb3 switching in button (prepared by users), XT Wiring terminal, SA Motor micro-switch / Signal light (prepared by users)

○ Figure 7c (the controller is H-type)



Other wirings of the intelligent controller

Terminals #1 and #2 are the input terminals of AC working current

#10, #11 A and B ends of RS485 communication interface lead-out wire

#12, #13 and #14, #15 and #16, #17 and #18, #19 Four sets of signal contacts, respectively; see Table 17 for the factory default states of output functions.

#20 Protective grounding

#21 N-phase

#22 A-phase

#23 B-phase

#24 C-phase

#25, #26 Input terminals of external neutral pole or underground current transformer

※Note:

(1) If the F, X and M have different controlling supply voltages, they should be connected with different power supplies respectively.

(2) The terminal #35 can be directly connected with the power supply (automatically pre-storing energy), and can also be connected with the power supply after connected in serial with normally open button (manually pre-storing energy).

(3) If required by users, the terminals #6~#7 can output the normally closed contacts.

(4) Additional accessories are prepared by users.

(5) When DC power supply is used as the working power supply of the intelligent controller, the conventional configuration adopts a "built-in" (not specified by users) DC power supply module, and terminals #1 and #2 can be directly connected to the DC power supply. If users adopt "external" DC power supply module, terminals #1 and #2 must not directly connected to the DC power supply which should be input through DC power supply modules U1(+) and U2 (-); the two output terminals of the DC power supply module are connected to the secondary wiring terminals 1(+) and 2(-), respectively.

SB1 Shunt button (prepared by users), X Switching in electromagnet, DF Auxiliary contact, Q Under-voltage release or under-voltage delay release

SB2 Under-voltage button (prepared by users), M Energy storage motor, F Shunt release, O Normally open contact (3A/AC380V)

Sb3 switching in button (prepared by users), XT Wiring terminal, SA Motor micro-switch / Signal light (prepared by users)

See Table 17 for the factory default states of output functions of the controller's 4 sets of signal contacts

Contact No. / Controller type	Contact 1 (12, 13)	Contacts (14, 15)	Contact 3 (16, 17)	Contact 4 (18, 19)
L and M types	Overload pre-alarm	Grounding fault Release or alarm	Self-diagnostic fault alarm	Fault tripping
H-type	Load monitor 1 unloading output	Load monitor 2 unloading output	Remote control switching out	Remote control switching in

Note: The contacts No.3 and 4 of H-type controller are exclusively used for remote control switching in and out, and cannot be tuned for other functions.

8 Installation and overall dimensions

Installation dimensions and overall dimensions of fixed circuit breakers

See Figure 8 for the installation dimensions and overall dimensions of (GYDW1-2000, 2000/4) fixed circuit breakers

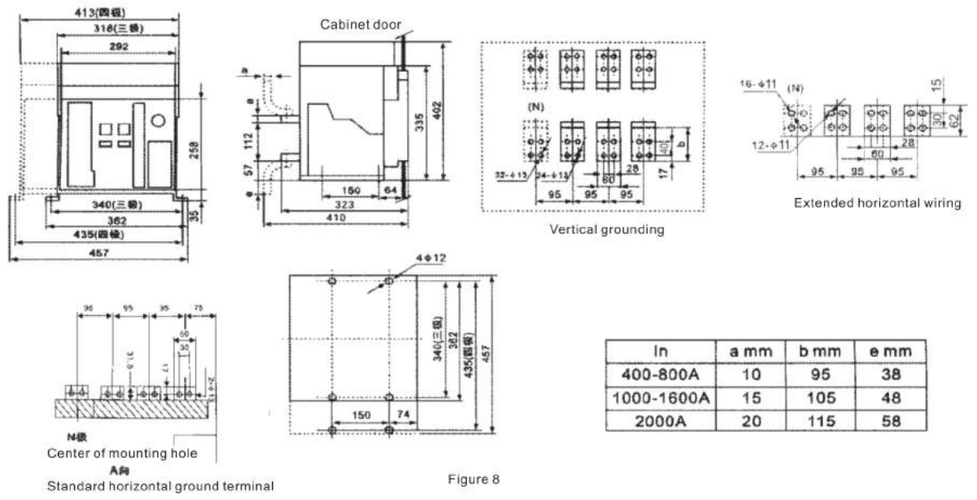


Figure 8

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

See Figure 9 for the installation dimensions and overall dimensions of (GYDW1-3200, 3200/4) fixed circuit breakers

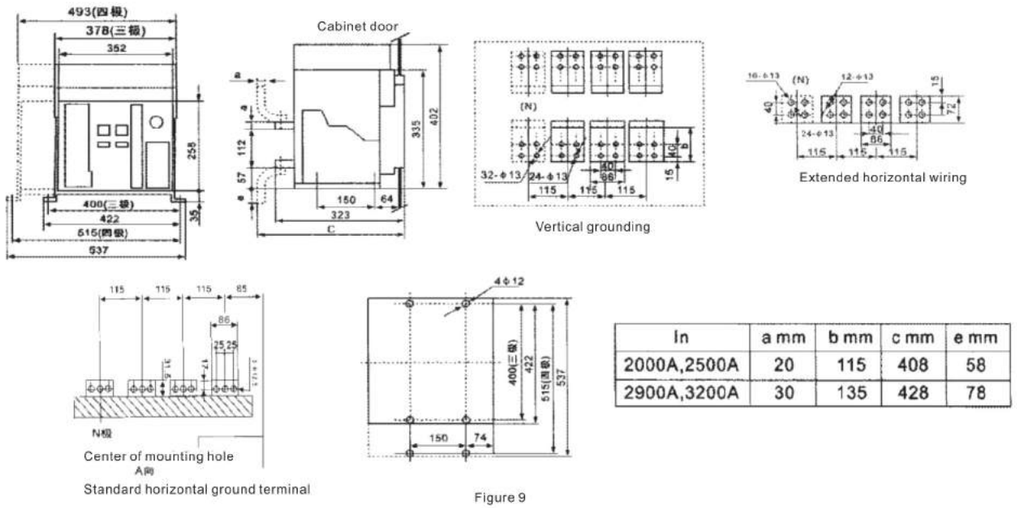
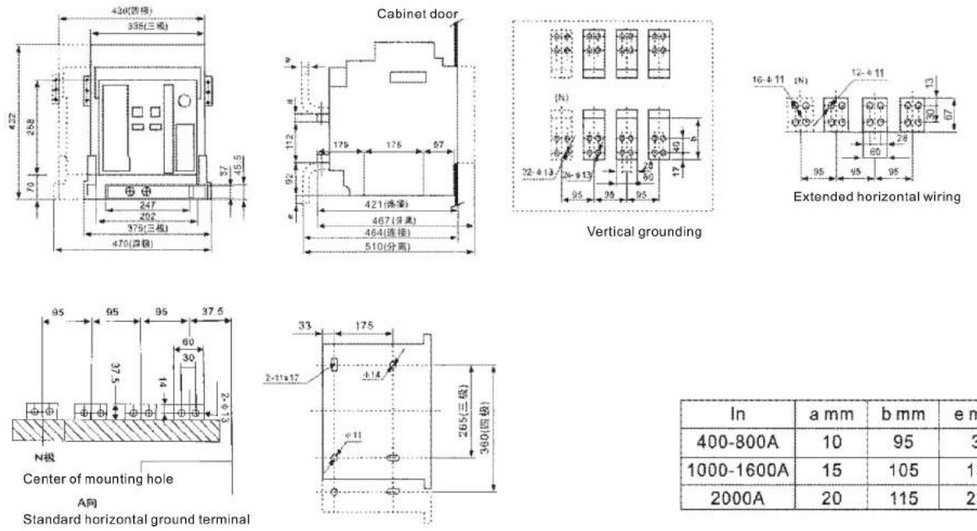


Figure 9

In	a mm	b mm	c mm	e mm
2000A,2500A	20	115	408	58
2900A,3200A	30	135	428	78

Installation dimensions and overall dimensions of withdrawable circuit breakers

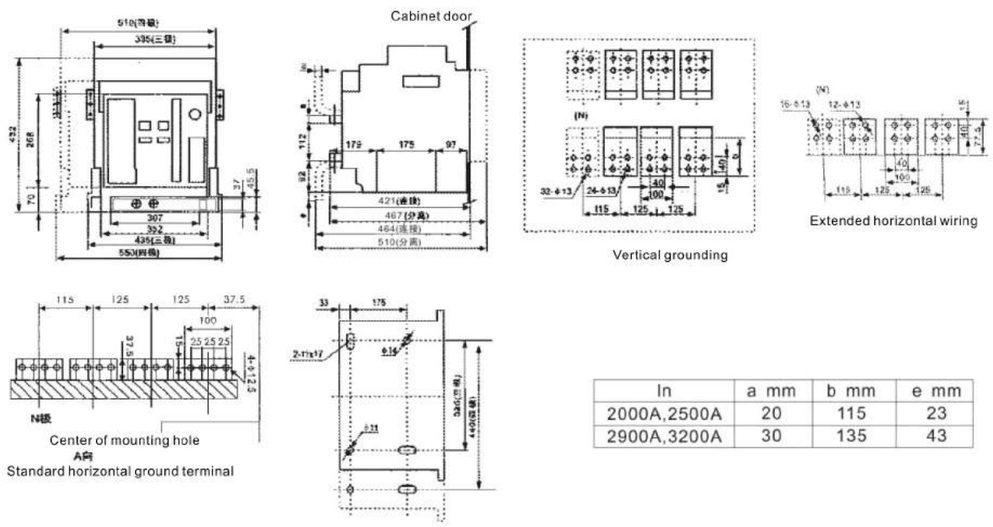
See Figure 10 for the installation dimensions and overall dimensions of (GYDW1-2000, 2000/4) withdrawable circuit breakers



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

Figure 10

See Figure 11 for the installation dimensions and overall dimensions of (GYDW1-3200, 3200/4) withdrawable circuit breakers



In	a mm	b mm	e mm
2000A,2500A	20	115	23
2900A,3200A	30	135	43

Figure 11

See Figure 12 for the installation dimensions and overall dimensions of (GYDW1-4000) withdrawable circuit breakers

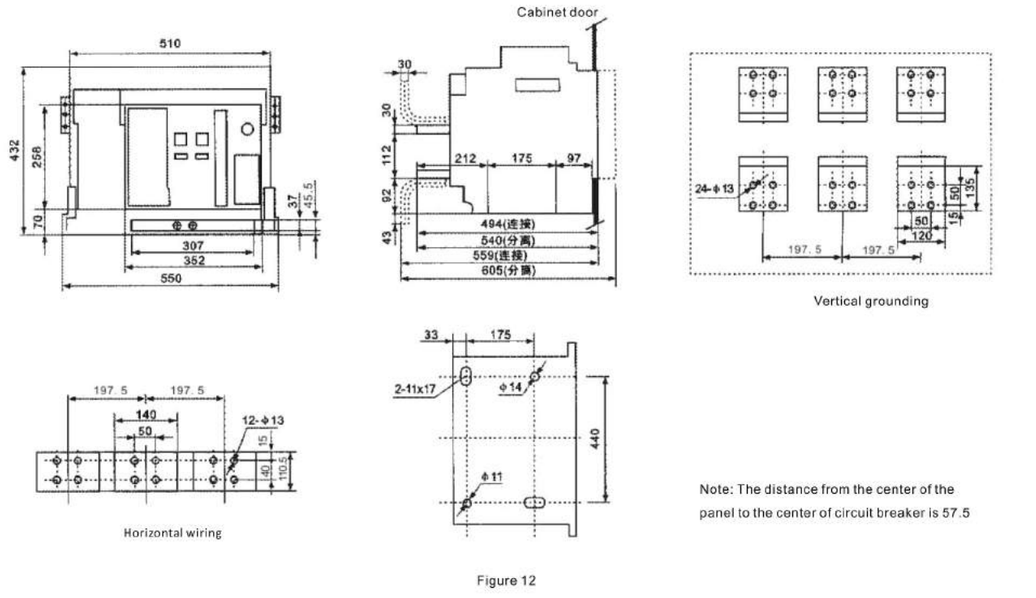
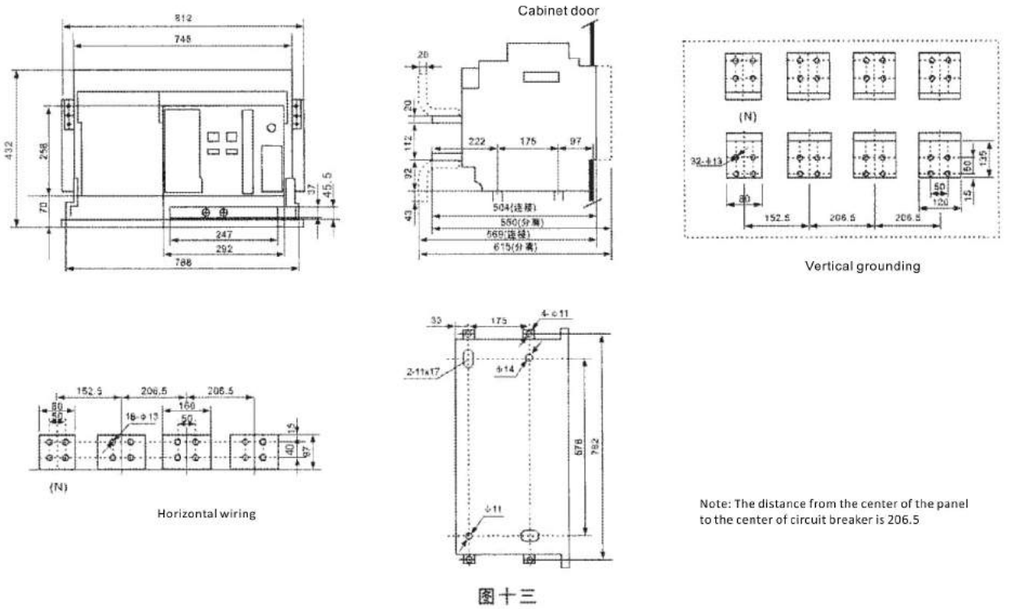


Figure 12

See Figure 13 for the installation dimensions and overall dimensions of (GYDW1-4000/4) withdrawable circuit breakers



图十三

See Figure 14 for the installation dimensions and overall dimensions of (GYDW1-4000) fixed circuit breakers

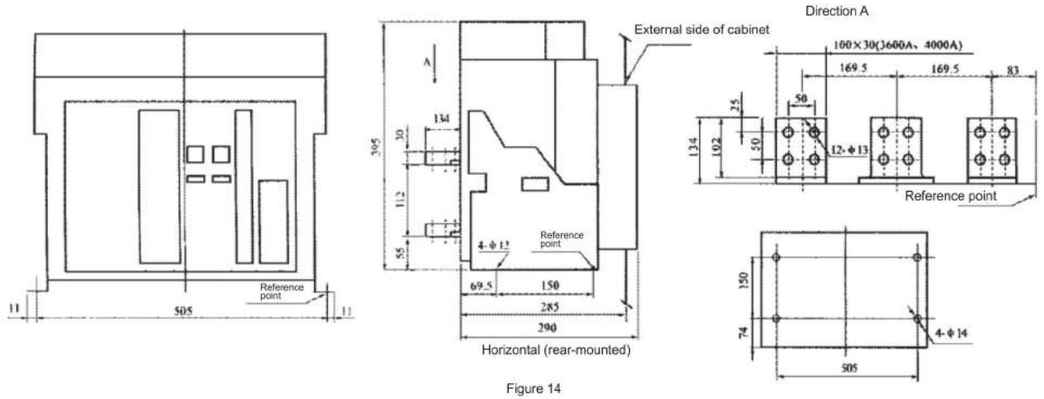


Figure 14

See Figure 15 for the installation dimensions and overall dimensions of (GYDW1-4000/4) fixed circuit breakers

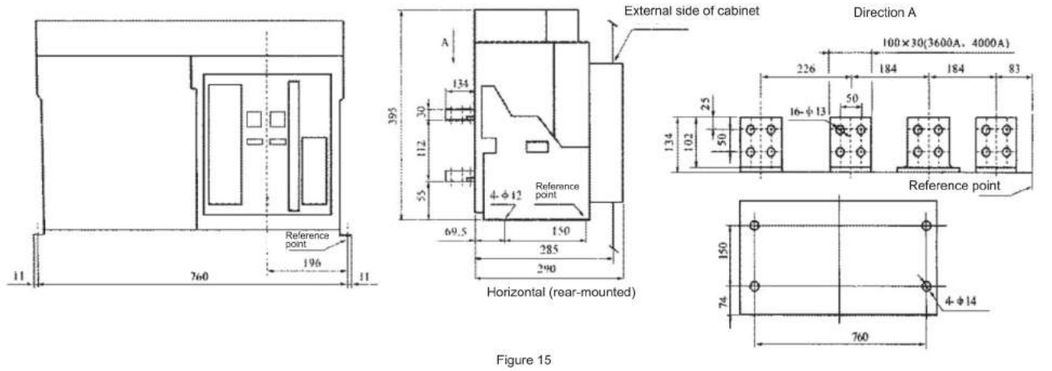


Figure 15

See Figure 16 for the installation dimensions and overall dimensions of (GYDW1-5000) fixed circuit breakers

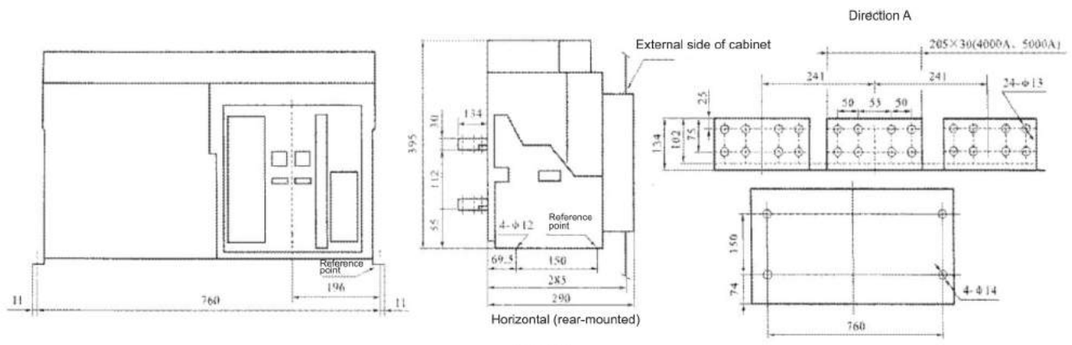


Figure 16

See Figure 17 for the installation dimensions and overall dimensions of (GYDW1-6300, 6300/4, In=4000, 5000) withdrawable circuit breakers

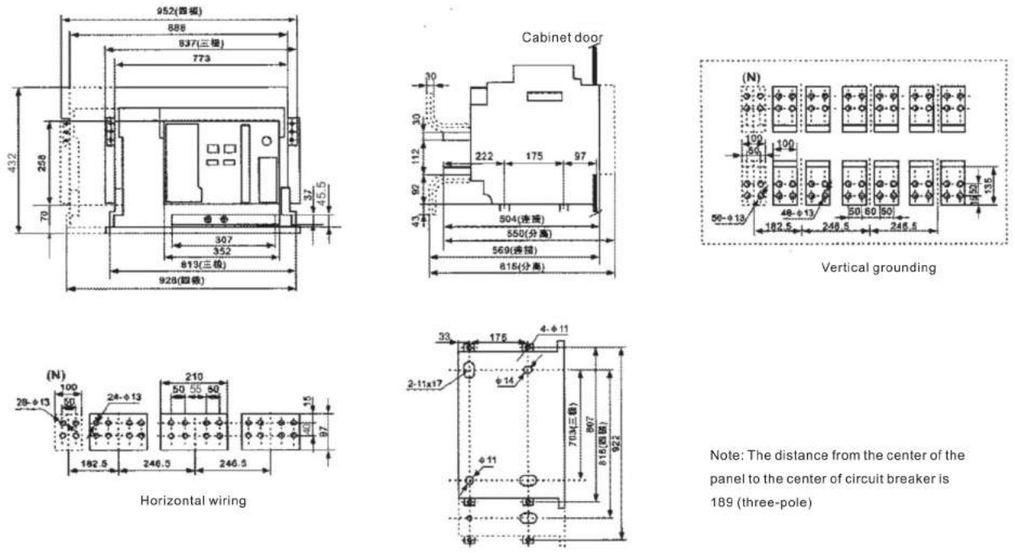


Figure 17

Note: The distance from the center of the panel to the center of circuit breaker is 189 (three-pole)

See Figure 18 for the installation dimensions and overall dimensions of (GYDW1-6300, In=6300A) withdrawable circuit breakers

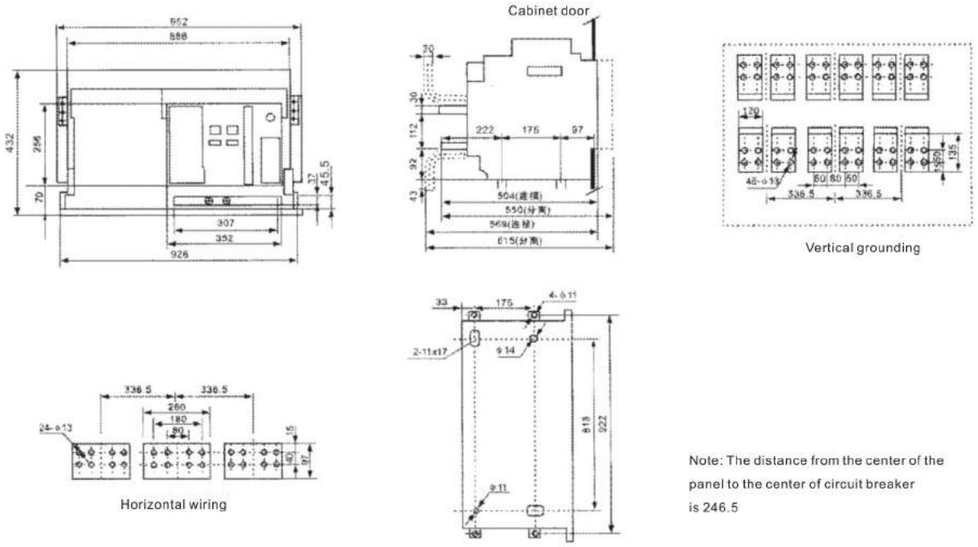
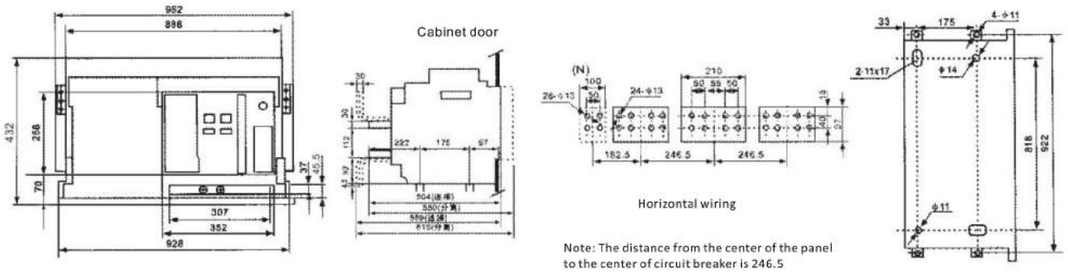


Figure 18

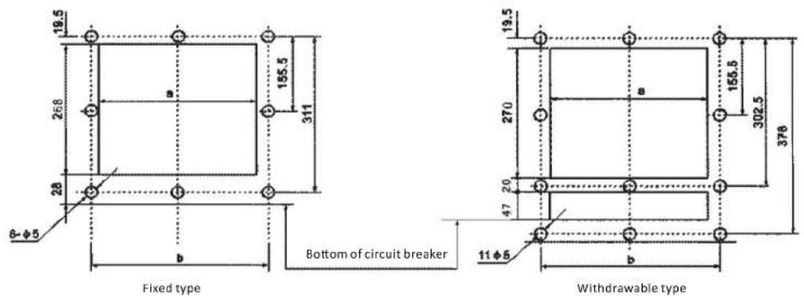
Note: The distance from the center of the panel to the center of circuit breaker is 246.5

See Figure 19 for the installation dimensions and overall dimensions of (GYDW1-6300/4, In=6300A) withdrawable circuit breakers



Rated current	External copper busbar specifications	Pieces per pole	Rated current	External copper busbar specifications	Pieces 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	80×6	2	5000A	120×10	5
2000A	80×8	2	6300A	120×10	6
2500A	100×10	2			

9 Dimensions and mounting holes spacing of door frame



Inm	a mm	b mm
2000	302	345
3200、4000/3	362	405
4000/4	302	345
6300	362	405

10 Installation, operation and maintenance

Installation

1. Before installation, check whether the specification of the circuit breaker meets relevant requirements.

2. Before installation, check the insulation resistance of the circuit breaker with a 500V megohmmeter, and the resistance shall not be less than 10MΩ when the temperature of the surrounding medium is 20±5℃ and the relative temperature is 50%~70%. Otherwise, the surrounding medium should be dried until the insulation resistance reaches the requirement.

3. During the installation of circuit breaker, its base shall be in horizontal position and fixed with M10 screws.

4. During installation, the circuit breaker should be reliably grounded for protection, and the grounding position should have an obvious mark .

5. Either upper or lower incoming feeder is adopted, its technical performance remains unchanged.

6. After the installation and wiring according to relevant wiring diagrams, the following operations and tests should be carried out before the main circuit is energized (the pointer on the drawer holder of the withdrawable circuit breaker is at the "test" position).

1) Check the under-voltage, shunt release and energy releasing (switching in) electromagnet and the voltage of electrically operated mechanism meet relevant requirements (before the circuit breaker switching in, the under-voltage release must be energized).

2) Pull the handle on the shell up and down for 7 times, then the panel displays "storing energy", and after hearing a "click" sound, the energy storage is finished; press "I" button or energy release (switching in) electromagnet, and the circuit breaker is reliably switched in (in case of the controller reset button is reliably reset); pulling the handle can store energy again.

3) Turn on the motor and the panel displays "storing energy", and after hearing "click" sound, the energy storage is finished, then the motor is automatically turned off; press the "I" button or energy release (switching in) electromagnet, and the circuit breaker is reliably switched in.

4) After switching in the circuit breaker, whatever the under-voltage, shunt release or "O" button, or the release tests of the intelligent controller shall be able to switch out the circuit breaker.

O Applications of intelligent controllers

Controller setting

Long delay current setting of the controller: After pressing the "clearing light" button, hold pressing the "setting" button until the long delay indicator light becomes bright and the panel displays factory long delay current setting value, which is generally In; current setting range is (0.4~1.0)In, and press the "+" and "-" buttons to adjust the current close to required value; each time you press the button, the current changes with an interval of <2%. Then press the "storage" button and the storage indicator light blinks once, indicating the long delay current setting value has been stored.

Long delay time setting: After setting the long delay current, press the "setting" button once more and the long delay state indicator light becomes bright and the panel displays the factory long delay setting; pressing the "+" button once doubles the time, while pressing the "-" button once reduces the time by half; after adjusting the time to required value, press the "storage" button once, then the storage indicator light blinks once, indicating the long delay setting being finished. The setting and of load monitoring, short delay, instantaneous, grounding and other protection action values and action time can be achieved by the above-mentioned methods, only with different indication states. If the grounding time is set in the "OFF" position, it indicates a fault state, and grounding fault only alarms rather than releasing; if instantaneous setting is in the "OFF" position, it indicates cancelling the protection; during setting process, if there is any fault signal, the controller automatically lock other functions and enter the fault handling state.

The setting values of various protection parameters should not be intersected. The protection priority of the controller is as follows: Long delay < short delay< instantaneous. For re-switching in, the setting value of ILc2 is smaller than that of ILc1, and after setting all the parameters of the controller, press again the "clear light" button or reset the controller by re-connecting the power supply, so as to keep the controller in running state.

Controller test

After setting the parameters of the controller and before operating the circuit breaker, users can check various protective functions of the controller according to their requirements; the controller tests have the option of release/un-release, and pressing the "release" button will switch out the circuit breaker, and pressing the "un-release" will not send the releasing signal, therefore, the circuit breaker will not be switched out. (L-type circuit breaker only has releasing test. Press the "test" button for one time, and the controller generates an instantaneous signal to switch out the circuit breaker).

Overload test: Press the "setting" button to enter the long delay state, then check the overload setting value and then other current states; press the "+" and "-" buttons to set the current to >1.3Ir1, then press the "test" button to enter the overload test state, and the controller actuates with time delay in inverse time-lag, and indicates the fault type and test state. Other characteristic tests are carried out in similar procedures; after tests, press the "clear light" button to enter normal running state, and meanwhile the mechanical "reset" button must be pressed at the same time, then the circuit breaker can be switched in.

Other operating rules of the controller

When the controller is in setting and checking states, if no button is pressed within 1 minute, the controller will automatically clear the buttons and enter the running state; at the same time, if there is any fault, the controller will automatically block other functions and enter the fault handling state.

1. Check setting

After the controller "clearing the lights", if there is no fault, continuously pressing the "setting" button can circularly indicate various states and corresponding setting current and time values. After checking, press the "clearing light" button (if no button is pressed within 1 minute, controller will automatically enters the normal running state).

2. Check power grid operating current and voltage

After the controller "clearing lights", if there is no fault, continuously press the " select 1" ("select") button to circularly indicate the operating currents of each phase as well as the grounding current value, and the current of the max. phase is normally displayed; continuously press the "select 2" button to circularly indicate the voltages of each circuit, and the voltage of the max. circuit is normally displayed.

After the controller "clearing the lights", press the "fault check" button to display the state and current of the fault happened last time, and after test or fault releasing, press the "select 1" ("select") button can circularly display test or fault current or time values. The test state is not stored.

3. Resetting

Before switching the circuit breaker, the "clear light" button of the controller must be pressed at first to make the controller entering normal running state, and press the mechanical "resetting" button, then the circuit breaker can be switched in.

If users have any specific requirement based on Table 4, Table 5 and Table 6, they can put forward the requirements in their orders, and corresponding parameters will be set according to the orders before delivery.

If there is specific requirement in users' orders, parameters of the controller will be set to default values, as shown in Table 18.

Load monitoring	Long delay protection	Short delay	Instantaneous protection	Grounding protection
IC1=In	Ir1=In	Ir2=8Ir1	Ir3=10In(L型) Ir3=12Ir1(M、H型)	Inm=2000A(0.4In) Inm=3200~4000A(0.2In) Inm=6300A(0.4In)
IC2=In	t_L=60s(L、M型) t_L=26.66s(H型)	t_S=0.4s	——	t_G=OFF
Note: The protection long delay setting value of the motor is 1.25In, and constant time-lag short delay protection is turned off.				

During operation, users need to change the factory setting value. After fully understanding the product, customers are allowed to set up the controller by themselves according to Table 4.

○ The panel layout of M-type (standard type) intelligent controller is as shown in Figure 20

1- Resetting button. After releasing, it is necessary to press the resetting button before again switching in the circuit breaker.

2- Current and time display, it displays current or time values.

3- "Select" button. In the normal running state, pressing it can display the currents in various phases; in the fault state or fault checking state, pressing it can display fault current or time values.

4-LED light indication. It can indicate various states and types.

5- "Clear light" button. This button must be pressed after controller setting and fault testing or before switching in the circuit breaker, so as to make sure the release is in normal operating state.

6- "Setting" button. This button is used to check or set various protection characteristic current or time values. Press this button can circularly indicate various states.

7- "Fault check" button. After the controller "clearing lights", pressing this button can display and indicate the state, current and time values of the fault happened last time. The fault current or time is circularly checked by pressing the "select" button.

8- "Display check" button.

9- "Release" and "Un-release" buttons. The two buttons are used in simulation tests.

10- "Storage", "+" and "-" buttons. Used for setting current and time.

Ir4- Grounding protection current setting value.

Ir1- Long delay current setting value.

Ir2- Short delay current setting value.

Ir3- Instantaneous current setting value.

tG- Grounding protection time setting value.

tL- Long delay time setting value.

tS- Short delay time setting value.

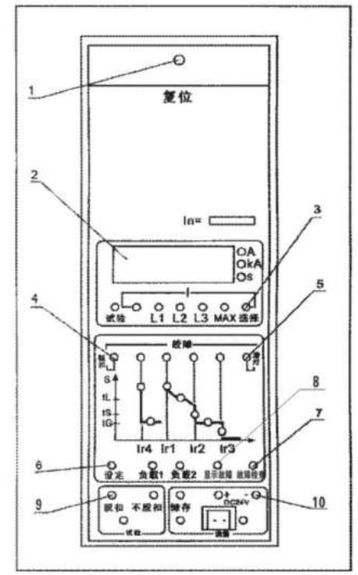


Figure 20

○ The panel layout of H-type (communication type) intelligent controller is as shown in Figure 21

1- Resetting button, 2- Voltage display, 3- Power and voltage unit, 4- Parameter display screen, 5- Three-phase current display
6- Circuit breaker switching out times, 7- Unbalance rate, 8- Current and time, 9- Grounding current and time indication
10- Long delay current and time indication, 11- Short delay current and time indication, 12- Instantaneous current indication
13- Self-diagnostic fault indication, 14- Fault release indication, 15- Fault alarm indication, 16- Setting value storage indication
17- Confirm button, 18- Return key, 19- Communication signal sending and receiving indication, 20- state and authority position lock
21- Status function select button, 22- Function up-turning and setting value ascending button, 23- Function down-turning and setting value descending button
24- Current and time setting states indication, 25- Fault inquiry state indication, 26- Test state indication
27- Load 1 current and time indication, 28- Load 2 current and time indication, 29- N-phase indication, 30- Unbalance rate and time indication

Figure 21

Basic functions:

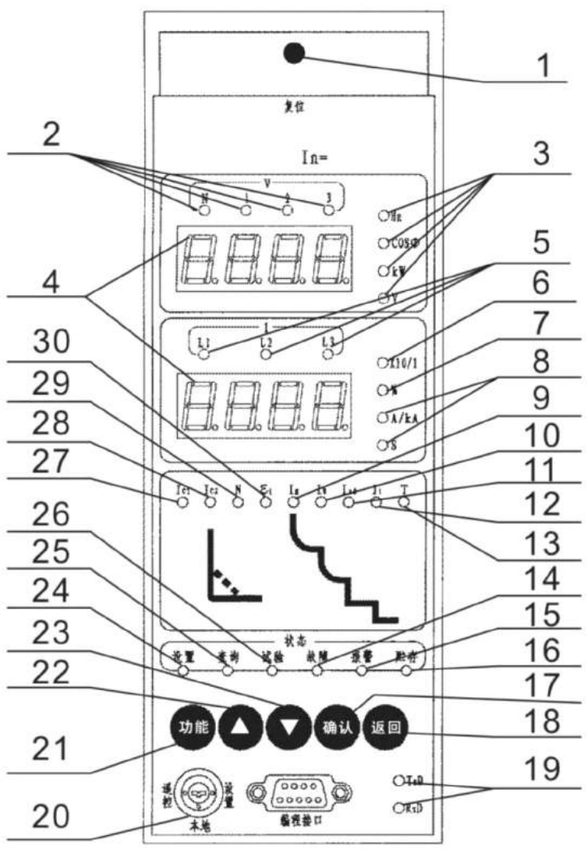
1. Overload long delay, short-circuit short delay, and short-circuit instantaneous protection
2. Grounding fault protection
3. Load monitoring protection
4. Various states indications and value display
5. Ammeter function
6. Voltmeter function
7. Fault memory function
8. Thermal memory function
9. Test function
10. RS485 serial interface

Optional functions

1) MCR switching in and out [MCR switching in and out protection, only working at the switching in moment (within about 100ms) of the circuit breaker].

2. Alarm or fault state indications. Among the 4 sets of remote output signal units, the first and the second sets can output according to users' needs, and the third set of signals are remote control switching in signals, and the fourth set of signals are remote control switching out signals.

Figure 21



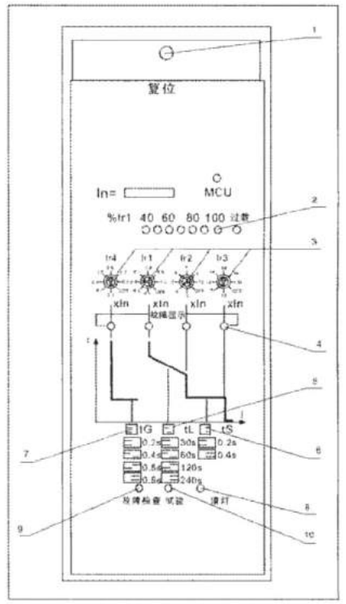
○ The panel layout of L-type (economic type) intelligent controller is as shown in Figure 21

1- Resetting button. After the circuit breaker fault and the test releasing, the circuit breaker can be switched in again only after pressing this button.
2. Load display. It displays overload long delay current.
3. The setting knob for long delay, short delay, instantaneous and grounding protection currents. Each protection current can be set according to the scale value on the knob.
4. Fault indicator light. It indicates the fault type.
5. Long delay overload protection time setting button. Toggle the switch position to adjust time.
6. Short delay protection time setting button. Toggle the switch position to adjust time.
7. Grounding fault protection time setting value. Toggle the switch position to adjust time.
8. Clear light button. After controller setting, testing and fault, this button must be pressed to make the controller entering normal operating state.
9. Fault check button. After the circuit breaker switching out due to faults, pressing this button can indicate the cause of fault tripping. The circuit breaker has a fault memory function even in case of power failures.
10. Test button. Pressing this button can check the cooperating conditions of the controller and the circuit breaker.

○ The setting method of L-type circuit breaker

1. Long delay setting
1) Rotate Ir1 switch to set the current from (0.4~1)In.
2) Toggling the "tL" button can set the time to 30s, 60s, 120s and 240s.
3) If the Ir1 switch is rotated to the OFF position, it indicates exiting this function.
2. Short delay setting
1) Rotate Ir2 switch to set the current from (3~10)In.
2) Toggling the "tS" button can set the current to 0.2s and 0.4s.
3) If the Ir2 switch is rotated to the OFF position, it indicates exiting this function.
3. Instantaneous current setting
1) Rotate Ir3 switch to set the current from (10~20)In or (7~14)In.
2) If the Ir3 switch is rotated to the OFF position, it indicates exiting this function.
4. Grounding fault protection setting
1) Rotate Ir4 switch to set the current from (0.2~0.8)In.
2) Toggling the "tG" button can adjust the current to 0.2s, 0.4s, 0.6s and 0.8s.
3) If the Ir4 switch is rotated to the OFF position, it indicates exiting this function.
5. The controller enters the operating state. After setting all parameters of the controller, it is necessary to press the "clear light" button.

Figure 22



Common faults and solving measure

No.	Description of fault	Causes	Solving methods
1	Circuit breakers cannot be switched in	Under-voltage release is not energized, without supply voltage. After the controller actuating, the red button on the upper panel of the controller panel is not reset. The operating mechanism has not stored energy. The withdrawable body has not been put in the "connecting" or "testing" position The "switching out position key lock" is in switching out state	Check the circuit and switch in the under-voltage release current. Pressing the resetting button Manually or electrically store energy in the mechanism Move the circuit breaker to the "connecting" or "testing" position by rotating the handle Switch in the key lock with a special key
2	The circuit breaker cannot store energy electrically	The power supply of electrically operated mechanism is not connected Insufficient power capacity	Check the circuit and switch on the power supply Check the operating voltage which should be greater than 85%Us
3	Closing the electromagnet does not switch in the circuit breaker	No supply voltage Insufficient power capacity The normally closed auxiliary contact is obstructed	Check the circuit and switch on the power supply Check the operating voltage which should be greater than 85%Us Check the states of contacts or adjust the auxiliary over position
4	The shunt release cannot switch out the circuit breaker	No supply voltage Insufficient power capacity After switching in, the auxiliary contact is not connected	Check the circuit and switch on the power supply Check the operating voltage which should be greater than 70%Us Check the states of contacts or adjust the auxiliary over position
5	Fault currents exceed long delay, short delay and instantaneous setting values and there are only instantaneous actions; no short delay and long delay actions.	The settings of long delay, short delay and instantaneous values are not proper, as they are set within the same current range.	Following the principle of Ir1<Ir2<Ir3 and considering the range of actions, reset the current values
6	Frequent tripping of the circuit breaker	Overload operation triggers overload protection tripping, and the circuit breaker is switched in again due to the overload thermal memory function fails to clear the fault by re-connecting the power supply in time.	Re-connect the power supply of the controller, or re-switch in the circuit breaker in 30min
7	The handle of withdrawable circuit breaker cannot be inserted into the circuit breaker	The withdrawable guide rail or circuit breaker body has not been completely pushed inside	Push the guide rail or circuit breaker body to the bottom
8	At the switching out position, the body of withdrawable circuit breaker cannot be pulled out from the holder	The handle has not been pulled out The circuit breaker does not completely reach the "separation" position	Pull out the swing handle Swing the handle to move the circuit breaker completely to the "separation" position

11 Specifications of ordering

(please mark □ in the □, or fill in numbers)

Order unit		Order quantity		Order date	

Model

□ GYDW1-2000[I frame] □ Fixed type □ Class III Nominal voltage Ue □ AC400V □ AC690V
□ GYDW1-3200[II frame] □ Withdrawable □ Class IV Rated current In= A
□ GYDW1-6300[III frame]
□ GYDW1-4000/3[II frame capacity expanding type]
□ GYDW1-4000/4[I frame 3+4]

Intelligent controller	Model "F" means generator protection		Basic functions		Additional functions or accessories can be added
	L-type	□L2	Long delay, instantaneous (3~10) In	1. Light beam indication of load 2. MCU operation monitoring 3. Fault state indication 4. Fault memory 5. Instantaneous actuation test function	□ MCR switch in and off, and analog releasing □ Pre-alarm, self-diagnosis, signal unit for OCR release alarm
		□L3	Long delay, short delay (3~10)In Instantaneous (10~20) In		
		□L4	Long delay, short delay (3~10)In Instantaneous (10~20) In, single phase grounding fault protection		
	M-type	□M	Long delay, short delay, instantaneous, single phase grounding fault protection	1. Various states indications and value display 2. Ammeter 3. Fault memory 4. Thermal memory 5. Test	□ Load monitoring □Method 1 □ Method 2 □Voltmeter □MCR switch in and off, and analog releasing □Pre-alarm, self-diagnosis, signal unit for OCR release alarm
		□M/F	Long delay, short delay, instantaneous, pre-alarm		
	H-type	□H	1. Long delay, short delay, instantaneous and load monitoring 2. Single phase grounding fault protection 3. Various states indications and value display 4. Ammeter 5. Voltmeter 6. Fault memory 7. Thermal memory 8. Test 9. RS485 serial interface 10. Alarm fault state		□MCR switch in and off, and analog releasing □RS485/232 converter □DP module
		□H/F			
	Power supply of intelligent controllers		□AC220V □AC380V □DC110V □DC220V		
附件			□AC220V □AC230V □AC380V □AC400V		
			□Under-voltage instantaneous release □Under-voltage delay release □0.5s □1s □3s □5s □10s		
	□Shunt release		□AC220V □AC380V □DC110V □DC220V		
	□Switching in electromagnet		□AC220V □AC380V □DC110V □DC220V		
	□Motor operating mechanism		□AC220V □AC380V □DC110V □DC220V		
	□Mechanism interlocking		□Horizontal interlocking (soft interlock) □Vertical interlocking (lever interlock) □door interlock (key lock)		
	□Key lock at switching out position		□lock □key (please fill in the number)		
	□Door frame				
	□External single-phase grounding transformer		□Difference value type (3P+N) T □Underground current type (3P+N)W		
	□External power supply module		Input □~220V □~380V □-110V □-220V PUT □~24V □-24V		
	Main circuit connection		□Horizontal connection (conventional supply) □vertical connection		

Note:
1.If users selected additional functions or accessories for the controller, additional cost will be needed;
2. The long delay setting value of L-type controller is 10% decrement of In;
3. When users select H-type controllers, please indicate applied communication protocols (1. Proprietary communication protocol; 2. DP protocol; 3. Modbus)